HAZARD RANKING SYSTEM (HRS) DOCUMENTATION RECORD- REVIEW COVER SHEET

Name of Site: Kokomo Contaminated Ground Water Plume

U.S. EPA ID No. INN000510479

Date Prepared: September 2014

Contact Persons

Documentation Record: Mark Jaworski
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Indiana Department of Environmental Management
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Pathways, Components, or Threats Not Scored

Surface Water Migration Pathway, Soil Exposure Pathway, and Air Migration Pathway:

The Surface Water Migration Pathway, Soil Exposure Pathway, and Air Migration Pathway were not scored as part of this Hazard Ranking System (HRS) evaluation. These pathways were not included because a release to these media does not significantly affect the overall score and because the ground water pathway produces an overall score above the minimum requirement for the Kokomo Contaminated Ground Water Plume to qualify for inclusion on the National Priorities List (NPL).

HRS DOCUMENTATION RECORD

Name of Site: Kokomo Contaminated Ground Water Plume

This site had been known previously as the Kokomo Garrison & Main Water Treatment Wellfield. The current site name is the Kokomo Contaminated Ground Water Plume. The online EPA database (Superfund Enterprise Management System) will be updated to reflect the new name when possible.

EPA Region: 5

Street Address*: The intersection of S. Elizabeth St. and E. Vaile Ave, (Figure 1-2 of this HRS Documentation Record)

Date Prepared: September 2014

City, County, State, Zip Code: Kokomo, Howard County, Indiana 46901

General Location in the State: North Central Indiana (Figure 1-1 of this HRS Documentation Record)

Topographic Map: Kokomo, Indiana Quad (7.5') (Ref. 3)

Latitude: 40° 28' 46.000" North

Longitude: 86° 06' 50.859" West

Reference Point: The intersection of S. Elizabeth Street and E. Vaile Ave, Kokomo. The intersection is the approximate center of the known location with VOC contamination in ground water.

Congressional District: 4

*The street address, coordinates, and contaminant locations presented in this HRS documentation record identify the general area 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, disposed, or placed, or has 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		10,000.00
2a.	Surface Water Overland/Flood Migration Component (from Table 4-1, line 30)	NS*		
2b.	Ground Water to Surface Water Migration Component (from Table 4-25, line 28)	NS		
2c.	Surface Water Migration Pathway Score (S_{sw}) Enter the larger of lines 2a and 2b as the pathway score.	NS		
3.	Soil Exposure Pathway Score (S_s) (from Table 5-1, line 22)	NS		
4.	Air Migration Pathway Score (S_a) (from Table 6-1, line 12)	NS		
5.	Total of $S_{gw}^2 + S_{sw}^2 + S_s^2 + S_a^2$			10,000.00
6.	**HRS Site Score** Divide the value on line 5 by 4 and take the square root		50.00	

Notes: *NS = Not Scored

HRS Table 3-1 –Ground Water Migration Pathway Scoresheet

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)	68,906.94
8b. Level II Concentrations	(b)	NS
8c. Potential Contamination	(b)	NS
8d. Population (lines 8a + 8b + 8c)	(b)	68,906.94
9. Resources	5	0
10. Wellhead Protection Area	20	20
11. Targets (lines 7 + 8d + 9 + 10)	(b)	68,976.94
Ground Water Migration Score For An Aquifer:		
12. Aquifer Score [(lines 3 x 6 x 11)/82,500][c] 550 x 32 x 36,048 = 634,444,800/82,500 = 7,690.24	100	100.00
Ground Water Migration Pathway Score:		
13. Pathway Score (S_{gw}), (highest value from line 12 for all aquifers evaluated)[c]	100	100.00

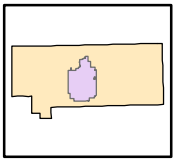
(a) Maximum value applies to waste characteristics category
(b) Maximum value not applicable
[c] Do not round to nearest integer
NS - Not Scored

Figure 1-1 - Kokomo Garrison and Main Water Treatment Plant Wellfield
EPA ID: INN000510479,
Kokomo, Howard County, Indiana - Area Location Map

0 400 Miles

0 20 40 Kilometers

Kokomo,
Howard County

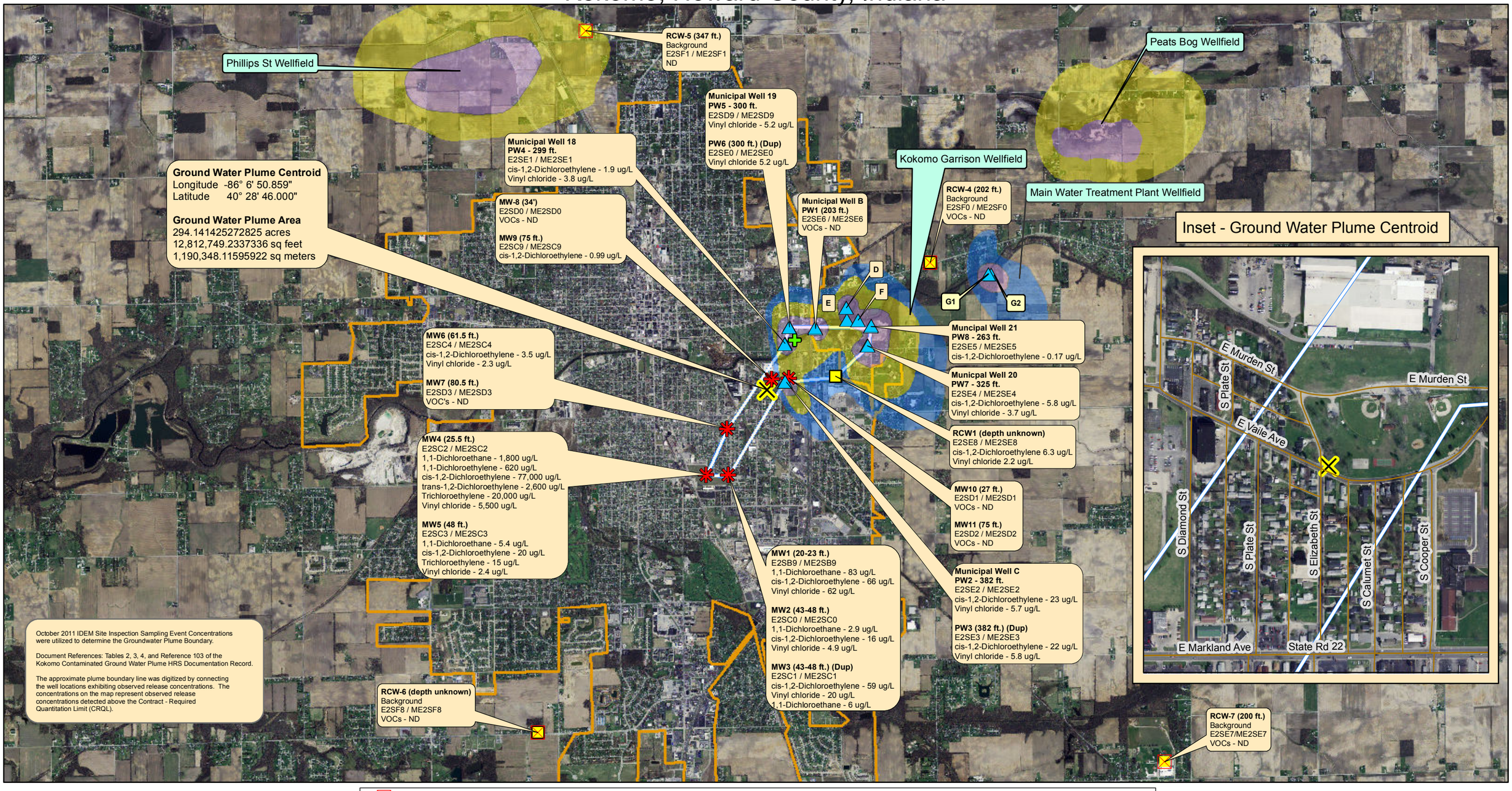


Non Orthophotography Data -
Source: State of Indiana Geographic Information Office Spatial Database Engine.
Topography-
Source: Indiana Map Framework Data, Topo USA (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped by: Lorraine Wright, **Date:** September 27, 2013

Figure 1-2 Kokomo Contaminated Ground Water Plume* - EPA ID: INN000510479, Kokomo, Howard County, Indiana



Non Orthophotography Data -
Source: State of Indiana Geographic Information Office Spatial Database Engine. The sample location coordinates were collected using GPS. The sample results were extracted from IDEM's SampDB.
Orthophotography -
Source: Indiana Map Framework Data (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

0 0.5 1 Miles
0 0.5 1 Kilometers

- Background Samples
- Municipal Well
- Residential Well
- Monitoring Well
- Ground Water Plume Centroid
- Wellhead Protection Area - 1 Year Delineation
- Wellhead Protection Area - 5 Year Delineation
- Wellhead Protection Area - 10 Year Delineation
- Kokomo Boundary
- Surface Intake
- Approximate Ground Water Plume Boundary

* Only CERCLA hazardous substances are evaluated
Dup Duplicate
ND Not detected
ug/L micrograms/liter
VOCs Volatile Organic Compounds

Howard Co.

This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped by: Lorraine Wright, **Date:** February 18, 2014

Orthophotography - 2005

Figure 1-3 Kokomo Contaminated Ground Water Plume*
EPA ID: INN000510479, Kokomo, Howard County, Indiana - Possible Sources Map

RACER/Motors Liquidation Company (Former GM Delco Plant 5)

Millbank Manufacturing

Empty Industrial Building

Coan Engineering Transmisssion

Padfields Auto Body

Omnisource

Stite Cleaners

PPG

Hunt's Salvage & Coal Yards

Wiese Collision Repair

Delphi Plant 1

Wiese Oldsmobile GMC Incorporated

Chrysler LLC

GMCH-Kokomo

ASF PARTNERSHIP

Inset - Ground Water Plume Centroid

October 2011 IDEM Site Inspection Sampling Event Concentrations were used to define Groundwater Plume Boundary. The approximate plume boundary line was digitized by connecting the well locations exhibiting the observed release concentrations.

* Used HRS criteria of an observed released

Document References: "Description of Possible Sources" listed under Sec 2.2 (Source Characterization) and Reference 103 of Kokomo Contaminated Ground Water Plume HRS Document Record.

Non Orthophotography Data -
Source: State of Indiana Geographic Information Office Spatial Database Engine.

Orthophotography -
Source: Indiana Map Framework Data. 2005 Orthophoto (www.indianamap.org)
Map Projection: UTM Zone 16 N **Map Datum:** NAD83

IDEM

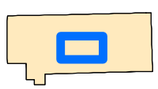
N W E S

0 1,000 2,000 Feet

0 500 1,000 Meters

- Potential Sources
- Ground Water Plume Centroid
- Kokomo Boundary
- Approximate Ground Water Plume Boundary
- Wellhead Protection Area - 1 Year Delineation
- Wellhead Protection Area - 5 Year Delineation
- Wellhead Protection Area - 10 Year Delineation
- Wellhead Protection Area - 3000-ft Fixed Radius Delineation

Howard Co.



This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.

Mapped by: Lorraine Wright, **Date:** July 1, 2014

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KOKOMO CONTAMINATED GROUND WATER PLUME

SUMMARY

The Kokomo Contaminated Ground Water Plume site consists of a ground water plume with no identified source. Chlorinated solvents, specifically vinyl chloride, have been detected in the ground water within several of the city of Kokomo's municipal wells. The city water utility is operated by the Indiana American Water Company (INAWC) and serves approximately 55,000 people (Ref. 96, pp. 1, 2).

The Kokomo Garrison Well Field consists of nine (9) wells located on the eastern edge of the city along Wildcat Creek (Ref. 8, p. 11; Figure 1-2). Five (5) of the wells have been contaminated by a ground water plume of chlorinated solvents, principally cis-1,2-dichloroethylene (cis-1,2-DCE) and vinyl chloride (VC) (Contaminated Ground Water From Public Wells Sample Table #3 of this HRS Documentation Record; Figure 1-2 of this HRS documentation record). Facilities that have been identified and/or investigated as possible contributors to the ground water plume are shown in Figure 1-3 and in Section 3.1.1 of this HRS documentation record. The Kokomo Contaminated Ground Water Plume is depicted aerially by ground water sample locations obtained from municipal wells and established monitoring wells in the surrounding area, with detections of the above mentioned chlorinated solvents meeting observed release criteria (Figure 1-2; Section 3.1.1; Contaminated Ground Water Samples Background Ground Water Sample Table #1, Contaminated Ground Water From Residential Wells Sample Table #2, Contaminated Ground Water From Public Wells Sample Table #3, and Contaminated Ground Water From Monitoring Wells Sample Table #4 of this HRS documentation record). The depicted plume encompasses approximately 294 acres and is composed of trichloroethylene (TCE), 1,1-dichloroethane (1,1-DCA), 1,1-dichloroethylene (1,1-DCE), cis-1,2-DCE, trans -1, 2 dichloroethylene (trans -1,2-DCE), and VC (Figure 1-2).

Pumping data exists to demonstrate that the unconsolidated materials and the bedrock are hydraulically interconnected in the area of the well field (Ref. 14, pp. 1-8). Multiple investigations and searches have been conducted to identify the source(s)of the contamination at the Kokomo Garrison Well Field; however, because of the known complex geology, multiple possible current and historical contaminant sources, and extensive pumping of ground water in this area that has likely resulted in commingling of multiple possible releases, individual sources of the contamination and the extent of any possible source-specific releases cannot be determined for HRS purposes at this time.

HISTORY

Raw water sample results taken from the Kokomo Garrison Well Field by INAWC and

submitted to the Indiana Department of Environmental Management (IDEM), showed VC levels exceeding its Maximum Contaminant Level (MCL) of 2.0 ug/l in two (2) wells between 2007 and 2010 (Refs. 85, pp. 1-5; 86, pp. 3- 29). Concentrations of arsenic were also detected in raw water in three (3) of the five municipal wells discussed in the Summary (Ref. 4, p. 23 [depicted by samples ME2SE2, ME2SE3, ME2SD9, ME2SE0, and ME2SE1]; Figure 1-2). Since arsenic issues are being addressed by Indiana's Voluntary Remediation Program (VRP), the elevated levels of arsenic in the ground water are not being addressed under this HRS documentation record (See discussion of PPG in Attribution Section on page 45 of this HRS documentation record).

As a result of the elevated levels of chlorinated solvents detected in the ground water in the municipal wells, the IDEM Site Investigation Program conducted a Pre-CERCLIS Screening and recommended that the Kokomo Garrison and Main Water Treatment Well Fields be entered into CERCLIS (Ref. 80, pp. 1, 2). A Preliminary Assessment of the well fields was completed on December 29, 2010 (Ref. 81, p. 9).

On October 3, 2011, the IDEM Site Investigation Program conducted a Site Inspection (Ref. 4, p. 8). A total of twenty-five (25) ground water samples, including three (3) duplicate samples and four (4) background samples were obtained (Ref. 4, p. 8). Ten (10) monitoring wells were sampled (plus one duplicate); six (6) municipal wells were sampled (plus two duplicates): and six (6) residential or commercial wells were sampled (including four background samples) (Ref. 4, p. 8). VC was detected in ground water in municipal wells #18, #19, #20, and well C, located within the Kokomo Garrison Well Field, at levels exceeding the MCL set by U.S. EPA (Ref. 4, p. 10). Municipal well #21 was found to be contaminated with cis-1,2-DCE (Refs. 4, p. 218; 11, p. 8). On May 31, 2013, IDEM requested EPA's assistance in evaluating a possible source of the ground water plume, the former Delphi Plant 1 located at 700 East Firmin Street in Kokomo, for a potential removal action (Ref. 93, pp. 1, 2). IDEM's concern is that residents located in direct proximity to the impacted ground water may be affected by vapor intrusion (Ref. 93, pp. 1, 2).

A Ground Water Investigation Monitoring Event – July 2013, Data Submittal Report, dated September 24, 2013, was submitted to IDEM's VRP for compliance regarding the three VRP projects; #6951202, #6101003, and #6101004 at the PPG industries, Inc., properties located just south of the impacted well field (Ref. 61, p. 2). The report identified the monitoring and supply well network, the ground water potentiometric surface in the upper and lower overburden material and the bedrock, the concentrations of volatile organic compounds (including TCE and VC) (Ref. 61, pp. 77- 87, 89, 91, 92). Currently seventy three (73) monitoring wells have been installed for assessing the three (#6951202, #6101003, and #6101004) VRP projects (Ref. 61, pp. 2, 71, 72).

2.2 SOURCE CHARACTERIZATION

2.2.1 Source Identification

Number of Source: 1

Source Type: Other: Ground Water Plume with No Identified Source

Description and Location of Source (Figure 1-2)

The source consists of a contaminated ground water plume with no identified source located north and south of Wildcat Creek in central Kokomo (Contaminated Ground Water from Residential Wells Sample Table #2, Contaminated Ground Water from Public Wells Sample Table #3, Contaminated Ground Water from Monitoring Wells Sample Table #4, and Figure 1-2 Kokomo Contaminated Ground Water Plume of this HRS documentation record). The source of contamination in the Kokomo Contaminated Ground Water Plume is unknown. Due to the complex regional geology, multiple possible current and historical contaminant sources, and extensive pumping of ground water in this area that has likely resulted in commingling of multiple possible releases, individual sources of the contamination and the extent of any possible source-specific releases cannot be determined for HRS purposes at this time. A description of possible sources that may have used or released solvents can be found in Section 2.4.2.1.5 and Figure 1-3 of this HRS documentation record.

The ground water samples used to delineate the outline of the plume, which covers approximately 294 acres (Figure 1-2 of this HRS documentation record); Sections 3.0.1 and 3.1.1 of this HRS documentation record). The area of the ground water plume is based on available samples that meet the criteria for an observed release and the target distance limit is measured from the center of the area of observed ground water contamination (Ref. 1, pp. 45, 46; Section 3.1.1 of this HRS documentation record).

The contaminated ground water plume is located north and south of Wildcat Creek in central Kokomo (Figure 1-2 of this HRS documentation record).

2.2.2 Hazardous Substances Associated with a Source

The following hazardous substance is associated with the source (see Section 3.1.1 of this HRS documentation record):

- trichloroethylene (TCE)
- 1,1-dichloroethane,
- 1,1-dichloroethylene,
- cis-1,2-dichloroethylene (cis-1,2-DCE)
- trans -1, 2 dichloroethylene,
- vinyl chloride (VC)

Location of the source with reference to a map:
See Figure 1-2, Kokomo Contaminated Ground Water Plume

2.2.3 Hazardous Substances Available to a Pathway

Containment Description	Containment Factor Value	References
Gas release to air: The air migration pathway was not evaluated; therefore, gas containment was not evaluated	Not Scored	
Particulate release to air: The air migration pathway was not evaluated; therefore, gas containment was not evaluated.	Not Scored	
Release to ground water: The applicable containment factor value was determined based on existing analytical evidence of hazardous substances in ground water from private and public wells. Therefore, based on evidence of release, the highest Ground Water Migration Pathway Containment Factor Value of 10 was assigned to Source No. 1 as specified in Table 3-2 of the HRS Rule (Ref. 1. Section 3.1.2.1)	10	Ref. 1, Table 3-2, p.70 See Section 3.1.1 of this HRS documentation
Release via overland migration and/or flood: The surface water pathway was not scored; therefore, surface water overland/flood migration component containment was not evaluated	Not Scored	

2.4.2 Hazardous Waste Quantity

2.4.2.1 Source Hazardous Waste Quantity

2.4.2.1.1 Hazardous Constituent Quantity (Tier A)

The hazardous constituent quantity for Source No. 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances in the source is not known and cannot be estimated with reasonable confidence [Ref. 1, pp. 64-65 (Section 2.4.2.1.1)]. There are insufficient historical and current data (Manifests, PRP records, State records, Permits, Waste concentration data, etc.) available to adequately calculate the total mass of all CERCLA hazardous substances in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous constituent quantity for Source No. 1 with reasonable confidence. 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, pp. 64, 65).

Hazardous Constituent Quantity Assigned Value: NS

2.4.2.1.2. Hazardous Wastestream Quantity (Tier B)

The hazardous wastestream quantity for Source No. 1 could not be adequately determined according to the HRS requirements; that is, the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in the source is not known and cannot be estimated with reasonable confidence [Ref. 1, pp. 65 (Section 2.4.2.1.2)]. There are insufficient historical and current data (Manifests, PRP records, State records, permits, etc.) available to adequately calculate the total mass of all hazardous wastestreams and CERCLA pollutants and contaminants in the source and the associated releases from the source. Therefore, there is insufficient information to evaluate the associated releases from the source to calculate the hazardous wastestream quantity for Source No. 1 with reasonable confidence. The information available is not sufficient to evaluate Tier B source hazardous wastestream (Ref. 1, Section 2.4.2.1.2, p. 65).

Hazardous Wastestream Quantity Assigned Value: NS

2.4.2.1.3. Volume (Tier C)

Horizontal and vertical extent of the plume cannot be determined based on available sampling data; a sufficient number of samples are not available to statistically represent the

range of contaminant concentrations throughout the source. Therefore, the source volume is unknown, but greater than 0 (Ref. 1, Section 2.4.2.1.3, p. 65).

Source Type	Description (# drums or dimensions)	Units (yd^3/gal)	References
Other	Unknown	--	Ref. 1, Table 2-5

Sum (yd^3/gal): > 0
Equation for Assigning Value (Ref. 1, Table 2-5): N/A

Volume Assigned Value: Unknown, but > 0

2.4.2.1.4. Area (Tier D)

The area measure (Tier D) is not evaluated for source type "other" (Ref. 1, Table 2-5, p. 65).

Area Assigned Value: NA

2.4.2.1.5. Source Hazardous Waste Quantity Value

Volume of ground water plume: >0
Highest assigned value assigned from Ref. 1, Table 2-5: > 0
Source Hazardous Waste Quantity Value: >0 (Ref. 1, Section 2.4.2.1.5, p. 65).

SUMMARY OF SOURCE DESCRIPTIONS

Source No.	Source Haz. 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	> 0	N	10	NS*	NS*	NS*	NS*

*NS (Not Scored)

3.0 GROUND WATER MIGRATION PATHWAY

3.0.1 General Considerations

Regional Geology

The area surrounding the Kokomo Garrison Well Field is in the Tipton Till Plain physiographic unit of the Upper Wabash River basin in north-central Indiana (Ref. 7, pp. 3, 5). The Tipton Till Plain is characterized as nearly flat to gently undulating, poorly drained, and featureless. Surface relief is generally less than 10 feet per 1,000 feet. The till plain is underlain by ground moraine and ablation tills. Resurgent periods during the retreat of the last glacial ice produced large concentric recessional moraine ridges. Relief across the moraines is low, generally less than 50 feet, although relief is slightly greater in several areas. The recessional moraines are 1 to 6 miles wide. Stratigraphy in the till plain area tends to be horizontally continuous, and less complex than in morainal deposits, except where thin till covers morainal deposits (Ref. 7, p. 5).

The Tipton Till Plain is underlain by buried moraines and thick deposits of drift. This is composed of an uncemented silty, sandy, calcareous till containing abundant pebbles and cobbles with scattered beds and lenses of silt, sand, and gravel (Ref. 7, p. 6). Thickness of the unconsolidated glacial drifts is approximately 50 feet in the city of Kokomo (Ref. 7, figure 39, p. 11).

Regionally, soils primarily consist of the Crosby series. Crosby series soils are described as being deep, somewhat poorly drained soils that occupy uplands, and are nearly level to gently sloping. These soils are formed in the thin deposits of loess, and in underlying glacial till. Crosby soils are moderate in organic matter content (Ref. 6, p. 2).

Regional Hydrogeology

The Tipton Till Plain contains discontinuous buried sand and gravel aquifers (Ref. 7, p. 18). These aquifers are small, discontinuous deposits (lenses) of sand and gravel at scattered elevations. Braided streams and sub-ice channels formed sinuous sand and gravel deposits, which are not continuous over broad areas. Further disruption of deposits resulted from glacial scour and shoving. Discontinuous aquifers supply adequate water for domestic needs; however, the larger yields necessary for agricultural, industrial, and municipal needs may be unavailable. Most wells penetrate several lenses of sand and gravel (Ref. 7, p. 18).

In the discontinuous sand and gravel aquifers, the interconnection between ground water and surface water is not evident due to the low permeability of the enclosing materials. Water in discontinuous sand and gravel aquifers is generally confined. When several discontinuous aquifers are penetrated, the potentiometric head in each successive aquifer is generally lower than the potentiometric head of the aquifer above it. This is indicative of ground water

recharge through low-permeability materials. Well yields (exclusive of domestic wells) from discontinuous sand and gravel deposits range from 20 to 300 gallons per minute, with a median of 90 gallons per minute. Median depths of wells in discontinuous sand and gravel aquifers are slightly greater than that of wells in continuous sand and gravel (buried and surficial) to accommodate larger drawdowns (Ref. 7, p. 18).

Ground water flow in the carbonate bedrock aquifer is through vertical fractures, horizontal bedding planes, and solution openings. Dissolution and mechanical weathering of the carbonate bedrock aquifer by surface water entering the ground water system has further enhanced the secondary permeability of the carbonate bedrock aquifer throughout the Upper Wabash River basin. The hydraulic conductivity of a carbonate bedrock aquifer is greatest near the pre-glacial erosion surface and decrease with depth. This secondary enhancement permeability is responsible for the largest well yields available from the carbonate bedrock aquifer (Ref. 7, p. 20).

In the Upper Wabash River basin, yields from the Silurian-Devonian carbonate bedrock aquifer are suitable for domestic uses. Well yields from the Silurian-Devonian carbonate bedrock aquifer system range from 15 to 1,250 gallons per minute. Median yields for nondomestic wells are 200 and 360 gallons per minute for the Silurian and Devonian carbonate rocks, respectively. If sufficient water is not found in the unconsolidated deposits, the carbonate bedrock is a dependable source in most of the Upper Wabash River basin (Ref. 7, p. 20).

A Silurian carbonate bedrock aquifer underlies nearly all of the Upper Wabash River basin (Ref. 7, p. 20). The uppermost bedrock unit overlain by glacial till is the Kokomo Limestone Member that characteristically consists of thinly laminated and dolomitic limestone (Ref. 9, p. 15).

Site Geology

- Stratum 1 (uppermost): Unconsolidated Deposits (Upper, Middle, and Lower Units)

Unconsolidated materials overlie the bedrock surface at the Garrison and Main Water Treatment Well Fields. The unconsolidated materials were glacially deposited and consist primarily of till and outwash sand and gravel. Specific information on the nature of the subsurface materials was obtained from well logs (Ref. 8, pages 72 through 114) and previous investigation within the Kokomo Garrison Well Field (Ref. 8, Appendices B and C, pages 60 through 114). The Kokomo Garrison Well Field partially overlaps the plume area and the Main Water Treatment Well Field is approximately one-half mile northeast of the northeastern boundary of the plume, as shown in Figure 1- 2).

The unconsolidated deposits range from 10 to 150 feet thick in the site vicinity, with the thickest sequences occurring in a buried valley. Buried valleys are drainage features eroded

into the bedrock surface that were subsequently filled with sediments, and buried by glacial till. The orientation of drainage on this bedrock surface was primarily to the west, and the trend of the buried valley is east west. Outwash sand and gravel deposits occur within the unconsolidated deposits, and range from zero to 50 feet thick (Ref. 8, p. 12). There are two continuous sand and gravel deposits occurring primarily within the buried valley. This buried valley is located north of Kokomo (Ref. 8, p. 12).

- Stratum 2 (deepest): Bedrock (Kokomo Limestone, Liston Creek Limestone, and Mississinewa Shale Units)

Bedrock underlying the Kokomo Garrison Well Field is primarily limestone and dolomite (Kokomo Limestone and Liston Creek Limestone Members of the Wabash Formation) (Ref. 8, pp. 12, 13). This carbonate bedrock contains fractures, solution channels, and thin interbedded shale units. The upper portions of the bedrock, generally above the elevation of 680 feet amsl, display greater density of fracturing and solution channeling. The Kokomo and Liston Creek Limestones are underlain by relatively impermeable shale (Mississinewa Shale Member of the Wabash Formation) (Ref. 8, p. 12). However, this shale aquifer appears to be interconnected through various fractures that cut through all three bedrock layers (Ref. 100, p. 3). The contact between the limestone and dolomite units and the underlying Mississinewa Shale occurs at an approximate elevation of 475 feet amsl beneath the Kokomo Garrison Well Field (Ref. 8, p. 12).

The elevation of the bedrock surface varies from approximately 800 feet amsl in the southern portions of the Kokomo Garrison Well Field to less than 700 feet amsl in the main channel of the buried valley located north of Kokomo. The orientation of drainage on this bedrock surface was primarily to the west and the trend of the buried valley is east-west as defined by the 700- and 750-foot contours (Ref 8, p. 12).

A bedrock investigation and characterization study was prepared by Conestoga-Rovers & Associates (CRA) for the Delphi Corporation Electronics and Safety Division former Plant 1 property, located approximately 4,800 feet southwest of the Kokomo Garrison Well Field and approximately 500 feet southwest of the southwestern boundary of the plume (Ref. 9, p. 40; Figure 1- 3 of this HRS documentation record). At Delphi, the top of the Kokomo Limestone is typically between the elevations of 787.3 and 804.8 feet AMSL. The unit is approximately 40 to 60 feet thick (Ref. 9, p. 15). Results of various downhole geophysical and hydraulic tests indicate the Kokomo Limestone contains hydraulically significant fractures below its weathered surface. The Kokomo Limestone slopes slightly to the southwest (Ref. 9, p. 16).

The Liston Creek Limestone Member underlies the Kokomo Limestone Member. The Liston Creek Limestone consists of about 30 feet of cherty limestone and dolomitic limestone that rests with sharp, but probably conformable contact on the Mississinewa Shale Member (Ref. 5, p. 3, 4, 5 and 6). At Delphi, the top of the Liston Creek Limestone is typically encountered

between elevations of 735.5 and 750.3 feet AMSL, and is approximately 43 feet thick. The most hydraulically significant bedding plane fractures were identified in the middle of the unit and at the base of the unit. As with the Kokomo Limestone, the Liston Creek Limestone slopes to the southwest (Ref. 9, p. 16).

The Mississinewa Shale Member consists of argillaceous dolomitic siltstone and silty dolomite (Ref. 5, p. 5). At Delphi, the top of the Mississinewa Shale is typically encountered between elevations of 694.5 and 707.2 feet AMSL. The Mississinewa Shale is approximately 100 feet thick, and according to CRA, acts as low permeability layer to ground water identified in the bedrock units above it (Ref. 9, p. 16).

Site Hydrogeology

Within the Garrison and Main Water Treatment Well Fields, the topography associated with Wildcat Creek, Kokomo Creek, and the INAWC Reservoirs controls both surface water drainage, and ground water flow. From areas both north and south of Wildcat Creek, surface water and ground water drainage is towards Wildcat Creek, Kokomo Creek, and the INAWC Reservoirs. Wildcat creek receives ground water flow from areas northeast and southeast of the city (Ref. 8, p. 14).

The middle sand and gravel unit of the unconsolidated deposits extends beneath the well fields. The thickness of this unit is approximately 20 and 40 feet at the Main Water Treatment and Garrison Well Fields, respectively. Ground water in this aquifer occurs under semi-confined to confined conditions, where the sand and gravel is completely saturated, and is overlain by the finer grained till (Ref. 8, p. 13). The Garrison and Main Water Treatment Well Fields draw ground water from the unconsolidated/bedrock aquifer systems. This aquifer is vertically separated from the middle sand and gravel aquifer by a unit of finer grained silt and clay. Ground water in this aquifer also occurs under semi-confined conditions (Ref. 8, p. 13). The limestone and dolomite bedrock aquifer extends beneath the entire Garrison and Main Water Treatment Well Fields, and ranges from 100 to 375 feet thick. This aquifer is approximately 200 feet thick at the Main Water Treatment Well Field where production wells have been completed in this unit (Ref. 8, p. 13). Ground water in this aquifer occurs under semi-confined to confined conditions (Ref. 8, p. 13-14).

The main factors controlling ground water flow in the Garrison and Main Water Treatment Well Fields are the configuration of the bedrock, the thickness, and extent of the sand and gravel aquifers, and the heterogeneity within the unconsolidated and consolidated materials. Ground water originating in the southern portions within the well fields flows north and west. In the area of the buried valley, ground water flows primarily east to west (Ref. 8, p. 14).

Within the glacial till/bedrock interface, including the upper five feet of the weathered bedrock surface of the Kokomo Limestone, ground water was encountered at Delphi. The interface is comprised of sand and gravel, and is typically a couple feet thick. The ground water occurs

under a semi-confined condition approximately 20 to 25 feet below grade. The flow is generally northwesterly with a seasonal northerly component (Ref. 9, p. 71).

As noted by CRA in the bedrock investigation and characterization study, the Kokomo Limestone and the Liston Creek Limestone are the predominant stratigraphic units that comprise the bedrock aquifer in the Kokomo area. Both units are located above the Mississinewa Shale. Ground water storage and flow in the two limestone units is predominantly through open fractures, joints, bedding planes, and solution channels as flow through uncompromised rock was determined to be negligible (Ref. 9, p. 18).

Fracture identification from surface geophysical analysis was performed by CRA, and was outlined in the bedrock investigation and characterization study. Results of lineament studies and geophysical survey efforts did identify suspected high angle fractures at and adjacent to Delphi. The predominant high angle fractures identified at Delphi appear to be oriented in a northeast-southwest direction between Delphi and the Garrison and Main Water Treatment Well Fields. These suspected high angle fractures in combination with known bedding plane fractures have apparently created zones of increased hydraulic conductivity and transmissivity within the bedrock between the Delphi and the high capacity pumping at the Garrison and Main Water Treatment Well Fields (Ref. 9, p. 69).

The results of the lineament studies and the hydraulic assessments indicate a suspected bedrock fault at Delphi. The suspected fault appears to extend in a northwest direction. According to CRA, this vertical bedrock feature restricts flow within bedding plane factures, and acts as a ground water divide promoting divergent ground water flow within the bedrock aquifer (Ref. 9, p. 69).

- Aquifer Interconnection within 2 miles

The unconsolidated sand and gravel deposits, and the fractured limestone and dolomite bedrock regionally act as a unconsolidated/bedrock aquifer system (Ref. 8, p. 13). Several lines of documentation substantiate hydraulic connection between the unconsolidated materials and the bedrock within two miles of the site.

First, the nature of the unconsolidated/bedrock aquifer system allow for both horizontal flow and vertical flow within and between the formations. The Kokomo Garrison Well Field partially overlaps the plume area and the Main Water Treatment Well Field is approximately 1mile northeast of the northeastern boundary of the plume (Figure 1-2 of this HRS documentation record). These well fields draw ground water from the unconsolidated/bedrock aquifer system (Ref. 8, p. 13). Second, five to 50 feet of glacial till overlies outwash sand and gravel, and bedrock within the Kokomo Garrison Well Field (Ref. 8, page 13). The till was deposited in continuous layers, whereas the sand and gravel was deposited in discontinuous sheets interspersed within the till. The layers of till are semiconfining beds, and ground water is confined in the sand and gravel aquifers. Ground water is also locally confined within open

fractures and solution channels in the upper beds of limestone and dolomite that underlie glacial deposits (Ref. 101, p. 26). Because of the contrast in hydraulic conductivity between the layers of till and the sand and gravel aquifers, horizontal flow predominates in the aquifers and is negligible in the semiconfining till. Recharge to the aquifers, however, is by downward vertical leakage through the semiconfining layers, and discharge is by upward vertical leakage through semiconfining beds and the streambeds (Ref. 101, p. 26).

Further, a bedrock fracture assessment completed in March 2007 by Conestoga-Rovers & Associates (CRA) documented connection between the unconsolidated and bedrock aquifers. CRA performed an Electrical Resistivity Tomography (ERT) geophysical survey to assess the suspected high angle fractures in the top three layers of bedrock – the Kokomo Limestone, Liston Creek Limestone, and Mississinewa Shale (Ref. 9, pp. 24-28). The ERT survey shows that the various aquifers beneath the Delphi Plant 1 site are vertically connected by high angle fractures which cut through the bedrock units. This suggests that the fractures in the Liston Creek Limestone and the Mississinewa Shale are continuous from the Delphi Plant 1 site to the Kokomo Garrison and Main Water Treatment Wellfield. Horizontal connectivity between the Delphi Plant 1 and the Kokomo Garrison and Main Water Treatment Wellfield is clearly shown by gradient and hydrograph data (Ref. 100, p. 2). Some of these fractures are drainage channels that flow to the northeast. The report concluded that the bedrock fractures are likely acting as preferential ground water migration pathways between the Delphi Plant 1 site and the Kokomo Garrison Well Field (Ref. 100, p. 3) within 2 miles of the plume.

Also, bedrock is close to the surface at Wildcat Creek and some sands may be directly interconnected. Sand and gravel deposits, especially those below and directly adjacent to Wildcat Creek, are thick, highly sorted, permeable (valley train) deposits that yield significant amounts of ground water (Ref. 9, p. 15). Former drainage channels cut into the bedrock surface (Ref. 9, p. 15). These drainage channels have cut through different bedrock stratigraphic units (Ref. 9, p. 15). The bedrock channels likely developed along predominant high angle bedrock fractures and are therefore likely to control bedrock ground water flow directions. These suspected bedrock fractures also appear to influence surface water flowing overburden deposits as the bedrock drainage appear to be in locations and orientations similar to Wildcat Creek and Little Wildcat Creek (Ref. 9, p. 15). At and adjacent to the site, the surface of the Kokomo limestone is covered with 13 to 30 feet of unconsolidated glacial drift. The first 5 to 10 feet of the Kokomo limestone is extremely weathered and fractured (Ref. 9, p. 16). Based on the saturated sand and gravel deposits in direct contact with the bedrock surface directly north of the site, the former Pete's Run is expected to contribute to the bedrock ground water system (Ref. 9, p. 17). Data shows that there is a direct correlation between precipitations events, surface elevation in Wildcat Creek and Bedrock water levels (Ref. 9, p. 17).

Available pump test data also indicate interconnection between the unconsolidated and bedrock aquifers. To further study the interconnectivity of the bedrock layers, the Bedrock

Characterization Report prepared by CRA analyzed hydraulic influences on monitoring wells in the shallow, unconsolidated aquifer and bedrock aquifers at the Delphi Plant 1 site. The Kokomo Garrison Well Field, which pumps from the Salamonie Dolomite bedrock aquifer, 170 feet below the Mississinewa Shale Interface, creates a distinctive pumping signature due to the time interval and volumes of ground water pumped. CRA was able to find correlations with the pumping signature from the Kokomo Garrison Well Field and with hydrographs created from transducer data from the monitoring wells screened in the Liston Creek Interface and Mississinewa Shale Interface bedrock aquifers. According to CRA, pumping from the Garrison and Main Water Treatment Well Fields appear to influence ground water elevations in bedrock monitoring wells on and adjacent to Delphi. Northeast ground water flow directions were observed by Delphi monitoring wells, and suggest the Garrison and Main Water Treatment Well Fields pumping operations influence water levels, and hydraulic gradients in areas directly northeast of the Delphi property boundary. The gradient and the hydrograph data suggest the Garrison and Main Water Treatment Well Fields pumping influence within the Liston Creek Limestone interface, Liston creek Limestone, and Mississinewa Shale interface fractures appears to be at least 4,000 feet (Ref. 9, p. 47, 113).

Additional evidence of unconsolidated/bedrock aquifer interconnection is the continuous presence of VOCs from the near surface to bedrock in monitoring well samples (Ref. 9, pages 138 and 139). At Delphi, the VOC concentration in the ground water decreases with depth. The maximum total VOC concentration in the shallow water table (approximately 8 to 12 feet below ground surface) is approximately 100 ppm. The maximum total VOC concentration in the glacial till/bedrock interface is approximately 14 ppm. The maximum total VOC concentration in the bedrock is approximately 0.6 ppm (Ref. 9, p. 75). This dramatic decrease in concentrations between the glacial till/bedrock interface and the underlying bedrock suggests there is a hydraulic connection between the weathered surface of the glacial till/bedrock interface and the first hydraulically significant fracture below the glacial till/bedrock interface. Ground water analytical results from a sample collected below the Mississinewa Shale at the Louisville Limestone interface did not detect any VOCs suggesting that VOCs have not migrated below the shale unit (Ref. 9, p. 76).

Based on this evidence of aquifer interconnection, the unconsolidated deposits aquifers and bedrock aquifers are considered to be a single hydrologic unit for HRS scoring purposes (i.e., the “unconsolidated/bedrock aquifer system”) (Ref. 1, Section 3.0.1.2).

- Aquifer Discontinuities within 4 miles

No discontinuities which completely transect the interconnected unconsolidated/bedrock aquifer system are present within the 4-mile target distance limit. Two main types of discontinuous aquifers within the Kokomo Garrison Well Field region (which overlaps the plume area) are buried sand and gravel aquifers. These aquifers are small, discontinuous deposits (lenses) of sand and gravel at scattered elevations. Braided streams and sub-ice channels formed sinuous sand and gravel deposits, which are not continuous over broad

areas. Further disruption of deposits resulted from glacial scour and shoving (Ref. 7, page 18, see Figure 2).

Other potential aquifer boundaries, (aka aquifer discontinuities), such as a mountain range, ocean, bedrock fault, etc., are not located within a 4-mile radius of the site.

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	Unconsolidated	NA	Y	N
2	Bedrock	Y	Y	N

3.1 LIKELIHOOD OF RELEASE

3.1.1 Observed Release

Aquifer Being Evaluated: The interconnected unconsolidated and bedrock aquifer

Establishing an observed release by chemical analysis requires analytical evidence of a hazardous substance in the media significantly above background level (Ref. 1, Section 2.3, p. 63). 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 its own Sample Quantitation Limit (SQL) and that of the background sample. If the SQL cannot be established, the U.S. EPA Contract-Required Quantitation Limit (CRQL) is used in place of the SQL (Ref. 1, Table 2-3, p. 63). Samples were analyzed for VOCs using CLP SOWM01.2 (Trace Volatiles) analysis procedure and metals using CLP SOW ISM01.3 (ICP-MS) (Ref. 4, p. 8).

Chemical Analysis

On October 3 and 4, 2011, IDEM Site Investigation Program staff conducted sampling for the Kokomo Garrison Well Field (Ref. 4, p. 8). Twenty-five groundwater samples were collected along with the prescribed Quality Assurance/Quality Control (QA/QC) samples and analyzed at an EPA Contract Laboratory Program lab. Additional information regarding the handling and collection method are discussed in the Site Inspection Report (Ref. 4, pp. 8, 9). Analyses included CLP SOW ISM01.3 (ICP-MS) for Metals and CLP SOW SOM01.2 (Trace

Volatiles) for Volatile Organic Compounds (VOCs) Ref. 4, p. 8).

- Background Concentrations:

IDEM Site Investigation Program staff conducted sampling for the Kokomo Garrison Well Field (Ref. 4, p. 8). Four (4) background water samples were obtained from residential wells (Ref. 4, p. 8).

Background Ground Water Sample Table #1
(Obtained from 4 established residential wells)

EPA CLP#	IDEM location#	Date	Location	Depth Below Ground Surface	Hazardous Substance	Hazardous Substance Concentration (Adjusted Concentration) µg/L	Contract Required Quantitation Limit (CRQL) µg/L	Reference
ES2E7	RCW-7	10/04/11	School	200 ft	VC Trans-1,2-DCE Cis-1,2-DCE TCE	ND* ND ND ND	0.5 0.5 0.5 0.5	Ref. 4, pp. 222, 251, 292, 293; 11, p. 13; 13, p. 20
E2SF0	RCW-4	10/04/11	Residential	202 ft	VC Trans-1,2-DCE Cis-1,2-DCE TCE	ND ND ND ND	0.5 0.5 0.5 0.5	Ref. 4, pp. 362, 386, 425, 426; 11, p. 10; 13, p. 20
E2SF1	RCW-5	10/04/11	Residential	347 ft	VC Trans-1,2-DCE Cis-1,2-DCE TCE	ND ND ND ND	0.5 0.5 0.5 0.5	Ref. 4, pp. 19, 368, 386, 432, 433; 11, p. 11; 13, p. 20
E2SF8	RCW-6	10/04/11	Residential	140 ft	VC Trans-1,2-DCE Cis-1,2-DCE TCE 1,1-DCE 1,1-DCA	ND ND ND ND ND ND	0.5 0.5 0.5 0.5 0.5 0.5	Ref. 4, pp. 370, 386, 435, 436; 11, p. 12; 13, p. 20; 107, p.1

ND* = Not Detected
** Limits used for all results reported in this table are equivalent to the CRQLs as defined by Exhibit C, Section 1 of CLP SOW SOM01.2. CRQLs reported for these results are equivalent to the CRQLs defined by the HRS Section 1.1 (Ref. 1, p. 59).

- Contaminated Samples:

In 2011, IDEM's Site Investigation Program conducted SI activities at the Kokomo Garrison Well Field and surrounding areas (Ref. 4, p. 8). The ground water obtained from monitoring wells and municipal wells was found to be contaminated with chlorinated VOCs (Ref. Sections 3.1.1 and 3.3.2.2 of this HRS documentation record).

The extent of the ground water plume is depicted by samples from municipal wells, residential wells, and monitoring wells meeting observed release criteria (Fig. 1-2 of this HRS documentation record). The extent of this plume has not been completely delineated at this time but has been characterized by data from monitoring wells and municipal wells (Ref. Section 3.1.1 of this HRS documentation record and Figure 1-2 of this HRS documentation record).

The plume currently measures approximately 294.14 acres (Fig. 1-2 of this HRS documentation record). The area of the ground water plume is based on available samples that meet the criteria for an observed release (Section 3.1.1 of this Documentation Record). The plume boundary was digitized by connecting wells that met observed release criteria (Figure 1-2 of this HRS documentation record). Background wells were identified outside the boundaries of the plume (Section 3.1.1 of this HRS documentation record; Figure 1-2 of the HRS documentation record).

The following set of tables depicts the samples that meet the observed release criteria (Ref. 1, Table 2-3, p. 63). These tables list the organic hazardous substances with their concentrations and SQLs for each sample. These samples were qualified as "releases" based on the criteria in the HRS (Ref. 1, Section 2.3, Table 2-3, p. 63). The well locations are depicted on Figure 1-2 of this HRS documentation record.

Contaminated Ground Water from Residential Wells Sample Table #2*

EPA CLP#	IDEM #	Date	Location	Depth Below Ground Surface (feet)	Hazardous Substance	Hazardous Substance Concentration (Adjusted Concentration) µg /L	Contract Required Quantitation Limit (CRQL) µg/L	Reference
ES2E8	RCW-1	10/04/11	Residential	76 ft	VC Cis-1,2-DCE	2.2 6.3	0.5 0.5	Refs. 4, p.360, 386, 422,; 11, p. 9; 13, p. 20

*Limits used for all results reported in this table are equivalent to the CRQLs as defined by Exhibit C, Section 1 of CLP SOW SOM01.2. CRQLs reported for these results are equivalent to the CRQLs defined by the HRS Section 1.1 (Ref. 1, p. 59).

**Note: The water from this well is not used for drinking water. It is used for watering a garden

Contaminated Ground Water from Public Wells Sample Table #3

EPA CLP#	IDEM #	Date	Location	Depth Below Ground Surface	Hazardous Substance	Hazardous Substance Concentration (Adjusted Concentration) µg/L	Contract Required Quantitation Limit (CRQL) µg/L	Reference
E2SD9	PW-5	10/04/11	IN-AWC Well 19	300 ft	VC	5.2	0.5	Refs. 4, pp. 202, 250, 323; 8, p.16, 84; 11, p. 5; 13, p. 19
E2SE0	PW-6	10/04/11	Duplicate of PW-5	300 ft	VC	5.2	0.5	Refs. 4, pp.204, 250, 320; 8, p.16, 84; 11, p. 6; 13, p. 19
E2SE1	PW-4	10/04/11	IN-AWC Well 18	300 ft	VC Cis-1,2-DCE	3.8 1.9	0.5 0.5	Refs. 4, pp. 206, 250, 317, 452; 8, p.16, 81; 11, p. 4 13, p. 19:
E2SE2	PW-2	10/04/11	IN-AWC Well C	382 ft	VC Trans-1,2-DCE Cis-1,2-DCE	5.7 0.86 23	0.5 0.5 4.0	Refs. 4, pp. 208, 210, 250, 314, 450, 451; 8, p.16; 11, p. 2 13, p. 19
E2SE3	PW-3	10/04/11	Duplicate of PW-2	382 ft	VC Trans-1,2-DCE Cis-1,2-DCE	5.8 0.84 22	0.5 0.5 2.0	Refs. 4, p. 212, 214, 250, 305, 308, 450, 451; 8, p.16; 11, p. 3 13, p. 19
E2SE4	PW-7	10/04/11	IN-AWC Well 20	325 ft	VC Cis-1,2-DCE	3.7 5.8	0.5 0.5	Refs. 4, p. 216, 250, 302; 8, p.16, 90; 11, p. 7 13, p. 19

*Limits used for all results reported in this table are equivalent to the CRQLs as defined by Exhibit C, Section 1 of CLP SOW SOM01.2. CRQLs reported for these results are equivalent to the CRQLs defined by the HRS Section 1.1 (Ref. 1, p 59).

Contaminated Ground Water from Monitoring Wells Sample Table #4

EPA CLP#	IDEM #	Date	Location	Depth Below Ground Surface	Hazardous Substance	Hazardous Substance Concentration (Adjusted Concentration) µg/L	Contract Required Quantitation Limit (CRQL) µg/L	Reference
E2SB9	MW-1	10/04/11	SW Corner of Delphos St. and Defenbaugh St.	20-23 ft	VC Cis-1,2-DCE 1,1-DCA	62 66 83	20 20 20	Refs. 4, pp.188, 250, 263; 11, p. 17; 13, p. 19
E2SC0	MW-2	10/04/11	SW Corner of Delphos St. and Defenbaugh St.	43-48 ft	VC Cis-1,2-DCE	4.9 16	0.5 0.5	Refs. 4, pp. 192, 250, 269; 11, p. 18; 13, p. 19
E2SC1	MW-3	10/04/11	Duplicate of MW-2	43-48 ft	VC Cis-1,2-DCE	20 59	0.5 5.0	Refs. 4, pp. 194, 196, 250, 272; 11, p. 19; 13, p. 19
E2SC9	MW-9	10/04/11	S of PPG Facility	75 ft	Cis-1,2-DCE	0.99	0.5	Refs. 4, pp. 198, 250, 329, 475; 11, p. 9; 13, p. 19
E2SC2	MW-4	10/04/11	SW of Jay St. and Defenbaugh St.	25.5 ft	VC Trans-1,2-DCE Cis-1,2-DCE TCE 1,1-DCE 1,1-DCA	5500 2600 77000 20000 620 1800	400 400 4000 4000 400 400	Refs. 4, pp. 342, 344, 251, 395, 396, 398, 399; 11, p. 20; 13, p. 19
E2SC3	MW-5	10/04/11	9 ft north of MW-4	48 ft	VC Cis-1,2-DCE TCE	2.4 20 15	0.5 0.5 0.5	Refs. 4, pp. 346, 251, 401, 402; 11, p. 21; 13, p. 19
E2SC4	MW-6	10/04/11	NW corner of Foster Stand Delphos St.	61.5 ft	VC Trans-1,2-DCE Cis-1,2-DCE TCE	2.3 0.51 3.5 0.6	0.5 0.5 0.5 0.5	Refs. 4, pp.348, 250, 404, 405; 11, p. 22; 13, p. 19

** Limits used for all results reported in this table are equivalent to the CRQLs as defined by Exhibit C, Section 1 of CLP SOW SOM01.2. CRQLs reported for these results are equivalent to the CRQLs defined by the HRS Section 1.1 (Ref. 1, p. 59).

Level I Sample Table #5

EPA CLP#	Hazardous Substance	Hazardous Substance Concentration (Adjusted Concentration) µg/L	Benchmark Concentration µg/L	Benchmark	Reference
E2SD9	VC	5.2	$1.7x10^{-2}$	Cancer Risk	Ref 2, p. 14; 4, pp. 202, 250
E2SE0	VC	5.2	$1.7x10^{-2}$	Cancer Risk	Ref 2, p. 14; 4, pp.204, 250
E2SE1	VC	3.8	$1.7x10^{-2}$	Cancer Risk	Ref 2, p. 14; 4, pp. 206, 250
E2SE2	VC	5.7	$1.7x10^{-2}$	Cancer Risk	Ref 2, p. 14; 4, pp. 208, 210, 250
E2SE3	VC	5.8	$1.7x10^{-2}$	Cancer Risk	Ref 2, p. 14; 4, pp. 212, 214, 250
E2SE4	VC	3.7	$1.7x10^{-2}$	Cancer Risk	Ref 2, p. 14; 4, pp. 216, 250

Attribution:

The Kokomo Contaminated Ground Water Plume is a contaminated ground water plume originating from unknown sources where hazardous substances may have been released and seeped through the ground to the aquifer. When the source itself consists of a ground water plume with no identified source, no separate attribution is required (Ref. 1, Sec. 3.1.1).

There are several possible sources of chlorinated solvents in the area. The sources of the contamination in the Kokomo Contaminated Ground Water Plume have not been determined.

A bedrock characterization report was prepared by Conestoga-Rovers and Associates (CRA) for the Delphi Corporation Electronics and Safety Division (Delphi) (Ref. 9, p. 1). According to that report, volatile organic compounds (VOCs) contaminants were detected in the bedrock ground water (Ref. 9, pp. 63, 64, 70, 75, 131-136, 138-139; Figure 1-2 of this HRS documentation record).

The report stated that it was unclear if the VOCs detected in the bedrock wells located outside of Delphi's property are from the Delphi releases or from releases associated with other facilities that have used the same solvents (Ref. 9, pp. 76, 79).

Ground water samples collected during the Site Inspection from Delphi's monitoring wells

confirmed elevated levels of trichloroethylene, 1,1-dichloroethane, and cis-1,2-DCE, and VC (Ref. 4, p. 10; Contaminated Ground Water from Monitoring Wells Sample Table #4 of this HRS documentation record; Figure 1-2).

There are three IDEM VRP projects in the immediate area. Seventy three (73) monitoring wells have been installed on the Omnisource and PPG properties for assessing the ground water for the three VRP projects (Ref. 61, p. 2). VOCs have been detected in ground water samples obtained by the Omnisource and PPG consultants in some of the 73 monitoring wells.

In addition, elevated levels of TCE and degradation products have also been detected on ASF Partnership, Stites Cleaners, and GMCH properties (Refer to Summary of Investigations table of this HRS documentation record).

Pumping data exists to demonstrate that the unconsolidated materials and the bedrock are hydraulically interconnected in the area of the well field (Ref. 14, pp. 1-8). Multiple investigations and searches have been conducted to identify the source(s) of the contamination at the Kokomo Garrison Well Field; however, because of the known complex geology, multiple possible current and historical contaminant sources, and extensive pumping of ground water in this area that has likely resulted in commingling of multiple possible releases, individual sources of the contamination and the extent of any possible source-specific releases cannot be determined for HRS purposes at this time.

In addition to the Pre-CERCLIS Screening, Preliminary Assessment, and Site Inspection Work conducted at this site, IDEM staff searched State files in an attempt to identify possible sources of the contamination at the Kokomo Garrison Well Field. The table below lists those facilities identified through the search.

Summary of Investigations of Current and Historical Facilities Associated with Solvents

Name	Investigation	Date	Samples	Substances	Comments	References
ASF Partnership	Phase I Environmental Site Assessment	2007	Ground Water	PCE	As of 2013, 180 pounds of VOCs have been removed from soil and ground water	Ref. 15, p. 8; 57, p. 6
Milbank Manufacturing Co. Inc.	Waste Manifests	2011	None	Waste paint, coolants, waste kerosene, grease, unidentified solvents (10	The facility ceased operations. It is not known if the unidentified	Ref. 37, p. 2; 43, pp. 3-6; 30, p. 1; 31, p. 1

				gallons per month)	solvents included chlorinated solvents.	
Empty Industrial Building	LUST Site Investigation Report	1995	Ground Water	Lead, benzene, ethylbenzene, toluene, xylenes, TPH, possible solvents associated with dry cleaners	Ground water samples were not analyzed for chlorinated solvents. The property was a former dry cleaners.	Ref. 49, pp. 4, 17, 41-59
Omnisource	Phase II Environmental Site Assessment	2006	Ground Water	TCE cis-1,2-DCE VC	The facility is in IDEM's Voluntary Remediation Program	Ref. 61, pp. 421-425
Site Cleaners	Further Site Investigation	2013	Ground Water	PCE	The facility is in IDEM's State Cleanup program	Ref. 59, pp. 1, 5, 6
Hunt's Salvage and Coal Yard	IDEM Inspection	2013	None	unknown	Fluids were observed leaking onto surrounding soils. Referred to EPA.	Ref. 58, pp. 1, 8
PPG Industries	Ground Water Investigation Monitoring Report	2013	Ground Water	1,1,1 TCA 1,1-DCA cis-1,2-DCE trans-1,2-DCE PCE VC	The facility is in IDEM's Voluntary Remediation Program	Ref. 61, pp. 2, 12-70,
GMCH	RCRA Facility Investigation Report	2013	Ground Water	TCE	The facility is being addressed by RCRA Corrective Action	Ref. 66, pp. 1, 140-142
Chrysler LLC	Ground water monitoring	2008	Ground Water	TCE cis-1,2-DCE, VC	The facility is in IDEM's Voluntary Remediation Program	Ref. 78, p. 1; 79, pp. 1-3
Delphi Plant 1	Ground water monitoring wells	2013	Ground Water	1,1-DCA 1,1-DCE Cis-1,2 DCE Trans 1,2 DCE TCE VC	IDEM referred the site to the U.S. EPA for possible removal action due to concerns of	Ref. 69, pp. 2, 3. 4; 93, pp. 1-4

					vapor intrusion in the nearby residential areas	
IDEM	Site Investigation (SI)	2013	Ground Water	1,1-DCA 1,1-DCE Cis-1,2 DCE Trans 1,2- DCE TCE VC	SI report confirms contamination in ground water at municipal wells and within a mile southwest of the well field	Tables 2, 3 and 4 of this HRS Documentation Record

Abbreviations

VC	Vinyl Chloride
PCE	Tetrachloroethene
1,1-DCA	1,1- Dichloroethane
1,1-DCE	1,1- Dichloroethene
Cis-1,2 DCE	Cis - 1,2 Dichloroethene
Trans 1,2 DCE	Trans 1,2 Dichloroethene
TCE	Trichloroethene
TPH	Total Petroleum Hydrocarbons

IDEM staff also conducted a search of State files to determine if other facilities could be possible sources of the contamination at the Kokomo Garrison Well Field. Staff also conducted several interviews with these active facilities.

Additional Facilities Investigated as Possible Sources

Name	Investigation	Date	Samples	Substances	Comments	References
Weise Oldsmobile and GMC Dealership	Site Characterization	2007, 2008	Ground Water	Polynuclear aromatic hydrocarbons	Ground water flow is in a southeast direction	Ref. 20, pp. 2, 3, 8, 9 10, 23
Wiese Collision Repair	Compliance Evaluation	2011	None	Paint waste materials	No violations were discovered	Ref. 22, pp. 1, 3, 6, 7
Coan Engineering	Interview	2013	None	Mineral spirits, cutting oils, transmission fluids	Facility uses Crystal Clean Inc. to dispose of waste products	Ref. 46, p. 1

PadField's Auto Body and Paint	Interview	2013	None	Paint, paint solvents	Facility uses Crystal Clean Inc. to dispose of waste products	Ref. 44, p. 1
Former GM Delco Plant 5	First Quarter 2012 Progress Report	2011	Ground Water	TCE	TCE in ground water extends only 800 feet from site	Ref. 104, pp. 1-3

A more detailed history of the facilities listed in the tables above is presented below.

ASF Partnership
3700-3714 South LaFountain Street
Kokomo, Indiana

The ASF Partnership facility is located at 3700-3714 S. LaFountain Street, Kokomo (Ref. 57, p. 1). The property is owned by Bernard Ampe, Thomas Simmons, and James Fleming, otherwise known as ASF Partnership (Ref. 57, pp. 5, 8). The surrounding area is primarily commercial and residential (Ref. 57, pp. 27, 28). Ground water in the area generally flows in the northwest direction toward Wildcat Creek (Ref. 57, p. 12). One building, Terrace Plaza shopping center, exists on the property (Refs. 15, p. 10; 57, p. 6). A Phase I Environmental Site Assessment of Terrace Plaza revealed two dry cleaning businesses as former tenants of the property (Ref. 57, p. 6). Historically, the dry cleaning facilities occupied suites in the middle and south end of the shopping center (Ref. 57, p. 8). Stite's Cleaners is currently located at the south end of the shopping center, but no dry cleaning is conducted at this facility (Ref. 57, p. 8).

In November 2007, Troy Risk notified IDEM of a release of tetrachloroethylene to on-site soils and ground water at the ASF Partnership facility (Ref. 57, pp. 9, 19). In September 2009, Troy Risk submitted a Corrective Action Plan (CAP) for the facility, and IDEM approved the CAP in November 2009 (Ref. 15, pp. 4, 5). Troy Risk employed a Multi Phase Extraction (MPE) system in October 2011 to remediate the contamination in the ground water (Ref. 15, pp. 5, 6). Most recently, the Third Quarter 2013 MPE System Performance and Ground Water Monitoring Report was sent to IDEM on October 31, 2013 (Ref. 15, pp. 1, 2). Sampling for this monitoring report completed on July 11, 2013 revealed contamination remains at the property (Ref. 15, p. 3). Monitoring wells MW-1, MW-2, MW-6, MW-7, and MW-9 had detections of one or more analytes above their respective laboratory reporting limit (Ref. 15, p. 7). MW-1 and MW-9 contained concentrations of tetrachloroethylene and trichloroethylene (Ref. 15, p. 7). MW-1 also had elevated levels of vinyl chloride (Ref. 15, p. 7). In addition, MW-1 and MW-9 contained concentrations of cis-1,2-dichloroethylene and MW-2 and MW-6 had detections of cis-1,2-dichloroethylene (Ref. 15, p. 7). As of September 30, 2013, the MPE system has removed approximately 180 pounds of VOCs from the soil and ground water at the property (Ref. 15, p. 8). Operation and maintenance of the MPE system will

continue until closure objectives have been met, or until asymptotic behavior is observed between ground water concentrations and incremental mass removal of VOCs (Ref. 15, p. 8).

This partnership is located less than two miles to the south of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record).

Milbank Manufacturing Co. Inc.
1400 E. Havens Street
Kokomo, Indiana

Milbank Manufacturing Co., Inc. is located at 1400 E. Havens Street (Ref. 29, p. 1). Milbank is a manufacturer of electrical meter products (Refs. 28, p. 1; 29, p. 1). The plant opened in 1950 (Ref. 27, p. 1). Through a national network of manufacturers' representatives they provide wholesale electrical distributors with electrical products for the utility, contractor, industrial and OEM markets (Ref. 28, p. 1). Currently, Milbank manufactures over 10,000 different catalog items (Ref. 28, p. 1).

An inspection conducted on April 18, 1978, noted that paint usage in a dip tank was 90 gallons per month and that solvent usage was 10 gallons per month (Ref. 37, p. 2). In 1983, the company obtained approval to dispose of asbestos powder on a one time basis (Ref. 38, p. 1). The powder was generated by drawing metal out of die parts (Ref. 40, p. 1). According to a 1991 Hazardous Waste Handler Information Update Form, the facility was conditionally exempt generator (Ref. 39, p. 1). In 1998, the company obtained certification to dispose of wastewater treatment filter cake (Ref. 41, p. 1). In a letter dated June 16, 1998, IDEM had requested additional information regarding the processes that generated the filter cake (Ref. 42, p. 1). According to a Special Waste Certification Application, the waste was not listed as hazardous waste nor was did the waste contain PCBs (Ref. 42, p. 11). On January 7, 2011, the company announced it was closing its Kokomo facility (Refs. 30, p. 1; 31, p. 1). Scanned copies of manifests for waste disposal related to the closure of the Milbank facility were sent by an email from Trace Tandy with Milbank to Lisa Frost (IDEM) in June 2011 (Ref. 43, pp. 1, 3-6). Coolants, used oil, non-regulated solids, aerosols, waste hydrochloric acid, waste paint materials, waste kerosene, waste potassium hydroxide, and grease were disposed via the use of Safety Kleen services (Ref. 43, pp. 3-6).

This facility is located less than one mile to the north of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record). Although this facility had utilized solvents in their former operations, no investigation involving soil or ground water sampling have been reported to IDEM.

Empty Industrial Building
815 North Touby Pike
Kokomo, Indiana

According to tax records, the property is owned by 815 N. Touby Pike LLC (Ref. 47, p. 1). A representative for the LLC is Jason Coan, one of the same business partners for Coan Engineering (Ref. 46, p. 1). According to an interview with Mr. Coan, the building is strictly used as a parts warehouse only (Ref. 46, p. 1). No chemicals are stored within the warehouse nor are any people employed at this building (Ref. 46, p. 1). Mr. Coan noted that prior to the purchase of this property, which occurred in 1997 or 1998, the facility was used as a uniform laundry service (Ref. 46, p. 1). He stated that the previous property owner had conducted remediation activities on the property prior to the purchase (Ref. 46, p. 1). A heating oil spill was reported to IDEM in October 1995. The extent of the spill was investigated and remediated (Ref. 48, pp. 1-2). A review of the Phase II report that discussed the investigation revealed that eight soil samples and three ground water samples (from three installed monitoring wells) were obtained (Ref. 49, pp. 7, 16). The ground water samples were analyzed for TPH, gasoline products (benzene, toluene, xylene, and MTBE), SVOCs, and lead (Ref. 49, pp. 16, 37, 53-59). The soil samples were analyzed for the same compounds except that only two of the eight samples were also sampled for chlorinated VOCs (Ref. 49, pp. 16, 43-52). No chlorinated VOCs were detected in those two samples (Ref. 49, p. 17). Lead, benzene, ethylbenzene, toluene, xylenes, tph and methylene (lab artifact) were detected in the in some of the soil samples (Ref. 49, p. 17). Monitoring well data depicts ground water flow from the property to be in a south southwest direction towards Kokomo Creek (Ref. 49, pp. 11, 23). Since a full VOC scan was not performed for all ground water and soils samples collected from this former uniform laundry service facility, a potential exists that this property may be a source of chlorinated volatile organic compounds. This facility is located less than 1 mile north of the impacted wells (Figures 1-2 and 1-3 of this HRS documentation record).

Omnisource
990 East Carter Street
Kokomo, Indiana

The former Omnisource facility is located at 990 East Carter Street, Kokomo (Ref. 18, p. 2). The property is 19 acres located in the center of Kokomo (Ref. 17, p. 6). In addition, a municipal well field operated by INAWC is located approximately 1,500 feet east of a former underground storage tank (UST) that was located on the property (Ref. 17, p. 6).

The property has been owned by PPG Industries, Inc. since September 2010 (Ref. 18, p. 2). Prior to PPG Industries, Omnisource owned the property from January 2007 to September 2010 (Ref. 18, p. 2). Omnisource is a recyclable material merchant wholesaler (Ref. 63, p. 1). Mervis Industries Inc., an auto shredding, salvaging, and metal recycling facility, which

owned the property from 1991 to 2007 (Refs. 62, p. 1, 2; 17, p. 6). The property was operated as a scrap metal facility by Universal Steel for approximately 30 years prior to Mervis' ownership. The property was used as a landfill before being purchased by Universal Steel (Ref. 19, p. 4).

Volatile organic compounds were detected at the former Omnisource property in more recent ground water monitoring events (Ref. 61, pp. 421-433). A Phase II Environmental Site Assessment was completed for the property in November 2006 by Golder Associates, Inc (Ref. 61, pp. 421-425). Trichloroethylene (TCE) and cis-1,2-dichloroethylene (cis-1,2-DCE) were found at 76 ug/L and 264 ug/L respectively (Ref. 61, p. 422). In 2010, a Baseline Site Investigation was completed for the property by IWM Consulting Group (Ref. 61, pp. 430-433). VOCs discovered include cis-1,2-DCE, TCE, and VC (Ref. 61, p. 431). Elevated levels of TCE and VC were also at levels of 0.105 mg/L and 0.0132 mg/L respectively (Ref. 61, p. 431).

The Carter Street property is currently undergoing remedial activities under IDEM's VRP as a portion of a larger PPG Industries investigation (Ref. 61, p. 2). All properties are currently owned by PPG Industries (Refs. 18, p. 2; 64, p. 1; 87, p. 1). Refer to the PPG Industries, Inc. summary in the Attribution section of this HRS documentation record for further review of recent ground water monitoring activities for the PPG Industries VRP facility.

This facility is located less than one mile to the north of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record).

Stite's Cleaners
519 W. Park Avenue
Kokomo, Indiana

Stite's Cleaners is located at 519 W. Park Avenue, Kokomo (Ref. 59, p. 1). Stite's Cleaners is an operating dry cleaner that uses tetrachloroethylene (PCE) in its dry cleaning operations (Ref. 59, p. 3). Wildcat Creek is located directly north of the dry cleaners, and the surrounding area is primarily residential and commercial (Ref. 59, p. 3). Ground water in the area flows in a north, northwest direction towards Wildcat Creek (Ref. 59, p. 4).

In May 2011, an incident of contamination at Stite's Cleaners was reported to IDEM (Ref. 26, pp. 15, 16). Chemicals of concern include PCE, cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene, vinyl chloride, trichloroethylene (TCE), and chloroform (Ref. 26, p. 2). Stite's Cleaners was initially admitted to IDEM's VRP in December 2012 (Ref. 60, p. 1, 2). However, Stite's Cleaners was terminated from the VRP in September 2013 and transferred to IDEM's State Cleanup Program due to failed submittal of a Remediation Work Plan in a timely manner (Ref. 60, p. 1).

In October 2013, ECC Horizon submitted a Further Site Investigation Work Plan to IDEM's

State Cleanup Program detailing present contamination at Stite's Cleaners and proposed future remedial actions (Ref. 59, p. 1). PCE was detected in soil samples. Three monitoring wells were sampled to analyze contamination of ground water (Ref. 59, p. 5). PCE was detected in MW 1 and MW 3 and, PCE, TCE and DCE was detected in MW2 (Ref. 59, pp. 5-6). PCE and TCE were detected indoor air vapor samples (Ref. 59, pp. 5-6). This facility is located less two miles to the west of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record).

Hunt's Salvage and Coal Yard
1010 South Ohio
Kokomo, Indiana

The Hunt's Salvage and Coal Yard property is located at 1010 South Ohio Street, Kokomo (Ref. 58, p. 1). Hunt's Salvage and Coal Yard is a licensed auto salvage facility and a scrap metal processor (Ref. 58, pp. 2, 8). Dale Hunt is the property owner, and Jason Grube is the facility owner (Ref. 58, p. 2). The facility requires vehicles to be free of fluids prior to accepting them for scrap (Ref. 58, p. 8). Engines and waste tires are sent to Rochester Iron & Metal. No paint or solvents are utilized on the property (Ref. 58, p. 3).

On July 1, 2013, IDEM received a complaint from a private citizen concerning improper release of refrigerants, open burning, and fluid releases from Hunt's Salvage and Coal Yard (Ref. 58, p. 8). The citizen revealed that Freon was being released into the atmosphere from refrigerators and air conditioning units (Ref. 58, p. 8). In addition, the complaint mentioned that there may be open burning of plastic, and an oily sheen is visible running off of the property (Ref. 58, p. 8).

On July 31, 2013, IDEM staff conducted an inspection of the facility (Ref. 58, p. 1). In the southern end of the facility, there was a 40 cubic yard roll-off container with whole engines stored inside (Ref. 58, p. 8). Fluids were observed leaking onto the surrounding soil (Ref. 58, p. 8). No other fluid releases were observed (Ref. 58, p. 8). There were no records documenting appropriate removal of refrigerants from vehicles or other goods (Ref. 58, p. 8). Evidence of open burning was observed (Ref. 58, p. 8). The facility was referred to IDEM's Office of Water Quality Storm Water Section and to EPA Region 5 (Ref. 58, p. 1).

This facility is located less than two miles to the south of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record). Although fluid were observed leaking onto the surrounding soils, no investigation involving soil or ground water sampling have been reported to IDEM.

PPG Industries, Inc.
1500 Murden Street
Kokomo, Indiana

The PPG Industries, Inc. facility is located at 1500 Murden Street, Kokomo (Ref. 84, p. 9; 95, p.1). Ground water tends to flow north, northeast towards the pumping wells (Ref. 84, pp. 9-10).

PPG is formerly known as the Pittsburgh Plate Glass Company, and glass making began on the property in 1895 (Ref. 84, p. 10). Arsenic, in the form of arsenic trioxide, was used as a refining agent to remove occluded bubbles from glass (Ref. 84, p. 10). PPG ceased glassmaking operations in 1931(Ref. 62, p. 1).

In August 1995, MFG, Inc. completed a Phase II Investigation of the PPG property (Ref. 84, p. 14). Arsenic concentrations in subsurface soil samples were found to range from 3.74 to 364 mg/kg (Ref. 84, p. 12). Arsenic in ground water samples within the bedrock aquifer ranged from <0.0011 to 10.5 mg/L (Ref. 84, pp. 12-13).

IDEM and PPG, Industries Inc. entered into a Voluntary Remediation Agreement in May 1996 to remediate arsenic contamination at the property (Refs. 84, p. 9; 88, pp. 1, 17-19). The former Omnisource properties, which are now owned by PPG Industries, located at 990 E. Carter Street and 631 South Ohio Street in Kokomo, were also subsequently accepted into IDEM's VRP in 2012 (Refs. 18, p. 2; 87, p. 1; 89, p. 1; 91, p. 1). IDEM's VRP currently addresses the former Omnisource properties at Carter Street and Ohio Street and the PPG Industries property at Murden Street as separate sites associated with the same company (Ref. 61, p. 2). PPG is addressed by IDEM's VRP under the following VRP numbers: #6951202, #6101003, and #6101004 (Ref. 95, p.1).

Most recently, a Ground water Investigation Monitoring report was provided to IDEM in September 2013 detailing a ground water monitoring event that took place in July 2013 (Ref. 61, p. 2). Elevated levels of VOCs have been detected in ground water samples at the PPG properties (Ref. 61, pp. 12-70). Elevated levels of VOCs in ground water at the PPG properties include 1,1,1-trichloroethylene (1,1,1-TCA), 1,1-dichloroethane (1,1-DCA), cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), TCE, and VC (Ref. 61, pp. 42-48). This facility is located less than 1 mile south of the impacted well field.

GMCH
2100 East Lincoln Road
Kokomo, Indiana

The General Motors Components Holdings LLC facility (GMCH) is located at 2100 E Lincoln Road, Kokomo (Ref. 56, p. 1). The GMCH facility includes 2.9 million square feet of building

space in a multi-building complex that lies on approximately 174.3 acres (Refs. 66, p. 14; 65, p. 1). The property was originally owned by General Motors Corporation (GMC) and operated as Delco Electronics division of GMC. In 1999, the property became part of Delphi Automotive Systems, later named Delphi Corporation, when that company separated from GMC (Ref. 66, p. 21). In 2009, GMC reacquired the property from Delphi Corporation, and GMC changed its name to GM LLC (Ref. 66, p. 21). Past production processes included activities such as electroplating, metal stamping, die casting, chlorinated solvent distillation and degreasing, and non-chlorinated solvent distillation and degreasing (Ref. 66, p. 21). GMCH currently produces components such as semiconductors, engine and transmission control modules, and crash sensing and diagnostic modules (Ref. 65, p. 1).

In July 1982, the former Delco Electronics became a registered RCRA facility with the U.S. EPA (Ref. 67, p. 2). A current conditions report submitted for the GMCH facility in 2009 outlines historical releases of contaminants, including hydrofluoric acid, acid/base, potassium hydroxide, waste mixed solvents, xylene solvent, fluorescent dye, and PCBs (Ref. 68, pp. 27-30). The waste mixed solvents contained TCE, 1,1,1-TCA, isopropanol, toluene, xylene, and benzene (Ref. 68, p. 29). In order to address contamination at the facility, GMCH entered into a Voluntary Corrective Action Agreement (VCAA) in March 2010 (Ref. 67, p. 1).

A RCRA Facility Investigation Report for the GMCH property was submitted in July 2013 (Ref. 66, p. 1). This investigation found levels of TCE and VOCs in ground water in several locations around the property (Ref. 66, pp. 140-142). Ground water and indoor air migration were identified as key pathways that will be addressed in a Corrective Measures Proposal (CMP) for the GMCH property (Ref. 66, p. 142). The CMP will outline corrective measures necessary to protect human health and the environment from all current and future unacceptable risks (Ref. 67, p. 5).

This facility is located less than three miles to the south of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record).

Chrysler LLC
2401 South Reed Road
Kokomo, Indiana

The Chrysler Kokomo Transmission Plant (KTP) is located at 2401 South Reed Road in Kokomo (Ref. 72, p. 1). KTP is an automotive production plant that manufactures and assembles automobile transmissions (Ref. 70, p. 4). The property is 110 acres with a casting plant. The KTP is currently a small quantity generator according to the Hazardous Waste Handler ID Form for 2013 (Ref. 74, p. 1). Hazardous waste items include paint waste from maintenance painting operations, waste gasoline, aerosols, elemental mercury from equipment change out, broken fluorescent light bulbs, and heat treat salt (Ref. 74, pp. 3-8).

The KTP has had multiple historic releases of hazardous materials at different locations on the property (Ref. 70, p. 4). Many of the hazardous materials released on the property included petroleum based materials and automobile related products (Ref. 70, p. 4). Remedial actions were taken in response to these spills, and other historic hazardous waste releases are in varying stages of investigation and remediation (Refs. 70, pp. 4-5; 71, p. 1). Two prominent historic releases of VOCs include the South Tank Farm release in 1988 and the No. 4 Primary Wastewater Treatment Tank in 2000 (Refs. 76 p. 1; 77, pp. 1-2).

During two sampling events following a UST removal, monitoring wells that had been placed in the area detected trichloroethylene (TCE), total hydrocarbons, trans-1,2-dichloroethylene (trans-1,2-DCE), and vinyl chloride (Ref. 76, p. 11). Ground water monitoring completed for a Further Site Investigation conducted in 2009 showed that chlorinated VOCs, including TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-DCE, and vinyl chloride were the primary chemicals of concern (Ref. 76, p. 23). The most recent ground water monitoring event in September 2013 showed TCE and vinyl chloride exceeding IDEM's RISC IDCLs (Ref. 75, pp. 1-4).

In January 2002, the Primary Wastewater Treatment Tank area was entered into IDEM's Voluntary Remediation Program to remediate the VOC plume, and in 2006 Chrysler excavated the chip/scrap bin area (Refs. 78, p. 1; 79, p. 1). Ground water monitoring conducted in April 2008 detected five wells with TCE, six wells with vinyl chloride, and two wells with cis-1,2-DCE (Ref. 79, pp. 2-3). The most recent ground water monitoring event in September 2013 showed elevated levels of cis-1,2-DCE, TCE, and vinyl chloride (Ref. 73, pp. 1-5). This facility is located less than three miles to the south of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record).

Delphi Plant 1
700 E. Firmin Street
Kokomo, Indiana

The former Delphi Corporation Electronics and Safety Division (Delphi) Plant 1 property is located at 700 E. Firmin Street, Kokomo (Refs. 9, p. 8; 69, p. 1). The Delphi Plant 1 property covers approximately 35.83 acres of land surrounded by industrial, commercial, and residential properties (Ref. 9, p. 8). The INAWC municipal well field is located approximately 1.0 mile northeast of the Delphi property (Ref. 9, p. 66). The original plant was constructed in 1922 on undeveloped property, and subsequently purchased by Crosley Radio in 1935 and by General Motors in 1936 (Refs. 9, p. 8; 69, p. 8). The plant historically produced radios, carburetors, military electronics, and automotive electronics (Refs. 9, p. 8; 69, p. 1). Degreasing solvents containing trichloroethylene (TCE) and 1,1,1-trichloroethane (1,1,1-TCA) were used for manufacturing operations (Ref. 9, p. 66). Delphi closed the plant in 1998 and subsequently demolished the building in 1999 (Refs. 9, p. 8; 69, p. 1). In 2003, the former manufacturing parcel was donated to the Kokomo-Howard County Development Corporation

(KHDC) (Refs. 9, p. 9; 90, p. 1). In 2010, the Greater Kokomo Development Economic Alliance (GKEDA) obtained the property (Ref. 90, p. 1).

Remedial investigations of the property in the late 1990s and early 2000s identified contaminants in shallow soils and ground water beneath the property including VOCs (Ref. 9, p. 9). VOCs included TCE, cis-1,2-dichloroethylene (cis-1,2-DCE), trans-1,2-dichloroethylene (trans-1,2-DCE), 1,1-dichloroethylene (1,1-DCE), VC, 1,1,1-TCA, 1,1-dichloroethane (1,1-DCA), benzene, toluene, ethylbenzene, and total xylenes (Ref. 9, p. 9)

In March 2011, Delphi, which was renamed DPH Holdings Corporation, terminated the voluntary corrective action agreement that required Delphi to remediate contamination at the property (Ref. 24, p. 1). DPH Holdings Corp. stated that they would no longer be responsible for corrective action at the facility (Ref. 24, p. 1). The most recent ground water monitoring investigation occurred in April 2013 (Ref. 69, p. 2). Seventeen monitoring wells in the perched zone (upper aquifer), bedrock interface zone (middle aquifer), and bedrock zone (lower aquifer) were sampled, and some wells were found to contain concentrations of VOCs. (Ref. 69, p. 2, 3, 4). In addition, wells sampled in the residential area to the north of the property also showed detections of VOCs (Ref. 69, p. 3). In May 2013, the Site Investigation Program referred the former Delphi Plant 1 property to the U.S. EPA for possible removal action due to concerns of vapor intrusion in the nearby residential areas (Ref. 93, pp. 1-2). This facility is located approximately 1 mile south of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record).

Wiese Oldsmobile and GMC Dealership
1400 East Boulevard
Kokomo, Indiana

The Wiese Oldsmobile and GMC dealership (Wiese) facility was located at 1400 E. Boulevard, Kokomo, on the north side of E. Boulevard and on the west side of S. Elizabeth Street (Ref. 20, pp. 2, 7). The surrounding area is mostly industrial and commercial including a mall and additional new and used car dealerships (Refs. 20, p. 7; 51, p. 1). The Wiese dealership was located on the property from the mid-1960s to the late 1990s (Refs. 50, p. 1; 52, p. 1). The dealership consisted of a 60,000 square foot facility including a showroom, service department, parts, and body shop (Ref. 50, p. 1). The full service body shop offered two frame straightening units and a factory level down-flow paint booth as well as a paint mixing system (Ref. 50, p. 2). Liquid Waste Removal Inc. was utilized for transportation of five (5) drums of waste paint related material to Essroc Cement Corporation for disposal (Ref. 21, p. 6). The location remained a car dealership under Wiese family ownership from its development in 1966 to 2013 (Refs. 50, p. 1; 52, p. 3). The property was sold to ADCO Properties LLC in January 2013, and Adams Auto Group now resides on the property (Refs. 52, p. 1; 53, p. 1).

Several inspections have been conducted on the property (Ref. 20, pp. 2, 3, 8). In 2004, Hydrotech Environmental Consulting and Engineering completed a Phase I Environmental Site Assessment of the Kokomo Executive Plaza, which included the former Wiese property (Ref. 20, pp. 2, 8). Several possible contamination sources were identified (Ref. 20, pp. 2, 8). Hydrotech completed a subsurface investigation in 2006 to determine the environmental impact around the possible contamination sources (Ref. 20, pp. 2, 8). In 2007, SESCO Group conducted an Initial Site Characterization in order to define the nature and extent of impacted soil and ground water beneath the former Wiese property (Ref. 20, pp. 3, 8). One ground water sample contained concentrations of two carcinogenic polynuclear aromatic hydrocarbons (cPAHs) (Ref. 20, p. 3). Three ground water samples contained total petroleum hydrocarbons (TPH) (Ref. 20, p. 3). In 2008, SESCO completed a Further Site Investigation (FSI) of the property as mandated by IDEM (Ref. 20, pp. 3, 8).

This facility is located less than two miles to the south of the impacted well field (Figures 1-2 and 1-3). The FSI identified that ground water flows in a perched confined system and in a southeasterly, easterly direction at the property (Ref. 20, pp. 2, 9, 10, 23). However, the ground water flow map does not show regional flow nor were there any control points to the west sectors of the facility to rule out a potential northern flow component (Ref. 20. p. 23).

Wiese Collision Repair
1951 S. Elizabeth Street
Kokomo, Indiana

Wiese Collision Repair facility was located at 1951 S. Elizabeth Street, Kokomo, directly north of the former Wiese Oldsmobile and GMC dealership (Ref. 22, p. 1). The Wiese Collision Repair facility offered two unibody measuring systems, advanced metal repair techniques, and a Devilbliss paint booth (Ref. 55, p. 1). The paint booth was ventilated by a “down-draft” air system which pulled free-floating paint and vapors down into a water filtration screen beneath the floor (Ref. 55, p. 1). Adams Collision Repair is now located at this property (Ref. 54, p. 1). According to a Hazardous Waste Handler Identification Form completed in April 2011, the facility was a small quantity generator in 2010 and 2011 (Ref. 23, p. 1). Safety Kleen Systems was utilized for transportation of old waste paint related materials and waste aerosols (Ref. 23, p. 3). In August 2011, the IDEM Industrial Waste Compliance Section completed a compliance evaluation inspection of the Wiese Collision and Repair facility (Ref. 22, p. 1). No violations were discovered during this inspection (Ref. 22, pp. 1, 6, 7). The inspection summary stated that waste paint related materials from paint gun cleaning were recycled through a solvent distillation unit (Ref. 22, p. 3). Approximately 15 gallons of the residue from the distillation unit were disposed annually by Safety Kleen Systems (Ref. 22, p. 3).

This facility is located less than two miles to the south of the impacted well field (Figures 1-2 and 1-3). Although this facility utilizes solvents in their operations, no investigation involving soil or ground water sampling has been reported to IDEM.

Coan Engineering
1602 E. Havens
Kokomo, Indiana

Coan Engineering specializes in custom designed transmission and torque converter packages for racing and street vehicles. According to an interview with one of the business partners, Mr. Jason Coan, the facility is a manufacturer of transmission components (Ref. 46, p. 1). This facility has been at this location since 1983 (Ref. 46, p. 1). Mr. Coan said that, prior to his operation, the property was part of an industrial park (Ref. 46, p. 1). The primary chemicals used at the facility include mineral spirits, water soluble oils, cutting oils, transmission fluids, and water soluble coolants (Ref. 46, p. 1). Coan currently utilizes the services of Crystal Clean Inc. to dispose of waste products (Ref. 46, p. 1). The facility is serviced by the city sewer system (Ref. 46, p. 1). He mentioned that no Phase I or Phase II investigations have been conducted on the property (Ref. 46, p. 1).

This facility is located less than one mile to the north of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record). Although this facility had utilized solvents in their former operations, no investigation involving soil or ground water sampling have been reported to IDEM.

PadField's Auto Body and Paint
1919 East Jefferson
Kokomo, Indiana

The facility is strictly an auto body repair facility. No auto mechanical work is conducted. This facility has been at this location since 1992 (Ref. 44, p. 1). Prior to the auto body repair operations the property was utilized as a sign shop specializing in signs, lights, etc. (Ref. 44, p. 1). The primary chemicals used at the body shop facility include paint, paint solvents, and other body rebuilding substances (Ref. 44, p. 1). Currently the facility utilizes the services of Crystal Clean Inc. for paint and solvent waste disposal (Ref. 44, p. 1). The facility is on a septic system (Ref. 44, p. 1). No Phase I or Phase II investigations have been conducted on the property (Ref. 44, p. 1).

This facility is located less than one mile to the north of the impacted well field (Figures 1-2 and 1-3 of this HRS documentation record). Although this facility had utilized solvents in their former operations, no investigation involving soil or ground water sampling have been reported to IDEM.

Former GM Delco Plant 5
1723 North Washington Street
Kokomo, Indiana

According to a 2012 Progress Report, TCE is the primary chemical of concern (Ref. 104, p. 3). The 2012 Progress Report was conducted in accordance with the Performance-Based Corrective Action Agreement between the U. S. Environmental Protection Agency Region 5 (USEPA) and Motors Liquidation Company (MLC) (Ref. 104, p. 1). TCE ground water impacts extend beyond the facility property but were not present in borehole water samples collected approximately 800 feet from the property (Ref. 104, p. 3). No potable water wells were identified in the immediate vicinity of the property (Ref. 104, p. 3).

This facility is located approximately 7000 feet northwest of the municipal wells (Figures 1-2 and 1-3 of this HRS documentation record). TCE concentration maps show that TCE does not likely extend to the municipal wells (Refs 105, p. 1; 106, p. 1).

Hazardous Substances Released

- TCE
- trans-1,2-DCE
- cis-1,2-DCE
- VC
- 1,1-DCA
- 1,1-DCE

Trans-1,2-DCE, cis-1,2-DCE, VC, and 1,1-DCE, are degradation products of TCE (Ref. 82, pp. 1, 2; 99, p. 38).

As specified in the HRS Rule (Ref. 1, Section 3.1.1. p. 69), an observed release factor value of 550 was assigned to the Kokomo Contaminated Ground Water Plume since an observed release by chemical analysis was established to the aquifer.

Ground Water Observed Release Factor Value: 550

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 present in the observed release and have a containment value greater than 0.

Hazardous Substance	Source No. (and/or Observed Release)	Toxicity Factor Value*	Mobility Factor Value	Does Hazardous Substance meet Observed Release by chemical analysis? (Y/N)	Toxicity/ Mobility (Ref. 1, Table 3-9)	References
1,1-DCA	Observed Release	10	1	Y	10	Ref. 2, p. 4
1,1-DCE	Observed Release	10	1	Y	10	Ref. 2, p. 6
cis-1,2-DCE	Observed Release	1,000	1	Y	1,000	Ref. 2, p. 8
trans-1,2-DCE	Observed Release	100	1	Y	100	Ref. 2, p. 10
TCE	Observed Release	1,000	1	Y	1,000	Ref. 2, p. 12
VC	Observed Release	10,000	1	Y	10,000	Ref. 2, p. 14

*All hazardous substances that meet the criteria for an observed release by chemical analysis to one or more aquifers underlying the source(s), regardless of the aquifer being evaluated, are assigned a mobility factor value of 1 (Ref. 1, Section 3.2.1.2, p. 72).

The hazardous substance with the highest toxicity/mobility factor value available to the ground water migration pathway is vinyl chloride (10,000).

Toxicity/Mobility Factor Value: 10,000
(Ref. 1, Table 3-9, p. 76)

3.2.2 Hazardous Waste Quantity

Source No.	Source Type	Source Hazardous Waste Quantity
1	Other	Unknown, but >0

The Kokomo Contaminated Ground Water Plume has been scored as consisting of a ground water plume with no identified source. According to Section 2.4.2.2 in the HRS (Ref. 1, p. 66), if any target for that migration pathway is subject to Level I or Level II concentrations and the hazardous constituent quantity is not adequately determined, assign a 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 were present in a drinking water well (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, Table 2-6, p. 66)

3.2.3 Waste Characteristics Factor Category Value

As specified in the HRS (Ref. 1, Section 3.2.3, p. 76), 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. Based on this product, a Waste Characteristics Factor Category Value of 32 was assigned from Table 2-7 of the HRS (Ref. 1, Section 2.4.3.1, p. 66).

Utilizing vinyl chloride 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

Hazardous Waste Quantity Factor Value: 1,000,000

Waste Characteristics Factor Category Value: 32
(Ref. 1, Table 2-7, p. 66)

3.3 GROUND WATER PATHWAY TARGETS

The Kokomo Garrison Well Field, which provides a portion of the potable drinking water to the city of Kokomo, lies within the ground water plume (Ref. 14, p. 6; Figure 1-2 of this HRS documentation record). Currently, municipal wells C, 18, 19, and 20, which are part of the Garrison Well Field, are subject to Level I vinyl chloride contamination (Section 3.1.1 of this HRS documentation record; Ref. 12, p. 1; Figure 1-2 of this HRS documentation record). There are (6890.6945) people known to be utilizing the water from these wells (Section 3.3.2 of this HRS documentation record).

3.3.1 Nearest Well

Well ID: E2SD9 (INAWC Well 19)
Level of Contamination (I, II, or potential): I
If potential contamination, distance from source in miles: N/A

Well ID: E2SE0 (Duplicate of INAWC Well 19)
Level of Contamination (I, II, or potential): I
If potential contamination, distance from source in miles: N/A

Well ID: E2SE1 (INAWC Well 18)
Level of Contamination (I, II, or potential): I
If potential contamination, distance from source in miles: N/A

Well ID: E2SE2 (INAWC Well C)
Level of Contamination (I, II, or potential): I
If potential contamination, distance from source in miles: N/A

Well ID: E2SE3 (Duplicate of INAWC Well C)
Level of Contamination (I, II, or potential): I
If potential contamination, distance from source in miles: N/A

Well ID: E2SE4 (INAWC Well 20)
Level of Contamination (I, II, or potential): I
If potential contamination, distance from source in miles: N/A

As specified in the HRS (Ref. 1, Section 3.3.1, Table 3-11, pp. 76, 77), if one or more drinking water wells are subject to Level I concentrations, a Nearest Well Factor Value of 50 is assigned. Level I vinyl chloride concentrations have been documented in the ground water of wells C, 18, 19, and 20 (Section 3.3.2.2 of this HRS documentation record).

Nearest Well Factor Value: 50
(Ref. 1, Table 3-11)

3.3.2 Population

3.3.2.1 Level of Contamination

3.3.2.2 Level I Concentrations

Four (4) municipal wells (Wells C, 18, 19, and 20) contain Level I concentrations of vinyl chloride (Ref. 12, p. 1). The wells draw water from the bedrock aquifer systems that act as a single aquifer system (Ref. 8, p.70; 14, p. 7).

The following facts were acquired to calculate the number of people served by the Kokomo Well Fields:

The Indiana American Water Company, water utility for the city of Kokomo, does not purchase water from another source and does not sell water to any other entity (Ref. 98, p.1). Water from the Garrison Well Field, Main Well Field, Peat Bog Well Field are treated and combined with water from the Wildcat Creek surface water intake (Ref. 12, p. 1) before distribution. The total demand from the Garrison Well Field, Main Well Field, and Peat Bog Well Field in 2013 was 962.8 million gallons (MG) (Ref. 109, p. 2). The total demand from the Wildcat Creek surface water intake in 2013 was 1,692.9 MG (Ref. 109, p. 2).

Water from the Phillips Street Well Field is blended with water from the Garrison Well Field, Main Well Field, Peat Bog Well Field, and Wildcat Creek surface water intake within a common distribution system that serves 55,000 people (Ref. 12, p. 1). The total demand from the Phillips Street Well Field in 2013 (390.147 MG) was calculated from the sum of the demand from each month of 2013:

Phillips Street 2013 Monthly and Total Demand in Millions of Gallons (Ref. 108, pp. 2-7)

Source	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Phillips Street	36.766	36.074	32.806	23.037	37.519	36.024	35.692	40.757	28.402	5.431	30.287	47.352	**390.147**

The total demand from the distribution serving 55,000 people was calculated from the sum of the total demands in 2013 from the Garrison Well Field, Main Well Field, Peat Bog Well Field, Wildcat Creek Surface Water Intake, and Phillips Street Well Field.

Source	**Total Demand in 2013 (Millions of Gallons)**
Garrison, Main, and Peat Bog Well Fields	962.8 (Ref. 109, p. 2)
Phillips Street Well Field	390.147
Wildcat Creek Surface Water Intake	1692.9 (Ref.109, p. 2)
Total (Sum)	***3,045.847***

Total Demand from Distribution System serving 55,000 people:

962.8 MG + 390.147. MG + 1692.9 MG = 3,045.847MG

The percentage of population served by each source well contaminated with Level I concentrations of vinyl chloride was calculated by dividing the annual demand of each Level I vinyl chloride contaminated source well in 2013 (as shown below) by the total annual demand from all sources for the entire distribution system in 2013 (3,045.847 MG). The population served by each contaminated source well was then calculated by multiplying the total population served by the distribution system (55,000) by the percentage of population served by each source well.

Source Well ID	Source Well Demand in 2012 (MG)		Total Demand from Dist. System in 2012 (MG)		Total Population Served by Distribution		Population Served by Source Well	Reference
Well C	36.6	÷	3,045.847	×	55,000	=	660.8999	Ref. 109 p. 2
Well 18	0	÷	3,045.847	×	55,000	=	0	Ref. 109 p. 2
Well 19	150.4	÷	3,045.847	×	55,000	=	2715.829	Ref. 109 p. 2
Well 20	194.6	÷	3,045.847	×	55,000	=	3513.965	Ref. 109 p. 2

The total population served by the municipal wells contaminated with Level I concentrations of vinyl chloride was then calculated by summing the calculated population served by each source well.

Sum of Population Served by Level I Wells: 660.308072 + 0 + 2713.3971 + 224.106279 = 6890.694

Sum of Population Served by Level I Wells x 10: 3597.81145 x 10 = 68906.94

Level I Concentrations Factor Value: 68906.94

3.3.2.3 Level II Concentrations

All drinking water wells in which observed releases are established are subject to Level I contamination. Therefore, Level II contamination was not calculated.

Level II Concentrations Factor Value: NS

3.3.2.4 Potential Contamination

Potential contamination was not calculated. The ground water plume has sufficient Level I targets to exceed the maximum value of one-hundred (100) for this pathway.

Potential Contamination Factor Value: NS

3.3.3 Resource

Resource use of the combined aquifer within the target distance limit does not include any of the Resource Factors. Therefore, a Resource Factor value of 0 is assigned (Ref. 1, Section 3.3.3, p. 78).

Resources Factor Value: 0

3.3.4 Wellhead Protection Area

The ground water plume lies partially within the Wellhead Protection Area of the Kokomo Garrison Well Field (Ref. 8, p. 21; Figure 1-3). Wellhead Protection Areas are designated by the U.S. EPA in accordance with Section 1428 of the Safe Drinking Water Act (Ref. 8, p. 10; 110, p. 1). Therefore, the Wellhead Protection Area Factor Value of 20 is assigned (Ref. 1, Section 3.3.4, p. 75).

Wellhead Protection Area Factor Value: 20