PRELIMINARY ASSESSMENT REPORT

for

Riverside Ground Water Contamination

Indianapolis, Indiana

INN000510936

PREPARED BY:

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF LAND QUALITY
SITE INVESTIGATION PROGRAM

November 1, 2013
Signature Page
For
Riverside Ground Water Contamination
Preliminary Assessment Report
Indianapolis, Indiana
Marion County

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Date: 11-6-13
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SECTION 1.0 INTRODUCTION

The Indiana Department of Environmental Management (IDEM), Office of Land Quality (OLQ), Site Investigation Program, under a Cooperative Agreement (CA) with the United States Environmental Protection Agency (U.S. EPA), Region V Office, has been funded to perform Preliminary Assessments (PA) at certain sites listed in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, commonly known as Superfund, and the Superfund Amendments and Reauthorization Act (SARA) of 1986.

The primary objectives of the PA are:

- to collect readily available information and conduct a site and environmental reconnaissance;
- to distinguish between sites that pose little or no risk to human health and the environment and sites that require further investigation; and
- to identify sites after requiring assessment for possible emergency response actions.

The Site Investigation Program was given approval by the U.S. EPA to conduct a PA at the Riverside Ground Water Contamination site located in the City of Indianapolis, in Marion County, Indiana. Elevated levels of volatile organic compounds (VOCs) were detected in the water of the Riverside Municipal wells located in Indianapolis, Indiana.

Information contained in this report will be used to evaluate this site to support a site decision regarding the need for further Superfund action, including the possibility for the Riverside Ground Water Contamination site to be considered for inclusion on the National Priorities List (NPL) of hazardous waste sites.
SECTION 2.0 SITE BACKGROUND

Section 2.1 Site Description

The site is relatively flat and is located at the northern sector of the Fall Creek/White River confluence, north of Indiana University Medical Center, in Indianapolis, Marion County, Indiana (Appendix A, Figure 1). The meridian coordinates for the site are latitude 39° 46’ 041” North and longitude 86° 11’ 11.303” West and can be found in Section 34, Township 16 North, Range 3 East. The Riverside Ground Water Contamination site is bordered by the White River to the west, Fall Creek to the south and east, and by a mix of commercial, industrial, and residential properties to the north.

Section 2.2 Site History

The Riverside Ground Water Contamination site is located in Indianapolis, Marion County, Indiana. On February 20, 2013, IDEM staff received notice from Citizens Energy Group that elevated levels of vinyl chloride (VC) and cis-1,2-dichloroethene (cis-1,2-DCE) are being detected in their Riverside municipal well field. The following table depicts the levels of VC and cis-1,2-DCE that were being detected in the individual wells of the well field:

<table>
<thead>
<tr>
<th>Municipal Well</th>
<th>Contaminant Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverside Well R7</td>
<td>VC - 0.56 ug/L; cis-1,2-DCE - 5.8 ug/L</td>
</tr>
<tr>
<td>Riverside Well R9</td>
<td>cis-1,2-DCE - .65 ug/L</td>
</tr>
<tr>
<td>Riverside Well R29</td>
<td>VC – 1.17 ug/L</td>
</tr>
<tr>
<td>Riverside Well R8</td>
<td>cis-1,2-DCE - .9 ug/L</td>
</tr>
</tbody>
</table>

Refer to the Riverside/White River Wellfield VOC Detections Map, Figure 4 of Appendix A, for a location of each of the twenty-three municipal wells in both the Riverside and White River Well Fields. Elevated levels of VC in well R29 were reported to IDEM in February 2013. Citizens Energy is concerned that the increasing levels of VC in Well
R29 are approaching the Maximum Contaminant Levels (MCL) for VC, which may adversely impact the use of that well to supply drinking water to residents in Indianapolis. The MCL for VC is 2.0 ug/L. The Riverside/White River Well Field supplies drinking water to over 10,000 people in Indianapolis.

SECTION 3.0 INVESTIGATION ACTIVITIES

Section 3.1 Site Reconnaissance and Observations

On June 18, 2013, Mark Jaworski (Project Manager) and Rick Milton (IDEM Site Investigation Program Staff) met on-site with Alan Wiseman, Environmental Engineer for Citizen Energy Group. Mr. Wiseman conducted a tour of the Riverside Municipal Well Field and indicated which wells had been impacted with volatile organic compounds.

After the tour was conducted, a site reconnaissance surrounding the well field was performed. The purpose of the reconnaissance was to document site conditions, identify any nearby industries, and determine any potential releases of hazardous materials. Inspection of the site revealed the following observations:

A. The municipal well field lies on and around a peninsula created by the confluence of the White River and Fall Creek.

B. The municipal well field encompasses approximately 40 acres. The wells appeared to be well maintained.

C. The lawn surrounding the municipal wells is well manicured.

D. The well field is located within a light to moderate industrial/commercial business area.

E. Some of the wells are located and moderately dispersed on properties not controlled by Citizens Energy Group (i.e. right of way, private property).

F. Moderate to heavy vehicular traffic was observed on all streets surrounding the well field.
Refer also to the Site Features Map, Appendix A, Figure 2 and the Site Photographs, Appendix D, for additional site conditions.

Section 3.2 Current Investigations Conducted by IDEM

Currently the State Cleanup Section, Leaking Underground Storage Tank (LUST) Section, and the Voluntary Remediation Program (VRP) of IDEM have been conducting management activities regarding the investigation of known ground water contamination at several facilities located in the immediate vicinity of the Riverside Ground Water Contamination area. Refer to the Potential Source Map, Appendix A, Figure 5, for a location of the potential sources. Below is a list of those nearby facilities along with a brief narrative of the investigative findings regarding the ground water contamination at each facility.

Rumpke Montcalm Street Property
2069 and 2101-2235 Montcalm Street
Indianapolis, Indiana 46202
The site is addressed by the Voluntary Remediation Program. It is located within the one year time-of-travel for the Riverside Wellhead Protection Area. The site has had varied industrial/commercial activities that include: gravel operations, various metal fabricators, garden tractor manufacturing, paper box company, carburetor parts, and brake companies. Various VOC, semi volatile organic compounds (SVOC), and metals were detected within the site’s soil and ground water. In February 2009, a supplemental site investigation was performed to evaluate the potential for source removal as a remediation strategy. Results from the investigation indicate that source removal alone is unlikely to be an effective method for remediation. Subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

Component Machines
Gent Avenue between 16th and 17th Street
Indianapolis, Indiana 46202
The site is currently addressed by the State Cleanup Section. It is located in the Riverside Well Field adjacent to (across the street from) Riverside Well A. Investigations at the facility revealed a ground water plume beneath the site building. Ground water sampling results indicate that the plume consists of various concentrations of tetrachloroethene (PCE), trichloroethene (TCE), 1,1,1-trichloroethane (1,1,1-TCA), and carbon tetrachloride. The responsible party has begun remediation activities at the site. Subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Flexdar**

**1825 W. 18th Street**

**Indianapolis, Indiana 46202**

The site is currently addressed by the State Cleanup Section. Flexdar is a former printing business with TCE contamination in soil and ground water. The plume passes directly over one of the municipal wells. There is currently insufficient geologic information to determine if the well is screened at a level deeper than this plume and if there is any interconnectivity of the strata where the plume exists and the municipal well. The former printing facility had a release of chlorinated hydrocarbons and petroleum compounds in soil and ground water. The ground water contamination (chlorinated hydrocarbons) extends off-site passing under several properties and has been delineated to the White River. Subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Citizens Gas & Coke Utility Property (former Water Gas and Coke Plant)**

**2150 Dr. Martin Luther King Jr. Street.**

**Indianapolis, Indiana 46202**

The site is currently addressed by the Voluntary Remediation Program. The site is located within the one-year time of travel for the Riverside Wellhead Protection Area. A gas plant with coke oven batteries was operated at the site from the early 1900’s to 1956. The site is currently being used as a maintenance/storage area for fleet vehicles,
material storage area, and natural gas fueling station. Various VOCs, SVOCs, and metals have been detected at levels. Site investigation activities are currently ongoing. Subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Former Minton Business Services**

**2330 North Meridian Street**

**Indianapolis, Indiana 46202**

The site is currently addressed by the Leaking Underground Storage Tank Section. The site was a former gas station from 1930s to 1960s. A Phase II investigation detected total petroleum hydrocarbons (TPH) in the on-site soils. Soil and ground water samples were collected. No chlorinated volatiles were detected. Only TPH was detected and is the only contaminant of concern. The three (3) underground storage tanks were removed in May 2009. Currently quarterly ground water monitoring is being conducted. Subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Southeast Trailways**

**1810 W. 16th Street**

**Indianapolis, Indiana 46202**

The site is currently addressed by the Leaking Underground Storage Tank Section. The site was a former trucking firm. Elevated levels of TPH were detected in on-site soils and ground water. A No Further Action (NFA) was issued to the site after remediation activities had occurred. Subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Karstadt Reed Cleaners**

**1449 N. Illinois Street**

**Indianapolis, Indiana 46202**

The site is currently addressed by the State Cleanup Section. Investigations conducted on site revealed elevated levels of TCE in waste sludge inside the building, in the
vadose zone beneath the building, and in the ground water on-site and immediately off-site. An investigation report for the site was submitted in March 2010. State Cleanup staff reviewed the report and requested further investigative activities to delineate the on-site vertical extent of ground water contamination and an off-site vapor intrusion investigation. The site has been in litigation with the owners of the Stewart Manufacturing site. Current subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Former Suron Facility/S. Cohn and Sons**  
**1402 N. Capitol Ave (corner of 14th Street and Capitol)**  
**Indianapolis, Indiana 46202**  
The site is currently addressed by the Voluntary Remediation Program. The former facility is located in the five (5) year time of travel of the Riverside wells. PCE is present in the ground water at this site. Ground water flow has been found to be in a southwest direction. PCE, as high as 3,370 ppb was detected in surface soils west of the site building and as high as 117,000 ug/kg in subsurface soils. A vapor intrusion investigation was completed within the site building which yielded very high sub-slab results. Current subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Michaelis Site/Former Fame Laundry**  
**1532 N. Illinois Street**  
**Indianapolis, Indiana 46202**  
The site is currently addressed by the Voluntary Remediation Program. PCE has been detected in the vadose zone on site. A soil vapor extraction system had begun to remediate the VOCs in March 2009. The system was installed in order to mitigate source zone soil and prevent further migration of contaminants to ground water. Initial monitoring results indicate that the system is removing PCE from the vadose zone at a rate of 4.36 lbs. per day. Remediation at the site is ongoing. Current subsurface investigations indicate that ground water contamination from the site is not impacting
the Riverside Well Field.

**Greater Diversified Supply**  
**1234 N. Capitol Avenue**  
**Indianapolis, Indiana 46202**  
The site is currently addressed by the State Cleanup Section. The facility has housed hardware and building material supply companies for an unknown length of time. In the past, a dry cleaning facility is reported to have existed on the site. Ground water samples obtained from monitoring wells that were installed on site revealed elevated levels of PCE. Ground water investigations indicate that this site may have minor contributions of VOC to the overall ground water plume. Investigation of the contamination is ongoing. Current subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Stewart Manufacturing**  
**1280 North Senate Avenue**  
**Indianapolis, Indiana 46202**  
The site is currently addressed by the Voluntary Remediation Program. The facility manufactured ventilation systems and vents. During these activities, chemicals used at the site included paints, coolants, and lubricants for machinery maintenance, and solvent degreasers for parts cleaning. Operations were discontinued in 2003. Elevated levels of VOCs have been found on site. In January 2005, about 525 tons of impacted soils were removed from under the building from the old drain and supply lines. Another 450 tons of impacted soil were removed from an outside degreaser storage area. Subsurface investigations demonstrated that a VOC plume is migrating onto the property from an unidentified up-gradient source (Karstadt-Reed Cleaners). Remediation at the site is ongoing. Current subsurface investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.
JPB Construction Incorporated (aka MLK Partners)
1802 Martin Luther King Drive
Indianapolis, Indiana 46202
The site is currently addressed by the State Cleanup Section. The site is a heating oil tank closure site. It is being addressed by State Cleanup’s Independent Closure program. Investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

Elston Richard Warehouse Building 7
aka Former Bearings And Seals
1301 W. 16th Street
Indianapolis, Indiana 46202
The site is currently addressed by the State Cleanup Section. The site is a leaking underground storage tank. The site has been given an NFA by State Cleanup and referred to IDEM’s Leaking Underground Storage Tank program. Investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

Speedway International Incorporated
1930 W. 16th Street
Indianapolis, Indiana 46202
The site is currently addressed by the State Cleanup Section. Elevated levels of petroleum was detected in soils while installing an oil/water separator on site. Investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

Do All Company
1850 W. 16th Street
Indianapolis, Indiana 46202
The site is currently addressed by the State Cleanup Section. Elevated levels of TPH
was detected in soils and ground water. The site has been given an NFA by State Cleanup. Investigations indicate that ground water contamination from the site is not impacting the Riverside Well Field.

**Carrier-Bryant**  
**1100 W. 21st Street**  
**Indianapolis, Indiana 46202**

In addition to the investigations being overseen by IDEM programs, U.S. EPA is currently conducting removal activities at the former Carrier-Bryant facility. The Site is in the municipal well-head protection area, 1 year time of travel. EPA and the Superfund Technical Assessment and Response Team contractor (START) performed a site assessment on February 7, 2012, and documented abandoned drums, storage tanks, and containers as well as unsecured perimeter fencing and signs of trespassing. Laboratory analysis of samples collected during the site assessment confirmed hazardous substances as VOCs (methyl ethyl ketone, trichloroethylene) in a drum sample. Removal activities of drums, asbestos, and other hazardous materials are currently on-going. It has not been determined if ground water has been impacted from this facility.

In addition to the potential sources in the immediate area that are being addressed by IDEM’s State Cleanup, LUST, and VRP sections as stated above, a Phase I, Revised Indianapolis Wellhead Protection Plan dated March 2007, listed numerous facilities within a 5 year time of travel for the Riverside Wellfield. Refer to Appendix E, Indianapolis Wellhead Protection Plan. A review of this wellhead protection plan revealed that there are at least 92 potential sources within the 5 year time of travel. These Potential Sources are depicted in Table 1, Riverside Wellheld Potential Sources of Chlorinated Solvents. Table 1 lists the names, distances, and other information concerning these 92 potential sources. The location of the these additional 92 potential sources in relation to Riverside Municipal Well RS29 can be found in Appendix A, Figure 6, Potential Contamination Sources Map. Note that the location numbers shown
on Figure 6 corresponds to the source numbers listed in Table 1.

SECTION 4.0 MIGRATION PATHWAYS

Section 4.1 Ground Water

The soils in the project area are Genesee-Sloam (GSI) and Urban Land-Fox-Ockley (ULFO) associations. Soils are well drained to very poorly drained, nearly level soils formed in loamy alluvium. ULFO soils are urban land and well drained, nearly level to moderately sloping soils that are moderately deep to deep over sand and gravel and formed in loamy outwash and the underlying gravelly sand and sand. Urban Land is so altered and obscured by public works and structures that identification is not feasible. Genesee silt loam consists of deep, nearly level, well drained soils on flood plains on loamy alluvium.

The project area elevation is approximately 700 feet above mean sea level (msl) and the topography is primarily flat with engineered levees along the White River. The physiographic settings are terraces and the floodplain of the White River. Beneath the surface soils, the project area is underlain by sand and gravel-dominated sequences deposited by large-scale channelized meltwaters. These sequences extend approximately 100 feet until bedrock is encountered around 600 feet msl. The bedrock in the project area consists of the Devonian-aged Muscatatuck Group of limestone and dolomite.

Two primary aquifers are in the project area: a shallow, unconfined aquifer located in the outwash deposits, and a deeper, karst aquifer in the carbonate rock. Both aquifers are used by private and municipal wells. The surface waters are hydraulically well connected to the sand and gravel aquifer. The transmissivity of the outwash aquifer is in the range of 35,000 ft²/day. The groundwater flow in the immediate area is primarily toward the White River. The aquifers extend beyond Marion County in all directions, therefore there are no aquifer boundaries within 4 miles from the site.
Within the study area the outwash aquifer is directly on the bedrock, which is relict karst, therefore the limestone aquifer is hydraulically connected to the outwash sand and gravel aquifer. Significant sub-grade karst features, such as crevices/caves, are likely present in the project area.

As a result of the high permeability characteristics of the sand and gravel outwash aquifer and the relict karst aquifer, the ground water is subject to potential contamination. The ground water has been impacted since VOCs have been detected at levels greater than MCLs in RS29, WR-09, and WR-03 and below MCLs in municipal wells RS 2, RS7, RS8, RS9, and WR06.

4.2 Surface Water Pathway

The Riverside municipal wells lie within the White River Basin. The White River Basin spans nearly the entire width of south-central Indiana. The basin encompasses 5,603 square miles in 27 counties. Overland flow from the site enters the White River. The White River discharges into the Ohio River in Gibson County approximately 120 miles downstream from the site.

4.2.1 Drinking Water Threat

The majority of residents within Indianapolis obtain drinking water from municipal and private groundwater wells. While the Indianapolis Water Company Canal runs northeast and east of the wellfield project area, including a surface water intake, because groundwater flow is generally southeast and southwest from the wellfield areas, there are no surface water intakes within the 15 mile surface water pathway downstream from the Riverside Municipal well field. There is no drinking water threat to the White River.

4.2.2 Human Food Chain Threat

The White River is considered a fishery. A fish advisory is posted for White River for mercury and polychlorinated biphenyls (PCBs). Since the surface waters are
hydraulically well connected to the sand and gravel aquifer as stated in Section 4.1, a ground water to surface water pathway may exist and could allow the contaminants from this site to flow into the White River. However, since PCBs and mercury are not contaminants of concern for this site, it appears unlikely that the White River would be significantly impacted.

4.2.3 Environmental Threat

A survey conducted by the Indiana Department of Natural Resources/Division of Nature Preserves/Heritage Program (IDNR/DNP/HP) indicated that there are endangered or threatened species and sensitive environments within the surface water pathway of the Riverside Ground Water Contamination site and within a 4-mile radius of the site. Refer to Appendix B for a detailed list of these special concerns. Sensitive environments along the White River could be adversely impacted by chlorinated solvents if a ground water to surface water migration route is present.

4.3 Soil Exposure

A fence surrounds the wells at the Riverside municipal well field. However entrance to some of the potential sources as discussed in Section 3.2 is possible since a fence does not surround many of the facilities. Currently it is not known if there are any contaminated soils within the top two feet at any of the potential sources. No residences are located within the project area where potential sources exist.

4.4 Air Pathway

No air samples were taken. No ambient odors were observed during the inspection of this site. Presently, there are no reports of adverse health effects resulting from the migration of hazardous substances through the air at this site. There does not appear to be a potential risk to nearby residents by the air pathway from the Riverside Ground Water Contamination site.
SECTION 5.0 SUMMARY

The Riverside Ground Water Contamination site is located in Indiana, Marion County, Indiana. On February 20, 2013, IDEM staff received notice from Citizens Energy Group that elevated levels of vinyl chloride (VC) and cis-1,2 dichloroethene (cis-1,2 DCE) are being detected in their Riverside municipal well field. Citizens Energy is concerned that the increasing levels of VC in Well R29 is approaching the Maximum Contaminant Level (MCL) for VC which may adversely impact the use of that well to supply drinking water to residents in Indianapolis. The MCL for VC is 2.0 ug/L. The State Cleanup Section, Leaking Underground Storage Tank Section, and the Voluntary Remediation Program of the Indiana Department of Environmental Management (IDEM) have been conducting management activities regarding the investigation of known ground water contamination at several facilities located in the immediate vicinity of the Riverside Ground Water Contamination area. Sixteen (16) facilities have been identified by IDEM within the immediate area near the Riverside Well Field however no definite source of the VOC contamination has been found.
Appendix A

Figure 1 – Site Location Map
Appendix A

Figure 2 – 4-Mile Radius Map
Four Mile Radius Map
Riverside Ground Water Contamination Site
Indianapolis, Marion County, IN

39°46'55.041"N
-86°11'11.303"W
(Approximate Center of Site)

Buffer Distance | Adjusted Population
--- | ---
0.25 Mile | 208
0.5 Mile | 974
1 Mile | 6253
2 Mile | 29860
3 Mile | 41761
4 Mile | 73190

Total Adjusted Population | 152246

Map by: Shane Moore, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services
April 24, 2013

Sources:
- IDEM 4 Mile Mapper Application
- Indiana Geographic Information Officer (GIO) Data Library
- USGS Digital Raster Graphics 1:24,000 topographic map
- Census block group 2010 total population

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

Method of Estimating Population: The adjusted population estimate is the sum of Census 2010 block group populations. The adjusted population estimate (TOTPOP field) is adjusted to include only the areas of the block groups contained inside the buffers. The adjusted population estimate assumes that the population is evenly distributed in each block group polygon. The specific procedure used in this analysis is as follows:
1. The point for the center of the site is selected interactively by the user through the 4 Mile Mapper model or a polygon is digitized through the 4 Mile Mapper Polygon model.
2. The user initiates the 4 Mile Mapper model to perform the rest of the multi-step analysis which is described in the following steps.
3. The study area point or polygon is buffered at 1/4, 1/2, 1, 2, 3 and 4 miles.
4. The original area of the census block polygons is calculated and stored.
5. The buffers are used to clip the census block group polygons. This is a new area referred to as the shape area. The shape area has the attribute records associated with the original census block group polygon with the area of the new polygon area.
6. The shape area of the census block polygons is divided by the original area of the census block polygons to calculate the percent change.
7. The percent change result is then multiplied by the population of the original census block to yield a calculated population for the new polygon. For example: Block Group A with an area of 10 square miles and a population of 200 people is split into 2 polygons by the 4 mile buffer ring. The area of the new polygons is 2 square miles, or 20% of the area of the original 10 square mile block group. Assuming the population is uniformly distributed in Block Group A, the population from Block Group A that is within the 4 mile buffer ring should be 20% of the total population for the block group. Twenty percent of 200 is 40 people. (2 ÷ 10 × 200 = 40)
8. The newly calculated population statistics are associated in a database table that is converted into a layer file that is displayed in the Four Mile Radius Map. The new population figures from the layers (attribute tables) are then copied into a spreadsheet that subtracts the population figure from the previous buffer. This is done by taking the population for each buffer distance and subtracting the population of the next smaller buffer distance to provide a population figure for the donut area bounded by each pair of consecutive buffer distances (e.g. 0 to 1/4, 1/4 to 1/2, 1/2 to 1, 1 to 2…). An adjusted population table is labeled and pasted into the Four Mile Radius Map.

The main code that repeats over and over for the 4Mi_Mapper model is: Buffer>Clip>Add Fields>Calculate Field>Dissolve All models were developed by E.J. McNaughton, IDEM GIS Coordinator.
Appendix A

Figure 3 – 15-Mile Surface Water Pathway Map
15 Mile Surface Water Map

Riverside Ground Water Contamination Site, Indianapolis, Marion County, IN

Probable Point of Entry (PPE)

Riverside Well RS 29

Target Distance Limit (TDL)

Map Projection: UTM Zone 16N
Map Datum: NAD 83

Sources:
- USGS Digital Raster Graphics 1:24,000 topographic map
- National Hydrography Dataset (NHD)
- INDOT County Boundaries
- Census 2000 City Boundaries
- INDOT State Boundary

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

Map Created by: Shane House, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, April 27, 2013

Probable Point of Entry (PPE)

Former Greensburg Manufacturing Site

Mapped By:
Shane House, IDEM, Office of Land Quality, Science Services Branch, Engineering & GIS Services, April 27, 2013

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Appendix A

Figure 4 – Riverside/White River Wellfield VOC Detection Map
(Confidential)
Appendix A

Figure 5 – Potential Sources Map
Appendix B

IDNR Sensitive Environments (Confidential)
Appendix C
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
INDIANAPOLIS

OFFICE MEMORANDUM

Date: June 6, 2013
To: Mark Jaworski
   Federal Programs Section
Thru: Larry Studebaker, Chief
   Geological Services Section
From: Juliet Port, LPG #2214
   Geologist
   Geological Services Section
Subject: Geological Review
   Riverside Ground Water Contamination
   Indianapolis, Marion County
   Site ID 7300210

Per your request, I have prepared the following for your use:

GEOLOGICAL REVIEW

The site is a municipal well called Riverside Well RS 29, located northwest of downtown Indianapolis (Site Location Map). The site is near the confluence of the White River and Fall Creek (Site Location Map). Fall Creek flows from northeast to southwest until it reaches the White River just south of the site (Topo). The White River flows generally from north to south in the project area (Topo).

Well RS 29 has a depth of 290 feet below surface grade (bgs) and a diameter of 10 inches (Wittman, p31). This well has a capacity of 600 gallons per minute (Wittman, p31). Geological Services requested well records from the operator, Citizens Energy Group, which will be forwarded when received.

The soils in the project area are Genesee-Sloam (GSI) and Urban land-Fox-Ockley (ULFO) associations (USDA, p6). GSI soils are deep, well drained and very poorly drained, nearly level soils formed in loamy alluvium (USDA, p6). ULFO soils are urban land and well drained, nearly level to moderately sloping soils that are moderately deep to deep over sand and gravel and formed in loamy outwash and the underlying gravelly sand and sand (USDA, p6). Urban Land is so altered and obscured by public works and structures that identification is not feasible (USDA, p4). Genesee silt loam consists of deep, nearly level, well drained soils on flood plains on loamy alluvium (USDA, p3-8).

The project area elevation is approximately 700 feet above mean sea level (msl) and the topography is primarily flat with engineered levees along the White River (Topo). The physiographic settings are terraces and the floodplain of the White River (IGS,
Beneath the surface soils, the project area is underlain by sand- and gravel-dominated sequences deposited by large-scale channelized meltwaters (IGS, p1). These sequences extend approximately 100 feet until bedrock is encountered around 600 feet msl (IGS, p5). The bedrock in the project area consists of the Devonian-aged Muscatatuck Group of limestone and dolomite (IGS, p4).

The hydrogeology of the project area has been heavily studied due to the presence of the City of Indianapolis Riverside Wellfield. The Wittman Hydro Planning Associates, Inc. (Wittman) Capture Zone Delineation (2000) forms the basis for much of the discussion provided herein.

Two primary aquifers are in the project area: a shallow, unconfined aquifer located in the outwash deposits (IGS, pp6-7), and a deeper, karst aquifer in the carbonate rock (Wittman, p24). Both aquifers are used by private and municipal wells (Wittman, p27). The surface waters are hydraulically well connected to the sand and gravel aquifer (Wittman, p24). The transmissivity of the outwash aquifer is in the range of 35,000 ft²/day (Wittman, p24). As shown on the potentiometric surface map, the groundwater flow is primarily toward the White River (IGS, p8). The aquifers extend beyond Marion County in all directions, therefore there are no aquifer boundaries within 4 miles from the site (Wittman, p29-30).

Within the study area the outwash aquifer is directly on the bedrock, which is relict karst, therefore “the limestone aquifer is hydraulically connected to the outwash sand and gravel aquifer” (Wittman 2000, p27). The “…carbonate rocks lying…immediately beneath the outwash have undergone extensive solution-channel development…”(Hartke, et. al. p15).

Significant subgrade karst features, such as crevices/caves, are likely present in the project area. Evidence of the presence of karst includes IDNR Well Log 63847, 2179 N Illinois Street, which reported a “Crevice” within limestone from 100 to 101 feet bgs (Wittman, p233).

Potential aquifer boundaries, (aka aquifer discontinuities), such as a mountain range, ocean, bedrock fault, etc., are not within a 4-mile radius of the project area (Topo and IGS p4).

REFERENCES

* Site Location Map provided by Mike Hill

* Topo map (digital raster graphic of USGS Indianapolis West 7.5 Minute Quadrangle) reviewed via OLQ SiteSeer)


CC: Unassigned, Chemistry Services Section
    Unassigned, Engineering and GIS Services Section
    Unassigned, Risk Services Section
Appendix D

Site Photographs
Site Name: Riverside Ground Water Contamination
City/State: Indianapolis/Indiana
Date: June 18, 2013
Time: 10:20 am
Comments: Picture is facing northwest and shows the area where municipal RS#29 is located.
Site Name: Riverside Ground Water Contamination
City/State: Indianapolis/Indiana
Date: June 18, 2013
Time: 10:20 am
Comments: Picture is facing northeast and shows a close up of municipal RS#29.
Site Name: Riverside Ground Water Contamination

City/State: Indianapolis/Indiana

Date: June 18, 2013

Time: 10:20 am

Comments: Picture is facing south-southeast and shows the area where municipal RS#7 is located. Picture also shows how well manicured the lawn is within the Riverside municipal well field.
Site Name: Riverside Ground Water Contamination
City/State: Indianapolis/Indiana
Date: June 18, 2013
Time: 10:20 am
Comments: Picture is facing northwest and shows a close up of municipal RS#7.
Site Name: Riverside Ground Water Contamination

City/State: Indianapolis/Indiana

Date: June 18, 2013

Time: 10:20 am

Comments: Picture is facing south-southeast and shows the area where municipal RS#8 is located. Picture also shows how well manicured the lawn is within the Riverside municipal well field. Pump station building is shown in background.
Site Name: Riverside Ground Water Contamination
City/State: Indianapolis/Indiana
Date: June 18, 2013
Time: 10:20 am
Comments: Picture is facing south-southeast and shows the area where municipal RS#9 is located. Picture also shows how well manicured the lawn is within the Riverside municipal well field.
Site Name: Riverside Ground Water Contamination
City/State: Indianapolis/Indiana
Date: June 18, 2013
Time: 10:20 am
Comments: Picture is facing south-southeast and shows the area where municipal RS#2 is located.
Site Name: Riverside Ground Water Contamination

City/State: Indianapolis/Indiana

Date: June 18, 2013

Time: 10:20 am

Comments: Picture is facing south-southeast and shows the area where municipal WR#9 is located. This well lies in the White River municipal well field which lies adjacent to the Riverside well field.
Site Name: Riverside Ground Water Contamination
City/State: Indianapolis/Indiana
Date: June 18, 2013
Time: 10:20 am
Comments: Picture is facing south-southeast and shows the area where municipal WR#9 is located..
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<td>Bredenstein Printing</td>
<td>1922 Dr. MLK Jr</td>
<td>6309</td>
<td>n/a</td>
<td>n/a</td>
<td>N</td>
<td>printer, etc.</td>
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<td>37</td>
<td>Schuchman Metals / Langsdale Metals /Republic Services</td>
<td>829 Langsdale</td>
<td>6382</td>
<td>20353 / 26312</td>
<td>IND 042812321 / FID 15160 /</td>
<td>N</td>
<td>salvage junk yard</td>
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<td>38</td>
<td>Republic Services / SMI Recycling/ Circle City</td>
<td>832 Langsdale</td>
<td>6593</td>
<td>14525</td>
<td>IND 980904213 Landfill 49-06</td>
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<td>11</td>
<td>Stewart Manufacturing</td>
<td>1280 N Senate</td>
<td>6630</td>
<td>n/a</td>
<td>n/a</td>
<td>Y</td>
<td>n/a</td>
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<td>6630</td>
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<td>Johnson Controls</td>
<td>1255 N Senate</td>
<td>6632</td>
<td>17486</td>
<td>IND964976381</td>
<td>Y</td>
<td>manufacturing</td>
<td>P</td>
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<td>23</td>
<td>Peerless Pump / Sterling Fluid Manufacturing</td>
<td>2005 Dr MLK Jr</td>
<td>6727</td>
<td>11493</td>
<td>IND990734873</td>
<td>Y</td>
<td>manufacturing</td>
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<td>36</td>
<td>McFarling Foods</td>
<td>333 W 16th</td>
<td>6742</td>
<td>18336</td>
<td>FID 6056 / BFD 4980005</td>
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<td>Dorothy Shamrock Coal</td>
<td>2110-2112 Dr. MLK Jr.</td>
<td>6896</td>
<td>20624</td>
<td>4960013</td>
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<td>Hittle Tool &amp; Dye</td>
<td>2122 Dr. MLK Jr</td>
<td>6961</td>
<td>16164</td>
<td>IND006065536</td>
<td>N</td>
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<td>Stanley Signs</td>
<td>1133 Burdsall</td>
<td>6982</td>
<td>18260</td>
<td>INR000103101</td>
<td>N</td>
<td>signs/paints</td>
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<td>Industrial Heat Treating / BodyCote Thermal</td>
<td>2131 Dr. MLK Jr. / 500 W 21st St</td>
<td>7029</td>
<td>11491</td>
<td>IND006417315</td>
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<td>Greater Diversified Supply</td>
<td>1234 N Capitol</td>
<td>7106</td>
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<td>SCP 200606202</td>
<td>Y</td>
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<td>DPW/Merr Corp</td>
<td>1021 Burdsall</td>
<td>7125</td>
<td>22656</td>
<td>BFD 4980024</td>
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<td>Citizens Coke Langsdale</td>
<td>2150 Dr MLK Jr</td>
<td>7148</td>
<td>n/a</td>
<td>VRP</td>
<td>N</td>
<td>manufactured gas plant</td>
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<td>13</td>
<td>H-N Advertising &amp; Display Co / Bowes Industries</td>
<td>1324-1334 N Capitol</td>
<td>7152</td>
<td>23884</td>
<td>IND006035968 / FID 21455</td>
<td>N</td>
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<td>12</td>
<td>Henley's Cabinets / Custom Printing /Chemcraft Satron Finishes Inc.</td>
<td>1310 N Capitol</td>
<td>7165</td>
<td>16911</td>
<td>IND 982616112</td>
<td>Y</td>
<td>furniture refinishing</td>
<td>U &amp; Q</td>
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<td>72</td>
<td>S. Cohn and Sons/ Shuron</td>
<td>1402 N Capitol</td>
<td>7220</td>
<td>28328</td>
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<td>84</td>
<td>Herff Jones</td>
<td>1411 N Capitol</td>
<td>7269</td>
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<td>1731 N Capitol</td>
<td>7620</td>
<td>n/a</td>
<td>n/a</td>
<td>N</td>
<td>nursing care?</td>
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<td>Address</td>
<td>Distance (feet)</td>
<td>IDEM Agency Identification Number</td>
<td>Other Identification Numbers</td>
<td>Documented cVOCs?</td>
<td>Facility Type</td>
<td>Specific Reference* (if applicable)</td>
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<td>73</td>
<td>Michaelis / Fame Laundry</td>
<td>1352 N Illinios</td>
<td>7678</td>
<td>23287</td>
<td>BFD 4091202</td>
<td>Y</td>
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<td>15</td>
<td>Karstadt-Reed Dry Cleaners</td>
<td>1449 N Illinois</td>
<td>7801</td>
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<td>Y</td>
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<td>1</td>
<td>Northside Trucking/Pallent Repair</td>
<td>1037 W 25th St</td>
<td>7871</td>
<td>16605</td>
<td>IN058477936</td>
<td>Y</td>
<td>haz waste hauler</td>
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<td>89</td>
<td>Dewers One LLC / Tuchman's Cleaners</td>
<td>30th &amp; Kessler</td>
<td>8355</td>
<td>23805</td>
<td>VRP 6051002</td>
<td>Y</td>
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<td>41</td>
<td>Executive 1 Hour Cleaners</td>
<td>2658 N Harding</td>
<td>8371</td>
<td>n/a</td>
<td>n/a</td>
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<td>29</td>
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<td>2179 N Illinois</td>
<td>9409</td>
<td>15994</td>
<td>IN016405854</td>
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<td>57</td>
<td>Quality Linen Service / Quality Products Inc.</td>
<td>1277 W 29th</td>
<td>9575</td>
<td>17350</td>
<td>INR000007450 / FID 9848</td>
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<td>1340 W 29th</td>
<td>9602</td>
<td>11500 / 23836 / 14562*</td>
<td>VRP 6020701 / IND006065296 / BFD 4130103</td>
<td>Y</td>
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<td>Indy Parks</td>
<td>1426 W 29th</td>
<td>9629</td>
<td>19673</td>
<td>BFD 4020002</td>
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<td>31</td>
<td>Sparkle Cleaners</td>
<td>2198 N Meridian</td>
<td>9944</td>
<td>17902</td>
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<td>30</td>
<td>45 Minute Cleaners</td>
<td>2179 N Pennsylvania</td>
<td>10137</td>
<td>16751</td>
<td>IN981783475</td>
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<td>11624</td>
<td>n/a</td>
<td>n/a</td>
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<td>76</td>
<td>19th St Corridor Plume</td>
<td>19th and Cornell</td>
<td>13253</td>
<td>n/a</td>
<td>n/a</td>
<td>Y</td>
<td>unknown</td>
<td>n/a - outside wellhead</td>
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<td>77</td>
<td>Wash Rite Company Inc</td>
<td>1720 Alvord St</td>
<td>13614</td>
<td>n/a</td>
<td>200803020</td>
<td>Y</td>
<td>dry cleaner</td>
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</table>

**Notes:** cVOCs = chlorinated volatile organic compounds; VFC = Virtual File Cabinet; n/a = not applicable; Y= yes; N= no

**References:** *Specific References obtained from IDEM Virtual File Cabinet and Marion County Health Department Records:* [Records Folder]

Table 3-10 "Potential Source Inventory - Riverside Wellhead Protection Area": [Author not listed], Phase I, revised Indianapolis Wellhead Protection Plan, March 2007, revised September 2007, prepared for Veolia Indianapolis Water, LLC. VFC Doc #26852099


Indiana Spatial Data Portal, 1915 Sanborn Map #376: [http://gis.iu.edu/isdp_dl/map/m10000.html](http://gis.iu.edu/isdp_dl/map/m10000.html)

Indiana Spatial Data Portal, USGS 1945 Indianapolis West topographic quadrangle: [http://gis.iu.edu/isdp_dl/map/m10000.html](http://gis.iu.edu/isdp_dl/map/m10000.html)