HRS DOCUMENTATION RECORD COVER SHEET

Name of Site: Lusher Street Ground Water Contamination
EPA ID No. IND982073785

Contact Persons

Site Investigation:
Mark Jaworski
Indiana Department of Environmental Management (IDEM)
Indianapolis, IN
(317)233-2407

Documentation Record:
Mark Jaworski
Indiana Department of Environmental Management (IDEM)
Indianapolis, IN
(317)233-2407

Laura Ripley
U.S. Environmental Protection Agency
Chicago, IL
(312)886-6040

Pathways, Components, or Threats Not Scored

The presence of volatile organic compounds (VOCs) (detected above maximum contaminant levels (MCLs)) found in the drinking water of private residential and commercial ground water wells is the primary concern for the ground water pathway. The surface water, air, and soil exposure pathways were not scored because there are insufficient data to evaluate these pathway scores.

Surface Water Migration Pathway

The most prominent surface water feature potentially subject to contamination in this area is the St. Joseph River which is located to the north of the known ground water contamination. There are no identified drinking water intakes along the possible 15-mile target distance limit. Currently there are no state fish advisories posted for the VOCs that were detected during the inspection of this site.

Air Migration Pathway

There are insufficient data to establish an observed release of VOCs to the air. Without an observed release, only the potential to release may be evaluated for this pathway, and this would minimally impact the overall site score.

Soil Exposure Pathway

There are insufficient data to establish an observed release of VOCs to the soil. No stressed vegetation or areas devoid of vegetation, which would indicate a soil exposure threat, were observed.

HRS DOCUMENTATION RECORD

Name of Site: Lusher Street Ground Water Contamination Date Prepared: September 2007

EPA Region: 5

Street Address of Site:* In the vicinity of 1619 Avalon Street

City, County, State, ZIP: Elkhart, Elkhart County, Indiana 46516 and 46517

General Location in the State: North Central Indiana in Elkhart County in the southwest sector of Elkhart, Indiana. The contaminated ground water is centered at 1619 Avalon Street, the residence with the highest concentration of trichloroethylene. (Refs. 13; 14, pp. 4-6 of this documentation record)

Topographic Map: Elkhart, IN and Osceola, IN

Latitude: 41° 40' 22.52" North Longitude: 85° 59' 46.41" West

References: 13; 14; pages 4-6 of this documentation record

The coordinates above define where the highest concentration of trichloroethylene was found in the drinking water of a residential well (Refs. 13; 14, pages 4-6 of this documentation record).

* The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area in which the site is located. They represent one or more locations EPA considers to be part of the site based on the screening information EPA used to evaluate the site for NPL listing. EPA lists national priorities among the known "releases or threatened releases" of hazardous substances; thus, the focus is on the release, not precisely delineated boundaries. A site is defined as where a hazardous substance has been "deposited, stored, placed, or otherwise come to be located." Generally, HRS scoring and the subsequent listing of a release merely represent the initial determination that a certain area may need to be addressed under CERCLA. Accordingly, EPA contemplates that the preliminary description of facility boundaries at the time of scoring will be refined as more information is developed as to where the contamination has come to be located.

Scores

Air Pathway	Not Scored
Ground Water Pathway	100.00
Soil Exposure Pathway	Not Scored
Surface Water Pathway	Not Scored
HRS SITE SCORE	50.00

WORKSHEET FOR COMPUTING HRS SITE SCORE

		S	S^2
1.	Ground Water Migration Pathway Score (S_{gw})	100.00	10,000
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	Not Scored	Not Scored
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	Not Scored	Not Scored
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	Not Scored	Not Scored
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	Not Scored	Not Scored
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	Not Scored	Not Scored
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$		10,000
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root	50.00	

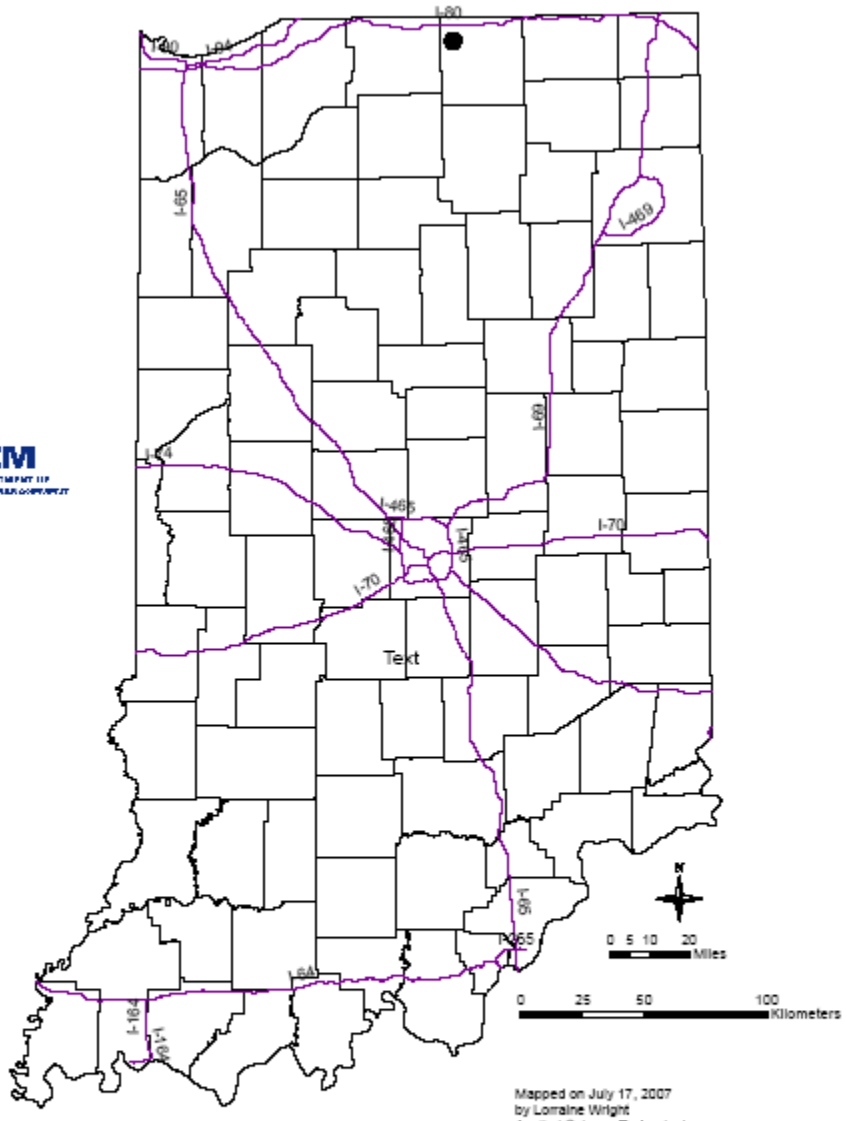
GROUND WATER MIGRATION PATHWAY SCORESHEET

REF.1, TABLE 3-1

Factor Categories and Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer:		
1. Observed Release	550	550
2. Potential to Release:		
2a. Containment	10	NS
2b. Net Precipitation	10	NS
2c. Depth to Aquifer	5	NS
2d. Travel Time	35	NS
2e. Potential to Release [lines 2a x (2b + 2c + 2d)]	500	NS
3. Likelihood of Release (higher of lines 1 and 2e)	550	550
Waste Characteristics:		
4. Toxicity/Mobility	a	10,000
5. Hazardous Waste Quantity	a	100
6. Waste Characteristics	100	32
Targets:		
7. Nearest Well	50	50
8. Population:		
8a. Level I Concentrations	b	354.2
8b. Level II Concentrations	b	92
8c. Potential Contamination	b	NS
8d. Population (lines 8a + 8b + 8c)	b	446.2
9. Resources	5	NS
10. Wellhead Protection Area	20	NS
11. Targets (lines 7 + 8d + 9 + 10)	b	496.2
GROUND WATER MIGRATION SCORE FOR AN AQUIFER		
12. Aquifer Score [(lines 3 x 6 x 11)/82500][c]	100	100
GROUND WATER MIGRATION PATHWAY SCORE		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100	100

a Maximum value applies to waste characteristics category.
b Maximum value not applicable.
c Do not round to nearest integer.
NS Not Scored

Site Location Map



IDEM

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Legend

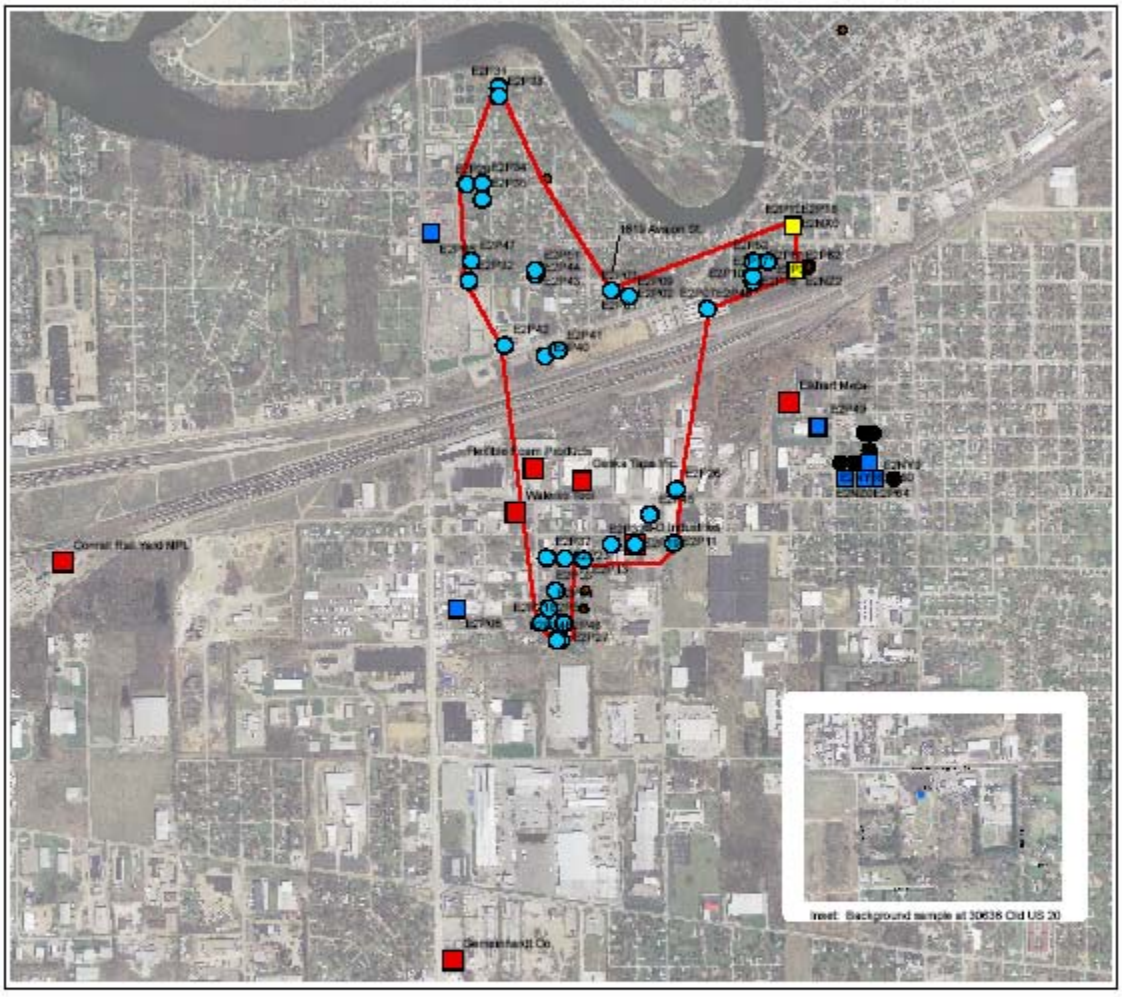
- Lusher Street Ground Water Contamination Site, Elkhart, IN
- Interstates_TIGER_IGS_IN
- County boundaries (TGR2K)

Mapped on July 17, 2007
by Lorraine Wright
Applied Science Technologies
Science Services Branch
Office of Land Quality
Indiana Department of Environmental Management

Source:
The location of the site was plotted using address matching by comparing the site address against the Elkhart, IN GIS parcel addresses.
Interstates - Tiger data
County boundaries - Tiger data

DISCLAIMER:
This map does not represent a legal document. It is intended to serve as an aid in graphic representation only. Information shown on this map is not warranted for accuracy.
This map does not contain sensitive or classified information.

Ground Water Plume Boundary Map
defined by Chlorinated VOCs from Key Findings Lists, Events 3, 4, & 5 including Potential Sources
Lusher Avenue Site, Elkhart, IN, IND982073785



Legend

- Sample location with chlorinated VOCs (from key findings list, event 3 - labeled)
- Sample location with chlorinated VOCs (from key findings list, events 4/5 - labeled)
- Potential contamination sources
- Background samples
- Ground water plume
- Sample location from event 4
- Sample location from event 5
- Sample location from event 3

IDEM
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

0 500 1,000 2,000 Feet

0 270 540 1,080 Meters

5

Revised final on July 17, 2007
by Lorraine Wright
Applied Science Technologies
Science Services Branch
Office of Land Quality
Indiana Department of Environmental Management

Source:
2005 Orthophotos - Color aerial imagery collected in Spring 2005, as part of the Indiana Statewide Orthophotography Project. Points for sample locations were located using a combination of digitizing and geocoding. The geocoding was matched using Elkhart, IN data. Samples that couldn't be located using geocoding where located using google maps and project manger identification.
The sample points represent samples collected during sample events 3, 4, and 5. The yellow and blue points represent locations where chlorinated VOCs were detected at concentrations greater than the detection limit. The ground water plume boundary was defined by drawing a line connecting the outer most ground water wells with known detections (greater than detection limit) of chlorinated VOCs based on the Key Findings Lists for events 3, 4, and 5 (level 1 and 2 data). Wells that showed a detection of a chemical without an MCL were not include in the Key Findings Lists.

DISCLAIMER:
This map does not represent a legal document. It is intended to serve as an aid in graphic representation only. Information shown on this map is not warranted for accuracy. This map does not contain sensitive or classified information.

Lusher Avenue Ground Water Contamination Site, Elkhart County, Elkhart, IN

Legend

- 1619 Avalon St.
- Lusher Ave site Boundary

IDEM
INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Mapped on July 18, 2007 by Lorraine Wright
Applied Science Technologies, Science Services Branch
Office of Land Quality, Indiana Department of Environmental Management

Sources: Aerials - 2005 Orthophotography (UTM NAD 83 Zone 16). Site boundary was defined based on the Project Manager's description and sampling points. Site location was obtained by address matching using the Elkhart, IN GIS website. Latitude, Longitude coordinates were converted from UTM NAD 83, Zone 16 coordinates. The map does not contain sensitive or classified information.

DISCLAIMER:
This map does not represent a legal document. It is intended to serve as an aid in graphic representation only. Information shown on this map is not warranted for accuracy.

REFERENCES

Ref. No.	Description of the Reference
1.	U.S. Environmental Protection Agency (EPA). Hazard Ranking System, 40 CFR Part 300, Appendix A, 55 FR 51533. December 14, 1990. 138 pages.
2.	EPA. Superfund Chemical Data Matrix, SCDM Data Versions: 10/23/2006 Appendix A (Trichloroethylene); 1/27/2004, Appendices BI (Hazardous Substance Factor Values), BII (Hazardous Substance Benchmarks); and 6/23/2006 Appendices BI and BII update. 60 pages.
3.	Indiana Department of Environmental Management (IDEM). Site Inspection Report for Lusher Street Ground Water Site. May 1, 2007. 665 pages.
4.	IDEM. Sample Field Sheet Affidavit, July 11, 2007. 1 page.
5.	IDEM. Sample Field Sheets, September 12, 2006. 17 pages.
6.	IDEM. Sample Field Sheets, December 5-7, 2006. 54 pages.
7.	IDEM. Sample Field Sheets, December 12 and 13, 2006. 5 pages.
8.	IDEM. Telephone Conversation Logs, various dates in March 2007. 11 pages.
9.	EPA. On-Scene Coordinator's Report, CERCLA Immediate Removal Action, Lusher Street Site, Elkhart, Indiana, March 6, 1989. 18 pages.
10.	EPA. Action Memorandum, Request for Removal Action at the Lusher Street Groundwater Contamination site, Elkhart, Indiana, December 21, 1987. 5 pages.
11.	WESTON-SPER. Memo Re: Lusher Street, Elkhart, Indiana, TDD #5-8710-16, January 15, 1988. 19 pages.
12.	EPA. Action Memorandum, Request for an Emergency Removal Action at the Lusher Street Site, (Second Removal), located in Elkhart, Indiana, Elkhart County, Site ID #05AB, December 4, 2006. 12 pages.
13.	United States Geological Survey (U.S.G.S). 7.5 Minute Series (Topographic), Elkhart Quadrangle, Indiana. Map Revised 1994. 1 sheet.
14.	U.S.G.S. 7.5 Minute Series (Topographic), Osceola Quadrangle, Indiana. Map Revised 1994. 1 sheet.

15. U.S.G.S. Hydrologic and Chemical Evaluation of Ground-Water Resources of Northwest Elkhart County, Indiana. October 1981. 150 pages.

16. Groundwater Technology, Inc. Subsurface Investigation for the Conrail Railyard, Elkhart, Indiana, November 10, 1989. 420 pages.

17. Ecology and Environment, Inc. Remedial Investigation/Feasibility Study, Conrail Site, Elkhart, Indiana, Remedial Investigation Report, Volume 1 of 2, March 31, 1994. 313 pages.

18. Ecology and Environment, Inc. Remedial Investigation/Feasibility Study, Conrail Site, Elkhart, Indiana, Remedial Investigation Report, Volume 2 of 2, March 31, 1994. 247 pages.

19. U.S.G.S. Hydrogeologic Atlas of Aquifers in Indiana, Water-Resources Investigations Report 92-4142, 1994. 13 pages.

20. IDEM. Site Visit/Interviews Affidavit, April 9, 2007. 20 pages.

21. EPA. Entry of United States v. Walerko Tool and Engineering Corporation cost recovery Consent Decree, Lusher Street Site, Elkhart, Indiana, Site #AB. November 22, 1993. 24 pages.

22. EPA. Evaluating the Ground Water Plumes Under the Hazard Ranking System, EPA 540-F-95-034, OSWER Publication 9320.8-01 FS, September 1998. 5 pages.

23. IDEM. Analytical Results for Sturgis Metals, December 12, 2006. 8 pages.

24. Ken McDaniel, IDEM. Correspondence to Mark Jaworski, IDEM, regarding 1619 Avalon. April, 13, 2007. 1 page.

25. Elkhart County Health Department, Groundwater Protection Section. State Road 19 and Lusher Street Investigation, January 20, 1988. 206 pages.

26. State of Indiana Department of Natural Resources Division of Water. Water Resource Availability in the St. Joseph River Basin, Indiana, 1987. Excerpt 22 pages.

27. IDEM. Technical Memorandum to 3B File, Hazard Ranking System Documentation Record, Lusher Avenue Groundwater Contamination Area, April 20, 2007. 18 pages.

28. IDEM. Ground Water Plume Boundary Map defined by Chlorinated VOCs from Key Findings Lists, Events 3, 4 & 5 including Potential Sources, Lusher Avenue Site, Elkhart, IN, IND982073785, July 18, 2007. 1 map.

29. Correspondence by Paul Giesting, Geological Services, to Mark Jaworski, Site Investigations, regarding Correlation of Sample Locations and IDNR Well Records for the Lusher Avenue Groundwater Contamination Area, April 19, 2007. 3 pages.

30. EPA. Hazard Ranking System Guidance Manual, Office of Solid Waste and Emergency Response, EPA 540-R-92-026, Publication 9345.1-07, November 1992. Excerpt 3 pages.

31. EPA Region V, Review of Data Received for Review on: October 4, 2006, Luster Street Groundwater Contamination (IN), Case Number 35735, Mitkem Corporation, Volatile Organics Analysis Data Sheets. October 25, 2006. 78 pages.

32. EPA Region V, Review of Data Received for Review on: December 28, 2006, Lusher Street Groundwater Contamination (IN), Case Number 35998, KAP Technologies, Volatile Organics Analysis Data Sheets. January 19 and 22, 2007. 321 pages.

33. EPA. In the Matter of: Gemeinhardt, A Unit of CBS, Inc., Administrative Order Docket No. V-W-85-C-003. March 7, 1985. 23 pages.

34. EPA. Superfund Information Systems – CERCLIS: Site Information, Lusher Street Groundwater Contamination, May 1, 2007, 2 pages. http://cfpub.epa.gov/supercpad/cursites/csitinfo.cfm?id=0500018 and http://cfpub.epa.gov/supercpad/cursites/cactinfo.cfm?id=0500018 Accessed (May 1, 05/01/2007).

35. United States District Court, Northern District of Indiana, South Bend Division. United States of America v. Walerko Tool & Engineering Corporation, Civil Action No. S91-00411M. 18 pages.

36. United States District Court for the Northern District of Indiana, South Bend Division. United States of America vs. Walerko Tool & Engineering, Case No. S91-00411M. January 6, 1992. 6 pages.

37. Bryan Landry, former employee of Walerko Tool & Engineering Corporation. Declaration of Brian Landry. August 27, 1992. 4 pages.

38. Doug McDaniel, former employee of Walerko Tool & Engineering Corporation. Declaration of Doug McDaniel. August 19, 1992. 3 pages.

39. United States District Court, Northern District of Indiana, South Bend Division. United States of America vs. Consolidated Rail Corporation a/k/a Conrail. Civil Action No. S90-00056. January 23, 1991. Excerpt 5 pages.

40. United States District Court, Northern District of Indiana, South Bend Division. United States of America vs. Walerko Tool and Engineering Corporation. Civil Case No. S91-00411(M). December 5, 1991. 11 pages.

41. United States District Court for the Northern District of Indiana, South Bend Division. United States of America v. Walerko Tool & Engineering Corporation. Civil Action No. S89-00348. September 11, 1992. 5 pages.

42. EPA. Drinking Water Contaminants, List of Contaminants & their MCLs, May 2, 2007, 12 pages. http://www.epa.gov/safewater/contaminants/index.html#mcls Accessed (May 2, 2007).

43. EPA. Lusher Avenue Groundwater, Elkhart, IN – EPA Region V, POLREP #1, First and Final POLREP, 01/29/2007, 2 pages. http://www.epaosc.net/polrep_profile.asp?site_id=2769 Accessed (May 2, 2007).

44. EPA. NPL Fact Sheet, Region 5 Superfund, Conrail Rail Yard, EPA ID# IND000715490, September 2006, 3 pages. http://www.epa.gov/R5Super/npl/indiana/IND000715490.htm Accessed (May 3, 2007).

45. EPA. Gemeinhardt Consent Order. February 1, 1990. 22 pages.

46. ThomasNet. B-D Industries, Inc. Elkhart, Indiana. 1 page. http://www.thomasnet.com/heading.html?cov=IN&what=b-d+industries+elkhart%2C+in&heading=1810407&searchpos=18&cid=618948&navsec=products Accessed (May 3, 2007).

47. EPA. Envirofacts Warehouse, Toxics Release Inventory, Flexible Foam Products results of data extracted on March 22, 2007. 8 pages. http://oaspub.epa.gov/enviro/tris_control.tris_print?tris_id=46515FLXBL1900W Accessed (May 3, 2007).

48. Flexible Foam Products, Inc. Flexible Foam Products, Inc., Company History. 1 page. http://www.flexiblefoam.com/About/History.aspx Accessed (May 3, 2007).

49. Indiana Geological Survey GIS Atlas. Lusher Street Groundwater Contamination Site. March 20, 2007. 1 page.

50. EPA. Envirofacts Warehouse. Toxics Release Inventory, Gaska Tape Incorporated results of query executed on May 7, 2007. 4 pages. http://oaspub.epa.gov/enviro/multisys2.get_list?facility_uin=110000398962 Accessed (May 7, 2007).

51. U.S. Census Bureau. Elkhart County, Indiana – Fact Sheet – American FactFinder: 2005. 2 pages. http://factfinder.census.gov/servlet/ACSSAFFFacts?_event=&geo_id=05000US18039&_geoContext=01000US%7C04000US18%7C05000US18039&_street=&_county=elkhart+county&_cityTown=elkhart+county&_state=04000US18&_zip=&_lang=en&_sse=on&ActiveGeoDiv=&_useEV=&pctxt=fph&pgsl=050&_submenuId=factsheet_1&ds_name=null&_ci_nbr=null&qr_name=null&reg=null%3Anull&_keyword=&_industry= Accessed (May 7, 2007).

52. Correspondence by Mark Espich to Mark Jaworski regarding Sturgis sample results, May 4, 2007. 1 page.

53. Gemeinhardt Company Incorporated. Elkhart, Indiana – Company Profile. 2 pages. http://www.manta.com/coms2/dnbcompany_gb5w5c. Accessed (June 27, 2007).

54. EPA. Superfund Analytical Services/Contract Laboratory Program, SOM01.1 Volatile Target Compound List and Corresponding CRQLs. 3 pages. http://www.epa.gov/superfund/programs/clp/som-vtarget.htm. Accessed (June 28, 2007).

55. Affidavit of Mark Jaworski, June 29, 2007. 1 page.

56. Correspondence by Sue Esserman to Mark Jaworski regarding Lusher Avenue Site – Site #0000028, July 9, 2007. 5 pages.

57. General Affidavit, Telephone conversation between Mark Jaworski and Gene Burger, July 9, 2007. 1 page.

58. EPA. Using Qualified Data to Document an Observed Release and Observed Contamination, EPA 540-F-94-028, November 1996. 18 pages.

59. General Affidavit of Mark Jaworski, July 16, 2007. 1 page.

60. Indiana Geological Survey, Total Thickness of Clay in Indiana. 2 pages. http://igs.indiana.edu/arcims/statewide/download.html. Accessed (July 18, 2007).

2.0 SITE SUMMARY

2.0.1 SITE DESCRIPTION

Lusher Street Ground Water Contamination can be found on the U.S.G.S. Elkhart Quadrangle and Osceola Quadrangle Topographic Maps (Refs. 13; 14; pp. 4-6 of this HRS documentation record). The contaminated ground water plume lies in Section 7 in Township 37 North, Range 5 East (Ref. 3, p. 2-1). The highest concentration of trichloroethylene (TCE) is located at 41°40'22.52" north latitude and 85° 59' 46.41 " west longitude (Refs. 13; 14; p. 6 of this HRS documentation record).

The contaminated ground water plume is bordered to the north by the St. Joseph River, to the west by Nappanee Street, to the south by Hively Avenue, and to the east by Oakland Avenue (Ref. 28; pp. 5-6 of this HRS documentation record). The site is characterized by the surface representation of a ground water plume contaminated with chlorinated solvents (Ref. 28; p. 5 and Section 2.2.2, Source Samples, pp. 17-23 of this HRS documentation record). The plume is outlined by private drinking water wells known to be contaminated by chlorinated solvents (Refs. 28; p. 5 and Section 2.2.2, Source Samples, pp.17-23 of this HRS documentation record). The site is located south of the St. Joseph River in Elkhart in a mixed light industrial, commercial and residential setting (Ref. 12, p. 1). Conrail and Norfolk Western railroads bisect the site (Refs. 13; 14; pp. 5-6 of this HRS documentation record; 28).

2.0.2 SITE HISTORY

Although the source of the chlorinated solvents has not been identified, there are numerous facilities in the area (Refs. 3, Appendix O; 9, p. 5; 20; 28; p. 5 of this HRS documentation record). The Lusher Street Ground Water Contamination area was discovered during the investigation of the K.G. Gemeinhardt Company as discussed below.

From the 1940s through 1977, K.G. Gemeinhardt Company, Inc., (Gemeinhardt), and its predecessors, owned and operated manufacturing facilities on a three-acre site at 57882 State Route 19 (Refs. 25, p. 3; 28; 33, pp. 2, 3, 4; 53, p. 1; p. 5 of this HRS documentation record). In 1985, Gemeinhardt agreed to an interim remedial action, whereby Gemeinhardt shall conduct an investigation sufficient to fully characterize the sources and extent of ground water identified to the north-northwest of the facility (Ref. 33, pp. 7, 8, 23). While conducting an extent of contamination study at Gemeinhardt under the terms of the 1985 Consent Order with the EPA, volatile organic compounds (VOCs) were detected in private drinking water wells in an area immediately south of Lusher Avenue (Ref. 9, p. 5). At the time of this investigation, Gemeinhardt believed that the contamination in this area was independent of the Gemeinhardt ground water plume (Ref. 9, p. 5). The Elkhart County Health Department (ECHD) was notified of the contamination (Ref. 9, p. 5). In 1987, ECHD began an investigation of the area (Ref. 9, p. 5). The investigation was limited to an area bordered by State Road 19 on the west, Avalon Street to the east, Lusher Street to the south, and the St. Joseph River to the north (Ref. 9, p. 5). The ECHD sampled 145 wells in this area (Ref. 9, p. 5). The ECHD identified 103 private drinking water wells that were found to contain elevated levels of trichloroethylene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA) (Refs. 9, p. 5; 10, p. 1; 25, pp. 3, 4, 5; 35, p. 3). Subsequently, ECHD requested assistance from EPA in providing alternate drinking water supplies to the affected residences and businesses (Refs. 9, p. 5; 25, p. 4; 41, p. 3).

In October 1987, the on-scene coordinator (OSC) of EPA, in conjunction with EPA's Technical

Assistance Team (TAT), began an investigation into the ground water contamination (Ref. 9, p. 5). Analytical results taken by TAT on November 3, 1987 confirmed the presence of TCE and 1,1,1-TCA as well as other volatile organic compounds found in concentrations exceeding the removal action levels of contaminated drinking water sites (Refs. 9, pp. 8, 11, 12; 10, p. 1; 11, pp. 11, 12, 14; 21, pp. 5-6). Of greatest concern were the levels of 1,1,1 TCA (1,590 ppb) at a location on W. Indiana and TCE (804 ppb) at a location on 17th Street (Refs. 9, pp. 8, 12; 11, p. 13). As a result of the investigation, EPA initiated a removal action at the Lusher Street Groundwater Contamination site to mitigate the immediate threats to human health and the environment posed by the ground water contamination of residential and business water wells (Ref. 10, p. 1). EPA discovered the site as Lusher Street Groundwater Contamination on January 12, 1988 (Ref. 34, p. 2). It should be noted that Lusher Street is actually Lusher Avenue. All references to Lusher Street apply to Lusher Avenue throughout this HRS documentation record (Ref. 3, p. 2-4). The removal action consisted of EPA installing 13 Elkhart residences and businesses point of use carbon filters to reduce contaminant concentrations below the acceptable safe drinking water standard for all contaminants involved (Refs. 9, pp. 2, 10, 11, 12; 10., p. 2; 11, pp. 1, 15). In addition, EPA converted two residences water supply from private well to city water because these residences showed contaminant levels, which exceed the contaminant actions levels for the Agency for Toxic Substances and Disease Registry (ATSDR) bathing concern levels (Refs. 9, pp. 2, 12, 13; 10, pp. 2; 11, pp. 1, 15). As directed by OSC Theisen, TAT conducted an extent of contamination study from January 18, 1988, to March 16, 1988, which included collecting a total of 45 residential and business well samples (Refs. 9, p. 13; 11, p. 17). From August 18, 1988, to August 31, 1988, based on the results of the extent of contamination study, five additional residences and businesses were provided with city water hookups (Ref. 9, pp. 13, 15). This removal action, which consisted of investigation and provision of point of use carbon filters and provision of city water hookups was completed on August 31, 1988 (Refs. 9, p. 2; 34, p. 2; 35, p. 4).

Indiana Department of Environmental Management (IDEM) began their own water testing during the summer of 1989 to determine if other residents would be provided alternate water supplies at the state's expense (Ref. 25, p. 5). Municipal water lines were extended to the majority of properties impacted except at one residence, located on Avalon Street (Refs. 24, p. 1; 25, pp. 19, 68). A municipal hook up was not provided to the residence on Avalon Street because no municipal water main was in close proximity (Refs. 24, p. 1).

EPA identified Walerko Tool & Engineering Corporation (Walerko) liable for the ground water contamination around Lusher Street (Ref. 35, pp. 1-3, 9-10). Walerko commenced business operations in 1952 (Refs. 35, p. 1; 39, p. 2). Walerko engages in machining, tool and die work at its manufacturing plant located at 1935 West Lusher Avenue in Elkhart, Indiana (Refs. 20, p. 18; 35, p. 2). Walerko used the cleaning solvent trichloroethane (TCA) as a parts cleaner in Walerko's manufacturing process (Refs. 35, p. 2; 39, p. 3; 38, p. 1; 40, p. 1). Periodically, when the tanks and smaller containers of solvent became dirty, Walerko employees disposed of the spent solvent outside of the facility onto the ground, and then refilled the containers with fresh solvent (Refs. 35, pp. 2, 3; 37, p. 1). In 1987, the drinking water well located at Walerko indicated the presence of TCA at a concentration of 660 parts per billion (ppb) and TCE at a concentration of 38 ppb (Refs. 35, p. 4; 41, p. 4). On September 24, 1993, EPA filed a Cost Recovery Consent Decree with Walerko Tool & Engineering Corporation (Ref. 21, p. 3). The consent decree filed a complaint pursuant to Sections 104(e) and 107 of the Comprehensive Environmental Response, Compensation, Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C Sections 9604(e) and 9607, and Section 3007 of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. Section 6927 (Ref. 21, p. 5). The United States was seeking reimbursement of response costs incurred by EPA and the Department of Justice for response actions in connection with the release or

threatened release of hazardous substances, including 1,1,1-TCA and TCE, at the Lusher Street Site in Elkhart, Indiana and civil penalties for Walerko's failure to timely respond to EPA's information requests dated March 26, 1990 (Ref. 21, p. 5). On July 20, 1993, Walerko agreed to enter into the consent decree provided a settlement schedule for payment of past costs $125,330 and a civil penalty $19,670 (Ref. 21, pp. 1, 22, 23).

In 1987, the water at the same Avalon Street location mentioned above had 1,1,1-TCA at 69 ug/L, TCE at 11 ug/L, 1,1,1-TCA at 74 ug/L, DCA at 19 ug/L, and DCE at 14 ug/L (Refs. 9, p. 10; 25, pp. 3, 68, 75, 76). From the 1980's to present IDEM has been conducting operation and maintenance (O&M) activities at that Avalon Street location. In 2005, the water at the Avalon Street location was sampled by IDEM staff to determine if operation and maintenance (O&M) activities still needed to be conducted (Ref. 24, p. 1). Sample results revealed that the TCE levels were now detected as high as 700 ug/L (Refs.12, p. 2; 24, p. 1). Subsequent ground water sampling, as part of the Site Inspection activities conducted in 2006, revealed that numerous nearby private wells have also been impacted with elevated levels of volatile organic compounds (See Section 2.2.2, Source Samples of this HRS documentation record).

In 2006, the Indiana Department of Environmental Management (IDEM), Site Investigation Section, began Site Inspection (SI) activities at Lusher Street Ground Water Contamination (Ref. 3, p. 3-1). The results showed that the concentrations of TCE were above the U.S. EPA Maximum Contaminant Level (MCL) of 5.0 ug/L for TCE in 11 wells in a range of 7.4 to 640 ug/L (Refs. 3, Appendix N, pp. 1-9, 44, 46, 48, 50, 52, 54, 62-64, 131-138, 171, 179, 187, 191, 311-318, 342, 344, 356; 6, pp. 2, 3, 7, 8, 10, 11, 17, 18, 21, 22, 24, 26, 43, 50, 54; 32, pp. 8, 11, 17, 32, 38, 44, 50, 65, 71, 77, 114, 120, 178, 226, 241; 42, p. 9). The water in another well was found to contain elevated levels of 1,1-Dichloroethylene (1,1-DCE) (16J ug/L) (Refs. 3, Appendix N, pp. 131-138, 177, 190; 6, p. 42; 32, p. 158). The MCL of 1,1-DCE is 7 ug/L(Ref. 42, p. 6). A total of ten wells used for drinking water were found to exceed U.S. EPA's MCLs (See Section 3.3.2.2, pp. 48-49 of this HRS documentation record). Level II concentrations of chlorinated VOCs (below MCLs) were detected in twenty-six (26) wells (See Section 3.3.2.3, pp. 49-50 of this HRS documentation record).

After the results of the water from the wells sampled were reviewed and found to be unacceptable for use, IDEM's State Clean Up Program provided bottled water to those people whose water was found to exceed MCLs (Ref. 24, p. 1). IDEM alerted U.S. EPA on scene coordinator that some residential sample results for TCE had exceeded or was close to the MCL (Ref. 43, p. 1). In August 2006, START sampled four residential and one business location to correlate IDEM's data results (Ref. 43, p. 1). U.S. EPA's Emergency Response on scene coordinator (OSC) then provided some residents with point of use carbon filters (Ref. 43, pp. 1, 2).

In addition to the ground water contamination, U.S. EPA and IDEM are concerned about potential vapor intrusion into the residences of the area.

2.2 SOURCE CHARACTERIZATION

2.2.1 SOURCE IDENTIFICATION

Source Number: 1

Source Type: Ground water plume with no identified source

Description and Location of Source (with reference to a map of the site):

The Lusher Street Ground Water Contamination site consists of a ground water plume. Due to the years which have passed from the first removal action in December 1987 to the second removal action in December 2006, and the number and close proximity of possible sources of chlorinated solvents, [including: TCE, 1,1,1-TCA, trans 1,2-dichloroethylene (trans 1,2-DCE), cis 1,2-Dichloroethylene (cis 1,2-DCE), 1,1-DCE, and tetrachloroethylene (PCE)]; with the recent state and federal funded investigations, EPA has not been able to identify and reasonably attribute with confidence the ground water contamination to any known source (Refs. 10, p. 1; 12, pp. 1, 2; 20, pp. 1-20; 33, p. 2-6; 59). Per the HRS, the plume itself will be considered the source (Ref. 1, Sec 1.1, p. 51587). The extent of this plume has not been completely delineated at this time but has been characterized by data from residential and commercial private wells (Refs.3, p. 2-1, Appendices D, E, R, S; 12, p. 2; 24, p. 1; 28; p. 5 of this HRS documentation record).

The outer boundaries of the contaminated ground water plume have tentatively been established from west to east along Lusher Street from Nappanee Street to Oakland Street and north to south from the St. Joseph River to Hively Avenue (Ref. 28). Non-detect wells were identified around the plume (See p. 5 and Section 2.2.2 of this HRS documentation record Background Concentrations; Ref. 28). The plume was drawn by connecting a line to the perimeter of all contaminated wells on the farthest edges of the sample area (Refs. 3, p. 2-1, Appendices D, E, R, S; 28; pp. 1, 4-7 of this HRS documentation record). 36 wells, consisting of residential and commercial private wells, were found to be contaminated with chlorinated VOCs (See Sections 2.2.2, 3.3.2.2, and 3.3.2.3 of this HRS documentation record). These 36 wells are within a one-mile radius of the center of the plume (Ref. 28). The center of the plume is denoted by the private well (at the Avalon Street location) with the highest concentration of VOCs in the drinking water (Refs.3, p. 2-1, Appendices D, E, R, S; 12, p. 2; 28; pp. 1, 4-7 of this HRS documentation record).

In 2006, IDEM's Site Investigation Section began Site Inspection (SI) activities at Lusher Street Ground Water Contamination (Ref. 3, p. 3-1). IDEM conducted five sampling events (Ref. 59). The first two events were conducted utilizing State funds (Ref. 59). The next three events were conducted using the U.S. EPA Contract Laboratory Program (CLP) for sample analysis (Ref. 3, pp. 3-15, Appendices K, L, M, and N). Only sample results obtained from the CLP were used for this HRS documentation record (Ref. 3, pp. 3-15, Appendices K, L, M, and N and See also Section 2.2.2 of this HRS documentation record). The results showed that the concentrations of TCE were above the U.S. EPA MCL of 5.0 ug/L for TCE in 9 wells in a range of 7.4 to 640 ug/L (See Section 2.2.2 of this HRS documentation record, pp. 17-23). The water in another well was found to contain elevated levels of 1,1-DCE (16J ug/L) (Refs. 3, Appendix N, pp. 131-138, 177, 186, 190; 6, p. 42; 32, pp. 158, 159). The MCL of 1,1-DCE is 7 ug/L (Ref. 42, p. 6). A total of 10 wells were found to exceed U.S. EPA's MCL (Section 3.3.2.2 of this HRS documentation record, pp. 49-50). Low concentrations of chlorinated VOCs (below MCLs) were detected in twenty-four (24) wells (Section 3.3.2.3 of this HRS documentation record, pp. 50-51).

2.2.2 HAZARDOUS SUBSTANCES ASSOCIATED WITH THE SOURCE

- Background Concentrations:

Eight (8) groundwater samples were collected during the site sampling investigation to be used as background samples. On September 12, 2006, December 5, 2006, and December 12, 2006, eight ground water samples were collected up gradient of the suspected ground water plume for background levels (Refs. 3, Appendices D, E; 28; 59).

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2NY9	Ground Water	9/12/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 15, 16, 24, 25, 26, Appendix D; 5, p. 10; 31, pp. 31-33; 54, pp. 1, 2
E2NZ0	Ground Water	9/12/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 15, 16, 24, 25, 26, Appendix D; 5, p.11; 31, pp. 34-36; 54, pp. 1, 2
E2NY6	Ground Water	9/12/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 13, 14, 24, 25, Appendix D; 5, p.7; 31, pp. 22-24; 54, pp. 1, 2
E2P06	Ground Water	12/5/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 46, 47, 61, 62, Appendix E; 6, p.6; 32, pp. 25-27; 54, pp. 1, 2
E2P49	Ground Water	12/5/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 346, 347, 354, 355, 357, 358, Appendix E; 6, p.29; 32, pp. 243-245; 54, pp. 1, 2

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2P50	Ground Water	12/6/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 346, 347, 355, 357, Appendix E; 6, p. 34; 32, pp. 250-252; 54, pp. 1, 2
E2P64	Ground Water	12/13/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398, Appendix E; 7, p. 3; 32, pp. 298-300; 54, pp. 1, 2
E2P66	Ground Water	12/13/06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 UJ ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398, Appendix E; 7, p. 4; 32, pp. 301-303; 54, pp. 1, 2

- Source Samples:

The site is being scored as a ground water plume (Ref. 1, Sec 1.1, p. 51587). The ground water samples along with their respective VOC detections listed below were collected by IDEM Site Investigation Staff from September to December 2006 (Refs. 3, Appendices D, E; 28; 59).

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2NX0	Ground Water	9/12/06	TCE Cis1,2-DCE	25 ug/L 0.52 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 11, 12, 24, 25; 5, p.1; 31, pp. 1-3; 54, pp. 1, 2
E2NX4	Ground Water	9/12/06	TCE Cis1,2-DCE	37 ug/L 0.66J ug/L	2.0 ug/L∗ 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 11, 12, 13, 14, 24, 25; 5, p. 5; 31, pp. 13-15, 16-18; 54, pp. 1, 2
E2NZ2	Ground Water	9/12/06	TCE Cis1,2-DCE	64 ug/L 0.63 ug/L	2.5 ug/L∗ 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 15, 16, 24, 27; 5, p. 13; 31, pp. 40-43, 44-46; 54, pp. 1, 2
E2P01	Ground Water	12/5/06	TCE Cis1,2-DCE 1,1,1-TCA	640 ug/L 4.9 ug/L 39 ug/L	20 ug/L∗ 0.5 ug/L 20 ug/L*	Refs. 3, Appendix N, pp. 2-9, 44, 45, 61, 62; 6, p. 2; 32, pp. 4-6; 54, pp. 1, 2
E2P02	Ground Water	12/5/06	TCE Cis1,2-DCE 1,1,1-TCA	7.4 ug/L 0.64 ug/L 2.6 ug/L	0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 44, 45, 61, 62; 6, p. 11; 32, pp. 10-12; 54, pp. 1, 2
E2P03	Ground Water	12/5/06	TCE Cis1,2-DCE 1,1,1-TCA 1,1-DCE	620 ug/L 4.2 ug/L 43J ug/L 1.3 ug/L	40 ug/L∗ 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 44, 45, 46, 47, 61, 62; 6, p. 3; 32, pp. 13-15; 54, pp. 1, 2
E2P04	Ground Water	12/5/06	1,1,1-TCA	2.0 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 46, 47, 61, 62; 6, p. 4; 32, pp. 19-21; 54, p. 2
E2P07	Ground Water	12/6/06	1,1,1-TCA TCE	4.2 ug/L 24 ug/L	0.5 ug/L 1.0 ug/L *	Refs. 3, Appendix N, pp. 2-9, 46, 47, 48, 49, 61, 62; 6, p. 7; 32, pp. 28-30, 31-33; 54, p. 2

∗ E2NX4 was diluted 4-fold for TCE. CRQL has been adjusted based on the dilution factor.
∗ E2NZ2 was diluted 5-fold for TCE. CRQL has been adjusted based on the dilution factor.
∗ E2P01 was diluted 40-fold for TCE and 1,1,1-TCA. CRQL has been adjusted based on the dilution factor.
∗ E2P03 was diluted 80-fold for TCE. CRQL has been adjusted based on the dilution factor.

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2P08	Ground Water	12/5/06	1,1,1-TCA	3.2 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 48, 49, 61, 62; 6, p. 9; 32, pp. 34-36; 54, p. 2
E2P09	Ground Water	12/5/06	TCE Cis1,2-DCE 1,1,1-TCA	7.9 ug/L 0.72 ug/L 2.8 ug/L	0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 48, 49, 61, 62; 6, p. 10; 32, pp. 37-39; 54, pp. 1, 2
E2P10	Ground Water	12/5/06	TCE Cis1,2-DCE 1,1,1-TCA Trans1,2-DCE	79 ug/L 16 ug/L 63 ug/L 6.5 ug/L	5.0 ug/L* 5.0 ug/L* 5.0 ug/L* 5.0 ug/L*	Refs. 3, Appendix N, pp. 2-9, 48, 49, 61, 63; 6, p. 22; 32, pp. 40-42, 43-45; 54, pp. 1, 2
E2P11	Ground Water	12/5/06	1,1,1-TCA	13 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 50, 51, 61, 63, 81, 82; 6, p. 16; 32, pp. 46-48; 54, p. 2
E2P12	Ground Water	12/5/06	TCE	15 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 50, 51, 61, 63; 6, p. 17; 32, pp. 49-51; 54, p. 2
E2P13	Ground Water	12/5/06	TCE PCE	1.6 ug/L 0.67 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 50, 51, 61, 63; 6, p. 20; 32, pp. 52-54; 54, p. 2
E2P14	Ground Water	12/5/06	1,1,1-TCA	0.87 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 50, 51, 61, 63; 6, p. 19; 32, pp. 55-57; 54, p. 2
E2P16	Ground Water	12/6/06	TCE Cis1,2-DCE 1,1,1-TCA Trans1,2-DCE	45 ug/L 13 ug/L 25 ug/L 3.9 ug/L	2.5 ug/L* 0.5 ug/L 2.5 ug/L* 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 52, 53, 61, 63, 97, 98; 6, p. 24; 32, pp. 61-63, 64-66; 54, pp. 1, 2

∗ E2P10 was diluted 10-fold for TCE, Cis1,2-DCE, 1,1,1-TCA, and Trans1,2-DCE. CRQLs have been adjusted based on the dilution factor.

∗ E2P16 was diluted 5-fold for TCE and 1,1,1-TCA. CRQL has been adjusted based on the dilution factor.

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2P17	Ground Water	12/5/06	TCE Cis1,2-DCE 1,1,1-TCA Trans1,2-DCE	73 ug/L 16 ug/L 59 ug/L 4.9 ug/L	5.0 ug/L∗ 0.5 ug/L 5.0 ug/L* 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 52, 53, 61, 63, 207, 208; 6, p. 21; 32, pp. 67-69; 54, pp. 1, 2
E2P18	Ground Water	12/5/06	TCE	13 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 186, 187, 208; 6, p. 18; 32, pp. 113-115; 54, p. 2
E2P19	Ground Water	12/5/06	TCE 1,1,1-TCA	45 ug/L 2.4 ug/L	2.5 ug/L∗ 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 172, 186, 187; 6, p. 26; 32, pp. 116-118, 119-121; 54, p. 2
E2P21	Ground Water	12/5/06	1,1,1-TCA	2.5 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 172, 186, 188; 6, p. 27; 32, pp. 122-124; 54, p. 2
E2P23	Ground Water	12/6/06	1,1,1-TCA	0.73 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 172, 186, 189; 6, p. 28; 32, pp. 125-127; 54, p. 2
E2P26	Ground Water	12/6/06	1,1,1-TCA	3.2 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 189; 6, p. 33; 32, pp. 131-133; 54, p. 2
E2P27	Ground Water	12/6/06	1,1,1-TCA	4.8 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 190; 6, p. 44; 32, pp. 134-136; 54, p. 2
E2P29	Ground Water	12/6/06	1,1,1-TCA	4.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 190; 6, p. 45; 32, pp. 137-139; 54, p. 2

∗ E2P17 was diluted 10-fold for TCE and 1,1,1-TCA. CRQLs have been adjusted based on the dilution factor.
∗ E2P19 was diluted 5-fold for TCE. CRQL has been adjusted based on the dilution factor.

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2P31	Ground Water	12/7/06	1,1,1-TCA	0.85 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 342, 343, 355, 356; 6, p. 48; 32, pp. 216-218; 54, p. 2
E2P32	Ground Water	12/6/06	1,1,1-TCA	7.1 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 342, 343, 355, 356; 6, p. 49; 32, pp. 219-221; 54, p. 2
E2P33	Ground Water	12/6/06	TCE 1,1,1-TCA	42 ug/L 0.5 ug/L	2.5 ug/L∗ 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 342, 343, 355, 356; 6, p. 50; 32, pp. 222-227; 54, p. 2
E2P34	Ground Water	12/6/06	1,1,1-TCA	6.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 51; 32, pp. 228-230; 54, p. 2
E2P35	Ground Water	12/6/06	1,1,1-TCA	9.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 190; 6, p. 46; 32, pp. 140-142; 54, p. 2
E2P37	Ground Water	12/7/06	TCE 1,1,1-TCA	1.1 ug/L 2.8 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 52; 32, pp. 231-233; 54, p. 2
E2P38	Ground Water	12/6/06	1,1,1-TCA	5.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 53; 32, pp. 234-236; 54, p. 2
E2P39	Ground Water	12/6/06	TCE Cis1,2-DCE 1,1,1-TCA	43 ug/L 14 ug/L 2.2 ug/L	2.5 ug/L∗ 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 54; 32, pp. 237-239, 240-242; 54, pp. 1, 2

∗ E2P33 was diluted 5-fold for TCE. CRQL has been adjusted based on the dilution factor.
∗ E2P39 was diluted 5-fold for TCE. CRQL has been adjusted based on the dilution factor.

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2P40	Ground Water	12/6/06	TCE	1.1 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, p. 36; 32, pp. 143-145; 54, p. 2
E2P41	Ground Water	12/6/06	TCE 1,1,1-TCA PCE	1.1 ug/L 0.71 ug/L 0.86 ug/L	0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, p. 37; 32, pp. 146-148; 54, p. 2
E2P42	Ground Water	12/6/06	1,1,1-TCA PCE	3.7 ug/L 0.73 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, 132-138, 175, 176, 186, 190; 6, p. 38; 32, pp. 149-151; 54, p. 2
E2P43	Ground Water	12/6/06	1,1,1-TCA	5.6 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, p. 39; 32, pp. 152-154; 54, p. 2
E2P44	Ground Water	12/6/06	1,1,1-TCA PCE	7.8 ug/L 0.62 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, 40; 32, pp. 155-157; 54, p. 2
E2P45	Ground Water	12/6/06	1,1-DCE 1,1,1-TCA	16J ug/L 88 ug/L	0.5 ug/L 10.0 ug/L*	Refs. 3, Appendix N, pp. 132-138, 177, 178, 186, 190; 6, p. 42; 32, pp. 158-160, 161-163; 54, pp. 1, 2
E2P46	Ground Water	12/6/06	1,1,1-TCA TCE	3.5 ug/L 26 ug/L	0.5 ug/L 1.0 ug/L*	Refs. 3, Appendix N, pp. 2-9, 52, 53, 54, 55, 61, 64; 6, p. 8; 32, pp. 73-75, 76-78; 54, p. 2
E2P47	Ground Water	12/5/06	1,1,1-TCA	0.70 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 54, 55, 61, 64; 6, p. 12; 32, pp. 79-81; 54, p. 2

* E2P45 was diluted 20-fold for 1,1,1-TCA. CRQL has been adjusted based on the dilution factor.
* E2P46 was diluted 2-fold for TCE. CRQL has been adjusted based on the dilution factor.

Sample ID	Sample Type	Date	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit (CRQL)	Reference
E2P48	Ground Water	12/5/06	1,1,1-TCA	1.6 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 177, 178, 186, 188; 6, p. 13; 32, pp. 164-166; 54, p. 2
E2P51	Ground Water	12/6/06	PCE 1,1,1-TCA	0.51 ug/L 4.7 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 179, 180, 186, 190, 232, 233; 6, p. 41; 32, pp. 171-173; 54, p. 2
E2P52	Ground Water	12/6/06	Trans 1,2-DCE Cis1,2-DCE 1,1,1-TCA TCE	2.3 ug/L 7.1 ug/L 27 ug/L 63 ug/L	0.5 ug/L 0.5 ug/L 5.0 ug/L∗ 5.0 ug/L	Refs. 3, Appendix N, pp. 132-138, 179, 180, 186, 191, 248, 249, 266; 6, p. 43; 32, pp. 174-176, 177-179; 54, pp. 1, 2
E2P58	Ground Water	12/5/06	1,1,1-TCA	0.81 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 348, 349, 355, 357; 6, p. 32; 32, pp. 265-267; 54, p. 2
E2P61	Ground Water	12/13/06	TCE	15 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398; 7, p. 1; 32, pp. 289-291; 54, p. 2
E2P62	Ground Water	12/13/06	TCE	18 ug/L	1.0 ug/L∗	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398; 7, p. 2; 32, pp. 292-294; 54, p. 2

∗ E2P52 was diluted 10-fold for TCE and 1,1,1-TCA. CRQLs have been adjusted based on the dilution factor.
∗ E2P62 was diluted 2-fold for TCE. CRQL has been adjusted based on the dilution factor.

List of Hazardous Substances Associated with Source

The following hazardous substances are associated with the source:
TCE
1,1-DCE
Cis 1,2-DCE
1,1,1-TCA
Trans 1,2-DCE
PCE

HAZARDOUS SUBSTANCES AVAILABLE TO A PATHWAY

Containment Description	Containment Factor Value	References
Gas release to air:	Not Scored	
Particulate release to air:	Not Scored	
Release to ground water: Because there is an observed release of a hazardous substance to ground water a containment value of 10 has been assigned (See Sections 2.2.2 and 3.1.1 of this HRS documentation record).	10	1, Table 3-2, p. 51596
Release via overland migration and/or flood:	Not scored	

Notes: The Containment Factor Value for the ground water migration pathway was evaluated for "All Sources" for evidence of hazardous substance migration from source area (i.e. source area includes source and any associated containment structures). The applicable containment factor value was determined based on existing analytical evidence of hazardous substance in ground water samples from private wells used for drinking water (Ref. 3, Appendices D, E; Sections 2.2.2 and 3.1.1 of this HRS documentation record). Based on an observed release of a hazardous substance to ground water a containment value of 10 has been assigned (See Sections 2.2.2 and 3.1.1 of this HRS documentation record; Ref. 1, Table 3-2, p. 51596).

2.4.2 HAZARDOUS WASTE QUANTITY

2.4.2.1.1 Hazardous Constituent Quantity

Description

The information available is not sufficient to evaluate Tier A source hazardous waste quantity; therefore, hazardous constituent quantity is not scored (NS). As a result, the evaluation of hazardous waste quantity proceeds to the evaluation of Tier B, hazardous wastestream quantity (Ref. 1, Section 2.4.2.1.1).

Hazardous Constituent Quantity Assigned Value: NS

2.4.2.1.2 Hazardous Wastestream Quantity

Description

The information available is not sufficient to evaluate Tier B source hazardous wastestream quantity; therefore, hazardous wastestream quantity is not scored (NS). As a result, the evaluation of Hazardous Waste Quantity proceeds to the evaluation of Tier C, Volume (Ref. 1, Section 2.4.2.1.2).

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3 Volume

Description

Since the hazardous waste quantity was not adequately determined under Tier A or B, the volume will be evaluated under Tier C. For the migration pathways, the source is assigned a value for volume using the appropriate Tier equation from Table 2-5 (Ref. 1, Section 2.4.2.1.3). The volume for a plume site with no identified source can be determined by measuring the area within all observed release samples combined with the vertical extent of contamination, to arrive at an estimate of the plume volume (Ref. 22, p. 4).

Since the vertical extent of the ground water plume has not been adequately characterized, the volume for the ground water plume will be designated as unknown, but greater than zero.

Volume Assigned Value: Unknown, but >0

2.4.2.1.4 Area

Description

Area, Tier D, is not scored (NS) for source type "other" (Ref. 1, Table 2-5).

Area Assigned Value: 0

2.4.2.1.5 Source Hazardous Waste Quantity Value

The source hazardous waste quantity value for Source 1 is unknown, but > 0 (Ref. 1, Section 2.4.2.1.5).

Source Hazardous Waste Quantity Value: Unknown, but >0

SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Hazardous Waste Quantity Value	Source Hazardous Constituent Quantity Complete? (Y/N)	Containment Factor Value by Pathway				
			Ground Water (GW) (Ref. 1, Table 3-2)	Surface Water (SW)		Air	
				Overland/flood (Ref. 1, Table 4-2)	GW to SW (Ref. 1, Table 3-2)	Gas (Ref. 1, Table 6-3)	Particulate (Ref. 1, Table 6-9)
1	Unknown, but >0	N	10	NS	NS	NS	NS

NS Not Scored

2.4.2.2 Hazardous Waste Quantity Factor Value

According to Section 2.4.2.2 of the HRS Rule (Ref. 1, Sec. 2.4.2.2, p. 51592), if the hazardous constituent quantity is not adequately determined for one or more sources, and if any target for the migration pathway under consideration is subject to Level I (or Level II) concentrations, assign either the value from Table 2-6 or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway. Because Level I concentrations are present in a drinking water well at the site (as presented in this HRS documentation record), a hazardous waste quantity factor value of 100 is assigned.

Hazardous Waste Quantity Factor Value: 100

Possible Sources of Ground Water Plume

Although the source of the chlorinated solvents has not been identified, there are numerous facilities in the area which are considered potential sources of the ground water contamination because TCE or other chlorinated solvents were found to have been used or were identified at these facilities (Refs. 3, Appendix O; 9, p. 5; 20, pp. 2, 7, 8, 18; 23, pp. 6, 7; 28; 33, pp. 3, 4; 35, pp. 2-4; 44, p. 1; p. 5 of this HRS documentation record).

From the 1940s through 1977, K.G. Gemeinhardt Company, Inc., (Gemeinhardt), and its predecessors, owned and operated manufacturing facilities on a three-acre site at 57882 State Route 19 (Refs. 25, p. 3; 33, p. 2; 28; 53, p. 1; p. 5 of this HRS documentation record). Gemeinhardt is located on Route 19 in Elkhart, Indiana approximately 0.75 miles south of Lusher Street (Refs. 9, p. 5; 28; 33, p. 2; p. 5 of this HRS documentation record). Gemeinhardt manufactures musical instruments (Ref. 45, p. 2). In the process of manufacturing these instruments, Gemeinhardt used 1,1,1-TCA, TCE, and PCE, which are chlorinated VOCs (Ref. 45, p. 2). In 1985, Gemeinhardt agreed to an interim remedial action, whereby Gemeinhardt shall conduct an investigation sufficient to fully characterize the sources and extent of ground water identified to the north-north-west of the facility (Ref. 33, pp. 7, 8, 23). While conducting an extent of contamination study at Gemeinhardt under the terms of the 1985 Consent Order with the EPA, volatile organic compounds (VOCs) were detected in private drinking water wells in an area immediately

south of Lusher Avenue (Ref. 9, p. 5). At the time of this investigation, Gemeinhardt believed that the contamination in this area was independent of the Gemeinhardt ground water plume (Ref. 9, p. 5). High levels of chlorinated solvents have been used at the Gemeinhardt facility (Ref. 33, p. 4). The chlorinated solvents detected in the drinking water wells included primarily TCE and PCE. Gemeinhardt produced process waste streams, which were disposed of on the facility (Ref. 33, p. 3). The process wastes drained to various sumps that pump the wastes to several dry wells, to a gravel seepage bed, or to a septic tank at the facility (Ref. 33, p. 3). These wastes were then allowed to seep into the ground and the shallow underlying aquifer (Ref. 33, p. 3). Gemeinhardt produced approximately 2,500 gallons of wastewater per operating day that were formerly pumped to the various seepage systems (Ref. 33, p. 3). Sometime prior to December 25, 1984, Gemeinhardt ceased all wastewater discharges to the dry wells (Ref. 33, p. 4). Gemeinhardt removed approximately 1,000 cubic yards of contaminated soil from the facility (Ref. 33, p. 4). As of January 8, 1985, Gemeinhardt contracted with the city of Elkhart to dispose of its wastewater at the Elkhart Municipal Wastewater Treatment Plant (Ref. 33, p. 4). In 1988, Gemeinhardt completed a comprehensive hydrogeological study which found 1,1,1-TCA, TCE, and PCE in the ground water at, and downgradient of, Gemeinhardt and a plume containing these VOCs extending north-northwest from the Gemeinhardt plant (Ref. 45, p. 2). The hydrogeological report also found evidence of at least one other source of these VOCs unrelated to the Gemeinhardt facility (Ref. 45, pp. 2-3). On January 23, 1990, EPA and IDEM issued an Administrative Order by Consent which required Gemeinhardt to undertake and complete certain response actions, including removal and treatment of ground water, to prevent the migration of hazardous substances in ground water and to prevent exposure to ground water containing hazardous substances (Ref. 45, pp. 1, 2, 20). The recommended action consisted of installing three recovery wells and a treatment facility to remove and treat contaminated ground water containing chlorinated VOCs (Ref. 45, p. 4).

The Conrail Rail Yard NPL site is located approximately 4500 feet to the west, south west of Lusher Street Ground Water Contamination (Refs. 28, 49; p. 5 of this HRS documentation record). The Conrail Railyard, which comprises approximately 675 acres, began operations in 1956 as part of the New York Central Railroad and continued operations as a subsidiary of the Penn Central Transportation Company until 1976 (Ref. 44, p. 1). In the early 1960s, a railcar containing carbon tetrachloride was punctured, and the contents were emptied onto the ground (Ref. 44, p. 1). In 1986, the United States Environmental Protection Agency (U.S. EPA) discovered volatile organic compounds (VOCs) in the ground water near the site (Ref. 44, p. 1). Wells in the vicinity of Conrail were found to contain up to 5,000 parts per billion (ppb) carbon tetrachloride and similar concentrations of TCE (Ref. 44, p. 1). Local ground water in the area is generally accepted to flow north toward and into the St. Joseph River (Refs. 15, p. 25; 26, pp. 16, 21 (pp. 43 and Plate 1); 27, p. 5). As this site is west, south west of Lusher Street Ground Water Contamination and local ground water in the area is generally accepted to flow north, Conrail Rail Yard is not a suspected possible source for Lusher Street Ground Water Contamination (Refs. 15, p. 25; 26, pp. 43 and Plate 1; 27, p. 5; 28; 49; p. 5 of this HRS documentation record). To further support this, the source areas on Conrail Rail Yard NPL site are hydraulically contained and continue to be protective of human health and the environment (Ref. 44, p. 2). Conrail Rail Yard NPL site was mentioned in this section based upon the presence of TCE in ground water.

Reconnaissance site visits at numerous facilities were conducted in August, October and November 2006 (Ref. 20, p. 1). The purpose of these visits was to conduct site visits or interview as facilities as part of the Lusher Street Ground Water contamination investigation (Ref. 20, p. 1). 46 facilities were visited (Ref. 20, pp. 1-20). Based on the information gathered from these site visits, the following five (5) facilities are considered potential sources of the ground water contamination because TCE or other chlorinated solvents

were found to have been used or were identified at these facilities (Refs. 20, pp. 2, 7, 8, 18; 23, pp. 6, 7; 28; 35, pp. 2-4; 37, p. 1; 38, p. 1; 39, p. 3; 40, p. 1; 41, p. 4; 47, pp. 1, 4; 50, p. 2; p. 5 of this HRS documentation record).

Walerko Tool & Engineering (Walerko) is a registered ISO9002 tool and engineering company (Ref. 20, p. 18). Walerko commenced business operations in 1952 (Refs. 35, p. 1; 39, p. 2). Walerko engages in machining, tool and die work at its manufacturing plant located at 1935 West Lusher Avenue in Elkhart, Indiana (Refs. 20, p. 18; 28; 35, p. 2; p. 5 of this HRS documentation record). Walerko used the cleaning solvent trichloroethane as a parts cleaner in Walerko's manufacturing process (Refs. 35, p. 2; 38, p. 1; 39, p. 3; 40, p. 1). Periodically, when the tanks and smaller containers of solvent became dirty, Walerko employees disposed of the spent solvent outside of the facility onto the ground, and then refilled the containers with fresh solvent (Refs. 35, pp. 2-3; 37, p. 1). In 1987, the drinking water well located at Walerko indicated the presence of TCA at a concentration of 660 parts per billion (ppb) and TCE at a concentration of 38 ppb (Refs. 35, p. 4; 41, p. 4). In 2007, an inspection along the eastern sector of the facility revealed dark oil stained soils beneath several dumpsters containing scrap metal (Refs. 20, p. 18; 35, p. 4). EPA identified Walerko Tool & Engineering Company (Walerko) liable for the ground water contamination around Lusher Street (Refs. 35, p. 1-3, 9-10). On September 24, 1993, EPA filed a Cost Recovery Consent Decree with Walerko Tool & Engineering Corporation (Ref. 21, p. 3). The consent decree filed a complaint pursuant to Sections 104(e) and 107 of the Comprehensive Environmental Response, Compensation, Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C Sections 9604(e) and 9607, and Section 3007 of the Resource Conservation and Recovery Act ("RCRA"), 42 U.S.C. Section 6927 (Ref. 21, p. 5). The United States was seeking reimbursement of response costs incurred by EPA and the Department of Justice for response actions in connection with the release or threatened release of hazardous substances, including 1,1,1-TCA and TCE, at the Lusher Street Site in Elkhart, Indiana and civil penalties for Walerko's failure to timely respond to EPA's information requests dated March 26, 1990 (Ref. 21, p. 5). On July 20, 1993, Walerko agreed to enter into the consent decree provided a settlement schedule for payment of past costs $125,330 and a civil penalty $19,670 (Ref. 21, pp. 1, 22, 23).

Flexible Foam Products is located at 1900 W Lusher in Elkhart, Indiana (Ref. 20, p. 2; 28; p. 5 of this HRS documentation record). The company was originally known as Indiana Foam (Ref. 20, p. 2). The company appears to be a subsidiary of Ohio Decorative Products, Inc. since 1971 (Refs. 47, p. 1; 48, p. 1). The company currently manufactures polyurethane foam and is a supplier of foam and foam products for residential and commercial applications (Ref. 20, pp. 2, 3). Toluene diissocyanate is used to manufacture the foam (Ref. 20, p. 3). Other substances used at the facility include carbon dioxide (which replaced methylene chloride), colorants, fire retardants, ethyl acetone naphtha, tin, and Poly All, which is supplied by Bayer (Ref. 20, p. 3). It would appear that 1,1,1-TCA was also used at the facility in 1991 as exhibited by Flexible Foam Products Toxics Release Inventory (Ref. 47, pp. 1, 4).

B-D Industries, Inc. is located at 1715 Fieldhouse Avenue in Elkhart, Indiana (Refs. 20, p. 7; 28; p. 5 of this HRS documentation record). The company was founded in 1979 (Ref. 46). The facility processes metal castings for the aerospace industry. The types of castings that the company works on include landing gears, brake parts, and other parts for 747s, 737s, and other planes (Ref. 20, p. 7). Parts are cleaned and put in tanks of sulfuric acid as part of a plating/anodizing process (as the company representative stated: The company changes the molecular structure of aluminum to aluminum oxide for corrosion protection) (Ref. 20, p. 7). Sulfuric acid, nitric acid, sodium hydroxide, hydrogen chloride (HCl), methyl ethyl ketone (MEK), and TCE are liquids that the company utilizes in their processing

(Ref. 20, p. 7). All hazardous wastes are sent off by Safety Clean twice a year. The company also uses some hydraulic oils (Ref. 20, p. 7).

Gaska Tape is located at 1810 W. Lusher in Elkhart, Indiana (Refs. 20, p. 2; 28; p. 5 of this HRS documentation record). This company is a poly vinyl chloride (PVC) foam manufacturer (Ref. 20, p. 2). The company began operations in 1965 (Ref. 20, p. 2). Gaska Tape is a manufacturer of closed-cell foams and adhesive tapes (PVC Foam, Polyester Foam and Gaska Hi Bond® Adhesive Tapes) (Ref. 20, p. 2). TCE had been used at the site as a support solvent for suspending silicone as a release coating agent (Refs. 20, p. 2; 50, p. 2). The company also uses oil base plasticizers in its manufacturing processes (Ref. 20, p. 2). The company utilizes the services of D&B Environmental Services to dispose of its waste material (Ref. 20, p. 2). The facility was formerly a RCRA large quantity generator of hazardous waste but is now a small quantity generator (Ref. 20, p. 2). The facility uses a regenerative thermo oxidizer that burns VOCs before they go into the air (Ref. 20, p. 2). A dry pond is located in a wooded area north of the plant building and captures any runoff from the facility (Ref. 20, p. 2). This pond is not lined (Ref. 20, p. 2).

The Sturgis Metal (aka Elkhart Metal) is located at 1514 W. Lusher in Elkhart, Indiana (Refs. 20, p. 8; 28; p. 5 of this HRS documentation record). The company is a metal recycling facility (Ref. 20, p. 8). The facility accepts and purchases scrap ferrous and nonferrous metal (Ref. 20, p. 8). The facility utilizes hydraulic oils, diesel fuel, antifreeze, transmission fluid, and solvents for a parts washer (Ref. 20, p. 8). Most of these fluids are stored in the maintenance building (Ref. 20, p. 8). All generated waste is handled by Safety Clean. In 2006, soil samples were collected by IDEM's Enforcement section at the Sturgis Metals facility to address some citizen complaints (Refs. 20, p. 8; 52, p. 1). Analysis of the soil revealed cis 1, 2 - DCE at an estimated 1.6J ug/kg (Ref. 23, p. 6) and PCE in an autofluff sample was estimated at 170J ug/kg (Ref. 23, p. 7). This data was considered to be equal to or greater than the detection limit, but less than the reporting limit (Ref. 23, p. 7).

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 GENERAL CONSIDERATIONS

Ground Water Migration Pathway Description

Lusher Street Ground Water Contamination is located within the St. Joseph Aquifer System, which is an aquifer composed of unconsolidated material dominated by glacial outwash sands and gravels (Refs. 26, p. 16 (p. 43); 27, p. 7; 27, pp. 2, 3, 7; 28; p. 5 of this HRS documentation record). The thickness of the aquifer, which is composed of all the unconsolidated material overlying bedrock, in the study area is believed to be between 120 and 200 feet (Refs. 15, pp. 23-26 (pp. 12-15); 26, pp. 12, 23 (pp. 13, figure 8, 108); 19, p. 8 (p. 29) note that surface elevations in the study area are between 720 and 760 feet above mean sea level (MSL) (Refs. 13; 14)). The bedrock formation underlying the St. Joseph Aquifer in the study area is believed to be the Ellsworth Shale, a Devonian-Mississippian formation (Refs. 15, p. 20 (p. 9), "Bedrock Geology"; 19, p. 6 (p. 27); 26, pp. 15, 23 (pp. 16, 108); 27, pp. 7, 8). The bedrock is shale and is not an aquifer (Ref. 17, p. 68 (p. 3-3)). All drinking water wells in the area with logs in the state database are completed in the sands and gravels of the St. Joseph Aquifer (Refs. 3, Appendix T, pp. 1-77; 26, pp. 15, 16 (pp. 16, 43); 27, pp. 10-12). Ground water flow is northward toward the St. Joseph River (Refs. 15, pp. 35, 38 (pp. 25, 28); 16, p. 68 (p. 48); 19, p. 7 (p. 28)); 26, p. 21 (plate 1); 27, p. 5, 6; 28; p. 5 of this HRS documentation record). Vertical gradients are small except in the immediate vicinity of the river, where a substantial upward gradient indicates discharge to the river, which is well-connected to the St. Joseph Aquifer (Ref. 15, p. 35 (p. 25); 17, p. 71 (p. 3-6); 26, p. 16(p. 43)). The river should, therefore, form a discharge barrier to contaminant migration beyond the river, although the aquifer continues for several miles in this direction (Ref. 26, pp. 16, 22 (p.43, plate 1)).

- Aquifer/Stratum 1 (uppermost):

Description

The St. Joseph aquifer is the aquifer being evaluated (See p. 34 of this HRS documentation record "Summary Of Aquifer(s) Being Evaluated"). According to the IDNR well logs, no known wells have penetrated the bedrock in Section 7 or the northern half of Section 18, Township 37N, Range 5E (Refs. 3, Appendix T, pp. 1-77; 27, p. 7). The aquifer consists of sand and gravel (Ref. 26, p. 16 (p. 43); 27, p. 7). Ground water flow is in a northern direction toward the St. Joseph River (Refs. 15, pp. 35, 38 (pp. 25, 28); 16, p. 63 (p. 48); 19, p. 7 (p. 28)); 26, p. 21 (plate 1); 28; p. 5 of this HRS documentation record). The St. Joseph River begins near Hillsdale, Michigan, and generally flows to the southwest, then to the north through South Bend, Indiana and empties into Lake Michigan (Ref. 19, p. 5 (p. 26)). The St. Joseph River flows from east to west through this region (Ref. 15, p. 19 (p. 8)).

3.0.2 GEOLOGY AND HYDROGEOLOGY

Regional Background

The regional geology is briefly reviewed in Reference 15, pp. 19-21 (pp. 8-10) and Reference 27, pp. 2-3. The St. Joseph Aquifer system is the one that has been contaminated by the hazardous materials in the Lusher Avenue Ground Water Contamination area (Ref. 26, pp. 16, 18, 22 (pp. 43, 45 and plate 2); 28; p. 5 of this HRS documentation record)). This aquifer system consists of Quaternary deposits laid down by

glaciation, with the modern surface shaped by the convergence of continental glacial lobes from the northwest (Lake Michigan lobe) and northeast (Saginaw and Erie lobes) (Refs. 19, p. 6 (p. 27); 26, pp. 10-13 (pp. 11-14); 27, p. 2).

The St. Joseph River flows in the eastern extension of the Kankakee Lowland outwash plain, a major southwestward outlet for meltwater from the Lake Michigan, Saginaw, and Erie glacial lobes; this outlet was active while the eastern Great Lakes and the St. Lawrence River were still icebound (Refs. 19, p. 5 (p. 26); 26, p. 11 (p. 12); 27, p. 3). This plain is mainly underlain by outwash sand and gravel; subordinate lenses of clay lie below, within, or above coarser deposits and some thin Holocene alluvium has been deposited at the surface (Refs. 15, pp. 26, 34 (pp. 15, 24); 26, p. 11 (p. 12); 27, p. 3). Because of the thick deposits of transmissive sediment that make up the aquifer, their position at or near the ground surface, and the relatively high precipitation rate of the Great Lakes region, the St. Joseph Aquifer system is capable of producing over 1000 gallons per minute from properly constructed wells (Refs. 26, pp. 17-18 (pp. 44-45); 27, p. 3).

Ground water flows toward the St. Joseph River from the north and south (Refs. 26, p. 21 (plate 1); 27, p. 7). Active connection is believed to exist between the St. Joseph Aquifer and the St. Joseph River, with substantial vertical gradients in its vicinity indicating a gaining stream (Refs. 15, pp. 35, 42, 47 (pp. 25, 32, 37); 17, p. 71 (p. 3-6); 18, p. 41 (p. 3-3)). A dam a short distance upstream in Elkhart stabilizes the local river level, which creates a local zone of recharge and affects ground water elevations in the vicinity (Ref. 15, pp. 35, 42 (pp. 25, 32)).

Site-specific Considerations

In the study area, the bedrock surface is believed to lie at an elevation of 550 to 600 feet above MSL (Ref. 15, p. 23 (p. 12)) and slopes westward and northwestward, and the ground surface varies in elevation from less than 720 feet above MSL at the river to 760 feet above MSL in the southern portion of the area (Refs. 3, Appendix T, pp. 39, 62 (well records 60975, 60279); 13; 14; 19, p. 8 (p. 29)). Thus, approximately 120 to 200 feet of unconsolidated sediment is present in the study area (See also Refs. 26, pp. 12, 16 (p. 13, figure 8, 43)).

Private wells that supply water for residents and businesses in the Lusher Street Ground Water Contamination area draw water from unconsolidated sand and gravel deposits south of the St. Joseph River (Refs. 3, Appendix T, pp. 1-77; 26, pp. 15, 16 (pp. 16, 43); 27, pp. 3, 10-12). According to available well logs obtained from the Indiana Department of Natural Resources for Section 7 and the northern half of Section 18, Township 37 North, Range 5E, wells are completed at depths ranging from 13.5 feet to 145 feet below ground surface (Refs. 3, Appendix T, pp. 1-77; 27, pp. 10-12; 29). It should be noted that the well record information for Sections 7 and 18 is incomplete: in particular, the majority of well logs are not available for the wells sampled for the Site Inspection (Ref. 3, p. 3-15). The screened intervals for these wells are therefore unknown (Refs. 3, Appendix T, pp. 1-77; 27, pp. 10-12 (pp. 9-11); 29; see Section 3.1.1 of this HRS documentation record). The screened intervals for these drinking water wells, excluding wells not used for drinking water, range from 22 feet to 150 feet below ground surface see Section 3.1.1 Observed Release, pp. 34-38 of this HRS documentation record).

3.0.2.1 Stratigraphy and Water-Bearing Properties

The geologic strata underlying the site will be described from the surface downward, in reverse chronological order of emplacement.

St. Joseph Aquifer (unconsolidated sand and gravel with some clay till, Pliocene/Pleistocene/Holocene)

The geology and hydrogeology of this aquifer is described in Reference 15, pp. 19-34 (pp. 8-24) and Reference 27, pp. 2-7. The St. Joseph River valley is underlain by thick, transmissive outwash sands and gravels, with local layers of clay, which make up the St. Joseph Aquifer (Ref. 26, p. 16 (p. 43); 27, p. 7). There is no continuous clay layer across the study area (Refs. 15, pp. 32-33 (pp. 22-23); 60, p. 2; 27, pp. 4, 5, 13, 18). Many water well logs present in the state records document a layer of clay at some depth, but these layers are seen to be discontinuous when the logs are used to construct cross-sections (Refs. 3, Appendix T, pp. 1-77; 27, pp. 14-16). Since the entire St. Joseph Aquifer is vertically continuous within the area being investigated, it is continuous within 2 miles of the area, and therefore the St. Joseph Aquifer will not be subdivided for the purpose of scoring, as per Reference 1, p. 51595, Section 3.0.1.2.1 and Reference 30, pp. 2, 3.

There are two boundaries of the St. Joseph Aquifer within 4 miles of the study area. The aquifer is underlain by the Ellsworth Shale (see below) at a depth of 120 to 200 feet below ground surface (Refs. 15, pp. 23-26 (pp. 12-15); Ref. 26, pp. 12, 15 (p. 13, 16), figures 8 and 12). Within the 4 mile radius, bedrock may be found as deep as 450 to 500 feet below ground surface (Ref. 15, p. 25 (p. 14)). The St. Joseph Aquifer is bounded to the south by the Nappanee Aquifer System, which consists of small deposits of sand and gravel embedded in a thick glacial till sequence; this boundary occurs approximately 1 to 2 miles south of the study area (Ref. 26, p. 22 (plate 2)).

Chlorinated contaminants have been found in a well reported to be 100 feet deep, according to a telephone interview with the property owner conducted by Mark Jaworski (Sample E2P29, Refs. 3, p. 3-26; Appendix N, pp. 132-138, 173, 186, 190; 6, p. 45; 8, p. 6; 32, pp. 137-139; 54, p. 2). Chlorinated contaminants have also been found in shallower portions of the St. Joseph Aquifer in this northwest region of the area under study (screened interval 50 to 54 feet below ground surface, sample E2P38), (screened interval 38 to 43 feet below ground surface, sample E2P41), (and screened interval 20 to 30 feet below ground surface, sample E2P42) (Refs. 3, pp. 3-25, 3-26, Appendix N, pp. 132-138, 175, 176, 186, 190, 311-318, 344, 355, 356, Appendix T, pp. 7, 10, 36, 51; 6, pp. 37, 38, 53; 32, pp. 146-151, 234-236; 29, p. 2; 54, p. 2) . These wells are all in the northwest quarter of the area of concern and thus, in this area, the St. Joseph Aquifer appears to contain contaminated ground water over a wide range of depths (Ref. 28; p. 5 and Sections 2.2.2 and 3.1.1 of this HRS documentation record).

Samples with chlorinated contaminants were taken from wells located south, i.e. upgradient of identified possible sources, including Walerko Tool and Engineering, Flexible Foam Products, and B-D Industries (Refs. 15, pp. 38-41 (pp. 28-31); 26, p. 21 (plate 1); Ref. 28; p. 5 of this HRS documentation record). The most notable examples are samples E2P04, E2P14, E2P21, E2P27, and E2P58 (Refs. 3, Appendix N, pp. 2-9, 46, 47, 50, 51, 61, 62, 63, 132-138, 171-174, 186, 188, 189, 190, 311-318, 348, 349, 355, 357; 6, pp. 4, 19, 27, 32, 44; 32, pp. 19-21, 55-57, 122-124, 134-136, 265-267; 28; p. 5 and Sections 2.2.2 and 3.1.1 of this HRS documentation record). The network of existing water wells does not provide enough information to determine where the plume source is located (Ref. 28; p. 5 of this HRS documentation record).

No chlorinated contaminants were detected in samples E2NY9, E2NZ0, E2NY6, E2P50, or E2P64, located in the southeast portion of the study area; sample E2P06, located in the southwest corner of the study area; sample E2P49, located in the east central portion of the study area (well record number 378988, ref. 3, Appendix T, p. 59; screened interval 88 to 108 feet below ground surface); or sample E2P66, located along the western edge of the study area (well record number 60291, Ref. 3, Appendix T, p. 19; screened interval 40 to 45 feet below ground surface) (See p. 5 and Sections 2.2.2 and Section 3.1.1 of this HRS documentation record; Ref. 28). These sample results demonstrate that the chemicals detected in the other wells are not ubiquitous in ground water within the study area. The screening depths for most of these wells are not known in most cases, but the wells with unknown screening depths are believed to be screened at depths comparable of known wells (See pp. 34-38 of this HRS documentation record). Known drinking water well screening depths within the study area range between 22 feet and 150 feet below ground surface and all are screened within unconsolidated materials (Refs. 3, Appendix T, pp. 1-77; 27, pp. 10-12; Section 3.1.1 of this HRS documentation record). As discussed above, this indicates that all the wells are screened within the St. Joseph Aquifer.

Ellsworth Shale, Lower Confining Bed (dense dark shale, Devonian/Mississippian)

This is the stratum below the St. Joseph Aquifer (Refs. 15, pp. 23-26 (pp. 12-15); 27, p. 7; 62, p. 12 (p. 13), figure 8). As discussed in Reference 17, p. 68 (p. 3-3) and Reference 27, p. 7, the shale underlying the St. Joseph Aquifer is not believed to be an aquifer. No water wells in the study area are known to be screened within bedrock (Ref. 3, Appendix T, pp. 1-77; Ref. 27, pp. 10-12).

SUMMARY OF AQUIFER(S) BEING EVALUATED

Aquifer No.	Aquifer Name	Is Aquifer Interconnected with Upper Aquifer within 2 miles? (Y/N/NA)	Is Aquifer Continuous within 4-mile TDL? (Y/N)	Is Aquifer Karst? (Y/N)
1	St. Joseph	NA	N*	N

This is the only aquifer being evaluated. There is no continuous clay layer across the study area according to available data (Refs. 15, pp. 32-33 (pp. 22-23); 27, pp. 13, 18; 60, p. 2). Bedrock beneath the aquifer is shale and is not believed to be an aquifer (Refs. 17, p. 68 (p. 3-3); 27, pp. 6, 9-11; Sections 2.2.2 and 3.1.1 of this HRS documentation record).

* See Reference 26, p. 22 (Plate 2). Although the aquifer is not continuous within 4 miles, because there is no continuous clay layer across the study area, this does not change the aquifer being evaluated.

3.1 LIKELIHOOD OF RELEASE

3.1.1 OBSERVED RELEASE

Aquifer Being Evaluated: 1 Surficial

Chemical Analysis

Establishing an observed release by chemical analysis requires analytical evidence of a hazardous substance in the media significantly above background level. If the background concentration is not detected (or is less than the detection limit), an observed release is established when the sample measurement equals or exceeds it own sample quantitation limit (SQL) and that of the background sample. If the SQL cannot be established, use the EPA contract-required quantitation limit (CRQL) in place of the SQL (Ref. 1, Section 2.3, p. 51589).

- Background Concentrations:

Seven (7) ground water samples were collected during the site sampling investigation to be used as background samples. On September 12, 2006, December 5, 2006, December 6, 2006, and December 12, 2006, seven ground water samples were collected up gradient of the suspected ground water plume for background levels (Refs. 5, pp. 7, 10, 11; 6, pp. 6, 29, 34; 7, pp. 3, 4; 27, p. 11; 28; 29, p. 2; 59; p. 5 of this HRS documentation record). The background and release sample are considered sufficiently similar to allow comparison. They were collected from the same aquifer system during similar time frames with same sampling procedures and were analyzed using the same methodologies (Refs. 3, 5, 6, 27 and Sections 3.0.1 and 3.0.2 of this HRS documentation record).

The following table provides a summary of the background sample descriptions including the typical well depth that drinking water wells are drilled and screened at in the area (Refs. 3, Appendix T, pp. 2, 12, 19, 56, 59; 27, p. 11; 29, p. 2). Specific driller's logs were not available for each well; however, a survey of IDNR well records for the nearby area shows that the shallowest well is 22 feet below ground surface (bgs) and the deepest well is screened to a depth of 150 feet bgs (Ref. 27, p. 11).

Sample ID	Screened Interval (feet bgs)	Date	Reference
E2NY9	UNKNOWN 22 TO 150 FEET	9/12/06	Refs. 5, p. 10; 27, p. 11
E2NZ0	UNKNOWN 22 TO 150 FEET	9/12/06	Refs.5, p. 11; 27, p. 11
E2NY6	UNKNOWN 22 TO 150 FEET	9/12/06	Refs. 5, p. 7; 27, p. 11
E2P06	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 6; 27, p. 11
E2P49	88-108 feet	12/5/06	Refs. 3, p. 3-25, Appendix T, p. 59; 6, p. 29

Sample ID	Screened Interval (feet bgs)	Date	Reference
E2P50	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 34; 27, p. 11
E2P64	43 feet to 48 feet	12/13/06	Refs. 3, p. 3-26, Appendix T, pp. 12, 56; 7, p. 3
E2P66	40 feet to 45 feet	12/13/06	Refs. 3, p. 3-26, Appendix T, pp. 2, 19; 7, p. 4; 29, p. 2

Sample ID	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit	References
E2NY9	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 15, 16, 24, 25, 26, Appendix D; 5, p. 10; 31, pp. 31-33; 54, pp. 1, 2
E2NZ0	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 15, 16, 24, 25, 26, Appendix D; 5, p.11; 31, pp. 34-36; 54, pp. 1, 2
E2NY6	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 13, 14, 24, 25, Appendix D; 5, p.7; 31, pp. 22-24; 54, pp. 1, 2
E2P06	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 46, 47, 61, 62, Appendix E; 6, p.6; 32, pp. 25-27; 54, pp. 1, 2
E2P49	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 346, 347, 354, 355, 357, 358, Appendix E; 6, p.29; 32, pp. 243-245; 54, pp. 1, 2

Sample ID	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit	References
E2P50	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 346, 347, 355, 357, Appendix E; 6, p. 34; 32, pp. 250-252; 54, pp. 1, 2
E2P64	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398, Appendix E; 7, p. 3; 32, pp. 298-300; 54, pp. 1, 2
E2P66	TCE 1,1-DCE Cis1,2-DCE Trans1,2-DCE 1,1,1-TCA PCE	Non Detect Non Detect Non Detect Non Detect Non Detect Non Detect	0.5 UJ ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398, Appendix E; 7, p. 4; 32, pp. 301-303; 54, pp. 1, 2

- Contaminated Samples:

The following samples meet the observed release criteria and are presented below indicating organic hazardous substances with their concentrations and CRQLs. These samples were qualified as observed releases based on the criteria in the HRS Rule (Ref. 1, Section 2.3). The well locations can be seen in Sample Location ID Maps (Ref. 3, Appendices D, E; 28). The table below presents the typical well depth that drinking water wells are drilled and screened at in the area (Refs. 3, Appendix T; 27, p. 11; 29). Specific driller's logs were not available for each well; however, a survey of IDNR well records for the nearby area shows that the shallowest well is 22 feet bgs and the deepest well is screened to a depth of 150 feet bgs (Ref. 27, p. 11).

Sample ID	Screened Interval (feet bgs)	Date	Reference
E2NX0	UNKNOWN 22 to 150 FEET	9/12/06	Refs. 5, p. 1, 27, p. 11
E2NX4	UNKNOWN 22 TO 150 FEET	9/12/06	Refs. 5, p. 5; 27, p. 11
E2NZ2	UNKNOWN 22 TO 150 FEET	9/12/06	Refs. 5, p. 13; 27, p. 11
E2P01	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 2, 27, p. 11
E2P02	22 feet to 26 Feet	12/5/06	Refs. 3, Appendix T, pp. 7, 38; 6, p. 11; 29, p. 2

Sample ID	Screened Interval (feet bgs)	Date	Reference
E2P03	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 3; 27, p. 11
E2P04	35 Feet to 40 Feet	12/5/06	Refs. 3, Appendix T, p. 61; 6, p. 4; 29, p. 2
E2P07	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 7; 27, p. 11
E2P08	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 9; 27, p. 11
E2P09	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 10; 27, p. 11
E2P10	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 22; 27, p. 11
E2P11	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 16; 27, p. 11
E2P12	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 17; 27, p. 11
E2P13	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 20; 27, p. 11
E2P14	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 19; 27, p. 11
E2P16	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 24; 27, p. 11
E2P17	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 21; 27, p. 11
E2P18	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 18; 27, p. 11
E2P19	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 26; 27, p. 11
E2P21	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 27; 27, p. 11
E2P23	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 28; 27, p. 11
E2P26	34 Feet to 38 Feet	12/6/06	Refs. 3, p. 3-25, Appendix T, pp. 4, 27; 6, p. 33; 29, p. 2; 55
E2P27	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 44; 27, p. 11
E2P29	100 FEET	12/6/06	Refs. 3, p. 3-26; 6, p. 45; 8, p. 6
E2P31	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 48; 27, p. 11
E2P32	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 49; 27, p. 11
E2P33	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 50; 27, p. 11

Sample ID	Screened Interval (feet bgs)	Date	Reference
E2P34	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 51; 27, p. 11
E2P35	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 46; 27, p. 11
E2P37	UNKNOWN 22 TO 150 FEET	12/7/06	Refs. 6, p. 52; 27, p. 11
E2P38	50 Feet to 54 Feet	12/6/06	Refs. 3, p. 3-26, Appendix T, pp. 7, 36; 6, p. 53; 29, p. 2
E2P39	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 54; 27, p. 11
E2P40	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 36; 27, p. 11
E2P41	38 Feet to 43 Feet	12/6/06	Refs. 3, p. 3-25, Appendix T, pp. 10, 51; 6, p. 37; 29, p. 2
E2P42	20 Feet to 30 Feet	12/6/06	Refs. 3, p. 3-25; 6, p. 38; 8, p. 5
E2P43	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 39; 27, p. 11
E2P44	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 40; 27, p. 11
E2P45	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 42; 27, p. 11
E2P46	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 8; 27, p. 11
E2P47	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 12; 27, p. 11
E2P48	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p.13; 27, p. 11
E2P51	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 41; 27, p. 11
E2P52	UNKNOWN 22 TO 150 FEET	12/6/06	Refs. 6, p. 43; 27, p. 11
E2P58	UNKNOWN 22 TO 150 FEET	12/5/06	Refs. 6, p. 32; 27, p. 11
E2P61	UNKNOWN 22 TO 150 FEET	12/13/06	Refs. 7, p. 1; 27, p. 11
E2P62	UNKNOWN 22 TO 150 FEET	12/13/06	Refs. 7, p.2; 27, p. 11

Notes: No log or other record of screened interval or depth is available for most wells. All wells are believed to be screened in the unconsolidated aquifer and this aquifer is believed to extend to less than 200 feet below ground surface, as discussed in Section 3.0.1 of this HRS documentation record.

Sample ID	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit	Reference
E2NX0	TCE Cis1,2-DCE	25 ug/L 0.52 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 11, 12, 24, 25; 5, p.1; 31, pp. 1-3; 54, pp. 1, 2
E2NX4	TCE	37 ug/L	2.0 ug/L*	Refs. 3, Appendix M, pp. 2-9, 11, 12, 13, 14, 24, 25; 5, p. 5; 31, pp. 13-15, 16-18; 54, pp. 1, 2
E2NZ2	TCE Cis1,2-DCE	64 ug/L 0.63 ug/L	2.5 ug/L* 0.5 ug/L	Refs. 3, Appendix M, pp. 2-9, 15, 16, 24, 27; 5, p. 13; 31, pp. 40-43, 44-46; 54, pp. 1, 2
E2P01	TCE Cis1,2-DCE 1,1,1-TCA	640 ug/L 4.9 ug/L 39 ug/L	20 ug/L* 0.5 ug/L 20 ug/L*	Refs. 3, Appendix N, pp. 2-9, 44, 45, 61, 62; 6, p. 2; 32, pp. 4-6; 54, pp. 1, 2
E2P02	TCE Cis1,2-DCE 1,1,1-TCA	7.4 ug/L 0.64 ug/L 2.6 ug/L	0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 44, 45, 61, 62; 6, p. 11; 32, pp. 10-12; 54, pp. 1, 2
E2P03	TCE Cis1,2-DCE 1,1-DCE	620 ug/L 4.2 ug/L 1.3 ug/L	40 ug/L* 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 44, 45, 46, 47, 61, 62; 6, p. 3; 32, pp. 13-15, 16-18; 54, pp. 1, 2
E2P04	1,1,1-TCA	2.0 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 46, 47, 61, 62; 6, p. 4; 32, pp. 19-21; 54, p. 2
E2P07	1,1,1-TCA TCE	4.2 ug/L 24 ug/L	0.5 ug/L 1.0 ug/L*	Refs. 3, Appendix N, pp. 2-9, 46, 47, 48, 49, 61, 62; 6, p. 7; 32, pp. 28-30, 31, 33; 54, p. 2
E2P08	1,1,1-TCA	3.2 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 48, 49, 61, 62; 6, p. 9; 32, pp. 34-36; 54, p. 2
E2P09	TCE Cis1,2-DCE 1,1,1-TCA	7.9 ug/L 0.72 ug/L 2.8 ug/L	0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 48, 49, 61, 62; 6, p. 10; 32, pp. 37-39; 54, pp. 1, 2
E2P10	TCE Cis1,2-DCE 1,1,1-TCA Trans1,2-DCE	79 ug/L 16 ug/L 63 ug/L 6.5 ug/L	5.0 ug/L* 5.0 ug/L* 5.0 ug/L* 5.0 ug/L*	Refs. 3, Appendix N, pp. 2-9, 48, 49, 61, 63; 6, p. 22; 32, pp. 40-42, 43-45; 54, pp. 1, 2

* Please refer to section 2.2.2 Hazardous Substances Associated With The Source, Source Samples, of this HRS documentation record regarding the CRQL adjustments.

Sample ID	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit	Reference
E2P11	1,1,1-TCA	13 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 50, 51, 61, 63, 81, 82; 6, p. 16; 32, pp. 46-48; 54, p. 2
E2P12	TCE	15 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 50, 51, 61, 63; 6, p. 17; 32, pp. 49-51; 54, p. 2
E2P13	TCE PCE	1.6 ug/L 0.67 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 50, 51, 61, 63; 6, p. 20; 32, pp. 52-54; 54, p. 2
E2P14	1,1,1-TCA	0.87 ug/L	0.5 ug/L	Refs. 6, p. 19; 3, Appendix N, pp. 2-9, 50, 51, 61, 63; 32, pp. 55-57; 54, p. 2
E2P16	TCE Cis1,2-DCE 1,1,1-TCA Trans1,2-DCE	45 ug/L 13 ug/L 25 ug/L 3.9 ug/L	2.5 ug/L* 0.5 ug/L 2.5 ug/L* 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 52, 53, 61, 63, 97, 98; 6, p. 24; 32, pp. 61-63, 64-66; 54, pp. 1, 2
E2P17	TCE Cis1,2-DCE 1,1,1-TCA Trans1,2-DCE	73 ug/L 16 ug/L 59 ug/L 4.9 ug/L	5.0 ug/L* 0.5 ug/L 5.0 ug/L* 0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 52, 53, 61, 63, 207, 208; 6, p. 21; 32, pp. 67-69, 70-72; 54, pp. 1, 2
E2P18	TCE	13 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 186, 187, 208; 6, p. 18; 32, pp. 113-115; 54, p. 2
E2P19	TCE 1,1,1-TCA	45 ug/L 2.4 ug/L	2.5 ug/L* 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 172, 186, 187; 6, p. 26; 32, pp. 116-118, 119-121; 54, p. 2
E2P21	1,1,1-TCA	2.5 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 172, 186, 188; 6, p. 27; 32, pp. 122-124; 54, p. 2
E2P23	1,1,1-TCA	0.73 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 171, 172, 186, 189; 6, p. 28; 32, pp. 125-127; 54, p. 2

* Please refer to section 2.2.2 Hazardous Substances Associated With The Source, Source Samples, of this HRS documentation record regarding the CRQL adjustments.

Sample ID	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit	Reference
E2P26	1,1,1-TCA	3.2 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 189; 6, p. 33; 32, pp. 131-133; 54, p. 2
E2P27	1,1,1-TCA	4.8 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 190; 6, p. 44; 32, pp. 134-136; 54, p. 2
E2P29	1,1,1-TCA	4.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 190; 6, p. 45; 32, pp. 137-139; 54, p. 2
E2P31	1,1,1-TCA	0.85 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 342, 343, 355, 356; 6, p. 48; 32, pp. 216-218; 54, p. 2
E2P32	1,1,1-TCA	7.1 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 342, 343, 355, 356; 6, p. 49; 32, pp. 219-221; 54, p. 2
E2P33	TCE 1,1,1-TCA	42 ug/L 0.5 ug/L	2.5 ug/L* 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 342, 343, 355, 356; 6, p. 50; 32, pp. 222-227; 54, p. 2
E2P34	1,1,1-TCA	6.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 51; 32, pp. 228-230; 54, p. 2
E2P35	1,1,1-TCA	9.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 173, 174, 186, 190; 6, p. 46; 32, pp. 140-142; 54, p. 2
E2P37	TCE 1,1,1-TCA	1.1 ug/L 2.8 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 52; 32, pp. 231-233; 54, p. 2
E2P38	1,1,1-TCA	5.7 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 53; 32, pp. 234-236; 54, p. 2
E2P39	TCE Cis1,2-DCE 1,1,1-TCA	43 ug/L 14 ug/L 2.2 ug/L	2.5 ug/L* 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 54; 32, pp. 237-239, 240-242; 54, pp. 1, 2

* Please refer to section 2.2.2 Hazardous Substances Associated With The Source, Source Samples, of this HRS documentation record regarding the CRQL adjustments.

Sample ID	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit	Reference
E2P40	TCE	1.1 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, p. 36; 32, pp. 143-145; 54, p. 2
E2P41	TCE 1,1,1-TCA PCE	1.1 ug/L 0.71 ug/L 0.86 ug/L	0.5 ug/L 0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, p. 37; 32, pp. 146-148; 54, p. 2
E2P42	1,1,1-TCA PCE	3.7 ug/L 0.73 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, 132-138, 175, 176, 186, 190; 6, p. 38; 32, pp. 149-151; 54, p. 2
E2P43	1,1,1-TCA	5.6 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, p. 39; 32, pp. 152-154; 54, p. 2
E2P44	1,1,1-TCA PCE	7.8 ug/L 0.62 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 175, 176, 186, 190; 6, p. 40; 32, pp. 155-157; 54, p. 2
E2P45	1,1-DCE 1,1,1-TCA	16J**[6.8] ug/L 88 ug/L	0.5 ug/L 10.0 ug/L*	Refs. 3, Appendix N, pp. 132-138, 177, 178, 186, 190; 6, p. 42; 32, pp. 158-160, 161-163; 54, pp. 1, 2, 58, pp. 7-12
E2P46	1,1,1-TCA TCE	3.5 ug/L 26 ug/L	0.5 ug/L 1.0 ug/L*	Refs. 3, Appendix N, pp. 2-9, 52, 53, 54, 55, 61, 64; 6, p. 8; 32, pp. 73-75, 76-78; 54, p. 2
E2P47	1,1,1-TCA	0.70 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 2-9, 54, 55, 61, 64; 6, p. 12; 32, pp. 79-81; 54, p. 2
E2P48	1,1,1-TCA	1.6 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 177, 178, 186, 188; 6, p. 13; 32, pp. 164-166; 54, p. 2
E2P51	PCE 1,1,1-TCA	0.51 ug/L 4.7 ug/L	0.5 ug/L 0.5 ug/L	Refs. 3, Appendix N, pp. 132-138, 179, 180, 186, 190, 232, 233; 6, p. 41; 32, pp. 171-173; 54, p. 2

* Please refer to section 2.2.2 Hazardous Substances Associated With The Source, Source Samples, of this HRS documentation record regarding the CRQL adjustments.

** This result was biased high and adjusted according to an EPA fact sheet (Ref.58). Please refer to Ref. 58 for explanation of adjustment procedure used. Adjusted concentration, shown in brackets [], is used to evaluate an observed release.

Sample ID	Hazardous Substance	Hazardous Substance Concentration	Contract Required Quantitation Limit	Reference
E2P52	Trans 1,2-DCE Cis1,2-DCE 1,1,1-TCA TCE	2.3 ug/L 7.1 ug/L 27 ug/L 63 ug/L	0.5 ug/L 0.5 ug/L 5.0 ug/L* 5.0 ug/L*	Refs. 3, Appendix N, pp. 132-138, 179, 180, 186, 191, 248, 249, 266; 6, p. 43; 32, pp. 174-176, 177-179; 54, pp. 1, 2
E2P58	1,1,1-TCA	0.81 ug/L	0.5 ug/L	Refs. 3, Appendix N, pp. 311-318, 348, 349, 355, 357; 6, p. 32; 32, pp. 265-267; 54, p. 2
E2P61	TCE	15 ug/l	0.5 ug/L	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398; 7, p. 1; 32, pp. 289-291; 54, p. 2
E2P62	TCE	18 ug/l	1.0 ug/L*	Refs. 3, Appendix N, pp. 374-380, 390, 391, 397, 398; 7, p. 2; 32, pp. 292-294; 54, p. 2

Level I Samples

Sample ID	Hazardous Substance	Hazardous Substance Concentration (unit)	Benchmark Concentration (mg/L)	Benchmark	Reference for Benchmark
E2NX0	TCE	25 ug/L	5 ug/L	MCL	Refs. 2, p. BII-11; 3, Appendix M, pp. 2-9, 11, 12, 24, 25; 5, p. 1; 31, pp. 1-3; 54, p. 2
E2NX4	TCE	37 ug/L	5 ug/L	MCL	Refs. 2, p. BII-11; 3, Appendix M, pp. 2-9, 11, 12, 13, 14, 24, 25; 5, p. 5; 31, pp. 13-15, 16-18; 54, p. 2
E2NZ2	TCE	64 ug/L	5 ug/L	MCL	Refs. 3, Appendix M, pp. 2-9, 11, 12, 13, 14, 24, 25; 5. p. 5; 31, pp. 40-43, 44-46; 54, p. 2
E2P01	TCE	640 ug/L	5 ug/L	MCL	Refs. 2, p. BII-11; 3, Appendix N, pp. 2-9, 44, 45, 61, 62; 6, p.2; 32, pp. 4-6; 54, p. 2
E2P02	TCE	7.4 ug/L	5 ug/L	MCL	Refs. 2, p. BII-11; 3, Appendix N pp. 2-9, 44, 45, 61, 62; 6, p. 11; 32, pp. 10-12

* Please refer to section 2.2.2 Hazardous Substances Associated With The Source, Source Samples, of this HRS documentation record regarding the CRQL adjustments.

Sample ID	Hazardous Substance	Hazardous Substance Concentration (unit)	Benchmark Concentration (mg/L)	Benchmark	Reference for Benchmark
E2P03	TCE	620 ug/L	5 ug/L	MCL	Refs. 2, p. BII-11; 3, Appendix N, pp. 2-9, 44, 45, 46, 47, 61, 62; 6, p. 3; 32, pp. 13-15, 16-18; 54, p. 2
E2P07	TCE	24 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 2-9, 46, 47, 48, 49, 61, 62; 6, p. 7; 32, pp. 28-30, 31-33; 54, p. 2
E2P09	TCE	7.9 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 2-9, 48, 49, 61, 62; 6, p. 10; 32, pp. 37-39; 54, p. 2
E2P10	TCE	79 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 2-9, 48, 49, 61, 63; 6, p. 22; 32, pp. 40-42, 43-45; 54, p. 2
E2P12	TCE	15 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 2-9, 50, 51, 61, 63; 6, p. 17; 32, pp. 49-51; 54, p. 2
E2P16	TCE	45 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 2-9, 52, 53, 61, 63, 97, 98; 6, p. 24; 32, pp. 61-63, 64-66; 54, p. 2
E2P17	TCE	73 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 2-9, 52, 53, 61, 63, 207, 208; 6, p. 21; 32, pp. 67-69, 70-72; 54, p. 2
E2P18	TCE	13 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 132-138, 171, 186, 187, 208; 6, p. 18; 32, pp. 113-115; 54, p. 2
E2P19	TCE	45 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 132-138, 171, 172, 186, 187; 6, p. 26; 32, pp. 116-118, 119-121; 54, p. 2
E2P33	TCE	42 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 311-318, 342, 343, 355, 356; 6, p. 50; 32, pp. 222-227; 54, p. 2

Sample ID	Hazardous Substance	Hazardous Substance Concentration (unit)	Benchmark Concentration (mg/L)	Benchmark	Reference for Benchmark
E2P39	TCE	43 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 311-318, 344, 345, 355, 356; 6, p. 54; 32, pp. 237-239, 240-242; 54, pp. 1, 2
E2P46	TCE	26 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 2-9, 52, 53, 54, 55, 61, 64; 6, p. 8; 32, pp. 73-75, 76-78; 54, p. 2
E2P52	TCE	63 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 132-138, 179, 180, 186, 191, 248, 249, 266; 6, p. 43; 32, pp. 174-176, 177-179; 54, p. 2
E2P61	TCE	15 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 374-380, 390, 391, 397, 398; 7, p. 1; 32, pp. 289-291; 54, p. 2
E2P62	TCE	18 ug/L	5 ug/L	MCL	Refs. 2, pp. A-2, BII-11; 3, Appendix N, pp. 374-380, 390, 391, 397, 398; 7, p. 2; 32, pp. 292- 294; 54, p. 2

Notes: ug/L – micrograms per liter. TCE was detected in 20 ground water samples at Level I concentrations. Samples E2NX0, E2P12, E2P18 were taken from the same well (Refs. 5, p. 1; 6, pp. 17, 18; 28). Samples E2NX4, E2NZ2, E2P61, and E2P62 were taken from the same well (Refs. 5, pp. 5, 13; 7, pp. 1, 2; 28). Samples E2P01 and E2P03 were taken from the same well (Refs. 6, pp. 2, 3; 28). Samples E2P02 and E2P09 were taken from the same well (Refs. 6, pp. 10, 11; 28). Samples E2P07 and E2P46 were taken from the same well (Refs. 6, pp. 7, 8; 28). Samples E2P10 and E2P17 were taken from the same well (Ref. 28).

Attribution

Due to the number and close proximity of possible sources of the chlorinated solvent contamination, including possible former sources, it is improbable to identify and reasonably attribute with confidence the ground water contamination to any known source. Because the source is a contaminated ground water plume with no positively identified source of contamination, attribution has not been determined (Ref. 1, Section 3.1.1, p. 51595).

Hazardous Substances Released

Trans1,2-DCE
Cis-1,2-DCE
1,1,1-TCA
TCE
1,1-DCE
PCE

Ground Water Observed Release Factor Value: 550

3.1.2 POTENTIAL TO RELEASE

As specified in the HRS Rule, since an observed release was established for the surficial aquifer, the potential to release was not scored (Ref. 1, Section 3.1.2, p. 51595).

3.2 WASTE CHARACTERISTICS

3.2.1 TOXICITY/MOBILITY

The following toxicity, mobility and combined toxicity/mobility factor values have been assigned to those substances associated with Source No. 1, or present in the observed release, which have a containment value greater than 0.

Hazardous Substance	Source No. (and/or Observed Release)	Toxicity Factor Value	Mobility Factor Value	Does Haz. Substance Meet Observed Release by chemical analysis? (Y/N)	Toxicity/ Mobility (Ref. 1, Table 3-9)	References
TCE	1, Observed Release	10,000	1	Y	10,000	Refs. 1, Section 3.2.1.3; 2, p. A-2, BI-11
1,1,1-TCA	1, Observed Release	1	1	Y	1	Refs. 1, Section 3.2.1.3; 2, p. BI-11
Cis-1,2-DCE	1, Observed Release	100	1	Y	100	Refs. 1, Section 3.2.1.3; 2, p. BI-5
Trans-1,2-DCE	1, Observed Release	100	1	Y	100	Refs. 1, Section 3.2.1.3; 2, p. BI-5
PCE	1, Observed Released	100	1	Y	100	Refs. 1, Section 3.2.1.3; 2, p. BI-10
1,1-DCE	1, Observed Release	100	1	Y	100	Refs. 1, Section 3.2.1.3; 2, p. BI-5

All hazardous substances that meet the criteria for an observed release by chemical analysis to one or more aquifers underlying the source(s) at the site, regardless of the aquifer being evaluated, are assigned a mobility factor value of 1 (Ref. 1, Section 3.2.1.2, p. 51601).

Contaminant characteristic values for hazardous substances found in an observed release to the surficial aquifer were derived from the Superfund Chemical Data Matrix (Ref. 2). The hazardous substance with the highest toxicity/mobility factor value available to the ground water migration pathway is TCE (10,000).

Toxicity/Mobility Factor Value: 10,000
(Ref. 1, Section 3.2.1.3, p. 51602)

3.2.2 HAZARDOUS WASTE QUANTITY

Source No.	Source Type	Source Hazardous Waste Quantity
1	Ground water Plume	Unknown, but >0

The Lusher Street Ground Water Contamination has been scored as a site consisting of a contaminated ground water plume with no positively identified source. According to Section 2.4.2.2 in the HRS Rule (Ref. 1, p. 51592), if any target sample for the migration pathway is subject to Level I (or Level II) concentrations, assign either the value from Table 2-6 (Ref. 1, p. 51591) or a value of 100, whichever is greater, as the hazardous waste quantity factor value for that pathway. Because Level I concentrations were present in a drinking water well (see Section 3.3.2.2 of this HRS documentation record), a hazardous waste quantity factor value of 100 is assigned for the ground water pathway.

Hazardous Waste Quantity Factor Value: 100
(Ref. 1, Section 2.4.2.2, p. 51592)

3.2.3 WASTE CHARACTERISTICS FACTOR CATEGORY VALUE

As specified in the HRS Rule (Ref. 1, Section 3.2.3, p. 51602), the Hazardous Waste Quantity Factor Value of 100 was multiplied by the highest toxicity/Mobility Value of 10,000, resulting in a product of 1,000,000 (1.0E+06). Based on this product, a Waste Characteristics Factor Category Value of 32 was assigned from Table 2-7 of the HRS Rule (Ref. 1, Section 2.4.3.1, p. 51592)

Utilizing TCE which has the highest Toxicity/Mobility Factor Value of the substances listed in Section 3.2.1 of this HRS documentation record:

Toxicity/Mobility Factor Value: 10,000
Hazardous Waste Quantity Factor Value: 100

Toxicity/Mobility Factor Value (10,000) X
Hazardous Waste Quantity Factor Value (100): 1,000,000 = $1X10^6$

Waste Characteristics Factor Category Value: 32
(Ref. 1, Table 2-7)

3.3 TARGETS

The primary targets are private residential and business drinking water wells. Of the 12 private wells within the area that are known to be subject to Level I contamination, 10 are used for drinking water. 35 people are known to be utilizing the water from these wells for drinking water (Refs. 4; 5, pp. 5, 13; 6, pp. 2, 3, 7, 8, 10, 11, 17, 18, 21, 22, 42, 43, 54; 7, pp. 1, 2; 8, pp. 4, 9, 10; Section 3.3.2.2 of this HRS documentation record). In addition, there are 24 private wells that are known to be subject to Level II contamination (Refs. 4; 6, pp. 4, 9, 12, 13, 16, 19, 20, 27, 28, 32, 33, 36-41, 44, 45, 46, 49, 51-53; Section 3.3.2.3 of this HRS documentation record). 91 people are known to be using these wells (Level II concentrations) for drinking water (Refs. 4; 6, pp. 4, 9, 12, 13, 16, 19, 20, 27, 28, 32, 33, 36-41, 44, 45, 46, 49, 51-53; Section 3.3.2.3 of this HRS documentation record).

3.3.1 NEAREST WELL

Sample ID: E2P01, E2P03
Level of Contamination (I, II, or potential): Level I
If potential contamination, distance from source in miles: Not applicable

Samples E2P01 and E2P03 were obtained at a residence on Avalon Street. The water in the well at this location was found to have the highest concentration of TCE. This well may be considered to be the center of the Lusher Ground Water Contamination site and is considered the nearest well (Refs. 28; page 5 of this HRS documentation record).

As specified in the HRS Rule (Ref. 1, p. 51603, Table 3-11), if one or more Drinking water wells is subject to Level I concentrations a Nearest Well Factor Value of 50 is assigned. Level I concentrations have been documented at ten wells within the ground water plume. Refer to table on next page.

Nearest Well Factor Value: 50
(Refs. 1, p. 51603, Table 3-11; 6, pp. 2, 3; 3, Appendix N, pp. 2-9, 44, 46, 61, 62; 32, pp. 5, 14)

3.3.2 POPULATION

3.3.2.1 Level of Contamination

3.3.2.2 Level I Concentrations

12 private wells within a four-mile radius of the center of the plume contained Level I concentrations. All wells draw water from the surficial aquifer (Refs. 3, Appendix T, pp. 1-77; 27, pp. 10-12; Section 3.1.1 of this HRS documentation record). 10 of these wells are used for drinking water (see table below). The number of people served by the private wells was documented (on the sample field sheets) at the time the ground water samples were obtained (See the table below). The population at sample location E2P16 was updated when new information became available. The water from these private wells is currently the sole source of drinking water for these residents (Refs. 4; 56; 57).

The samples shown below include detections in drinking water wells that meet or exceed their corresponding benchmark concentrations. An observed release to the Ground Water Migration Pathway has been established based on the detection of these compounds found in the drinking water (See Sections 2.2.2 and 3.1.1 of this HRS documentation record); thus, these wells are associated with Level I concentrations (Ref. 1, Section 3.3.2.1, 3.3.2.2, p. 51603).

As specified in the HRS Rule, (Ref. 1, Section 3.3.2.2, p. 51603), the number of people served by drinking water from points of withdrawal subject to Level I concentrations were summed. The total population counted from the ten wells is 2.71 + 2 + 3 + 2 + 3+ 2 + 2 + 8 + 8 + 2.71 = 35.42. The total of 35.42 was multiplied by 10 for a product of 354.2 (Ref. 1, Section 3.3.2.2, p. 51603).

Level I Sample	Aquifer	Population	References
E2P01, E2P03	St. Joseph	2.71*	Refs. 4; 6, pp. 2, 3 ; 51, p. 1
E2P07, E2P46	St. Joseph	2	Refs. 3, p. 3-25; 4; 6, pp. 7, 8; 8, p. 4
E2P02, E2P09	St. Joseph	3	Refs. 3, p. 3-25; 4; 6, pp. 10, 11; 8, p. 9
E2P12, E2P18, E2NX0	St. Joseph	2	Refs. 3, 3-24, 3-26; 4; 5, p. 1; 6, pp. 17, 18; 8, p. 10
E2P16	St. Joseph	3	Refs. 3, p. 3-25; 56, pp. 1, 4, 5; 57, p. 1
E2P17, E2P10	St. Joseph	2	Refs. 4; 6, pp. 21, 22
E2P33	St. Joseph	2	Refs. 4; 6, p. 50
E2P39	St. Joseph	8	Refs. 4; 6, p. 54
E2P52	St. Joseph	8	Refs. 4; 6, p. 43
E2P61, E2P62, E2NX4, E2NZ2	St. Joseph	2.71*	Refs. 4; 5, pp. 5, 13; 7, pp. 1, 2; 51, p. 1

*In estimating residential population for the two residences where data were not available, the average persons per residence for the county in which the residence is located was used (Ref. 1, Section 3.3.2.2, p. 51603)

Sum of Population Served by Level I Wells: 35.42
Sum of Population Served by Level I Wells x 10: 354.2

Level I Concentrations Factor Value: 354.2

3.3.2.3 Level II Concentrations

26 private wells within a four-mile radius of the center of the plume contained Level II concentrations (Ref. 28 and see the table below). All wells draw water from the surficial aquifer (Refs. 3, Appendix T, pp. 1-77; 27, pp. 10-12; Section 3.1.1 of this HRS documentation record). The number of people served by the private wells was documented (on the sample field sheets) at the time the ground water samples were obtained (See the table below). The water from these private wells is currently the sole source of drinking water for these residents (Ref. 4).

The samples shown below include detections in drinking water wells that meet observed release criteria. An observed release to the Ground Water Migration Pathway has been established based on the detection of these compounds found in the drinking water (See Sections 2.2.2 and 3.1.1 of this HRS documentation record); thus, these wells are associated with Level II concentrations (Ref. 1, Section 3.3.2.1, 3.3.2.3, p. 51603).

As specified in the HRS rule, (Ref. 1, Section 3.3.2.3, p. 51603), the number of people served by drinking water from points of withdrawal subject to Level II concentrations were summed. The total population counted from the twenty four wells is 92 (2 + 15 + 1 + 2 + 3 + 1 + 2 + 21 + 2 + 3 + +1 + 1 + 4 + 2 + 2 + 3 + 1 + 9 + 1 + 2 + 2 +3+ 3 + 3 + 2 + 1 = 92). The total of 92 was not multiplied by any factor (Ref. 1, Section 3.3.2.3, p. 51603).

Level II Sample	Aquifer No.	Population	References
E2P04	St. Joseph	2	Refs. 3, p. 3-25; 4; 6, p. 4; 8, p.11
E2P08	St. Joseph	15	Refs. 3, p. 3-25; 4; 6, p. 9; 8, p. 1
E2P11	St. Joseph	1	Refs. 3, p 3-25; 4; 6, p. 16; 8, p. 3
E2P13	St. Joseph	2	Refs. 4; 6, p. 20
E2P14	St. Joseph	3	Refs. 4; 6, p. 19
E2P21	St. Joseph	1	Refs. 4; 6, p. 27
E2P23	St. Joseph	2	Refs. 4; 6, p. 28
E2P26	St. Joseph	21	Refs. 3, p. 3-25; 4; 6, p. 33; 8, p. 8; 55
E2P27	St. Joseph	2	Refs. 4; 6, p. 44
E2P29	St. Joseph	3	Refs. 3, p. 3-26; 4; 6, p. 45; 8, p. 6
E2P31	St. Joseph	1	Refs. 4; 6, p. 48
E2P32	St. Joseph	1	Refs. 4; 6, p. 49
E2P34	St. Joseph	4	Refs. 4; 6, p. 51
E2P35	St. Joseph	2	Refs. 4; 6, p. 46
E2P37	St. Joseph	2	Refs. 3, p. 3-26; 4; 6, p. 52; 8, p. 2
E2P38	St. Joseph	3	Refs. 4; 6, p. 53
E2P40	St. Joseph	1	Refs. 4; 6, p. 36
E2P41	St. Joseph	9	Refs. 4; 6, p. 37
E2P42	St. Joseph	1	Refs. 3, p. 3-25; 4; 6, p. 38; 8, p. 5
E2P43	St. Joseph	2	Refs. 4; 6, p. 39
E2P44	St. Joseph	2	Refs. 4; 6, p. 40
E2P45	St. Joseph	3	Refs. 4; 6, p. 42
E2P47	St. Joseph	3	Refs. 4; 6, p. 12
E2P48	St. Joseph	3	Refs. 4; 6, p. 13
E2P51	St. Joseph	2	Refs. 4; 6, p. 41
E2P58	St. Joseph	1	Refs. 4; Ref. 6, p. 32

Sum of Population Served by Level II Wells: 92

Level II Concentrations Factor Value: 92

3.3.2.4 Potential Contamination

The potential contamination factor was not scored (NS) for this HRS documentation record. Although potential contamination was not scored in this document, IDEM and the U.S. EPA are concerned about populations that may be potentially exposed to contaminated drinking water.

Potential Contamination Factor Value: NS

3.3.3 RESOURCES

Resource use of the surficial aquifer within the target distance limit does not include any of the uses as enumerated in Section 3.3.3 of Reference 1, page 51604. Therefore, a resources factor value of 0 is assigned (Ref. 1, Section 3.3.3, p. 51604).

Resources Factor Value: 0

3.3.4 WELLHEAD PROTECTION AREA

There is no Wellhead Protection Area where the ground water contamination exists, as enumerated in Section 3.3.4 of Reference 1, page 51604 and Reference 3, Appendix U. Therefore, the Wellhead Protection Area factor value of 0 is assigned (Ref. 1, Section 3.3.4, p. 51604).

Wellhead Protection Area Factor Value: 0