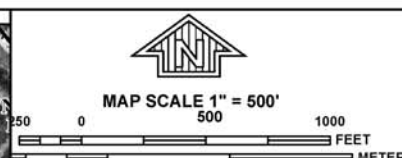
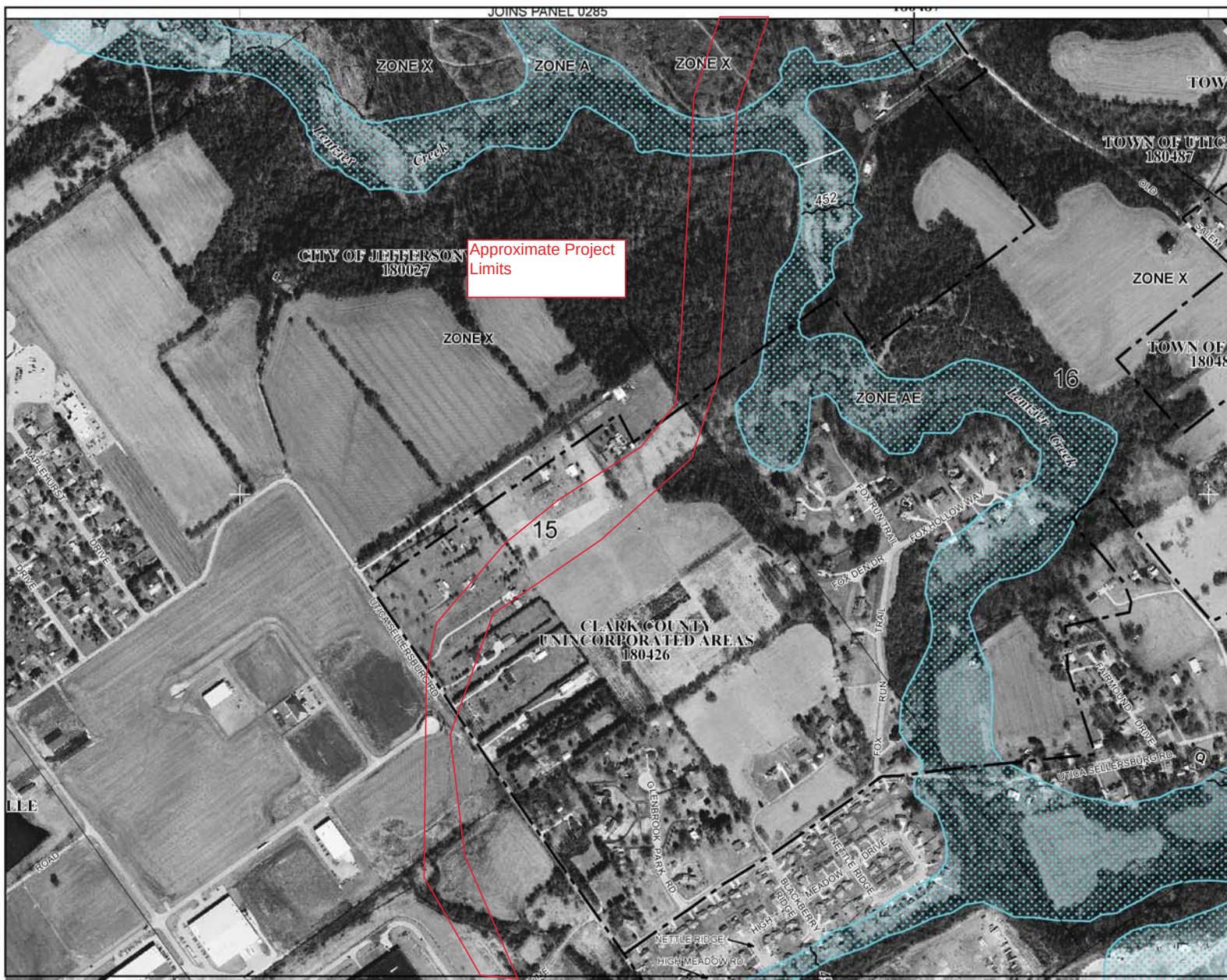


**Appendix E: Water Resources and Ecological Information**

- FEMA FIRM Map (Panel #18019C0283E, April 16, 2014)
- Wetland Delineation and Waters Report – Approved October 13, 2017
- Karst Report – Approved January 3, 2018



**NATIONAL FLOOD INSURANCE PROGRAM**

**NFIP**

PANEL 0283E

**FIRM**

**FLOOD INSURANCE RATE MAP**

**CLARK COUNTY, INDIANA AND INCORPORATED AREAS**

**PANEL 283 OF 295**  
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

| CONTAINS:      | COMMUNITY | NUMBER | PANEL | SUFFIX |
|----------------|-----------|--------|-------|--------|
| CLARK COUNTY   | 180426    | 0283   | E     |        |
| JEFFERSONVILLE | 180027    | 0283   | E     |        |
| UTICA, TOWN OF | 180487    | 0283   | E     |        |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

**MAP NUMBER**  
**18019C0283E**

**EFFECTIVE DATE**  
**APRIL 16, 2014**

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)



**From:** Kang, Li  
**To:** [Boits, Leah](#)  
**Cc:** [Heustis, Ronald](#); [Hope, Briana](#)  
**Subject:** RE: Heavy Haul Transportation Corridor (Des. No. 1382612) - Waters Report  
**Date:** Friday, October 13, 2017 2:56:28 PM  
**Attachments:** [image001.png](#)  
[image002.png](#)  
[image003.png](#)  
[image004.png](#)  
[image005.png](#)  
[image006.png](#)  
[image007.png](#)

---

Leah,  
The Waters Report review has been completed and no comments at this time. Please forward the report to the designer for the future permit application. If you have any questions please let me know.  
Thanks,

Li Kang  
Ecology & Waterway Permitting Office  
INDOT N. 642  
317-232-6766

---

**From:** Boits, Leah [mailto:lboits@structurepoint.com]  
**Sent:** Friday, September 08, 2017 2:24 PM  
**To:** Rehder, Crystal <CRehder@indot.IN.gov>  
**Cc:** Bowman, Sandra A <SBowman@indot.IN.gov>; Kang, Li <LKANG@indot.IN.gov>; Hilden, Laura <lhilden@indot.IN.gov>; michelle.allen@dot.gov; Heustis, Ronald <RHEUSTIS@indot.IN.gov>; Andrews, Jeff <JeffA@ucindy.com>; Hope, Briana <bhope@structurepoint.com>  
**Subject:** Heavy Haul Transportation Corridor (Des. No. 1382612) - Waters Report

\*\*\*\* This is an EXTERNAL email. Exercise caution. DO NOT open attachments or click links from unknown senders or unexpected email. \*\*\*\*

---

Crystal,

The Wetland Delineation and Waters Report for the above-referenced project has been uploaded to the Transportation Corridor – Des. No. 1382612 folder on our Sharefile site for your review and comment. Please use the link provided below to access the document:

<https://structurepoint.sharefile.com/d-s1334060c9434aceb>

If you have any issues accessing the document or need additional information, please feel free to contact me.

Thank you,  
Leah

---

**LEAH S. BOITS**

**Project Manager**

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# WETLAND DELINEATION AND WATERS REPORT

HEAVY HAUL TRANSPORTATION CORRIDOR  
UTICA TOWNSHIP, CLARK COUNTY, INDIANA  
DES. NO. 1382612



Prepared for:

INDIANA DEPARTMENT OF TRANSPORTATION  
100 NORTH SENATE AVENUE  
INDIANAPOLIS, INDIANA 46204

Prepared by:

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Briana M. Hope

June 9, 2017

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## 1.0 Introduction

American Structurepoint, Inc. was contracted by the Indiana Department of Transportation (INDOT) Central Office, to perform a wetland delineation on the approximately 200-acre area surrounding the proposed Heavy Haul Transportation Corridor construction project in Utica Township, Clark County, Indiana. Several alignments have been proposed and are being analyzed as part of project development. The proposed project corridor generally extends north from the Port of Indiana-Jeffersonville (Port) to the State Road (SR) 265/Old Salem Road Interchange. The proposed project corridor width varies, but is generally 1,000 feet. The proposed project corridor (henceforth referred to as the area) is located on the Jeffersonville USGS 7.5 Minute Quadrangle Map in Tracts 7, 15-16, and 25. The location and approximate boundaries of the investigated area can be seen in the attached maps and aerial photographs (Appendix D).

Preliminary investigation of available data depicted Lentzier Creek and several tributaries to Lentzier Creek flowing through the area. Several businesses are located in the southern portion of the area, and residential homes are scattered near the center of the area. A large forested area is also apparent near the center of the area, north of residential homes. I-265 has been recently constructed and is depicted at the northern terminus of the area. Five National Wetland Inventory (NWI) wetlands are mapped within the investigated area. Two of the mapped wetlands are associated with open water features, one at the northern limits and one near the southern limits of the area. The three remaining mapped wetlands are located near the center of the investigated area adjacent to Lentzier Creek. Two FEMA-designated 100-year floodplains, one associated with Lentzier Creek and one associated with an unnamed tributary to Lentzier Creek, are mapped within the investigated area.

The USGS Topographic map depicts the southern portion of the investigated area as relatively flat developed land with an intermittent unnamed stream flowing through. An open water feature associated with a sand and gravel pit is mapped adjacent to the southern limits of the investigated area. The USGS Topographic map depicts a forested area near the center of the area with Lentzier Creek, a perennial stream (solid blue line), flowing through. Two unnamed intermittent streams (dashed blue lines) are depicted flowing into Lentzier Creek just at the boundaries of the investigated area in the northern half of the area. Topographic mapping depicts the northern half of the investigated area as steep, hilly terrain with little development. The *1974 Clark County Soil Survey* map depicts Lentzier Creek as an intermittent stream flowing through the center of the investigated area along with five intermittent unnamed tributaries. Two additional intermittent unnamed streams are shown on the *1974 Clark County Soil Survey* map within the investigated area, one near the northern terminus and one near the southern terminus of the investigated area limits.

The predominant soil types on this site are Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG); Crider silt loam, 2 to 6 percent slopes, eroded (CspB2); Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded (CxbC2); Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA), 2 to 6 percent slopes (EesB), 6 to 12 percent slopes, eroded (EesC2), and 12 to 18 percent slopes, eroded (EesD2); Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW); Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded (HtwD2); Newark silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration (NbhAK); Ryker silt loam, 2 to 6 percent slopes, eroded (RtcB2); Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded (RztC2); Udorthents, cut and filled (Uaa); Urban land-Udarents, clayey substratum, complex,

hills, 2 to 10 percent slopes (UnsB). None of the soil series within the investigated area are mapped hydric soils.

American Structurepoint staff visited the site on May 6 and 7, 2014, and July 21, 2015, to conduct a wetland delineation. The proposed project is located in Land Resource Region (LRR) M, as recognized by the US Department of Agriculture. As such, this wetland delineation was conducted in accordance with the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory, 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region* (U.S. Army Corps of Engineers, 2010).

Ten wetlands (Wetlands A-J) totaling 4.42 acres, one open water feature (Pond 1) totaling 1.31 acres, and nine streams (Lentzier Creek and UNT 1 – UNT 8) totaling 8,575 linear feet (1.47 acres) were delineated within the investigated area. All of the delineated features appear to drain to Lentzier Creek, which drains to the Ohio River, a Traditional Navigable Waterway (TNW). Therefore, these 10 wetlands, nine streams (including Lentzier Creek), and one open water feature are anticipated to be considered jurisdictional “waters of the U.S.”



## **2.0 Site Characterization – Records Review**

### **2.1 USGS Topographic Mapping**

The investigated area is shown on the Jeffersonville USGS 7.5 Minute Quadrangle Map. The topographic mapping depicts the southern half of the area as cleared, gently rolling land with several businesses along roadways. The northern half of the area is depicted as undeveloped land with steep changes in elevations. A forested area is mapped near the center of the area. Lentzier Creek is depicted as a solid blue line (perennial) within the area. Lentzier Creek is mapped flowing through the northern half of the area, entering from the west and exiting on the east. Lentzier Creek then reenters the area from the west, flows south through the center of the area and exits to the west again. Two unnamed tributaries to Lentzier Creek are depicted as dashed blue lines (intermittent) within the area. The confluence of one of these unnamed tributaries with Lentzier Creek is mapped in the northern half of the investigated area. The other is mapped in the southern half of the investigated area. An open water feature associated with a sand and gravel pit is mapped adjacent to the southern terminus of the investigated area. Lentzier Creek was field verified as a perennial stream during the 2014 and 2015 field investigations. The unnamed tributary entering Lentzier Creek from the north and the unnamed tributary located near the southern terminus of the investigated area were field verified as intermittent streams during the 2014 and 2015 field investigations.

### **2.2 National Wetlands Inventory Mapping (NWI) Maps**

The NWI mapping was reviewed for the investigated area. Five NWI wetlands are mapped within the investigated area. The first of these is located near the southern terminus of the investigated area and is associated with an open water feature. It would be classified as Palustrine, Unconsolidated Bottom, Intermittently Exposed, Diked/Impounded (PUBGh) under the Cowardin Classification System. This NWI was identified as an open water feature (Pond 1) during the 2015 field investigation.

Three NWI wetlands are mapped within the forested area near the center of the project corridor adjacent to Lentzier Creek. Of these, two would be classified as Palustrine, Forested, Broad Leaf Deciduous, Temporarily Flooded (PFO1A) and one would be classified as Palustrine, Forested, Broad Leaf Deciduous, Seasonally Flooded (PFO1C) under the Cowardin Classification System. Several wetlands were delineated during the 2014 and 2015 field investigations within the area of these three mapped NWI wetlands. Wetlands E and F were associated with the most southern PFO1A mapped wetland, and Wetland H was associated with the mapped PFO1C wetland. The most northern PFO1A mapped wetland was not field verified.

The final mapped NWI wetland is associated with an open water feature located near the northern terminus of the investigated area and would be classified as a PUBGh wetland under the Cowardin Classification System. This NWI wetland was not field verified. The land in this area had been cleared and filled during the 2014 and 2015 field investigations for the construction of I-265.

### **2.3 County Soil Survey**

The Natural Resources Conservation Service (NRCS) Web Soil Survey Geographic (SSURGO) (<https://websoilsurvey.sc.egov.usda.gov>) was reviewed on February 1, 2017 to determine soil classification and drainage features within the study area. Soil types mapped within the proposed project right-of-way include:

| Soil Name                                                                           | Soil Symbol | Hydric or Non-Hydric | SSURGO Hydric Rating by Mapped Unit |
|-------------------------------------------------------------------------------------|-------------|----------------------|-------------------------------------|
| Caneyville-Rock outcrop complex, 25 to 60 percent slopes                            | CcaG        | Non-Hydric           | 0%                                  |
| Crider silt loam, 2 to 6 percent slopes, eroded                                     | CspB2       | Non-Hydric           | 0%                                  |
| Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded                           | CxhC2       | Non-Hydric           | 0%                                  |
| Elkinsville-Millstone silt loams, 0 to 2 percent slopes                             | EesA        | Non-Hydric           | 0%                                  |
| Elkinsville-Millstone silt loams, 2 to 6 percent slopes                             | EesB        | Non-Hydric           | 0%                                  |
| Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded                    | EesC2       | Non-Hydric           | 0%                                  |
| Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded                   | EesD2       | Non-Hydric           | 0%                                  |
| Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration | HcgAW       | Non-Hydric           | 0%                                  |
| Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded                      | HtwD2       | Non-Hydric           | 0%                                  |
| Newark silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration       | NbhAK       | Non-Hydric           | 1-32%                               |
| Ryker silt loam, 2 to 6 percent slopes, eroded                                      | RtcB2       | Non-Hydric           | 0%                                  |
| Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded                           | RztC2       | Non-Hydric           | 0%                                  |
| Udorthents, cut and filled                                                          | Uaa         | Non-Hydric           | 0%                                  |
| Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes      | UnsB        | Non-Hydric           | 0%                                  |

The 1974 *Clark County Soil Survey* depicts Lentzier Creek as an intermittent stream traversing the investigated area in the northern half of the area. Lentzier Creek is depicted entering the area from the west, flowing generally east across the area, and exiting to the east. The stream appears to then flow south back into the investigated area, and exit the area again to the east near the center of the investigated area. Lentzier Creek was field verified during the 2014 and 2015 field investigations.

In addition to Lentzier Creek, eight unnamed intermittent tributaries to Lentzier Creek are depicted in the 1974 *Clark County Soil Survey* mapping. The first intermittent stream is depicted entering the southern half of the investigated area from the west, generally flowing southeast through the area, and exiting to the east. This stream was field verified as UNT 3 during the 2015 field investigation.

The second intermittent stream is depicted entering near the center of the investigated area from the west and flowing west into Lentzier Creek within the investigated area limits. This intermittent stream was field verified as UNT 4 during the 2014 and 2015 field investigations. UNT 4 appears to be channeled to a

manmade pond outside of the investigated area limits, which then drains to Lentzier Creek outside of the area limits.

The third intermittent stream is mapped approximately 0.12 mile north of the second mapped stream (UNT 4). This stream is mapped entering the investigated area from the east and flowing west into Lentzier Creek within the area limits. This stream was not field verified during the 2014 or 2015 field investigations.

The fourth unnamed intermittent stream is mapped entering the investigated area from the west, across from the previously discussed mapped stream. The stream generally flows north to Lentzier Creek within the investigated area. This mapped stream was field verified as UNT 5 during the 2015 field investigation. UNT 5 was determined to begin within the investigated area limits, then generally flows north to Lentzier Creek.

The fifth and sixth unnamed intermittent streams are mapped flowing south into Lentzier Creek, near the mapped location of UNT 5. The fifth stream enters the investigated area from the west and flows into Lentzier Creek almost immediately upon entering the area. This stream was field verified as UNT 7 during the 2015 field investigation. The sixth mapped stream enters from the east and also flows into Lentzier Creek almost immediately upon entering the area. This stream was not field verified within the investigated area limits during the 2014 or 2015 field investigations, and appears to be located just outside of the area to the east.

The seventh unnamed intermittent stream is mapped flowing into the northern portion of the investigated area from the north. The stream traverses the area and flows out of the area to the south, where it drains to the mapped stream described above (sixth mapped stream) outside of the area limits. This intermittent stream was field verified as UNT 8 during the 2014 field investigation.

The eighth and final mapped intermittent stream is depicted beginning within the area limits at the northern terminus. The stream flows south and east, and exits to the east. This stream was not field verified during the 2014 or 2015 field investigation. The area appeared to have been recently cleared and filled for the construction of I-265.

## **2.4 Aerial Photography**

The 2005 (IndianaMap) and 2016 (NAIP) Aerial Photography was reviewed for the investigated area. Both 2005 and 2016 aerial photography depict the southern half of the project corridor as developed with one open water feature within the project corridor and another immediately adjacent to the southern terminus of the project corridor. A stream appears to traverse the southern half of the investigated area in the 2005 aerial photography. The stream is not apparent on the 2016 photography likely due to tree canopy cover. One open water feature (Pond 1) was field verified within the investigated area and the other open water feature was verified to be located outside of the investigated area limits adjacent to the southern terminus. The apparent stream was field verified during the 2015 field investigation as an intermittent stream (UNT 3).

The northern half of the investigated area is depicted as heavily wooded in both 2005 and 2016 aerial photography. Land has been cleared in the northern terminus for the construction of I-265 in the 2005 photography; I-265 has been constructed in the 2016 photography. Lentzier Creek is visible flowing across the center of the investigated area in both the 2005 and 2016 aerial photography. Lentzier Creek was field

verified as a perennial stream during the 2014 and 2015 field investigations. An open water feature is apparent at the northern terminus of the area in the 2005 aerial photography, but is not visible on the 2016 photography. The open water feature was not field verified during the 2014 or 2015 field investigations because the area had recently been cleared and filled for the construction of I-265.

## **2.5 Floodways and Floodplains**

Federal Emergency Management Agency (FEMA) Flood Insurance Rate Mapping (FIRM) was reviewed for the investigated area. The investigated area encroaches on two FEMA-designated 100-year floodplains, one associated with Lentzier Creek and one associated with UNT 3. Lentzier Creek and its associated floodplain are located within the forested area in the northern half of the investigated area. Lentzier Creek and its floodplain cross back into the investigated area from the east near the center of the area. UNT 3 and its associated floodplain are located near the southern terminus of the investigated area.

## **2.6 Legal Drain**

The Clark County Drainage Board was contacted on March 13, 2017 to determine the presence or absence of regulated drains within the investigated area. In an emailed response on March 13, 2017, the Clark County Surveyor indicated that there were no regulated drains within the investigated area.

# **3.0 Field Reconnaissance**

The approximately 200-acre area for the proposed Heavy Haul Transportation Corridor construction project was examined May 6 and 7, 2014 and July 21, 2015 for the presence of wetlands and “waters of the U.S.” Data points were strategically placed to identify appropriate boundaries of delineated wetlands and to determine the presence or absence of jurisdictional wetlands and “waters of the U.S.” A total of 10 wetlands, nine streams, and one open water feature were identified. Data sheets and a map indicating the location of data points documenting the field investigation are included in the appendix.

## **3.1 Wetlands**

### **3.1.1 Wetland A**

Wetland A is an emergent wetland located approximately 560 feet north of Loop Road near the southern terminus of the investigated area. The wetland appears to be associated with an unmaintained detention area that collects surface runoff from businesses to the south via a culvert. Wetland A appears to drain north to Pond 1, which is located approximately 90 feet north. Pond 1 drains east beneath a roadway via a culvert to Wetland B, which drains east to UNT 1. UNT 1 drains to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland A will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Persicaria pensylvanica* (FACW) and *Carex trichocarpa* (OBL). Hydrologic indicators included High Water Table present at two inches below the surface (A2), Saturation at surface (A3), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland A was delineated for 1.47 acres and would be considered a Palustrine, Emergent, Seasonally Flooded (PEMC) wetland under the Cowardin Classification System. The wetland appears to be associated with an unmaintained drainage area that collects surface runoff from businesses to the south via a culvert. On aerial

photography there appears to be a concrete drainage ditch running through the center of the wetland, but this was not observed during the 2015 field visit. Because this wetland collects surface runoff and appears to have developed due to lack of maintenance of a drainage ditch, it would be considered a poor quality wetland. For reference to the field data collected for this wetland, see Data Point (DP) 01 included in Appendix B. DP02 included in Appendix B is representative of the upland area surrounding Wetland A.

### **3.1.2 Wetland B**

Wetland B is an emergent wetland located approximately 800 feet north of Brown Forman Road, east of Pond 1. The wetland is located at the toe of slope within the 100-year floodplain of UNT 1. The wetland appears to collect drainage from Pond 1 via a culvert under the roadway. Wetland B then drains west to UNT 1, which drains to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland B will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW) and *Carex cristatella* (FACW). Hydrologic indicators included High Water Table at seven inches below surface (A2), Saturation at two inches below surface (A3), Sediment Deposits (B2), Drift Deposits (B3), Iron Deposits (B5), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland B was delineated for 0.04 acre. Although trees were listed as dominant within the wetland, the trees included on the datasheet were from the canopy cover. Therefore, Wetland B would be considered a PEMC wetland under the Cowardin Classification System. The wetland appears to be associated with a low area where drainage from Pond 1 and sheet flow from the abutting abandoned field is conveyed west to UNT 1. Because the wetland is used to convey drainage within a highly developed area and has a diverse plant community, it would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP04 in Appendix B. DP05 included in Appendix B is representative of the upland area surrounding Wetland B.

### **3.1.3 Wetland C**

Wetland C is an emergent wetland located in the northwest quadrant of the Utica-Sellersburg Road and Maritime intersection. The wetland is a depressed area in an open field. The wetland appears to drain south to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland C will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Persicaria pensylvanica* (FACW) and *Pilea pumila* (FACW). Hydrologic indicators included Drainage Patterns (B10), Geomorphic Position (D2), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland C was delineated for 0.12 acre and would be considered a Palustrine, Emergent, Seasonally Flooded/Saturated (PEME) wetland under the Cowardin Classification System. The wetland appears to be a large depressional area where sheet flow is collected from the surrounding field before draining to UNT 3. Because of the diverse vegetative community and surrounding undeveloped land, this wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP08 in Appendix B. DP07 included in Appendix B is representative of the upland area surrounding Wetland C.



#### 3.1.4 Wetland D

Wetland D is a scrub-shrub wetland located approximately 340 feet south of New Middle Road. UNT 3 appears to drain to Wetland D from the north. A continuous bed and bank or ordinary high water mark (OHWM) are not apparent as the stream enters the wetland. A continuous bed and bank and OHWM become apparent again in the western half of the wetland and then UNT 3 drains out of the wetland via a culvert. Wetland D appears to drain to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland D will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Salix nigra* (OBL), *Carex frankii* (OBL), and *Phragmites australis* (FACW). Hydrologic indicators included High Water Table present at six inches below surface (A2), Saturation at surface (A3), Sediment Deposits (B2), Drift Deposits (B3), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland D was delineated for 0.59 acre and would be considered a Palustrine, Scrub-Shrub, Broad Leaf Deciduous, Seasonally Flooded (PSS1C) wetland under the Cowardin Classification System. The wetland appears to be a low area associated with the floodplain of UNT 3. Because of the association with a stream as well as tree and scrub-shrub cover, this wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP09 in Appendix B. DP10 included in Appendix B is representative of the upland area surrounding Wetland D.

#### 3.1.5 Wetland E

Wetland E is an emergent wetland located within the FEMA-designated 100-year floodplain of Lentzier Creek. The wetland is a small depressional area located at the toe of slope in a cleared area near the center of the investigated area approximately 0.27 mile north of Fox Den. The wetland appears to drain south to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland E will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Platanus occidentalis* (FACW), *Juncus effusus* (OBL), and *Carex frankii* (OBL). Hydrologic indicators included Sediment Deposits (B2), Algal Mat or Crust (B4), Water-Stained Leaves (B-9), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland E was delineated for 0.01 acre. Although trees were listed as a dominant species, the total coverage from trees was due to canopy cover; trees were not located within the wetland boundaries. Therefore, this wetland would be considered a PEME wetland under the Cowardin Classification System. Due to the relatively small size and location within a FEMA-designated 100-year floodplain, the wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP14 in Appendix B. DP15 included in Appendix B is representative of the upland area surrounding Wetland E.

#### 3.1.6 Wetland F

Wetland F is an emergent wetland located within the FEMA-designated 100-year floodplain of Lentzier Creek. The wetland is a small depressional area located at the toe of slope in a cleared area near the center of the investigated area approximately 38 feet north of Wetland E. The wetland appears to drain east to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland F will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Liquidambar styraciflua* (FACW), *Fraxinus pennsylvanica* (FACW), *Acer negundo* (FAC), *Schedonorus arundinaceus* (FACU), *Carex frankii* (OBL), *Lycopus asper* (OBL), and *Juncus effusus* (OBL). Hydrologic indicators included Sediment Deposits (B2), Algal Mat or Crust (B4), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland F was delineated for 0.01 acre. Although trees were listed as a dominant species, the total coverage from trees was due to canopy cover; trees were not located within the wetland boundaries. Therefore, this wetland would be considered a PEME wetland under the Cowardin Classification System. Due to the relatively small size and location within a FEMA-designated 100-year floodplain, the wetland would be considered an average quality wetland. For reference to the field data collected for this wetland, see DP16 in Appendix B. DP15 included in Appendix B is representative of the upland area surrounding Wetland F.

### 3.1.7 Wetland G

Wetland G is a forested wetland located south of Lentzier Creek approximately 0.4 mile northwest of Fox Den. The wetland is a small depressional area located at the toe of slope. The wetland appears to drain east to UNT 6 (described below), which drains through Wetland H, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland G will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Liquidambar styraciflua* (FACW), *Fraxinus pennsylvanica* (FACW), *Rosa multiflora* (FACU), *Persicaria virginiana* (FAC), *Lysimachia nummularia* (FACW), and *Elymus virginicus* (FACW). Hydrologic indicators included High Water Table present at one inch below surface (A2), Saturation at one inch below surface (A3), Sediment Deposits (B2), Water-Stained Leaves (B9), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland G was delineated for 0.02 acre and would be considered a Palustrine, Forested, Broad Leaf Deciduous, Seasonally Flooded (PFO1C) wetland under the Cowardin Classification System. Because the wetland is forested and within close proximity of a stream, Wetland G would be considered an excellent quality wetland. For reference to the field data collected for this wetland, see DP19 in Appendix B. DP18 included in Appendix B is representative of the upland area surrounding Wetland G.

### 3.1.8 Wetland H

Wetland H is a forested wetland located south of Lentzier Creek within the FEMA-designated 100-year floodplain. The wetland is a large depressional area located at the toe of slope approximately 160 feet northeast of Wetland G. The wetland appears to drain north to Lentzier Creek via UNT 6 (described below). Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland H will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Fagus grandifolia* (FACU), *Ulmus americana* (FACW), *Rosa multiflora* (FACU), *Iris virginica* (OBL), *Euonymus fortune* (UPL), and *Viola bicolor* (FACU). Hydrologic indicators included High Water Table at 10 inches below surface (A2), Saturation at eight inches below surface at DP21 and 12 inches below surface at DP23 (A3), Sediment Deposits (B2), and Drift Deposits (B3), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland H was delineated for 1.00 acre within the investigated area and would be considered a PFO1C wetland under the Cowardin Classification System. Wetland H appears to extend outside of the investigated area to the east. Because the wetland is forested and within close proximity of a stream, Wetland H would be considered an excellent quality wetland. For reference to the field data collected for this wetland, see DP21 and DP23

in Appendix B. DP20 and DP22 included in Appendix B are representative of the upland area surrounding Wetland H.

### 3.1.9 Wetland I

Wetland I is a forested and emergent wetland located north of Lentzier Creek within the FEMA-designated 100-year floodplain. The wetland is a large depressional area located at the toe of slope, approximately 0.3 mile west of Old Salem Road. Wetland I was delineated for 1.06 acres within the investigated area and appears to extend west outside of the investigated area limits. The wetland appears to drain south to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland has a hydrologic connection to a TNW, it is anticipated that Wetland I will be considered a jurisdictional “waters of the U.S.”

For the emergent portion of Wetland I, the dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Platanus occidentalis* (FACW), *Salix nigra* (OBL), *Rosa palustris* (OBL), *Carex frankii* (OBL), *Plantago major* (FACU), *Lysimachia nummularia* (FACU), *Coleataenia rigidula* (FACW), *Lythrum salicaria* (OBL), *Juncus tenuis* (FAC), *Echinochloa crus-galli* (FACW), and *Phalaris arundinacea* (FACW). Hydrologic indicators included two inches of Surface Water present at DP32 (A1); High Water Table at 10 inches below surface at DP27, at six inches below surface at DP29, and above surface at DP32 (A2); Saturation at 10 inches below surface at DP27 and at surface at DP29 and DP32 (A3); Sediment Deposits (B2); Geomorphic Position (D2); and FAC-Neutral (D5). The hydric soil indicator included Depleted Matrix (F3). The emergent portion of the wetland was delineated for 0.47 acre within the investigated area, but appears to extend west outside of the investigated area limits. This portion of the wetland would be considered a PEMC wetland under the Cowardin Classification System.

For the forested portion of Wetland I, the dominant vegetation consisted of *Fraxinus pennsylvanica* (FACW), *Platanus occidentalis* (FACW), and *Lysimachia nummularia* (FACW). Hydrologic indicators included High Water Table present at seven inches below surface (A2), Saturation at seven inches below surface (A3), Geomorphic Position (D2), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). The forested portion of the wetland was delineated for 0.59 acre within the investigated area, but appears to extend west out of the investigated area limits. This portion of the wetland would be considered a PFO1C wetland under the Cowardin Classification System.

Because the wetland is partially forested and located within a FEMA-designated 100-year floodplain, Wetland I would be considered an excellent quality wetland. For reference to the field data collected for the emergent portion of this wetland, see DPs 27, 29, and 32; for reference to the field data collected for the forested portion of this wetland, see DP 32 in Appendix B. DP28 and DP31 included in Appendix are representative of the upland area surrounding Wetland I.

### 3.1.10 Wetland J

Wetland J is a forested wetland located northeast of Lentzier Creek approximately 0.14 mile west of Old Salem Road. The wetland is not mapped within a FEMA-designated floodplain within the investigated area; however, the wetland appears to extend south outside of the investigated area into a FEMA-designated 100-year floodplain associated with UNT 8 (described below). The wetland is a low area surrounding UNT 8, which flows through Wetland J from the north. A continuous ordinary high water mark (OHWM) and defined bed and bank are apparent through the center of the wetland. Wetland J appears to drain to UNT 8, which eventually drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the wetland

has a hydrologic connection to a TNW, it is anticipated that Wetland J will be considered a jurisdictional “waters of the U.S.”

The dominant vegetation consisted of *Acer negundo* (FAC), *Fraxinus pennsylvanica* (FACW), *Lonicera morrowii* (FACU), *Lindera benzoin* (FACW), *Geum canadense* (FAC), and *Elymus virginicus* (FACW). Hydrologic indicators included Saturation at 12 inches below surface (A3), Drift Deposits (B3), Drainage Patterns (B10), and FAC-Neutral Test (D5). The hydric soil indicator included Depleted Matrix (F3). Wetland J was delineated for 0.10 acre within the investigated area and would be considered a PFO1C wetland under the Cowardin Classification System. Because the wetland is forested and with an apparent association with the floodplain of a stream, Wetland J would be considered an excellent quality wetland. For reference to the field data collected for this wetland, see DP34 in Appendix B. DP 33 included in Appendix B is representative of the upland area surrounding Wetland J.

## **3.2 Drainage Features, Streams, and Other Potential “Waters of the US”**

### **3.2.1 Unnamed Tributary 1 (UNT 1)**

UNT 1 is an intermittent stream that generally flows east through the investigated area approximately 700 feet north of North Access Drive. UNT 1 begins at a culvert outfall located at the eastern terminus of Wetland B and extends approximately 195 linear feet through the investigated area to its confluence with UNT 3. The stream is located within the FEMA-designated 100-year floodplain associated with UNT 3 (described below) and has a drainage area of approximately 0.04 square mile. The stream is not depicted on the 1974 *Clark County Soil Survey* map or on the USGS Topographic map. UNT 1 flows to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 1 will be considered a jurisdictional “waters of the U.S.”

UNT 1 was delineated for approximately 195 linear feet within the investigated area. The OHWM was approximately one foot deep by three feet wide. The channel width at top of bank was five feet. Bank height was one foot on each bank. The flow regime appears to be intermittent. No riffle/runs were present within this segment of the stream at the time of the field investigation. The substrate was primarily silt and sand. Herbaceous vegetation dominated the northern bank and immature scrubby trees dominated the southern bank. This stream would be considered a Riverine, Intermittent, Unconsolidated Bottom, Seasonally Flooded/Saturated (R4UBE) stream under the Cowardin Classification System.

A Qualitative Habitat Evaluation (QHEI) was conducted for UNT 1 (QHEI 1) approximately 200 feet west of Brown Forman Road. The overall QHEI score for the 195-foot sampled stream was 38. This is a Poor narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (8/10). The stream scored lowest in Riffle/Run Quality (0/8) as no riffles were present.

### **3.2.2 Unnamed Tributary 2 (UNT 2)**

UNT 2 is an intermittent stream that generally flows east through the investigated area adjacent to Maritime Road. UNT 2 enters the investigated area from the west within a ditchline running alongside Maritime Road. The stream continues south along the ditchline for approximately 785 linear feet. The stream then flows east through a culvert which conveys the stream under a roadway. The stream continues east through an undeveloped field to its confluence with UNT 3. The stream is not located within a FEMA-designated floodplain nor is it depicted on the 1974 *Clark County Soil Survey* map or USGS Topographic map. UNT 2 has

a drainage area of approximately 0.06 square mile. UNT 2 flows into UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 2 will be considered a jurisdictional “waters of the U.S.”

UNT 2 was delineated for approximately 1,489 linear feet within the investigated area. The OHWM was approximately 1.5-foot deep and two feet wide. The channel width at top of bank was two feet. Bank height was 1.5 feet on each bank. The flow regime appears to be intermittent. Riffle (5%) / Run (40%) complexes were observed in this segment of UNT 2. The substrate was primarily silt and sand. Herbaceous vegetation dominated both the north and south banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 2) was conducted for UNT 2, approximately 390 feet west of Brown Forman Road. The overall QHEI score for the 200-foot sampled stream segment was 39.5. This is a Poor narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (6.5/10). The stream scored lowest in Riffle/Run Quality (2/8).

### **3.2.3 Unnamed Tributary 3 (UNT 3)**

UNT 3 is an intermittent stream that generally flows south through the investigated area, approximately 235 feet west of the intersection of Utica Sellersburg Road and Brown Forman Road. UNT 3 begins within the investigated area west of Utica Sellersburg Road just south of the New Middle Road *cul de sac*. The stream flows south and west for approximately 666 linear feet through an open field into Wetland D. A continuous OHWM and defined bed and bank are absent as the stream enters the wetland from the east, and are then redefined at the southern boundary of Wetland D as the stream flows out of the wetland. UNT 3 continues southeast for approximately 1,786 linear feet through a wooded corridor. UNT 3 flows out of the investigated area near the southern terminus to the east. The southernmost 250 feet of the stream are located within a FEMA-designated 100-year floodplain. UNT 3 has a drainage area of approximately 0.23 square mile. UNT 3 is depicted as an intermittent stream on the 1974 *Clark County Soil Survey* map and on the USGS Topographic map (dashed blue line). UNT 3 drains to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 3 will be considered a jurisdictional “waters of the U.S.”

UNT 3 was delineated for approximately 2,452 linear feet within the investigated area. The OHWM was approximately two feet deep and five feet wide. Near the southern portion of the stream, the channel width at top of bank was five feet; near the northern portion of the stream, the channel width was seven feet. Near the south, bank height was two feet on each bank; near the northern end of the stream bank height was approximately four feet on each bank. The flow regime appears to be intermittent. Riffle (20%) / Run complexes (40%) were observed throughout UNT 3. The substrate was primarily sand, silt, and gravel. Near the northern terminus of the stream, herbaceous vegetation dominated both banks of the stream; woody trees dominated both banks of the remainder of the stream within the investigated area. The stream would be considered a Riverine, Intermittent, Unconsolidated Bottom, Semipermanently Flooded (R4UBF) stream under the Cowardin Classification System.

Two QHEIs (QHEI 3 and QHEI 4) were conducted for UNT 3. QHEI 3 was conducted approximately 315 feet southeast of the New Middle Road *cul de sac*, south of Wetland D. The overall score for the 200-foot sampled stream segment was 56.5. This segment of the stream scored highest in Substrate (14/20) and Bank Erosion



and Riparian Zone (7/10) and lowest in Channel Morphology (9/20). QHEI 4 was conducted approximately 330 feet southwest of the Utica Sellersburg Road and Brown Forman Road intersection, north of Wetland D. The overall score for the 200-foot sampled stream segment was 50.5. This segment of the stream scored highest in Pool/Glide Quality and Gradient (6/10) and lowest in Riffle/Run Quality (3/8). Overall, the scores average to 53.5, which is a Fair narrative rating according to the manual.

#### **3.2.4 Unnamed Tributary 4 (UNT 4)**

UNT 4 is an intermittent stream that generally flows east through a wooded area near the center of the investigated area. UNT 4 begins within the investigated area approximately 890 feet west of Fox Run, flows east for approximately 404 linear feet before flowing out of the investigated area to the east. The stream appears to flow to a pond located outside of the investigated area. The stream is not located within a FEMA-designated floodplain within the investigated area, but appears to be located within the FEMA-designated 100-year floodplain of Lentzier Creek immediately east of the investigated area. UNT 4 has a drainage area of less than 0.10 square mile. UNT 4 is depicted on the *1974 Clark County Soil Survey* map as an unnamed intermittent tributary to Lentzier Creek. The stream is not depicted on the USGS Topographic map. UNT 4 appears to drain east out of the area to a pond located within the FEMA-designated 100-year floodplain of Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 4 will be considered a jurisdictional “waters of the U.S.”

UNT 4 was delineated for approximately 404 linear feet within the investigated area. The OHWM was six inches deep and three feet wide. The channel width at top of bank was five feet. Bank height was approximately three feet on each bank. The flow regime appears to be intermittent. Riffle (25%) / Run (45%) complexes were observed within UNT 4. The substrate was primarily hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 5) was conducted for UNT 4, approximately 775 feet northwest of Fox Run. The overall QHEI score for the 200-foot sampled stream segment was 59.5. This is a Good narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Pool/Glide Quality (3/12).

#### **3.2.5 Unnamed Tributary 5 (UNT 5)**

UNT 5 is an intermittent stream that generally flows northeast through the heavily wooded area near the center of the investigated area. UNT 5 begins within the investigated area approximately 0.50 mile west of Old Salem Road, flows northeast for approximately 413 linear feet to its confluence with Lentzier Creek. Approximately 328 linear feet of UNT 5 are located within the FEMA-designated 100-floodplain of Lentzier Creek. UNT 5 has a drainage area of approximately 0.04 square mile. The stream is depicted on the *1974 Clark County Soil Survey* map as an unnamed intermittent tributary to Lentzier Creek, but it is not depicted on the USGS Topographic map. UNT 5 flows north to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 5 will be considered a jurisdictional “waters of the U.S.”

UNT 5 was delineated for approximately 413 linear feet within the investigated area. The OHWM was six inches deep and three feet wide. The channel width at top of bank was four feet. Bank height was approximately one foot on each bank. The flow regime appears to be intermittent. Riffle (5%) / Run (15%)

complexes were observed within UNT 5. The substrate was primarily hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 6) was conducted for UNT 5, approximately 125 feet southeast of the confluence with Lentzier Creek. The overall QHEI score for the 200-foot sampled stream segment was 57.5. This is a Good narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Pool/Glide Quality (1/12).

### **3.2.6 Unnamed Tributary 6 (UNT 6)**

UNT 6 is an intermittent stream that generally flows north through the heavily wooded area near the center of the investigated area. UNT 6 begins within the investigated area approximately 300 feet southeast of the start of UNT 5 (described above). The stream flows northeast for approximately 163 linear feet where it continues to flow through Wetland H (described above) for approximately 243 linear feet, and then flows out of the investigated area to the east. Approximately 161 linear feet of UNT 6 are located within the FEMA-designated floodplain of Lentzier Creek, and the stream has a drainage area of less than 0.10 square mile. The stream is not depicted on the *1974 Clark County Soil Survey* map or on the USGS Topographic map. East of the investigated area, UNT 6 appears to flow north and drain into another unnamed stream. The unnamed stream appears to drain to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 6 will be considered a jurisdictional “waters of the U.S.”

UNT 6 was delineated for approximately 406 linear feet within the investigated area. The OHWM was two inches deep and one foot wide. The channel width at top of bank was one foot wide. Bank height was approximately four inches on each bank. The flow regime appears to be intermittent. No riffle/run complexes were observed within UNT 6 during the field investigation. The primary substrate was silt and sand. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A Primary Headwater Habitat Evaluation Index (HHEI) was conducted for UNT 6, approximately 287 feet southeast of the confluence with an unnamed tributary to Lentzier Creek (HHEI 1). The overall HHEI score for the 200-foot sampled stream segment was 17. Due to the absence of flow and presence of moderate erosion, this would be considered a poor quality stream. The stream scored highest in Substrate (12/40). The stream scored lowest in Maximum Pool Depth (0/30).

### **3.2.7 Unnamed Tributary 7 (UNT 7)**

UNT 7 is an intermittent stream that generally flows southeast through the investigated area. The stream enters the investigated area from the west within the heavily wooded area in the northern half of the area, approximately 0.40 mile west of Old Salem Road and 0.30 mile south of I-265. Upon entering the investigated area, UNT 7 flows southeast approximately 123 feet through the southwestern point of Wetland I to its confluence with Lentzier Creek. UNT 7 is depicted on the *1974 Clark County Soil Survey* map and the USGS Topographic map as an unnamed intermittent stream (dashed blue line). UNT 7 is located within the FEMA-designated 100-year floodplain associated with Lentzier Creek and has a drainage area of approximately 0.61 square mile. The unnamed stream drains to Lentzier Creek, which drains south to the Ohio River, a

TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 7 will be considered a jurisdictional “waters of the U.S.”

UNT 7 was delineated for approximately 123 feet within the investigated area. The OHWM was approximately 2.5 feet deep and 13 feet wide. The channel width at top of bank was 17 feet. Bank height was approximately five feet on each bank. The flow regime appears to be perennial. Riffle (5%) / Run (45%) complexes were observed in UNT 7. The primary substrate was hardpan and silt. Forest vegetation dominated both banks of the stream. UNT 7 would be considered a Riverine, Lower Perennial, Unconsolidated Bottom, Intermittently Exposed (R2UBG) stream under the Cowardin Classification System.

A QHEI (QHEI 7) was conducted for UNT 7, approximately 15 feet northwest of its confluence with a Lentzier Creek. The overall QHEI score for the 123-foot sampled stream was 62.5. This is a Good narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Substrate (7/20).

### **3.2.8 Unnamed Tributary 8 (UNT 8)**

UNT 8 is an intermittent stream that generally flows south through the northern portion of the investigated area. The stream enters the investigated area from the north, approximately 683 feet west of Old Salem Road. The stream flows south adjacent to a utility corridor for approximately 902 feet where it enters Wetland J. UNT 8 continues through Wetland J for approximately 111 feet where it flows south out of the investigated area. UNT 8 is depicted on the *1974 Clark County Soil Survey* map as an intermittent stream. UNT 8 is not depicted on the USGS Topographic map. UNT 8 is not located within a FEMA-designated floodplain within the investigated area, but appears to be located in one associated with Lentzier Creek just south of the investigated area. The stream has a drainage area of approximately 0.14 square mile. UNT 8 appears to drain out of the investigated area to the south to an unnamed stream. The unnamed stream drains to Lentzier Creek, which drains south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that UNT 8 will be considered a jurisdictional “waters of the U.S.”

UNT 8 was delineated for approximately 1,012 linear feet within the investigated area. The OHWM was approximately one foot deep and six feet wide. The channel width at top of bank was seven feet. Bank height was approximately two feet on each bank. The flow regime appears to be intermittent. Riffle (5%) / Run (25%) complexes were observed in UNT 8. The primary substrate was hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R4UBE stream under the Cowardin Classification System.

A QHEI (QHEI 8) was conducted for UNT 8, approximately 370 feet north of Wetland J (described above). The overall QHEI score of the 200-foot sampled stream segment was 46. This is a Fair narrative rating according to the manual. The stream scored highest in Bank Erosion and Riparian Zone (9/10). The stream scored lowest in Pool/Glide and Riffle/Run Quality (3/12 and 2/8, respectively).

### **3.2.9 Lentzier Creek**

Lentzier Creek is a perennial stream that generally flows east and south in the heavily wooded area near the center of the investigated area. The stream enters the investigated area from the east near the northern limits of the wooded area, approximately 0.50 mile west of Old Salem Road. The stream flows east across the area, then exits the investigated area to the east, just north of Wetland H (described above). Lentzier

Creek then flows south outside of the investigated area and reenters the investigated area from the east just south of Wetlands E and F (described above). Lentzier Creek generally flows south through the investigated area for approximately 756 linear feet before exiting the investigated area to the south. Lentzier Creek is depicted as an intermittent stream on the *1974 Clark County Soil Survey* map and as a perennial stream (solid blue line) on the USGS Topographic map. The Creek is located within a FEMA-designated 100-year floodplain. Lentzier Creek appears to drain south to the Ohio River, a TNW. Since the stream has a hydrologic connection to a TNW, it is anticipated that Lentzier Creek will be a jurisdictional “waters of the U.S.”

Lentzier Creek was delineated for a total of 2,081 linear feet within the investigated area. The OHWM was approximately 3 feet deep and 18 feet wide. The channel width at top of bank was 20 feet. Bank height was approximately six feet on each bank. The flow regime appears to be perennial. Riffle (10%) / Run (50%) were observed in Lentzier Creek. The primary substrate was hardpan and silt. Forest vegetation dominated both banks of the stream. The stream would be considered a R2UBG stream under the Cowardin Classification System.

Two QHEIs (QHEI 9 and QHEI 10) were conducted for Lentzier Creek. QHEI 9 was conducted approximately 130 feet southwest of Wetland E (described above). The overall score for the 200-foot sampled stream segment was 63.5. This segment of the stream scored highest in Gradient (10/10) and lowest in Substrate (7/20). QHEI 10 was conducted approximately 85 feet southeast of the UNT 9 (described above) confluence. The overall score for the 200-foot sampled stream segment was 64.5. This segment of the stream scored highest in Gradient (10/10) and lowest in Substrate (7/10). Overall, the scores average a Good narrative rating according to the manual.

### **3.2.10 Pond 1**

Pond 1 is located near the southern terminus of the investigated area approximately 750 feet west of Brown Forman Road. The pond is a manmade feature which, according to aerial photography, appears to have been constructed in upland soils sometime after 1998 for the purpose of stormwater detention. Approximately 1.31 acres were delineated within the investigated area, and the pond extends beyond the investigated area limits to the west. There appears to be a culvert on the eastern side of Pond 1 that drains water to the east under the road. The culvert was under water and not visible during the 2015 field investigation. However, the culvert is visible on several years of aerial photography. Pond 1 would be classified as Lacustrine, Limnetic, Unconsolidated Bottom, Permanently Flooded, Diked/Impounded (L1UBHh) under the Cowardin Classification System. Because this open water feature is manmade to collect surface runoff from the surrounding areas, Pond 1 would be considered poor quality. Pond 1 appears to drain east under a road to Wetland B via a culvert. Wetland B drains to UNT 1, which drains to UNT 3, which drains to Lentzier Creek. Lentzier Creek drains south to the Ohio River, a TNW. Since the pond has a hydrologic connection to a TNW, it is anticipated that Pond 1 will be considered a jurisdictional “waters of the U.S.”

## **3.3 Non-Jurisdictional Features and Non-Wetland Data Points**

All features delineated are anticipated to be considered jurisdictional “waters of the U.S.” No other features were identified within the investigated area.

Eleven non-wetland data points (DPs 03, 06, 11-13, 17, 24-26, 35, and 36) were collected to confirm upland conditions within the area. DP03 was collected due to the presence of hydrophytic vegetation near a culvert

outlet, south of Wetland B. DP03 met hydrophytic vegetation, but did not meet hydric soil or wetland hydrology criteria.

DP06 was collected to confirm upland conditions adjacent to UNT 1. DP06 did not meet hydrophytic vegetation, hydric soil criteria, or wetland hydrology criteria.

DPs 11, 12, and 13 were collected to confirm upland conditions within the wooded area, near the center of the investigated area. DP11 was collected toward the western boundary of the area. DP12 was collected near the eastern boundary of the area on the east bank of Lentzier Creek, and DP13 was also collected near the eastern boundary of the area on the west bank of Lentzier Creek. Neither DP11 nor DP12 met any of the three wetland criteria. DP13 met hydrophytic vegetation and wetland hydrology criteria, but did not meet hydric soil criteria.

DP17 was collected due to the presence of hydrophytic vegetation between two streams (UNT 6 and Lentzier Creek). DP17 was collected near the eastern boundary of the area, east of UNT 6 and west of Lentzier Creek. DP17 met hydrophytic vegetation criteria, but did not meet hydric soil or wetland hydrology criteria.

DPs 24 and 26 were collected to confirm the upland conditions adjacent to two streams. DP24 was collected on the west bank of UNT 5 near the confluence with Lentzier Creek, and DP26 was collected on the east bank of Lentzier Creek near the UNT 7 confluence. DPs 24 and 26 met hydrophytic vegetation and wetland hydrology criteria, but not hydric soil criteria. Although water appears to move through these areas, the water appears to sheet flow toward the streams rather than standing.

DP25 was collected to confirm upland conditions within the floodplain of Lentzier Creek. DP25 was collected south of Lentzier Creek and west of UNT 5. DP25 did not meet any of the three wetland criteria.

DPs 35 and 36 were collected to confirm upland conditions adjacent to UNT 8. DP35 was collected along the west bank of UNT 8, approximately 340 feet northwest of Wetland J, and DP36 was collected east of UNT 8, approximately 830 feet northwest of Wetland J. DPs 35 and 36 met hydrophytic vegetation, but did not meet wetland hydrology or hydric soil criteria.

## 4.0 Conclusions

Ten wetlands (Wetlands A-J), one open water feature (Pond 1), and nine streams (Lentzier Creek and UNT 1-8) were delineated within the investigated area. The total delineated wetland acreage within the investigated area is approximately 4.42 acres. Pond 1 was delineated for 1.31 acres within the investigated area. Stream length within the investigated area totals approximately 8,575 linear feet and 1.47 acres. All ten wetlands, one open water feature, and nine streams are anticipated to be considered jurisdictional “waters of the U.S.”

If impacts to any of these water resources are necessary, permits from the USACE and IDEM will be required. Mitigation may be a condition of receiving these permits. The INDOT Environmental Services and the Seymour District Environmental Unit should be contacted immediately if impacts occur. The final determination of jurisdictional waters is ultimately made by the USACE.



#### **4.1 Jurisdictional Analysis**

The 10 wetlands delineated within the investigated area (Wetlands A-J) appear to drain to Lentzier Creek, which drains to the Ohio River, a TNW. Therefore, all 10 wetlands are anticipated to be considered jurisdictional “waters of the U.S.”

The eight unnamed streams delineated within the investigated area (UNT 1-8) and one open water feature (Pond 1) appear to drain to Lentzier Creek, which drains to the Ohio River, a TNW. Therefore, Pond 1 and all nine streams (Lentzier Creek and UNT 1-8) are anticipated to be considered jurisdictional “waters of the U.S.”

All jurisdictional wetlands are under the regulatory authority of the USACE under Section 404 of the Clean Water Act. Impacts to less than one acre of wetland are generally permitted under the RGP for Indiana. Impacts to jurisdictional wetlands and impacts to isolated wetlands are also under the regulatory authority of the IDEM under Section 401 of the Clean Water Act or the Indiana Isolated Wetlands Act.

Impacts to the wetlands identified in this report would require a determination of jurisdictional status by the USACE.

## 5.0 References

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## **Appendix A - Aquatic Resource Summary Tables**

**Table 1 – Data Points Summary**

| Data Points Summary |            |                |                        |              |                   |                  |
|---------------------|------------|----------------|------------------------|--------------|-------------------|------------------|
| Photos              | Data Point | Water Resource | Hydrophytic Vegetation | Hydric Soils | Wetland Hydrology | Within a Wetland |
| 3-4                 | 01         | Wetland A      | Yes                    | Yes          | Yes               | Yes              |
| 5-6                 | 02         | Wetland A      | No                     | Yes          | No                | No               |
| 9-10                | 03         | N/A            | Yes                    | No           | No                | No               |
| 11-12               | 04         | Wetland B      | Yes                    | Yes          | Yes               | Yes              |
| 13-14               | 05         | Wetland B      | No                     | No           | No                | No               |
| 20-21               | 06         | UNT 2          | No                     | No           | No                | No               |
| 23-24               | 07         | Wetland C      | No                     | Yes          | No                | No               |
| 25-26               | 08         | Wetland C      | Yes                    | Yes          | Yes               | Yes              |
| 32-33               | 09         | Wetland D      | Yes                    | Yes          | Yes               | Yes              |
| 35-36               | 10         | Wetland D      | No                     | Yes          | No                | No               |
| 52-53               | 11         | N/A            | No                     | No           | No                | No               |
| 50-51               | 12         | N/A            | No                     | No           | No                | No               |
| 54-55               | 13         | N/A            | Yes                    | No           | Yes               | No               |
| 58                  | 14         | Wetland E      | Yes                    | Yes          | Yes               | Yes              |
| 58-59               | 15         | Wetlands E & F | No                     | Yes          | Yes               | No               |
| 60-61               | 16         | Wetland F      | Yes                    | Yes          | Yes               | Yes              |
| 63-64               | 17         | N/A            | Yes                    | No           | No                | No               |
| 65-66               | 18         | Wetland G      | No                     | No           | No                | No               |
| 67-68               | 19         | Wetland G      | Yes                    | Yes          | Yes               | Yes              |
| 71-72               | 20         | Wetland H      | Yes                    | No           | Yes               | No               |
| 73-74               | 21         | Wetland H      | Yes                    | Yes          | Yes               | Yes              |
| 75-76               | 22         | Wetland H      | Yes                    | No           | Yes               | No               |
| 77-78               | 23         | Wetland H      | Yes                    | Yes          | Yes               | Yes              |
| 79-80               | 24         | UNT 5          | Yes                    | No           | Yes               | No               |
| 83-84               | 25         | N/A            | No                     | No           | No                | No               |
| 85-86               | 26         | N/A            | Yes                    | No           | Yes               | No               |
| 89-90               | 27         | Wetland I      | Yes                    | Yes          | Yes               | Yes              |
| 91-92               | 28         | Wetland I      | No                     | No           | Yes               | No               |
| 93-94               | 29         | Wetland I      | Yes                    | Yes          | Yes               | Yes              |
| 95-96               | 30         | Wetland I      | Yes                    | Yes          | Yes               | Yes              |
| 97-98               | 31         | Wetland I      | Yes                    | No           | No                | No               |
| 99-100              | 32         | Wetland I      | Yes                    | Yes          | Yes               | Yes              |
| 105-106             | 33         | Wetland J      | Yes                    | No           | No                | No               |
| 103-104             | 34         | Wetland J      | Yes                    | Yes          | Yes               | Yes              |
| 107-108             | 35         | UNT 8          | Yes                    | No           | No                | No               |
| 111-112             | 36         | UNT 8          | Yes                    | No           | No                | No               |

**Table 2 – Aquatic Resources Summary**

| <b>Aquatic Resources Summary: Wetlands &amp; Open Water</b> |               |                      |             |                |                      |                                               |
|-------------------------------------------------------------|---------------|----------------------|-------------|----------------|----------------------|-----------------------------------------------|
| <b>Delineated Resource</b>                                  | <b>Photos</b> | <b>Lat/ Long</b>     | <b>Type</b> | <b>Quality</b> | <b>Jurisdiction</b>  | <b>Total Acreage within Investigated Area</b> |
| Wetland A                                                   | 3-6           | 38.32752 / -85.67099 | PEMC        | Poor           | "waters of the U.S." | 1.47                                          |
| Wetland B                                                   | 11-15         | 38.32877 / -85.67042 | PEMC        | Average        | "waters of the U.S." | 0.04                                          |
| Wetland C                                                   | 23-27         | 38.33096 / -85.67155 | PEME        | Average        | "waters of the U.S." | 0.12                                          |
| Wetland D                                                   | 32-36         | 38.33205 / -85.67445 | PSS1C       | Average        | "waters of the U.S." | 0.59                                          |
| Wetland E                                                   | 58-59, 61     | 38.33982 / -85.66754 | PEME        | Average        | "waters of the U.S." | 0.01                                          |
| Wetland F                                                   | 59-62         | 38.34001 / -85.66751 | PEME        | Average        | "waters of the U.S." | 0.01                                          |
| Wetland G                                                   | 65-68         | 38.34116 / -85.66964 | PFO1C       | Excellent      | "waters of the U.S." | 0.02                                          |
| Wetland H                                                   | 71-78         | 38.34177 / -85.66876 | PFO1C       | Excellent      | "waters of the U.S." | 1.00                                          |
| Wetland I                                                   | 89-100        | 38.34319 / -85.67087 | PEMC/PFO1C  | Excellent      | "waters of the U.S." | 1.06<br>0.47 PEMC; 0.59 PFO1C                 |
| Wetland J                                                   | 103-106       | 38.34343 / -85.66734 | PFO1C       | Excellent      | "waters of the U.S." | 0.10                                          |
| Pond 1                                                      | 1-2           | 38.32815 / -85.67215 | L1UBHh      | Poor           | "waters of the U.S." | 1.31                                          |
| <b>Total</b>                                                |               |                      |             |                |                      | <b>5.73</b>                                   |



| Aquatic Resources Summary: Streams |                   |                        |                |            |            |                   |                                 |                        |                      |                   |             |
|------------------------------------|-------------------|------------------------|----------------|------------|------------|-------------------|---------------------------------|------------------------|----------------------|-------------------|-------------|
| Delineated Resource                | Photos            | Lat/ Long              | USGS Blue Line | OHWM Width | OHWM Depth | Narrative Quality | Riffle/Run Presence             | Substrate              | Jurisdiction         | Total Linear Feet | Total Acres |
| UNT 1                              | 15-16             | 38.32903/<br>-85.66988 | No             | 3'         | 1'         | Poor              | No riffle/run present           | Silt and sand          | "waters of the U.S." | 195               | 0.01        |
| UNT 2                              | 18-21             | 38.32938/<br>-85.67263 | No             | 2'         | 1.5'       | Poor              | 40% run/<br>5% riffle present   | Silt and sand          | "waters of the U.S." | 1,489             | 0.07        |
| UNT 3                              | 22, 30-31         | 38.33089/<br>-85.67251 | Yes            | 5'         | 2'         | Fair              | 40% run /<br>20% riffle present | Sand, silt, and gravel | "waters of the U.S." | 2,452             | 0.28        |
| UNT 4                              | 48-49             | 38.33762/<br>-85.66877 | No             | 3'         | 0.5'       | Good              | 45% run /<br>25% riffle present | Hardpan and silt       | "waters of the U.S." | 404               | 0.03        |
| UNT 5                              | 81-82             | 38.34196/<br>-85.66992 | No             | 3'         | 0.5'       | Good              | 15% run /<br>5% riffle present  | Hardpan and silt       | "waters of the U.S." | 413               | 0.03        |
| UNT 6                              | 69-70             | 38.34153/<br>-85.66893 | No             | 1'         | 2"         | Poor              | None riffle/run present         | Silt and sand          | "waters of the U.S." | 406               | 0.01        |
| UNT 7                              | 101-102           | 38.34316/<br>-85.67144 | Yes            | 13'        | 2.5'       | Good              | 45% run /<br>5% riffle present  | Hardpan and silt       | "waters of the U.S." | 123               | 0.04        |
| UNT 8                              | 108-110           | 38.34383/<br>-85.66754 | No             | 6'         | 1'         | Fair              | 25% run /<br>5% riffle present  | Hardpan and silt       | "waters of the U.S." | 1,012             | 0.14        |
| Lentzier Creek                     | 56-57, 87-88, 101 | 38.34209/<br>-85.66905 | Yes            | 18'        | 3'         | Good              | 50% run /<br>10% riffle present | Hardpan and silt       | "waters of the U.S." | 2,081             | 0.86        |
| <b>Total</b>                       |                   |                        |                |            |            |                   |                                 |                        |                      | <b>8,575</b>      | <b>1.47</b> |

\*Narrative Rating assigned to streams evaluated with QHEI based on Narrative Rating scale provided in QHEI manual. Narrative Rating assigned to streams evaluated with HHEI based on visual observations; no Narrative Rating scale provided in HHEI manual.

## **Appendix B - Routine Wetland Determination Data Forms**

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP01  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3278 Long: 85.6711 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                             |                                                               |                                          |                                                               |
|-------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                             | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                        | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                  | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of Wetland A. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. _____                                |                  |                   |                  |
| 2. _____                                |                  |                   |                  |
| 3. _____                                |                  |                   |                  |
| 4. _____                                |                  |                   |                  |
| 5. _____                                |                  |                   |                  |
| 0 = Total Cover                         |                  |                   |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Persicaria pensylvanica</i>      | 50               | Yes               | FACW             |
| 2. <i>Carex trichocarpa</i>            | 35               | Yes               | OBL              |
| 3. <i>Ambrosia artemisiifolia</i>      | 20               | No                | FACU             |
| 4. <i>Cyperus strigosus</i>            | 20               | No                | FACW             |
| 5. <i>Echinochloa crus-galli</i>       | 10               | No                | FACW             |
| 6. <i>Andropogon gerardii</i>          | 5                | No                | FAC              |
| 7. <i>Solidago patula</i>              | 3                | No                | OBL              |
| 8. _____                               |                  |                   |                  |
| 9. _____                               |                  |                   |                  |
| 10. _____                              |                  |                   |                  |
| 143 = Total Cover                      |                  |                   |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                      |                  |                   |                  |
| 2. _____                                      |                  |                   |                  |
| 0 = Total Cover                               |                  |                   |                  |

Remarks: (Include photo numbers here or on a separate sheet.)

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: 0 (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

# SOIL

Sampling Point: DP01

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | %  |                   |                  |                 |         |
| 0-4               | 10YR 4/2      | 60  | 10YR 4/6       | 40 | C                 | M                | Silty Clay Loam |         |
| 4-18              | 10YR 4/6      | 100 |                |    |                   |                  | Silty Clay Loam |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

**Primary Indicators (minimum of one is required; check all that apply)**

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

**Secondary Indicators (minimum of two required)**

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): 2  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 0  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP02  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 2.0 Lat: 38.3279 Long: 85.6711 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland A.       |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <u>Morus alba</u>                             | 15               | Yes               | FAC              |
| 2. <u>Acer saccharinum</u>                       | 10               | Yes               | FACW             |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 25               | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Coronilla varia</u>                        | 50               | Yes               | UPL              |
| 2. <u>Ambrosia artemisiifolia</u>                | 30               | Yes               | FACU             |
| 3. <u>Plantago lanceolata</u>                    | 10               | No                | FACU             |
| 4. <u>Trifolium pratense</u>                     | 5                | No                | FACU             |
| 5. _____                                         |                  |                   |                  |
| 6. _____                                         |                  |                   |                  |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 95               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 4 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species 10 x 2 = 20  
 FAC species 15 x 3 = 45  
 FACU species 95 x 4 = 380  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 120 (A) 445 (B)  
 Prevalence Index = B/A = 3.71

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | %  |                   |                  |                 |         |
| 0-4               | 10YR 4/2      | 60  | 10YR 4/6       | 40 | C                 | M                | Silty Clay Loam |         |
| 4-18              | 10YR 4/6      | 100 |                |    |                   |                  | Silty Clay Loam |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP03  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 1.0 Lat: 38.3282 Long: 85.6706 Datum: WGS 1984  
 Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                        |                                                                                   |                                                                                                     |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>          | Hydic Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>               |                                                                                   |                                                                                                     |
| Remarks:<br>This datapoint was collected due to the presence of hydrophytic vegetation near a culvert. |                                                                                   |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Populus deltoides</i>                      | 10               | Yes               | FAC              |
| 2. _____                                         | _____            | _____             | _____            |
| 3. _____                                         | _____            | _____             | _____            |
| 4. _____                                         | _____            | _____             | _____            |
| 5. _____                                         | _____            | _____             | _____            |
| 10 = Total Cover                                 |                  |                   |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Salix nigra</i>                            | 30               | Yes               | OBL              |
| 2. <i>Fraxinus pennsylvanica</i>                 | 10               | No                | FACW             |
| 3. <i>Juniperus communis</i>                     | 5                | No                | UPL              |
| 4. <i>Daucus carota</i>                          | 5                | No                | UPL              |
| 5. <i>Solidago patula</i>                        | 5                | No                | OBL              |
| 55 = Total Cover                                 |                  |                   |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Festuca trachyphylla</i>                   | 40               | Yes               | FACU             |
| 2. _____                                         | _____            | _____             | _____            |
| 3. _____                                         | _____            | _____             | _____            |
| 4. _____                                         | _____            | _____             | _____            |
| 5. _____                                         | _____            | _____             | _____            |
| 6. _____                                         | _____            | _____             | _____            |
| 7. _____                                         | _____            | _____             | _____            |
| 8. _____                                         | _____            | _____             | _____            |
| 9. _____                                         | _____            | _____             | _____            |
| 10. _____                                        | _____            | _____             | _____            |
| 40 = Total Cover                                 |                  |                   |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         | _____            | _____             | _____            |
| 2. _____                                         | _____            | _____             | _____            |
| 0 = Total Cover                                  |                  |                   |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 3 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 0 (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture         | Remarks                       |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------------|-------------------------------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |                 |                               |
| 0-2               | 10YR 4/2      | 100 |                |   |                   |                  | Silty Clay Loam | Restrictive layer at 2 inches |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |
|                   |               |     |                |   |                   |                  |                 |                               |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: Riprap  
Depth (inches): 2

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): >18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): >18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP04  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3286 Long: 85.6708 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                             |                                                               |                                          |                                                               |
|-------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                             | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                        | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                  | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of Wetland B. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. _____                                |                  |                   |                  |
| 2. _____                                |                  |                   |                  |
| 3. _____                                |                  |                   |                  |
| 4. _____                                |                  |                   |                  |
| 5. _____                                |                  |                   |                  |
| 0 = Total Cover                         |                  |                   |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Fraxinus pennsylvanica</i>                 | 15               | Yes               | FACW             |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 15 = Total Cover                                 |                  |                   |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Carex cristatella</i>            | 75               | Yes               | FACW             |
| 2. <i>Bidens frondosa</i>              | 10               | No                | FACW             |
| 3. <i>Glechoma hederacea</i>           | 5                | No                | FACU             |
| 4. <i>Microstegium vimineum</i>        | 2                | No                | FAC              |
| 5. _____                               |                  |                   |                  |
| 6. _____                               |                  |                   |                  |
| 7. _____                               |                  |                   |                  |
| 8. _____                               |                  |                   |                  |
| 9. _____                               |                  |                   |                  |
| 10. _____                              |                  |                   |                  |
| 92 = Total Cover                       |                  |                   |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                      |                  |                   |                  |
| 2. _____                                      |                  |                   |                  |
| 0 = Total Cover                               |                  |                   |                  |

Remarks: (Include photo numbers here or on a separate sheet.)

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: 0 (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

# SOIL

Sampling Point: DP04

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |    |                   |                  |                 |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
| Depth (inches)                                                                                                      | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|                                                                                                                     | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-7                                                                                                                 | 10YR 4/1      | 85 | 10YR 4/6       | 15 | C                 | M                | Sandy Clay Loam |         |
| 7-18                                                                                                                | 10YR 5/2      | 60 | 10YR 5/4       | 40 | C                 | M                | Sandy Clay Loam |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                          | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|                                                                                 |                                                                                           |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Restrictive Layer (if observed):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/> |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input checked="" type="checkbox"/> Sediment Deposits (B2)<br><input checked="" type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input checked="" type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt;0</u><br>Water Table Present?    Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>7</u><br>Saturation Present?    Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>2</u><br>(includes capillary fringe)                                                                                                                                                                          | <b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP05  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 2.0 Lat: 38.3286 Long: 85.6708 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 0 to 2 percent slopes (EesA) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>      |                                                                                                     |
| Remarks:<br>The data point is representative of the upland area surrounding Wetland B.        |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Toxicodendron radicans</i>                 | 30               | Yes               | FAC              |
| 2. <i>Rubus idaeus</i>                           | 20               | Yes               | FACU             |
| 3. <i>Glechoma hederacea</i>                     | 20               | Yes               | FACU             |
| 4. <i>Solidago caesia</i>                        | 20               | Yes               | FACU             |
| 5. <i>Bidens frondosa</i>                        | 5                | No                | FACW             |
| 6. <i>Sorghum halepense</i>                      | 5                | No                | FACU             |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
| 100 = Total Cover                                |                  |                   |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 4 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 25 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species 5 x 2 = 10  
 FAC species 30 x 3 = 90  
 FACU species 65 x 4 = 260  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 100 (A) 360 (B)  
 Prevalence Index = B/A = 3.60

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture         | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |                 |         |
| 0-18              | 10YR 5/4      | 100 |                |   |                   |                  | Silty Clay Loam |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP06  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 0.5 Lat: 38.3295 Long: 85.6721 Datum: WGS 1984  
 Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                |                                                               |                                          |                                                               |
|------------------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                                | Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                           | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                                     | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point was collected to characterize the upland conditions next to UNT 1. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. _____                                |                  |                   |                  |
| 2. _____                                |                  |                   |                  |
| 3. _____                                |                  |                   |                  |
| 4. _____                                |                  |                   |                  |
| 5. _____                                |                  |                   |                  |
| 0 = Total Cover                         |                  |                   |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Schedonorus arundinaceus</i>     | 20               | Yes               | FACU             |
| 2. <i>Melilotus officinalis</i>        | 15               | Yes               | FACU             |
| 3. <i>Daucus carota</i>                | 10               | Yes               | FACU             |
| 4. <i>Sorghum halepense</i>            | 10               | Yes               | FACU             |
| 5. <i>Ambrosia artemisiifolia</i>      | 7                | No                | FACU             |
| 6. <i>Dipsacus fullonum</i>            | 5                | No                | FACU             |
| 7. <i>Solidago caesia</i>              | 5                | No                | FACU             |
| 8. _____                               |                  |                   |                  |
| 9. _____                               |                  |                   |                  |
| 10. _____                              |                  |                   |                  |
| 72 = Total Cover                       |                  |                   |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                      |                  |                   |                  |
| 2. _____                                      |                  |                   |                  |
| 0 = Total Cover                               |                  |                   |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 4 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species 72 x 4 = 288  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 72 (A) 288 (B)  
 Prevalence Index = B/A = 4.00

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

**Remarks:** (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP06

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |    |                   |                  |                 |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
| Depth (inches)                                                                                                      | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|                                                                                                                     | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-4                                                                                                                 | 10YR 3/2      | 95 | 10YR 4/4       | 5  | C                 | M                | Silty Clay Loam |         |
| 4-18                                                                                                                | 10YR 4/6      | 90 | 10YR 5/2       | 10 | C                 | M                | Silty Clay Loam |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                     | Indicators for Problematic Hydric Soils <sup>3</sup> :    |                                                                                                                           |
|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   | <input type="checkbox"/> Coast Prairie Redox (A16)        | <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           | <input type="checkbox"/> Dark Surface (S7)                |                                                                                                                           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       | <input type="checkbox"/> Iron-Manganese Masses (F12)      |                                                                                                                           |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |                                                                                                                           |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   | <input type="checkbox"/> Other (Explain in Remarks)       |                                                                                                                           |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |                                                           |                                                                                                                           |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |                                                           |                                                                                                                           |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |                                                           |                                                                                                                           |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |                                                           |                                                                                                                           |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |                                                           |                                                                                                                           |

|                                                                                 |                                                                                           |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Restrictive Layer (if observed):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Remarks:                                                                        |                                                                                           |

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt; 0</u><br>Water Table Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>Saturation Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>(includes capillary fringe)                                                                                                      | <b>Wetland Hydrology Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP07  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): convex  
 Slope (%): 1.0 Lat: 38.3308 Long: 85.6711 Datum: WGS 1984  
 Soil Map Unit Name: Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes (UnsB) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                         |                                                               |                                          |                                                               |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                         | Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                    | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                              | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland C. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                                                                                                                                                                                                                                                                                                                                                                | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>3</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)                                                                                                                                                                                                                                                                                                                                                                      |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|----------------------|----------------|------------------------|-----------------|----------------------|----------------|------------------------|------------------|-----------------------|------------------|-------------------------------|----------------|--------------------------------------|--|
| 1. <u>Fraxinus pennsylvanica</u>                                                                                                                                                                                                                                                                                                                                                                       | <u>1</u>         | <u>Yes</u>        | <u>FACW</u>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| 2. _____                                                                                                                                                                                                                                                                                                                                                                                               | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| 3. _____                                                                                                                                                                                                                                                                                                                                                                                               | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| 4. _____                                                                                                                                                                                                                                                                                                                                                                                               | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| 5. _____                                                                                                                                                                                                                                                                                                                                                                                               | _____            | _____             | _____            | <b>Prevalence Index worksheet:</b><br><table border="0"> <tr> <td>Total % Cover of:</td> <td>Multiply by:</td> </tr> <tr> <td>OBL species <u>0</u></td> <td>x 1 = <u>0</u></td> </tr> <tr> <td>FACW species <u>21</u></td> <td>x 2 = <u>42</u></td> </tr> <tr> <td>FAC species <u>0</u></td> <td>x 3 = <u>0</u></td> </tr> <tr> <td>FACU species <u>45</u></td> <td>x 4 = <u>180</u></td> </tr> <tr> <td>UPL species <u>40</u></td> <td>x 5 = <u>200</u></td> </tr> <tr> <td>Column Totals: <u>106</u> (A)</td> <td><u>422</u> (B)</td> </tr> <tr> <td colspan="2">Prevalence Index = B/A = <u>3.98</u></td> </tr> </table> | Total % Cover of: | Multiply by: | OBL species <u>0</u> | x 1 = <u>0</u> | FACW species <u>21</u> | x 2 = <u>42</u> | FAC species <u>0</u> | x 3 = <u>0</u> | FACU species <u>45</u> | x 4 = <u>180</u> | UPL species <u>40</u> | x 5 = <u>200</u> | Column Totals: <u>106</u> (A) | <u>422</u> (B) | Prevalence Index = B/A = <u>3.98</u> |  |
| Total % Cover of:                                                                                                                                                                                                                                                                                                                                                                                      | Multiply by:     |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| OBL species <u>0</u>                                                                                                                                                                                                                                                                                                                                                                                   | x 1 = <u>0</u>   |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| FACW species <u>21</u>                                                                                                                                                                                                                                                                                                                                                                                 | x 2 = <u>42</u>  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| FAC species <u>0</u>                                                                                                                                                                                                                                                                                                                                                                                   | x 3 = <u>0</u>   |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| FACU species <u>45</u>                                                                                                                                                                                                                                                                                                                                                                                 | x 4 = <u>180</u> |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| UPL species <u>40</u>                                                                                                                                                                                                                                                                                                                                                                                  | x 5 = <u>200</u> |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| Column Totals: <u>106</u> (A)                                                                                                                                                                                                                                                                                                                                                                          | <u>422</u> (B)   |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| Prevalence Index = B/A = <u>3.98</u>                                                                                                                                                                                                                                                                                                                                                                   |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| <b>Sapling/Shrub Stratum (Plot size: <u>15 ft</u>)</b><br>1. _____<br>2. _____<br>3. _____<br>4. _____<br>5. _____<br>_____ = Total Cover                                                                                                                                                                                                                                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| <b>Herb Stratum (Plot size: <u>5 ft</u>)</b><br>1. <u>Solidago altissima</u> <u>40</u> <u>Yes</u> <u>FACU</u><br>2. <u>Glycine max</u> <u>40</u> <u>Yes</u> <u>UPL</u><br>3. <u>Alopecurus pratensis</u> <u>20</u> <u>No</u> <u>FACW</u><br>4. <u>Sorghum halepense</u> <u>5</u> <u>No</u> <u>FACU</u><br>5. _____<br>6. _____<br>7. _____<br>8. _____<br>9. _____<br>10. _____<br>_____ = Total Cover |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| <b>Woody Vine Stratum (Plot size: <u>15 ft</u>)</b><br>1. _____<br>2. _____<br>_____ = Total Cover                                                                                                                                                                                                                                                                                                     |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |
| Remarks: (Include photo numbers here or on a separate sheet.)                                                                                                                                                                                                                                                                                                                                          |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                   |              |                      |                |                        |                 |                      |                |                        |                  |                       |                  |                               |                |                                      |  |

# SOIL

Sampling Point: DP07

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |    |                   |                  |                 |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|----|-------------------|------------------|-----------------|---------|
| Depth (inches)                                                                                                      | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | %  |                   |                  |                 |         |
| 0-4                                                                                                                 | 10YR 3/2      | 100 |                |    |                   |                  | Silty Clay Loam |         |
| 4-8                                                                                                                 | 10YR 4/2      | 90  | 10YR 5/4       | 10 | C                 | M                | Silty Clay Loam |         |
| 8-18                                                                                                                | 10YR 4/2      | 85  | 10YR 4/6       | 10 | C                 | M                | Silty Clay Loam |         |
|                                                                                                                     |               |     | 10YR 5/8       | 5  | C                 | M                |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                          | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| Restrictive Layer (if observed): | Hydric Soil Present?                                          |
|----------------------------------|---------------------------------------------------------------|
| Type: _____                      | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Depth (inches): _____            |                                                               |

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Wetland Hydrology Present?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt; 0</u><br>Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>Saturation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>(includes capillary fringe)                                                                                                                                             | Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP08  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3310 Long: 85.6714 Datum: WGS 1984  
 Soil Map Unit Name: Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes (UnsB) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                             |                                                               |                                          |                                                               |
|-------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                             | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                        | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                  | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of Wetland C. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>2</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 0 = Total Cover                                               |                  |                   |                  | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                     |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Herb Stratum (Plot size: <u>5 ft</u> )                        |                  |                   |                  | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <i>Persicaria pensylvanica</i>                             | 30               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. <i>Pilea pumila</i>                                        | 20               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. <i>Vernonia fasciculata</i>                                | 10               | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. <i>Rumex crispus</i>                                       | 7                | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5. <i>Sorghum halepense</i>                                   | 7                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 6. <i>Alopecurus pratensis</i>                                | 7                | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 7. <i>Solidago altissima</i>                                  | 5                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 8. <i>Cyperus strigosus</i>                                   | 3                | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 9. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 10. _____                                                     |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 89 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 |                  |                   |                  | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



# SOIL

Sampling Point: DP08

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | %  |                   |                  |                 |         |
| 0-4               | 10YR 3/2      | 100 |                |    |                   |                  | Silty Clay Loam |         |
| 4-8               | 10YR 4/2      | 80  | 10YR 3/6       | 20 | C                 | M                | Clay Loam       |         |
| 8-18              | 10YR 5/2      | 75  | 10YR 4/6       | 25 | C                 | M                | Clay Loam       |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |
|                   |               |     |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☒ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☒ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): >18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): >18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland C appears to be depressional area that collects sheet flow from the surrounding field.

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP09  
 Investigator(s): Leah Boits, Chad Costa Section, Township, Range: Clark's Grant #15  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3321 Long: 85.6743 Datum: WGS 1984  
 Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                             |                                                               |                                          |                                                               |
|-------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                             | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                        | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                  | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of Wetland D. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>5</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Fraxinus pennsylvanica</i>                              | 25               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Populus deltoides</i>                                   | 5                | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 30 = Total Cover                                              |                  |                   |                  | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                 |
| <b>Sapling/Shrub Stratum (Plot size: <u>15 ft</u>)</b>        |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Fraxinus pennsylvanica</i>                              | 25               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Salix nigra</i>                                         | 15               | Yes               | OBL              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 40 = Total Cover                                              |                  |                   |                  | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| <b>Herb Stratum (Plot size: <u>5 ft</u>)</b>                  |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Carex frankii</i>                                       | 25               | Yes               | OBL              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Phragmites australis</i>                                | 10               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Eleocharis equisetoides</i>                             | 5                | No                | OBL              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. <i>Solidago altissima</i>                                  | 3                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 7. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10. _____                                                     |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 43 = Total Cover                                              |                  |                   |                  | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Woody Vine Stratum (Plot size: <u>15 ft</u>)</b>           |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

# SOIL

Sampling Point: DP09

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-4               | 10YR 5/1      | 95 | 10YR 4/6       | 5  | C                 | M                | Silty Clay Loam |         |
| 4-18              | 10YR 6/1      | 85 | 7.5YR 4/6      | 15 | C                 | M                | Silty Clay Loam |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)         | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input checked="" type="checkbox"/> Drift Deposits (B3)            | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0

Water Table Present? Yes ☐ No ☒ Depth (inches): 6

Saturation Present? Yes ☒ No ☐ Depth (inches): 0  
(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP10  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): convex  
 Slope (%): 2.0 Lat: 38.3322 Long: 85.6742 Datum: WGS 1984  
 Soil Map Unit Name: Udorthents, cut and filled (Uaa) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                         |                                                               |                                          |                                                               |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                         | Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                    | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                              | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland D. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Pyrus calleryana</i>                       | 65               | Yes               | NI               |
| 2. <i>Robinia pseudoacacia</i>                   | 25               | Yes               | FACU             |
| 3. <i>Maclura pomifera</i>                       | 25               | Yes               | FACU             |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 115              | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Lonicera morrowii</i>                      | 10               | Yes               | FACU             |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 10               | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Lonicera morrowii</i>                      | 5                | Yes               | FACU             |
| 2. <i>Carex blanda</i>                           | 2                | Yes               | FAC              |
| 3. <i>Sanicula canadensis</i>                    | 2                | Yes               | FACU             |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 6. _____                                         |                  |                   |                  |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 9                | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)  
 Total Number of Dominant Species Across All Strata: 7 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 14 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species 2 x 3 = 6  
 FACU species 67 x 4 = 268  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 69 (A) 274 (B)  
 Prevalence Index = B/A = 3.97

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)



# SOIL

Sampling Point: DP10

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture   | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|-----------|---------|
|                   | Color (moist) | %   | Color (moist)  | %  |                   |                  |           |         |
| 0-7               | 10YR 3/2      | 100 |                |    |                   |                  | Silt Loam |         |
| 7-18              | 2.5YR 6/2     | 60  | 7.5YR 5/8      | 20 | C                 | M                | Silt Loam |         |
|                   |               |     | 10YR 2/1       | 20 | D                 | M                |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP11  
 Investigator(s): Audrey Hanner, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3393 Long: 85.6698 Datum: WGS 1984  
 Soil Map Unit Name: Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded (RztC2) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                |                                                                                                     |
|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>  | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>             |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>       |                                                                                                     |
| Remarks:<br>This datapoint was collected to characterize upland conditions within wooded area. |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Juglans nigra</i>                 | 45               | Yes               | FACU             |
| 2. <i>Tilia americana</i>               | 20               | Yes               | FACU             |
| 3. <i>Maclura pomifera</i>              | 15               | No                | FACU             |
| 4. <i>Carya glabra</i>                  | 15               | No                | FACU             |
| 5. _____                                |                  |                   |                  |
|                                         | 95               | = Total Cover     |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Verbesina alternifolia</i>       | 35               | Yes               | FACW             |
| 2. <i>Dichanthelium clandestinum</i>   | 20               | Yes               | FACW             |
| 3. <i>Lonicera japonica</i>            | 15               | No                | FACU             |
| 4. <i>Sanicula canadensis</i>          | 10               | No                | FACU             |
| 5. <i>Elymus virginicus</i>            | 5                | No                | FACW             |
| 6. _____                               |                  |                   |                  |
| 7. _____                               |                  |                   |                  |
| 8. _____                               |                  |                   |                  |
| 9. _____                               |                  |                   |                  |
| 10. _____                              |                  |                   |                  |
|                                        | 85               | = Total Cover     |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                      |                  |                   |                  |
| 2. _____                                      |                  |                   |                  |
|                                               | 0                | = Total Cover     |                  |

Remarks: (Include photo numbers here or on a separate sheet.)

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 4 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: Multiply by:  
 OBL species 0 x 1 = 0  
 FACW species 60 x 2 = 120  
 FAC species 0 x 3 = 0  
 FACU species 120 x 4 = 480  
 UPL species 0 x 5 = 0  
 Column Totals: 180 (A) 600 (B)  
 Prevalence Index = B/A = 3.33

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

# SOIL

Sampling Point: DP11

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture         | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |                 |         |
| 0-18              | 10YR 4/4      | 100 |                |   |                   |                  | Silty Clay Loam |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): >18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): >18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP12  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3390 Long: 85.6674 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded (EesD2) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                                              |                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>                                | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>                                           |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>                                     |                                                                                                     |
| Remarks:<br>This datapoint was collected to characterize upland conditions within the wooded area adjacent to Lentzier Creek |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Liriodendron tulipifera</i>                | 45               | Yes               | FACU             |
| 2. <i>Carya glabra</i>                           | 35               | Yes               | FACU             |
| 3. <i>Sassafras albidum</i>                      | 15               | No                | FACU             |
| 4. <i>Tilia americana</i>                        | 15               | No                | FACU             |
| 5. _____                                         |                  |                   |                  |
|                                                  | 110              | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Rosa multiflora</i>                        | 15               | Yes               | FACU             |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 15               | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Microstegium vimineum</i>                  | 17               | Yes               | FAC              |
| 2. <i>Vitis riparia</i>                          | 15               | Yes               | FACW             |
| 3. <i>Fraxinus pennsylvanica</i>                 | 7                | No                | FACW             |
| 4. <i>Rubus idaeus</i>                           | 4                | No                | FACU             |
| 5. <i>Elymus virginicus</i>                      | 2                | No                | FACW             |
| 6. <i>Parthenocissus quinquefolia</i>            | 2                | No                | FACU             |
| 7. <i>Persicaria pensylvanica</i>                | 2                | No                | FACW             |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 49               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 20 (A/B)

**Prevalence Index worksheet:**

|                                          |                |
|------------------------------------------|----------------|
| Total % Cover of:                        | Multiply by:   |
| OBL species _____ x 1 = _____            |                |
| FACW species <u>26</u> x 2 = <u>52</u>   |                |
| FAC species <u>17</u> x 3 = <u>51</u>    |                |
| FACU species <u>131</u> x 4 = <u>524</u> |                |
| UPL species _____ x 5 = _____            |                |
| Column Totals: <u>174</u> (A)            | <u>627</u> (B) |

Prevalence Index = B/A = 3.60

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP12

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |   |                   |         |                 |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|---|-------------------|---------|-----------------|
| Depth<br>(inches)                                                                                                   | Matrix        |     | Redox Features |   |                   | Texture | Remarks         |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> |         |                 |
| 0-18                                                                                                                | 2.5Y 5/4      | 100 |                |   |                   |         | Silty clay loam |
|                                                                                                                     |               |     |                |   |                   |         |                 |
|                                                                                                                     |               |     |                |   |                   |         |                 |
|                                                                                                                     |               |     |                |   |                   |         |                 |
|                                                                                                                     |               |     |                |   |                   |         |                 |
|                                                                                                                     |               |     |                |   |                   |         |                 |
|                                                                                                                     |               |     |                |   |                   |         |                 |
|                                                                                                                     |               |     |                |   |                   |         |                 |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                     | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|                                                                                 |                                                                                           |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Restrictive Layer (if observed):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/> |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt; 0</u><br>Water Table Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>Saturation Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>(includes capillary fringe)                                                                                                      | <b>Wetland Hydrology Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP13  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 1.0 Lat: 38.3396 Long: 85.6673 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                            |                                                               |                                                                                                        |
|------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                                            | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                                       | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                                                                                        |
| Wetland Hydrology Present?                                                                                 | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                                                                                        |
| Remarks:<br>This datapoint was collected to characterize the upland conditions adjacent to Lentzier Creek. |                                                               |                                                                                                        |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet:<br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>6</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>83</u> (A/B)                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------|------------------|-------------------|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Ulmus americana</i>                                     | 65               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2. <i>Fraxinus pennsylvanica</i>                              | 30               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3. <i>Morus alba</i>                                          | 15               | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 110 = Total Cover                                             |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              | Absolute % Cover | Dominant Species? | Indicator Status | Prevalence Index worksheet:<br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                     |
| 1. <i>Acer negundo</i>                                        | 5                | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Herb Stratum (Plot size: <u>5 ft</u> )                        | Absolute % Cover | Dominant Species? | Indicator Status | Hydrophytic Vegetation Indicators:<br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <i>Elymus riparius</i>                                     | 15               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2. <i>Verbesina alternifolia</i>                              | 15               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 3. <i>Pilea pumila</i>                                        | 10               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 4. <i>Viola sororia</i>                                       | 10               | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 5. <i>Euonymus americanus</i>                                 | 5                | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 6. <i>Amphicarpaea bracteata</i>                              | 3                | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 7. <i>Impatiens capensis</i>                                  | 2                | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 8. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 9. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 10. _____                                                     | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 60 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 | Absolute % Cover | Dominant Species? | Indicator Status | Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1. <i>Parthenocissus quinquefolia</i>                         | 1                | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 2. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| 1 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



# SOIL

Sampling Point: DP13

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture   | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |           |         |
| 0-5               | 7.5YR 3/2     | 100 |                |   |                   |                  | Silt Loam |         |
| 5-20              | 7.5YR 4/4     | 100 |                |   |                   |                  | Silt Loam |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)         | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP14  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3398 Long: 85.6676 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                   |                                                                                          |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Hydic Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Remarks:<br>This datapoint is representative of Wetland E.                                    |                                                                                   |                                                                                          |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <u>Platanus occidentalis</u>                  | 45               | Yes               | FACW             |
| 2. _____                                         | _____            | _____             | _____            |
| 3. _____                                         | _____            | _____             | _____            |
| 4. _____                                         | _____            | _____             | _____            |
| 5. _____                                         | _____            | _____             | _____            |
| 45 = Total Cover                                 |                  |                   |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         | _____            | _____             | _____            |
| 2. _____                                         | _____            | _____             | _____            |
| 3. _____                                         | _____            | _____             | _____            |
| 4. _____                                         | _____            | _____             | _____            |
| 5. _____                                         | _____            | _____             | _____            |
| 0 = Total Cover                                  |                  |                   |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <u>Juncus effusus</u>                         | 35               | Yes               | OBL              |
| 2. <u>Carex frankii</u>                          | 20               | Yes               | OBL              |
| 3. <u>Carex vulpinoidea</u>                      | 10               | No                | FACW             |
| 4. <u>Schedonorus arundinaceus</u>               | 10               | No                | FACU             |
| 5. <u>Leersia virginica</u>                      | 5                | No                | FACW             |
| 6. <u>Salix interior</u>                         | 5                | No                | FACW             |
| 7. <u>Bidens frondosa</u>                        | 5                | No                | FACW             |
| 8. _____                                         | _____            | _____             | _____            |
| 9. _____                                         | _____            | _____             | _____            |
| 10. _____                                        | _____            | _____             | _____            |
| 90 = Total Cover                                 |                  |                   |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         | _____            | _____             | _____            |
| 2. _____                                         | _____            | _____             | _____            |
| 0 = Total Cover                                  |                  |                   |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)  
 Total Number of Dominant Species Across All Strata: 3 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 0 (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP14

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-9               | 10YR 4/3      | 90 | 10YR 5/6       | 10 | C                 | M                | Silty Clay Loam |         |
| 9-18              | 5YR 5/2       | 70 | 10YR 5/6       | 30 | C                 | M                | Silty Clay Loam |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input checked="" type="checkbox"/> Water-Stained Leaves (B9)       |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)         | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4)        | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP15  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3399 Long: 85.6675 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>      |                                                                                                     |
| Remarks:<br>This point is representative of the upland area surrounding Wetland E.            |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Schedonorus arundinaceus</i>               | 60               | Yes               | FACU             |
| 2. <i>Trifolium repens</i>                       | 5                | No                | FACU             |
| 3. <i>Acalypha rhomboidea</i>                    | 5                | No                | FACU             |
| 4. <i>Bidens frondosa</i>                        | 2                | No                | FACW             |
| 5. _____                                         |                  |                   |                  |
| 6. _____                                         |                  |                   |                  |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
| 72 = Total Cover                                 |                  |                   |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 0 = Total Cover                                  |                  |                   |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)  
 Total Number of Dominant Species Across All Strata: 1 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 0 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species <sup>2</sup> \_\_\_\_\_ x 2 = 4  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species <sup>70</sup> \_\_\_\_\_ x 4 = 280  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 72 (A) 284 (B)  
 Prevalence Index = B/A = 3.94

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)



# SOIL

Sampling Point: DP15

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |    |                   |                  |                 |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
| Depth (inches)                                                                                                      | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|                                                                                                                     | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-9                                                                                                                 | 10YR 4/3      | 90 | 10YR 5/6       | 10 | C                 | M                | Silty Clay Loam |         |
| 9-18                                                                                                                | 5YR 5/2       | 70 | 10YR 5/6       | 30 | C                 | M                | Silty Clay Loam |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                          | Indicators for Problematic Hydric Soils <sup>3</sup> :    |                                                                                                                           |
|------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        | <input type="checkbox"/> Coast Prairie Redox (A16)        | <sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                | <input type="checkbox"/> Dark Surface (S7)                |                                                                                                                           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            | <input type="checkbox"/> Iron-Manganese Masses (F12)      |                                                                                                                           |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |                                                                                                                           |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        | <input type="checkbox"/> Other (Explain in Remarks)       |                                                                                                                           |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |                                                           |                                                                                                                           |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |                                                           |                                                                                                                           |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |                                                           |                                                                                                                           |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |                                                           |                                                                                                                           |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |                                                           |                                                                                                                           |

|                                                                                 |                                                                                           |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Restrictive Layer (if observed):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Remarks:                                                                        |                                                                                           |

# HYDROLOGY

| Wetland Hydrology Indicators:                                         |                                                                     |                                                                    |  |
|-----------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------|--|
| Primary Indicators (minimum of one is required; check all that apply) |                                                                     | Secondary Indicators (minimum of two required)                     |  |
| <input type="checkbox"/> Surface Water (A1)                           | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |  |
| <input type="checkbox"/> High Water Table (A2)                        | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |  |
| <input type="checkbox"/> Saturation (A3)                              | <input type="checkbox"/> True Aquatic Plants (B14)                  | <input type="checkbox"/> Dry-Season Water Table (C2)               |  |
| <input type="checkbox"/> Water Marks (B1)                             | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Crayfish Burrows (C8)                     |  |
| <input type="checkbox"/> Sediment Deposits (B2)                       | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |  |
| <input type="checkbox"/> Drift Deposits (B3)                          | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |  |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4)           | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Geomorphic Position (D2)                  |  |
| <input type="checkbox"/> Iron Deposits (B5)                           | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input type="checkbox"/> FAC-Neutral Test (D5)                     |  |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)    | <input type="checkbox"/> Gauge or Well Data (D9)                    |                                                                    |  |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)      | <input type="checkbox"/> Other (Explain in Remarks)                 |                                                                    |  |

|                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------|
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt; 0</u><br>Water Table Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>Saturation Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>(includes capillary fringe) |  | <b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                        |  |                                                                                                 |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                 |



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP16  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3400 Long: 85.6675 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                   |                                                                                          |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Hydic Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Remarks:<br>This data point is representative of Wetland F.                                   |                                                                                   |                                                                                          |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Liquidambar styraciflua</i>       | 20               | Yes               | FACW             |
| 2. <i>Fraxinus pennsylvanica</i>        | 10               | Yes               | FACW             |
| 3. <i>Acer negundo</i>                  | 10               | Yes               | FAC              |
| 4. _____                                |                  |                   |                  |
| 5. _____                                |                  |                   |                  |
|                                         | 40               | = Total Cover     |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Schedonorus arundinaceus</i>     | 20               | Yes               | FACU             |
| 2. <i>Carex frankii</i>                | 15               | Yes               | OBL              |
| 3. <i>Lycopus asper</i>                | 15               | Yes               | OBL              |
| 4. <i>Juncus effusus</i>               | 15               | Yes               | OBL              |
| 5. <i>Salix interior</i>               | 5                | No                | FACW             |
| 6. <i>Juncus interior</i>              | 5                | No                | FAC              |
| 7. <i>Mimulus alatus</i>               | 3                | No                | OBL              |
| 8. <i>Eleocharis equisetoides</i>      | 3                | No                | OBL              |
| 9. _____                               |                  |                   |                  |
| 10. _____                              |                  |                   |                  |
|                                        | 81               | = Total Cover     |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                      |                  |                   |                  |
| 2. _____                                      |                  |                   |                  |
|                                               | 0                | = Total Cover     |                  |

Remarks: (Include photo numbers here or on a separate sheet.)

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)  
 Total Number of Dominant Species Across All Strata: 7 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by:  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 0 (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☒ No ☐

# SOIL

Sampling Point: DP16

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth (inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture   | Remarks |
|----------------|---------------|----|----------------|----|-------------------|------------------|-----------|---------|
|                | Color (moist) | %  | Color (moist)  | %  |                   |                  |           |         |
| 0-9            | 2.5YR 5/2     | 80 | 10YR 5/6       | 20 | C                 | M                | Clay Loam |         |
| 9-18           | 5YR 5/1       | 80 | 2.5YR 3/4      | 20 | C                 | M                | Clay Loam |         |
|                |               |    |                |    |                   |                  |           |         |
|                |               |    |                |    |                   |                  |           |         |
|                |               |    |                |    |                   |                  |           |         |
|                |               |    |                |    |                   |                  |           |         |
|                |               |    |                |    |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

|                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

|                                                           |
|-----------------------------------------------------------|
| <input type="checkbox"/> Coast Prairie Redox (A16)        |
| <input type="checkbox"/> Dark Surface (S7)                |
| <input type="checkbox"/> Iron-Manganese Masses (F12)      |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (Explain in Remarks)       |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes ☒ No ☐

Remarks:

# HYDROLOGY

**Wetland Hydrology Indicators:**

|                                                                              |                                                                     |                                                                    |
|------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------|
| <u>Primary Indicators (minimum of one is required; check all that apply)</u> |                                                                     | <u>Secondary Indicators (minimum of two required)</u>              |
| <input type="checkbox"/> Surface Water (A1)                                  | <input type="checkbox"/> Water-Stained Leaves (B9)                  | <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> High Water Table (A2)                               | <input type="checkbox"/> Aquatic Fauna (B13)                        | <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Saturation (A3)                                     | <input type="checkbox"/> True Aquatic Plants (B14)                  | <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Water Marks (B1)                                    | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 | <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)                   | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) | <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Drift Deposits (B3)                                 | <input type="checkbox"/> Presence of Reduced Iron (C4)              | <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4)                  | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) | <input type="checkbox"/> Geomorphic Position (D2)                  |
| <input type="checkbox"/> Iron Deposits (B5)                                  | <input type="checkbox"/> Thin Muck Surface (C7)                     | <input checked="" type="checkbox"/> FAC-Neutral Test (D5)          |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)           | <input type="checkbox"/> Gauge or Well Data (D9)                    |                                                                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)             | <input type="checkbox"/> Other (Explain in Remarks)                 |                                                                    |

**Field Observations:**

|                        |                                                               |                                |
|------------------------|---------------------------------------------------------------|--------------------------------|
| Surface Water Present? | Yes <input type="radio"/> No <input checked="" type="radio"/> | Depth (inches): <u>&lt; 0</u>  |
| Water Table Present?   | Yes <input type="radio"/> No <input checked="" type="radio"/> | Depth (inches): <u>&gt; 18</u> |
| Saturation Present?    | Yes <input type="radio"/> No <input checked="" type="radio"/> | Depth (inches): <u>&gt; 18</u> |

(includes capillary fringe)

**Wetland Hydrology Present?** Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Surface water adjacent

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP17  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 0.5 Lat: 38.3411 Long: 85.6682 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                          |                                                               |                                                                                                        |
|------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                          | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                     | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                                                                                        |
| Wetland Hydrology Present?                                                               | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                                                                                        |
| Remarks:<br>This data point was collected due to the presence of hydrophytic vegetation. |                                                               |                                                                                                        |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>9</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>56</u> (A/B)                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Liriodendron tulipifera</i>                             | 40               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Liquidambar styraciflua</i>                             | 40               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Juglans cinerea</i>                                     | 30               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                 |
| 110 = Total Cover                                             |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              | Absolute % Cover | Dominant Species? | Indicator Status |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Liriodendron tulipifera</i>                             | 25               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Lindera benzoin</i>                                     | 15               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Fraxinus pennsylvanica</i>                              | 10               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      | _____            | _____             | _____            | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 50 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Herb Stratum (Plot size: <u>5 ft</u> )                        | Absolute % Cover | Dominant Species? | Indicator Status |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Fraxinus pennsylvanica</i>                              | 10               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Viola sororia</i>                                       | 7                | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Sanicula canadensis</i>                                 | 5                | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. <i>Polystichum acrostichoides</i>                          | 2                | No                | UPL              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 7. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10. _____                                                     | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 24 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 | Absolute % Cover | Dominant Species? | Indicator Status | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. _____                                                      | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

# SOIL

Sampling Point: DP17

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture         | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |                 |         |
| 0-8               | 10YR 4/4      | 100 |                |   |                   |                  | Silty Clay Loam |         |
| 8-16              | 10YR 5/6      | 100 |                |   |                   |                  | Silty Clay Loam |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP18  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 2.0 Lat: 38.3411 Long: 85.6695 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland G.       |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Juglans nigra</i>                          | 15               | Yes               | FACU             |
| 2. <i>Liriodendron tulipifera</i>                | 5                | Yes               | FACU             |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 20               | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Rosa multiflora</i>                        | 10               | Yes               | FACU             |
| 2. <i>Lonicera morrowii</i>                      | 10               | Yes               | FACU             |
| 3. <i>Acer negundo</i>                           | 5                | Yes               | FAC              |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 25               | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Lonicera japonica</i>                      | 15               | Yes               | FACU             |
| 2. <i>Ageratina altissima</i>                    | 10               | Yes               | FACU             |
| 3. <i>Microstegium vimineum</i>                  | 10               | Yes               | FAC              |
| 4. <i>Elymus villosus</i>                        | 10               | Yes               | FACU             |
| 5. _____                                         |                  |                   |                  |
| 6. _____                                         |                  |                   |                  |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 45               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)  
 Total Number of Dominant Species Across All Strata: 9 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 22 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species 15 x 3 = 45  
 FACU species 75 x 4 = 300  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 90 (A) 345 (B)  
 Prevalence Index = B/A = 3.83

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)



# SOIL

Sampling Point: DP18

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture   | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |           |         |
| 0-18              | 10YR 4/4      | 100 |                |   |                   |                  | Silt Loam |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): <18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): <18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP19  
 Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3411 Long: 85.6696 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                             |                                                               |                                          |                                                               |
|-------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                             | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                        | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                  | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of Wetland G. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>6</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>7</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>86</u> (A/B)                                                                                                                                                                                                                                                                                                                                             |
|---------------------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Liquidambar styraciflua</i>                             | 45               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Fraxinus pennsylvanica</i>                              | 25               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Liriodendron tulipifera</i>                             | 15               | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. <i>Platanus occidentalis</i>                               | 15               | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                 |
| 100 = Total Cover                                             |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              | Absolute % Cover | Dominant Species? | Indicator Status |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Fraxinus pennsylvanica</i>                              | 15               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Rosa multiflora</i>                                     | 10               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 25 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Herb Stratum (Plot size: <u>5 ft</u> )                        | Absolute % Cover | Dominant Species? | Indicator Status |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Persicaria virginiana</i>                               | 15               | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Lysimachia nummularia</i>                               | 15               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Elymus virginicus</i>                                   | 10               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. <i>Fraxinus pennsylvanica</i>                              | 7                | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 7. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10. _____                                                     | _____            | _____             | _____            | <b>Woody Vine Stratum (Plot size: <u>15 ft</u>)</b><br>1. _____<br>2. _____<br>0 = Total Cover                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 47 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

# SOIL

Sampling Point: DP19

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |    |                   |                  |                 |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|----|-------------------|------------------|-----------------|---------|
| Depth<br>(inches)                                                                                                   | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | %  |                   |                  |                 |         |
| 0-6                                                                                                                 | 2.5YR 5/2     | 75  | 10YR 3/6       | 15 | C                 | M                | Silty Clay Loam |         |
|                                                                                                                     |               |     | 10YR 3/1       | 10 | D                 | M                |                 |         |
| 6-18                                                                                                                | 10YR 5/6      | 100 |                |    |                   |                  | Silty Clay Loam |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                          | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| Restrictive Layer (if observed):     | Hydric Soil Present?                                          |
|--------------------------------------|---------------------------------------------------------------|
| Type: _____<br>Depth (inches): _____ | Yes <input type="radio"/> No <input checked="" type="radio"/> |

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input checked="" type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input checked="" type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Wetland Hydrology Present?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt;0</u><br>Water Table Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>1</u><br>Saturation Present? (includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>1</u>                                                                                                                                                                                              | Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP20  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3421 Long: 85.6681 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland H.       |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Fraxinus nigra</i>                | 30               | Yes               | FACW             |
| 2. <i>Gleditsia triacanthos</i>         | 30               | Yes               | FAC              |
| 3. <i>Ulmus rubra</i>                   | 20               | Yes               | FAC              |
| 4. <i>Celtis occidentalis</i>           | 10               | No                | FAC              |
| 5. <i>Fraxinus pennsylvanica</i>        | 10               | No                | FACW             |
|                                         | 100              | = Total Cover     |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Carya ovata</i>                            | 7                | Yes               | FACU             |
| 2. <i>Lindera benzoin</i>                        | 5                | Yes               | FACW             |
| 3.                                               |                  |                   |                  |
| 4.                                               |                  |                   |                  |
| 5.                                               |                  |                   |                  |
|                                                  | 12               | = Total Cover     |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Carex jamesii</i>                | 15               | Yes               | NI               |
| 2. <i>Verbesina alternifolia</i>       | 10               | Yes               | FACW             |
| 3. <i>Sanicula canadensis</i>          | 10               | Yes               | FACU             |
| 4. <i>Elymus riparius</i>              | 10               | Yes               | FACW             |
| 5. <i>Toxicodendron radicans</i>       | 5                | No                | FAC              |
| 6. <i>Amphicarpaea bracteata</i>       | 5                | No                | FAC              |
| 7. <i>Glechoma hederacea</i>           | 5                | No                | FACU             |
| 8. <i>Euonymus alatus</i>              | 3                | No                | NI               |
| 9. <i>Ageratina altissima</i>          | 3                | No                | FACU             |
| 10.                                    |                  |                   |                  |
|                                        | 66               | = Total Cover     |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1.                                            |                  |                   |                  |
| 2.                                            |                  |                   |                  |
|                                               | 0                | = Total Cover     |                  |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 9 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: 0 (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)



# SOIL

Sampling Point: DP20

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |   |                   |                  |           |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|---|-------------------|------------------|-----------|---------|
| Depth (inches)                                                                                                      | Matrix        |     | Redox Features |   | Type <sup>1</sup> | Loc <sup>2</sup> | Texture   | Remarks |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | % |                   |                  |           |         |
| 0-7                                                                                                                 | 7.5YR 3/4     | 100 |                |   |                   |                  | Silt Loam |         |
| 7-18                                                                                                                | 7.5YR 5/4     | 95  | 7.5YR 3/4      | 5 | C                 | M                | Silt Loam |         |
|                                                                                                                     |               |     |                |   |                   |                  |           |         |
|                                                                                                                     |               |     |                |   |                   |                  |           |         |
|                                                                                                                     |               |     |                |   |                   |                  |           |         |
|                                                                                                                     |               |     |                |   |                   |                  |           |         |
|                                                                                                                     |               |     |                |   |                   |                  |           |         |
|                                                                                                                     |               |     |                |   |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                     | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|                                                                                 |                                                                                           |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Restrictive Layer (if observed):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/> |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input checked="" type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt; 0</u><br>Water Table Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>Saturation Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>(includes capillary fringe)                                                                                                                 | <b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP21  
 Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3420 Long: 85.6683 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                             |                                                               |                                          |                                                               |
|-------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                             | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                        | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                  | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of Wetland H. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                              | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>3</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)                                                                                                                                                                                                                                     |
|----------------------------------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Fraxinus pennsylvanica</i>                                     | 75               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2. <i>Platanus occidentalis</i>                                      | 20               | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3. <i>Ulmus americana</i>                                            | 10               | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4. _____                                                             | _____            | _____             | _____            | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                          |
| 5. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 105 = Total Cover                                                    |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Sapling/Shrub Stratum (Plot size: <u>15 ft</u>)</b>               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1. <i>Fraxinus pennsylvanica</i>                                     | 30               | Yes               | FACW             | <b>Hydrophytic Vegetation Indicators:</b><br><input checked="" type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) |
| 2. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5. _____                                                             | _____            | _____             | _____            | <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.                                                                                                                                                                                                                                                                                                                                                                              |
| 6. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 7. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 8. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 9. _____                                                             | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                        |
| 10. _____                                                            | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 30 = Total Cover                                                     |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Herb Stratum (Plot size: <u>5 ft</u>)</b>                         |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1. <i>Iris virginica</i>                                             | 40               | Yes               | OBL              | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. <i>Persicaria virginiana</i>                                      | 12               | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3. <i>Cinna arundinacea</i>                                          | 7                | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 5. _____                                                             | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                        |
| 6. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 7. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 8. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 9. _____                                                             | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                        |
| 10. _____                                                            | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 59 = Total Cover                                                     |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Woody Vine Stratum (Plot size: <u>15 ft</u>)</b>                  |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 1. _____                                                             | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 3. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 4. _____                                                             | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 0 = Total Cover                                                      |                  |                   |                  | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Remarks: (Include photo numbers here or on a separate sheet.)</b> |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

# SOIL

Sampling Point: DP21

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture   | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|-----------|---------|
|                   | Color (moist) | %   | Color (moist)  | %  |                   |                  |           |         |
| 0-6               | 10YR 4/2      | 100 |                |    |                   |                  | Silt Loam |         |
| 6-18              | 10YR 4/1      | 50  | 7.5YR 3/3      | 50 | C                 | M                | Silt Loam |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☒ No ☐ Depth (inches): 10  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 8  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Standing water adjacent

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP22  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3420 Long: 85.6688 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland H.       |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Fraxinus nigra</i>                         | 70               | Yes               | FACW             |
| 2. <i>Platanus occidentalis</i>                  | 20               | No                | FACW             |
| 3. <i>Acer negundo</i>                           | 20               | No                | FAC              |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 110              | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Forestiera acuminata</i>                   | 7                | Yes               | OBL              |
| 2. <i>Acer negundo</i>                           | 7                | Yes               | FAC              |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 14               | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Verbesina alternifolia</i>                 | 35               | Yes               | FACW             |
| 2. <i>Elymus riparius</i>                        | 25               | Yes               | FACW             |
| 3. <i>Boehmeria cylindrica</i>                   | 15               | No                | OBL              |
| 4. <i>Smilax hispida</i>                         | 10               | No                | FAC              |
| 5. <i>Leersia virginica</i>                      | 5                | No                | FACW             |
| 6. _____                                         |                  |                   |                  |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 90               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Toxicodendron radicans</i>                 | 5                | Yes               | FAC              |
| 2. <i>Smilax hispida</i>                         | 3                | No                | FAC              |
|                                                  | 8                | = Total Cover     |                  |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: 0 (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Remarks: (Include photo numbers here or on a separate sheet.)

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

# SOIL

Sampling Point: DP22

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture   | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |           |         |
| 0-6               | 7.5YR 2.5/3   | 100 |                |   |                   |                  | Silt Loam |         |
| 6-18              | 7.5YR 5/4     | 100 |                |   |                   |                  | Silt Loam |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |
|                   |               |     |                |   |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)         | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP23  
 Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3418 Long: 85.6694 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of Wetland H.                                   |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Fraxinus pennsylvanica</i>                              | 35               | Yes               | FACW             |
| 2. <i>Fagus grandifolia</i>                                   | 30               | Yes               | FACU             |
| 3. <i>Ulmus americana</i>                                     | 25               | Yes               | FACW             |
| 4. _____                                                      |                  |                   |                  |
| 5. _____                                                      |                  |                   |                  |
| 90 = Total Cover                                              |                  |                   |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Rosa multiflora</i>                                     | 15               | Yes               | FACU             |
| 2. <i>Fraxinus pennsylvanica</i>                              | 12               | Yes               | FACW             |
| 3. _____                                                      |                  |                   |                  |
| 4. _____                                                      |                  |                   |                  |
| 5. _____                                                      |                  |                   |                  |
| 27 = Total Cover                                              |                  |                   |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )                        | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Euonymus fortunei</i>                                   | 9                | Yes               | UPL              |
| 2. <i>Viola bicolor</i>                                       | 7                | Yes               | FACU             |
| 3. <i>Sanicula canadensis</i>                                 | 5                | No                | FACU             |
| 4. <i>Smilax hispida</i>                                      | 3                | No                | FAC              |
| 5. <i>Cinna latifolia</i>                                     | 3                | No                | FACW             |
| 6. <i>Elymus virginicus</i>                                   | 3                | No                | FACW             |
| 7. <i>Bidens frondosa</i>                                     | 2                | No                | FACW             |
| 8. _____                                                      |                  |                   |                  |
| 9. _____                                                      |                  |                   |                  |
| 10. _____                                                     |                  |                   |                  |
| 32 = Total Cover                                              |                  |                   |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                                      |                  |                   |                  |
| 2. _____                                                      |                  |                   |                  |
| 0 = Total Cover                                               |                  |                   |                  |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)  
 Total Number of Dominant Species Across All Strata: 7 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 43 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species 0 x 1 = 0  
 FACW species 80 x 2 = 160  
 FAC species 3 x 3 = 9  
 FACU species 56 x 4 = 224  
 UPL species 10 x 5 = 50  
 Column Totals: 149 (A) 443 (B)  
 Prevalence Index = B/A = 2.97

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☐ 2 - Dominance Test is >50%  
☒ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐



# SOIL

Sampling Point: DP23

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |    |                   |                  |           |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|----|-------------------|------------------|-----------|---------|
| Depth (inches)                                                                                                      | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture   | Remarks |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | %  |                   |                  |           |         |
| 0-6                                                                                                                 | 10YR 4/2      | 100 |                |    |                   |                  | Silt Loam |         |
| 6-18                                                                                                                | 10YR 4/2      | 70  | 10YR 5/1       | 20 | RM                | M                | Silt Loam |         |
|                                                                                                                     |               |     | 10YR 4/6       | 10 | C                 | M                |           |         |
|                                                                                                                     |               |     |                |    |                   |                  |           |         |
|                                                                                                                     |               |     |                |    |                   |                  |           |         |
|                                                                                                                     |               |     |                |    |                   |                  |           |         |
|                                                                                                                     |               |     |                |    |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                          | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| Restrictive Layer (if observed): | Hydric Soil Present?                                          |
|----------------------------------|---------------------------------------------------------------|
| Type: _____                      | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Depth (inches): _____            |                                                               |

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input checked="" type="checkbox"/> Sediment Deposits (B2)<br><input checked="" type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input checked="" type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Wetland Hydrology Present?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt;0</u><br>Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>14</u><br>Saturation Present? (includes capillary fringe) Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>12</u>                                                                                                                                                                                            | Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP24  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 1.0 Lat: 38.3420 Long: 85.6696 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                                                                                        |                                                               |                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                                                                                                        | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                                                                                                   | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                                                                                        |
| Wetland Hydrology Present?                                                                                                                                             | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                                                                                        |
| Remarks:<br>This data point was collected to confirm upland conditions adjacent to UNT 5. Water appears to sheet toward the streams rather than standing in this area. |                                                               |                                                                                                        |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30 ft )                              | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)<br>Total Number of Dominant Species Across All Strata: 6 (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Platanus occidentalis</i>                               | 50               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Celtis occidentalis</i>                                 | 40               | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Juglans nigra</i>                                       | 20               | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. <i>Ulmus rubra</i>                                         | 10               | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: 0 (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                        |
| 120 = Total Cover                                             |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sapling/Shrub Stratum (Plot size: 15 ft )                     | Absolute % Cover | Dominant Species? | Indicator Status |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Acer negundo</i>                                        | 5                | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Forestiera acuminata</i>                                | 5                | Yes               | OBL              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Platanus occidentalis</i>                               | 5                | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      | _____            | _____             | _____            | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 15 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Herb Stratum (Plot size: 5 ft )                               | Absolute % Cover | Dominant Species? | Indicator Status |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 1. <i>Euonymus americanus</i>                                 | 45               | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Rosa multiflora</i>                                     | 10               | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Parthenocissus quinquefolia</i>                         | 10               | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. <i>Persicaria pensylvanica</i>                             | 7                | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. <i>Viola sororia</i>                                       | 6                | No                | FAC              | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 6. <i>Smilax hispida</i>                                      | 5                | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 7. <i>Elymus riparius</i>                                     | 3                | No                | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8. <i>Sanicula canadensis</i>                                 | 1                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10. _____                                                     | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 87 = Total Cover                                              |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Woody Vine Stratum (Plot size: 15 ft )                        | Absolute % Cover | Dominant Species? | Indicator Status | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. _____                                                      | _____            | _____             | _____            | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

# SOIL

Sampling Point: DP24

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture   | Remarks |
|-------------------|---------------|-----|----------------|----|-------------------|------------------|-----------|---------|
|                   | Color (moist) | %   | Color (moist)  | %  |                   |                  |           |         |
| 0-3               | 7.5YR 2.5/1   | 60  | 7.5YR 4/3      | 40 | C                 | M                | Silt Loam |         |
| 3-13              | 7.5YR 5/4     | 100 |                |    |                   |                  | Silt Loam |         |
| 13-18             | 7.5YR 5/4     | 95  | 7.5YR 3/3      | 5  | C                 | M                | Clay      |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |
|                   |               |     |                |    |                   |                  |           |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
 Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)         | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input checked="" type="checkbox"/> Drift Deposits (B3)            | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP25  
 Investigator(s): Audrey Hanner, Briana Hope Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 0.5 Lat: 38.3423 Long: 85.6706 Datum: WGS 1984  
 Soil Map Unit Name: Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded (EesC2) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                                        |                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input type="radio"/> No <input checked="" type="radio"/>                          | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>                                     |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>                               |                                                                                                     |
| Remarks:<br>This data point is representative of the upland conditions within the wooded area, south of Lentzier Creek |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>7</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>29</u> (A/B)                                                                                                                                                                                                                |
|---------------------------------------------------------------|------------------|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Liriodendron tulipifera</i>                             | 85               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 2. <i>Tilia americana</i>                                     | 15               | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3. <i>Fagus grandifolia</i>                                   | 10               | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                               |                  | 110               | = Total Cover    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              | Absolute % Cover | Dominant Species? | Indicator Status | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species <u>33</u> x 3 = <u>99</u><br>FACU species <u>177</u> x 4 = <u>708</u><br>UPL species _____ x 5 = _____<br>Column Totals: <u>210</u> (A) <u>807</u> (B)<br>Prevalence Index = B/A = <u>3.84</u>                                                                                                     |
| 1. <i>Liriodendron tulipifera</i>                             | 15               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 2. <i>Asimina triloba</i>                                     | 15               | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                               |                  | 30                | = Total Cover    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Herb Stratum (Plot size: <u>5 ft</u> )                        | Absolute % Cover | Dominant Species? | Indicator Status | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) |
| 1. <i>Liriodendron tulipifera</i>                             | 15               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 2. <i>Persicaria virginiana</i>                               | 13               | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 3. <i>Sanicula canadensis</i>                                 | 10               | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 4. <i>Acer saccharum</i>                                      | 7                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 5. <i>Elymus trachycaulus</i>                                 | 7                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 6. <i>Viola bicolor</i>                                       | 7                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 7. <i>Maianthemum canadense</i>                               | 5                | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 8. <i>Agrimonia gryposepala</i>                               | 5                | No                | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 10. _____                                                     |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                               |                  | 69                | = Total Cover    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 | Absolute % Cover | Dominant Species? | Indicator Status | <b>Hydrophytic Vegetation Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                  |
| 1. <i>Lonicera japonica</i>                                   | 1                | Yes               | FACU             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                               |                  | 1                 | = Total Cover    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



# SOIL

Sampling Point: DP25

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |    |                   |                  |                 |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|----|-------------------|------------------|-----------------|---------|
| Depth (inches)                                                                                                      | Matrix        |     | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | %  |                   |                  |                 |         |
| 0-8                                                                                                                 | 10YR 4/4      | 100 |                |    |                   |                  | Silt Loam       |         |
| 8-14                                                                                                                | 10YR 5/4      | 85  | 10YR 4/2       | 15 | D                 | M                | Silt Loam       |         |
| 14-18                                                                                                               | 10YR 5/6      | 95  | 10YR 4/2       | 5  | D                 | M                | Silty Clay Loam |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |
|                                                                                                                     |               |     |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                     | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| Restrictive Layer (if observed):     | Hydric Soil Present?                                          |
|--------------------------------------|---------------------------------------------------------------|
| Type: _____<br>Depth (inches): _____ | Yes <input type="radio"/> No <input checked="" type="radio"/> |

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                               |                               |                      |                                                               |                                |                     |                                                               |                                |                                                                                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------|----------------------|---------------------------------------------------------------|--------------------------------|---------------------|---------------------------------------------------------------|--------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Surface Water (A1)</li> <li><input type="checkbox"/> High Water Table (A2)</li> <li><input type="checkbox"/> Saturation (A3)</li> <li><input type="checkbox"/> Water Marks (B1)</li> <li><input type="checkbox"/> Sediment Deposits (B2)</li> <li><input type="checkbox"/> Drift Deposits (B3)</li> <li><input type="checkbox"/> Algal Mat or Crust (B4)</li> <li><input type="checkbox"/> Iron Deposits (B5)</li> <li><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)</li> <li><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)</li> </ul> | <b>Secondary Indicators (minimum of two required)</b> <ul style="list-style-type: none"> <li><input type="checkbox"/> Water-Stained Leaves (B9)</li> <li><input type="checkbox"/> Aquatic Fauna (B13)</li> <li><input type="checkbox"/> True Aquatic Plants (B14)</li> <li><input type="checkbox"/> Hydrogen Sulfide Odor (C1)</li> <li><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)</li> <li><input type="checkbox"/> Presence of Reduced Iron (C4)</li> <li><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)</li> <li><input type="checkbox"/> Thin Muck Surface (C7)</li> <li><input type="checkbox"/> Gauge or Well Data (D9)</li> <li><input type="checkbox"/> Other (Explain in Remarks)</li> </ul> |                                                               |                               |                      |                                                               |                                |                     |                                                               |                                |                                                                                                 |
| <b>Field Observations:</b> <table border="0"> <tr> <td>Surface Water Present?</td> <td>Yes <input type="radio"/> No <input checked="" type="radio"/></td> <td>Depth (inches): <u>&lt; 0</u></td> </tr> <tr> <td>Water Table Present?</td> <td>Yes <input type="radio"/> No <input checked="" type="radio"/></td> <td>Depth (inches): <u>&gt; 18</u></td> </tr> <tr> <td>Saturation Present?</td> <td>Yes <input type="radio"/> No <input checked="" type="radio"/></td> <td>Depth (inches): <u>&gt; 18</u></td> </tr> </table> <p>(includes capillary fringe)</p>                                                                                                                                                           | Surface Water Present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Yes <input type="radio"/> No <input checked="" type="radio"/> | Depth (inches): <u>&lt; 0</u> | Water Table Present? | Yes <input type="radio"/> No <input checked="" type="radio"/> | Depth (inches): <u>&gt; 18</u> | Saturation Present? | Yes <input type="radio"/> No <input checked="" type="radio"/> | Depth (inches): <u>&gt; 18</u> | <b>Wetland Hydrology Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Surface Water Present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Depth (inches): <u>&lt; 0</u>                                 |                               |                      |                                                               |                                |                     |                                                               |                                |                                                                                                 |
| Water Table Present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Depth (inches): <u>&gt; 18</u>                                |                               |                      |                                                               |                                |                     |                                                               |                                |                                                                                                 |
| Saturation Present?                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Depth (inches): <u>&gt; 18</u>                                |                               |                      |                                                               |                                |                     |                                                               |                                |                                                                                                 |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                               |                               |                      |                                                               |                                |                     |                                                               |                                |                                                                                                 |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                               |                               |                      |                                                               |                                |                     |                                                               |                                |                                                                                                 |



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP26  
 Investigator(s): Ben Harvey, Josh Price Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 1.0 Lat: 38.3428 Long: 85.6712 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                                                                                                                  |                                                               |                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                                                                                                                  | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                                                                                                             | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                                                                                        |
| Wetland Hydrology Present?                                                                                                                                                       | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                                                                                        |
| Remarks:<br>This data point was collected to confirm upland conditions adjacent to Lentzier Creek. Water appears to sheet flow toward the stream rather than stand in this area. |                                                               |                                                                                                        |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Fraxinus pennsylvanica</i>                 | 30               | Yes               | FACW             |
| 2. <i>Acer negundo</i>                           | 20               | Yes               | FAC              |
| 3. <i>Platanus occidentalis</i>                  | 5                | No                | FACW             |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 55               | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Acer negundo</i>                           | 15               | Yes               | FAC              |
| 2. _____                                         |                  |                   |                  |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 15               | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Elymus riparius</i>                        | 30               | Yes               | FACW             |
| 2. <i>Elymus virginicus</i>                      | 15               | Yes               | FACW             |
| 3. <i>Rosa multiflora</i>                        | 10               | No                | FACU             |
| 4. <i>Verbesina alternifolia</i>                 | 7                | No                | FACW             |
| 5. <i>Toxicodendron radicans</i>                 | 7                | No                | FAC              |
| 6. <i>Glechoma hederacea</i>                     | 5                | No                | FACU             |
| 7. <i>Ageratina altissima</i>                    | 3                | No                | FACU             |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 77               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Vitis vulpina</i>                          | 5                | Yes               | FAC              |
| 2. <i>Parthenocissus quinquefolia</i>            | 5                | Yes               | FACU             |
|                                                  | 10               | = Total Cover     |                  |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: 0 (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Remarks: (Include photo numbers here or on a separate sheet.)

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

# SOIL

Sampling Point: DP26

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |   |                   |         |           |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|---|-------------------|---------|-----------|
| Depth<br>(inches)                                                                                                   | Matrix        |     | Redox Features |   |                   | Texture | Remarks   |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> |         |           |
| 0-18                                                                                                                | 7.5YR 4/4     | 100 |                |   |                   |         | Silt Loam |
|                                                                                                                     |               |     |                |   |                   |         |           |
|                                                                                                                     |               |     |                |   |                   |         |           |
|                                                                                                                     |               |     |                |   |                   |         |           |
|                                                                                                                     |               |     |                |   |                   |         |           |
|                                                                                                                     |               |     |                |   |                   |         |           |
|                                                                                                                     |               |     |                |   |                   |         |           |
|                                                                                                                     |               |     |                |   |                   |         |           |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.      <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                     | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

|                                                                                 |                                                                                           |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <b>Restrictive Layer (if observed):</b><br>Type: _____<br>Depth (inches): _____ | <b>Hydric Soil Present?</b> Yes <input type="radio"/> No <input checked="" type="radio"/> |
|---------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input checked="" type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b><br>Surface Water Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt; 0</u><br>Water Table Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>Saturation Present?    Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>(includes capillary fringe)                                                                                                                 | <b>Wetland Hydrology Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP27  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant # 16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3426 Long: 85.6698 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                     |                                                               |                                          |                                                               |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                     | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                                                | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                          | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of the emergent portion of Wetland I. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. _____                                |                  |                   |                  |
| 2. _____                                |                  |                   |                  |
| 3. _____                                |                  |                   |                  |
| 4. _____                                |                  |                   |                  |
| 5. _____                                |                  |                   |                  |
| 0 = Total Cover                         |                  |                   |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Fraxinus pennsylvanica</i>                 | 7                | Yes               | FACW             |
| 2. <i>Platanus occidentalis</i>                  | 7                | Yes               | FACW             |
| 3. <i>Salix nigra</i>                            | 6                | Yes               | OBL              |
| 4. <i>Rosa palustris</i>                         | 5                | Yes               | OBL              |
| 5. _____                                         |                  |                   |                  |
| 25 = Total Cover                                 |                  |                   |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Carex frankii</i>                | 40               | Yes               | OBL              |
| 2. <i>Plantago major</i>               | 15               | Yes               | FACU             |
| 3. <i>Lysimachia nummularia</i>        | 15               | Yes               | FACW             |
| 4. <i>Ambrosia artemisiifolia</i>      | 10               | No                | FACU             |
| 5. <i>Mimulus alatus</i>               | 2                | No                | OBL              |
| 6. _____                               |                  |                   |                  |
| 7. _____                               |                  |                   |                  |
| 8. _____                               |                  |                   |                  |
| 9. _____                               |                  |                   |                  |
| 10. _____                              |                  |                   |                  |
| 82 = Total Cover                       |                  |                   |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1. _____                                      |                  |                   |                  |
| 2. _____                                      |                  |                   |                  |
| 0 = Total Cover                               |                  |                   |                  |

Remarks: (Include photo numbers here or on a separate sheet.)

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 86 (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: 0 (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

# SOIL

Sampling Point: DP27

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-18              | 10YR 4/2      | 90 | 10YR 4/6       | 10 | C                 | M                | Silty Clay Loam |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)         | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☒ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0  
 Water Table Present? Yes ☒ No ☐ Depth (inches): 10  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 10  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

This wetland is located within a large depressional area at the toe of slope.



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP28  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3427 Long: 85.6698 Datum: WGS 1984  
 Soil Map Unit Name: Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                         |                                                               |                                          |                                                               |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                         | Yes <input type="radio"/> No <input checked="" type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                    | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                              | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland I. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet:                                                                                                       |
|---------------------------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Ulmus americana</i>                                     | 30               | Yes               | FACW             |                                                                                                                                 |
| 2. <i>Prunus serotina</i>                                     | 20               | Yes               | FACU             | Total Number of Dominant Species Across All Strata: <u>9</u> (B)                                                                |
| 3. <i>Liriodendron tulipifera</i>                             | 20               | Yes               | FACU             | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)                                                         |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 70 = Total Cover                                              |                  |                   |                  |                                                                                                                                 |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              | Absolute % Cover | Dominant Species? | Indicator Status | Prevalence Index worksheet:                                                                                                     |
| 1. <i>Lonicera morrowii</i>                                   | 30               | Yes               | FACU             |                                                                                                                                 |
| 2. <i>Juniperus virginiana</i>                                | 30               | Yes               | FACU             | OBL species _____ x 1 = _____                                                                                                   |
| 3. <i>Quercus rubra</i>                                       | 20               | Yes               | FACU             | FACW species <u>40</u> x 2 = <u>80</u>                                                                                          |
| 4. _____                                                      | _____            | _____             | _____            | FAC species <u>10</u> x 3 = <u>30</u>                                                                                           |
| 5. _____                                                      | _____            | _____             | _____            | FACU species <u>130</u> x 4 = <u>520</u>                                                                                        |
| 80 = Total Cover                                              |                  |                   |                  | UPL species _____ x 5 = _____                                                                                                   |
|                                                               |                  |                   |                  | Column Totals: <u>180</u> (A) <u>610</u> (B)                                                                                    |
|                                                               |                  |                   |                  | Prevalence Index = B/A = <u>3.39</u>                                                                                            |
| Herb Stratum (Plot size: <u>5 ft</u> )                        | Absolute % Cover | Dominant Species? | Indicator Status | Hydrophytic Vegetation Indicators:                                                                                              |
| 1. <i>Toxicodendron radicans</i>                              | 10               | Yes               | FAC              |                                                                                                                                 |
| 2. <i>Dichanthelium clandestinum</i>                          | 10               | Yes               | FACW             | <input type="checkbox"/> 2 - Dominance Test is >50%                                                                             |
| 3. <i>Glechoma hederacea</i>                                  | 10               | Yes               | FACU             | <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup>                                                              |
| 4. _____                                                      | _____            | _____             | _____            | <input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) |
| 5. _____                                                      | _____            | _____             | _____            | <input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)                                              |
| 6. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 7. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 8. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 9. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 10. _____                                                     | _____            | _____             | _____            |                                                                                                                                 |
| 30 = Total Cover                                              |                  |                   |                  | <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 | Absolute % Cover | Dominant Species? | Indicator Status | Hydrophytic Vegetation Present?                                                                                                 |
| 1. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 2. _____                                                      | _____            | _____             | _____            |                                                                                                                                 |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                 |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                 |



# SOIL

Sampling Point: DP28

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture         | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |                 |         |
| 0-18              | 10YR 4/3      | 100 |                |   |                   |                  | Silty Clay Loam |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input checked="" type="checkbox"/> Sediment Deposits (B2)         | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP29  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3429 Long: 85.6704 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>      |                                                                                                     |
| Remarks:<br>This Data Point is representative of the emergent portion of Wetland I.           |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Platanus occidentalis</i>                  | 25               | Yes               | FACW             |
| 2. _____                                         | _____            | _____             | _____            |
| 3. _____                                         | _____            | _____             | _____            |
| 4. _____                                         | _____            | _____             | _____            |
| 5. _____                                         | _____            | _____             | _____            |
| 25 = Total Cover                                 |                  |                   |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Fraxinus pennsylvanica</i>                 | 17               | Yes               | FACW             |
| 2. <i>Platanus occidentalis</i>                  | 10               | Yes               | FACW             |
| 3. <i>Salix interior</i>                         | 7                | No                | FACW             |
| 4. <i>Acer saccharinum</i>                       | 5                | No                | FACW             |
| 5. _____                                         | _____            | _____             | _____            |
| 39 = Total Cover                                 |                  |                   |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Coleataenia rigidula</i>                   | 70               | Yes               | FACW             |
| 2. <i>Lythrum salicaria</i>                      | 30               | Yes               | OBL              |
| 3. <i>Glechoma hederacea</i>                     | 10               | No                | FACW             |
| 4. <i>Dichanthelium clandestinum</i>             | 10               | No                | FACW             |
| 5. <i>Lysimachia nummularia</i>                  | 5                | No                | FACW             |
| 6. <i>Carex cristatella</i>                      | 5                | No                | FACW             |
| 7. _____                                         | _____            | _____             | _____            |
| 8. _____                                         | _____            | _____             | _____            |
| 9. _____                                         | _____            | _____             | _____            |
| 10. _____                                        | _____            | _____             | _____            |
| 130 = Total Cover                                |                  |                   |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         | _____            | _____             | _____            |
| 2. _____                                         | _____            | _____             | _____            |
| 0 = Total Cover                                  |                  |                   |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)  
 Total Number of Dominant Species Across All Strata: 5 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 0 (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

## SOIL

Sampling Point: DP29

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |    |                |    |                   |                  |                 |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
| Depth<br>(inches)                                                                                                   | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|                                                                                                                     | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-18                                                                                                                | 10YR 4/2      | 50 | 10YR 4/1       | 40 | D                 | M                | Silty Clay Loam |         |
|                                                                                                                     |               |    | 7.5YR 4/6      | 10 | C                 | M                |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |
|                                                                                                                     |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                          | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|----------------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| Restrictive Layer (if observed):     | Hydric Soil Present?                                          |
|--------------------------------------|---------------------------------------------------------------|
| Type: _____<br>Depth (inches): _____ | Yes <input checked="" type="radio"/> No <input type="radio"/> |

Remarks:

## HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input checked="" type="checkbox"/> High Water Table (A2)<br><input checked="" type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input checked="" type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <b>Wetland Hydrology Present?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt;0</u><br>Water Table Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>6</u><br>Saturation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> Depth (inches): <u>0</u><br>(includes capillary fringe)                                                                                                                                                                                           | Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| This wetland is located in a large depression located at the toe of slope.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP30  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant 16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3432 Long: 85.6707 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                     |                                                               |                                          |                                                               |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                     | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                                                | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                          | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This Data Point is representative of the forested portion of Wetland I. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>3</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Fraxinus pennsylvanica</i>                              | 50               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. <i>Platanus occidentalis</i>                               | 50               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 100 = Total Cover                                             |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              |                  |                   |                  | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                     |
| 1. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Herb Stratum (Plot size: <u>5 ft</u> )                        |                  |                   |                  | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <i>Lysimachia nummularia</i>                               | 5                | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 3. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 4. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 6. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 7. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 8. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 9. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 10. _____                                                     |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 5 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 |                  |                   |                  | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 1. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 2. _____                                                      |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 0 = Total Cover                                               |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |



# SOIL

Sampling Point: DP30

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-18              | 10YR 4/2      | 85 | 10YR 4/6       | 15 | C                 | M                | Silty Clay Loam |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☒ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): <0  
 Water Table Present? Yes ☒ No ☐ Depth (inches): 7  
 Saturation Present? Yes ☒ No ☐ Depth (inches): 7  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

This wetland is located within a large depression area located along the toe of slope.



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP31  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3433 Long: 85.6706 Datum: WGS 1984  
 Soil Map Unit Name: Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                         |                                                               |                                          |                                                               |
|-----------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                         | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present?                                                                    | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                              | Yes <input type="radio"/> No <input checked="" type="radio"/> |                                          |                                                               |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland I. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                                                                                                                                                                                                                 | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>1</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>3</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33</u> (A/B)                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Platanus occidentalis</i>                                                                                                                                                                                                                         | 90               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                          |
| 2. <i>Acer negundo</i>                                                                                                                                                                                                                                  | 10               | No                | FAC              |                                                                                                                                                                                                                                                                                                                                                                          |
| 3. _____                                                                                                                                                                                                                                                |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                          |
| 4. _____                                                                                                                                                                                                                                                |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                          |
| 5. _____                                                                                                                                                                                                                                                |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                          |
| 100 = Total Cover                                                                                                                                                                                                                                       |                  |                   |                  | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species <u>90</u> x 2 = <u>180</u><br>FAC species <u>10</u> x 3 = <u>30</u><br>FACU species <u>15</u> x 4 = <u>60</u><br>UPL species _____ x 5 = _____<br>Column Totals: <u>115</u> (A) <u>270</u> (B)<br>Prevalence Index = B/A = <u>2.35</u> |
| <b>Sapling/Shrub Stratum (Plot size: <u>15 ft</u>)</b><br>1. _____<br>2. _____<br>3. _____<br>4. _____<br>5. _____<br>0 = Total Cover                                                                                                                   |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Herb Stratum (Plot size: <u>5 ft</u>)</b><br>1. <i>Glechoma hederacea</i> 10 Yes FACU<br>2. <i>Lonicera japonica</i> 5 Yes FACU<br>3. _____<br>4. _____<br>5. _____<br>6. _____<br>7. _____<br>8. _____<br>9. _____<br>10. _____<br>15 = Total Cover |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Woody Vine Stratum (Plot size: <u>15 ft</u>)</b><br>1. _____<br>2. _____<br>0 = Total Cover                                                                                                                                                          |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                          |
| Remarks: (Include photo numbers here or on a separate sheet.)                                                                                                                                                                                           |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                          |

# SOIL

Sampling Point: DP31

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |     | Redox Features |   |                   |                  | Texture         | Remarks |
|-------------------|---------------|-----|----------------|---|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %   | Color (moist)  | % | Type <sup>1</sup> | Loc <sup>2</sup> |                 |         |
| 0-18              | 7.5YR 4/6     | 100 |                |   |                   |                  | Silty Clay Loam |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |
|                   |               |     |                |   |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 7/21/15  
 Applicant/Owner: INDOT State: IN Sampling Point: DP32  
 Investigator(s): Rick Paul, Monica Del Real Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 2.0 Lat: 38.3430 Long: 85.6715 Datum: WGS 1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: n/a

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                     |                                                               |                                          |                                                               |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------|---------------------------------------------------------------|
| Hydrophytic Vegetation Present?                                                     | Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area<br>within a Wetland? | Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present?                                                                | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Wetland Hydrology Present?                                                          | Yes <input checked="" type="radio"/> No <input type="radio"/> |                                          |                                                               |
| Remarks:<br>This Data Point is representative of the emergent portion of Wetland I. |                                                               |                                          |                                                               |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )                       | Absolute % Cover | Dominant Species? | Indicator Status | <b>Dominance Test worksheet:</b><br>Number of Dominant Species That Are OBL, FACW, or FAC: <u>5</u> (A)<br>Total Number of Dominant Species Across All Strata: <u>5</u> (B)<br>Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Platanus occidentalis</i>                               | 35               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                               |                  | 35 = Total Cover  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> )              | Absolute % Cover | Dominant Species? | Indicator Status | <b>Prevalence Index worksheet:</b><br>Total % Cover of: _____ Multiply by: _____<br>OBL species _____ x 1 = _____<br>FACW species _____ x 2 = _____<br>FAC species _____ x 3 = _____<br>FACU species _____ x 4 = _____<br>UPL species _____ x 5 = _____<br>Column Totals: <u>0</u> (A) _____ (B)<br>Prevalence Index = B/A = _____                                                                                                                                                                                                                                                                 |
| 1. <i>Fraxinus pennsylvanica</i>                              | 10               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                               |                  | 10 = Total Cover  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Herb Stratum (Plot size: <u>5 ft</u> )                        | Absolute % Cover | Dominant Species? | Indicator Status | <b>Hydrophytic Vegetation Indicators:</b><br><input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation<br><input checked="" type="checkbox"/> 2 - Dominance Test is >50%<br><input type="checkbox"/> 3 - Prevalence Index is ≤3.0 <sup>1</sup><br><input type="checkbox"/> 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)<br><input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)<br><sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. <i>Juncus tenuis</i>                                       | 15               | Yes               | FAC              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. <i>Echinochloa crus-galli</i>                              | 10               | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 3. <i>Phalaris arundinacea</i>                                | 7                | Yes               | FACW             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 5. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 6. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 7. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 8. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 9. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 10. _____                                                     | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                               |                  | 32 = Total Cover  |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )                 | Absolute % Cover | Dominant Species? | Indicator Status | <b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="radio"/> No <input type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 1. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 2. _____                                                      | _____            | _____             | _____            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                                                               |                  | 0 = Total Cover   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Remarks: (Include photo numbers here or on a separate sheet.) |                  |                   |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |

# SOIL

Sampling Point: DP32

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture         | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|-----------------|---------|
|                   | Color (moist) | %  | Color (moist)  | %  |                   |                  |                 |         |
| 0-18              | 10YR 4/2      | 85 | 10YR 4/6       | 15 | C                 | M                | Silty Clay Loam |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |
|                   |               |    |                |    |                   |                  |                 |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

**Hydric Soil Indicators:**

|                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

|                                                           |
|-----------------------------------------------------------|
| <input type="checkbox"/> Coast Prairie Redox (A16)        |
| <input type="checkbox"/> Dark Surface (S7)                |
| <input type="checkbox"/> Iron-Manganese Masses (F12)      |
| <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Other (Explain in Remarks)       |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if observed):**

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

**Hydric Soil Present?** Yes ☒ No ☐

Remarks:

# HYDROLOGY

**Wetland Hydrology Indicators:**

Primary Indicators (minimum of one is required; check all that apply)

|                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input checked="" type="checkbox"/> Surface Water (A1)             | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input checked="" type="checkbox"/> High Water Table (A2)          | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

|                                                                    |
|--------------------------------------------------------------------|
| <input type="checkbox"/> Surface Soil Cracks (B6)                  |
| <input type="checkbox"/> Drainage Patterns (B10)                   |
| <input type="checkbox"/> Dry-Season Water Table (C2)               |
| <input type="checkbox"/> Crayfish Burrows (C8)                     |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) |
| <input type="checkbox"/> Stunted or Stressed Plants (D1)           |
| <input checked="" type="checkbox"/> Geomorphic Position (D2)       |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5)          |

**Field Observations:**

|                        |                                                               |                    |
|------------------------|---------------------------------------------------------------|--------------------|
| Surface Water Present? | Yes <input checked="" type="radio"/> No <input type="radio"/> | Depth (inches): 2  |
| Water Table Present?   | Yes <input checked="" type="radio"/> No <input type="radio"/> | Depth (inches): <0 |
| Saturation Present?    | Yes <input checked="" type="radio"/> No <input type="radio"/> | Depth (inches): <0 |

(includes capillary fringe)

**Wetland Hydrology Present?** Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

The wetland is located within a large depression located at the toe-of-slope.



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14  
 Applicant/Owner: INDOT State: IN Sampling Point: DP33  
 Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 1.0 Lat: 38.3433 Long: 85.6675 Datum: D\_WGS\_1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐ Soil ☐ or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of the upland area surrounding Wetland J.       |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: 30 ft)          | Absolute % Cover | Dominant Species? | Indicator Status |
|------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Fraxinus pennsylvanica</i>         | 30               | Yes               | FACW             |
| 2. <i>cer negundo</i>                    | 20               | Yes               | FAC              |
| 3. <i>Morus rubra</i>                    | 15               | Yes               | FACU             |
| 4. _____                                 |                  |                   |                  |
| 5. _____                                 |                  |                   |                  |
|                                          | 65               | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: 15 ft) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>cer negundo</i>                    | 30               | Yes               | FAC              |
| 2. <i>Rosa multiflora</i>                | 5                | No                | FACU             |
| 3. <i>Lonicera morro ii</i>              | 5                | No                | FACU             |
| 4. _____                                 |                  |                   |                  |
| 5. _____                                 |                  |                   |                  |
|                                          | 40               | = Total Cover     |                  |
| Herb Stratum (Plot size: 5 ft)           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>eranium maculatum</i>              | 30               | Yes               | FACU             |
| 2. <i>Verbesina alternifolia</i>         | 20               | Yes               | FACW             |
| 3. <i>Elymus virginicus</i>              | 10               | No                | FACW             |
| 4. <i>eum venum</i>                      | 5                | No                | FACU             |
| 5. <i>lilium canadense</i>               | 3                | No                | FACU             |
| 6. <i>alium aparine</i>                  | 2                | No                | FACU             |
| 7. <i>Viola sororia</i>                  | 2                | No                | FAC              |
| 8. <i>Erigeron philadelphicus</i>        | 2                | No                | FACW             |
| 9. <i>eracleum mantega ianum</i>         | 1                | No                | FAC              |
| 10. _____                                |                  |                   |                  |
|                                          | 75               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: 15 ft)    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                 |                  |                   |                  |
| 2. _____                                 |                  |                   |                  |
|                                          | 0                | = Total Cover     |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)  
 Total Number of Dominant Species Across All Strata: 6 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 67 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 0 (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)



# SOIL

Sampling Point: DP33

**Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)**

| Depth<br>(inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|---------|---------|
|                   | Color (moist) | %  | Color (moist)  | %  |                   |                  |         |         |
| 0-8               | 10YR 3/3      | 95 | 10YR 2/2       | 5  | D                 | M                |         |         |
| 8-18              | 10YR 4/3      | 80 | 10YR 4/6       | 20 | C                 | M                |         |         |
|                   |               |    |                |    |                   |                  |         |         |
|                   |               |    |                |    |                   |                  |         |         |
|                   |               |    |                |    |                   |                  |         |         |
|                   |               |    |                |    |                   |                  |         |         |
|                   |               |    |                |    |                   |                  |         |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☐ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14  
 Applicant/Owner: INDOT State: IN Sampling Point: DP34  
 Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): concave  
 Slope (%): 1.5 Lat: 38.3434 Long: 85.6673 Datum: D\_WGS\_1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input checked="" type="radio"/> No <input type="radio"/> |
| Hydric Soil Present? Yes <input checked="" type="radio"/> No <input type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input checked="" type="radio"/> No <input type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of Wetland J.                                   |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Acer negundo</i>                           | 45               | Yes               | FAC              |
| 2. <i>Fraxinus pennsylvanica</i>                 | 25               | Yes               | FACW             |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 70               | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Lonicera morrowii</i>                      | 8                | Yes               | FACU             |
| 2. <i>Lindera benzoin</i>                        | 8                | Yes               | FACW             |
| 3. <i>Rosa multiflora</i>                        | 3                | No                | FACU             |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 19               | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Geum canadense</i>                         | 20               | Yes               | FAC              |
| 2. <i>Elymus virginicus</i>                      | 15               | Yes               | FACW             |
| 3. <i>Impatiens capensis</i>                     | 7                | No                | FACW             |
| 4. <i>Viola sororia</i>                          | 5                | No                | FACW             |
| 5. _____                                         |                  |                   |                  |
| 6. _____                                         |                  |                   |                  |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 47               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. _____                                         |                  |                   |                  |
| 2. _____                                         |                  |                   |                  |
|                                                  | 0                | = Total Cover     |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)  
 Total Number of Dominant Species Across All Strata: 6 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 83 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 0 (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP34

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |    | Redox Features |    | Type <sup>1</sup> | Loc <sup>2</sup> | Texture    | Remarks |
|-------------------|---------------|----|----------------|----|-------------------|------------------|------------|---------|
|                   | Color (moist) | %  | Color (moist)  | %  |                   |                  |            |         |
| 0-8               | 10YR 4/2      | 60 | 10YR 4/1       | 40 | D                 | M                | silty loam |         |
| 8-18              | 10YR 4/2      | 85 | 7.5YR 4/6      | 5  | C                 | M                | silty loam |         |
|                   |               |    | 10YR 4/1       | 10 | D                 | M                |            |         |
|                   |               |    |                |    |                   |                  |            |         |
|                   |               |    |                |    |                   |                  |            |         |
|                   |               |    |                |    |                   |                  |            |         |
|                   |               |    |                |    |                   |                  |            |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                          |
|------------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> Histic Solonchale (A1)            | <input type="checkbox"/> Sandy Gleyed Matrix (S4)        |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)                |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)            |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)        |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)        |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input checked="" type="checkbox"/> Depleted Matrix (F3) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)         |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7)      |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)          |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                          |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)
- ☐ Dark Surface (S7)
- ☐ Iron-Manganese Masses (F12)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_

Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☒ No ☐

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input checked="" type="checkbox"/> Drift Deposits (B3)            | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☒ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Stunted or Stressed Plants (D1)
- ☐ Geomorphic Position (D2)
- ☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0

Water Table Present? Yes ☐ No ☒ Depth (inches): 14

Saturation Present? Yes ☒ No ☐ Depth (inches): 12

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14  
 Applicant/Owner: INDOT State: IN Sampling Point: DP35  
 Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 0.5 Lat: 38.3445 Long: 85.6679 Datum: D\_WGS\_1984  
 Soil Map Unit Name: Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration (HcgAW) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of the upland conditions surrounding UNT 8.     |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Acer negundo</i>                  | 35               | Yes               | FAC              |
| 2. <i>Celtis occidentalis</i>           | 15               | Yes               | FAC              |
| 3. <i>Fraxinus pennsylvanica</i>        | 15               | Yes               | FACW             |
| 4. _____                                |                  |                   |                  |
| 5. _____                                |                  |                   |                  |
|                                         | 65               | = Total Cover     |                  |

| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Lonicera morrowii</i>                      | 3                | No                | FACU             |
| 2. <i>Acer negundo</i>                           | 2                | No                | FAC              |
| 3. _____                                         |                  |                   |                  |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 5                | = Total Cover     |                  |

| Herb Stratum (Plot size: <u>5 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|----------------------------------------|------------------|-------------------|------------------|
| 1. <i>Phacelia ranunculacea</i>        | 65               | Yes               | FACW             |
| 2. <i>Rosa multiflora</i>              | 10               | No                | FACU             |
| 3. <i>Elymus virginicus</i>            | 5                | No                | FACW             |
| 4. <i>Galium aparine</i>               | 5                | No                | FACU             |
| 5. <i>Boehmeria cylindrica</i>         | 5                | No                | OBL              |
| 6. <i>Geum vernum</i>                  | 5                | No                | FACU             |
| 7. <i>Toxicodendron radicans</i>       | 5                | No                | FAC              |
| 8. _____                               |                  |                   |                  |
| 9. _____                               |                  |                   |                  |
| 10. _____                              |                  |                   |                  |
|                                        | 100              | = Total Cover     |                  |

| Woody Vine Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
|-----------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Parthenocissus quinquefolia</i>         | 10               | Yes               | FACU             |
| 2. _____                                      |                  |                   |                  |
|                                               | 10               | = Total Cover     |                  |

**Dominance Test worksheet:**

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 (A/B)

**Prevalence Index worksheet:**

Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_

OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_

FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_

FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_

FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_

UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_

Column Totals: 0 (A) \_\_\_\_\_ (B)

Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>

☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)



# SOIL

Sampling Point: DP35

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) |               |     |                |    |                   |                  |            |         |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|----|-------------------|------------------|------------|---------|
| Depth (inches)                                                                                                      | Matrix        |     | Redox Features |    |                   |                  | Texture    | Remarks |
|                                                                                                                     | Color (moist) | %   | Color (moist)  | %  | Type <sup>1</sup> | Loc <sup>2</sup> |            |         |
| 0-4                                                                                                                 | 10YR 3/3      | 100 |                |    |                   |                  |            |         |
| 4-12                                                                                                                | 10YR 4/4      | 100 |                |    |                   |                  |            |         |
| 12-18                                                                                                               | 10YR 4/4      | 80  | 10YR 4/1       | 20 | D                 | M                | silty loam |         |
|                                                                                                                     |               |     |                |    |                   |                  |            |         |
|                                                                                                                     |               |     |                |    |                   |                  |            |         |
|                                                                                                                     |               |     |                |    |                   |                  |            |         |
|                                                                                                                     |               |     |                |    |                   |                  |            |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix.

| Hydric Soil Indicators:                                    |                                                     | Indicators for Problematic Hydric Soils <sup>3</sup> :    |  |
|------------------------------------------------------------|-----------------------------------------------------|-----------------------------------------------------------|--|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   | <input type="checkbox"/> Coast Prairie Redox (A16)        |  |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           | <input type="checkbox"/> Dark Surface (S7)                |  |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       | <input type="checkbox"/> Iron-Manganese Masses (F12)      |  |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |  |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   | <input type="checkbox"/> Other (Explain in Remarks)       |  |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |                                                           |  |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |                                                           |  |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |                                                           |  |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |                                                           |  |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |                                                           |  |

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

| Restrictive Layer (if observed): | Hydric Soil Present?                                          |
|----------------------------------|---------------------------------------------------------------|
| Type: _____                      | Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Depth (inches): _____            |                                                               |

Remarks:

# HYDROLOGY

| Wetland Hydrology Indicators:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Primary Indicators (minimum of one is required; check all that apply)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                           | <b>Secondary Indicators (minimum of two required)</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <input type="checkbox"/> Surface Water (A1)<br><input type="checkbox"/> High Water Table (A2)<br><input type="checkbox"/> Saturation (A3)<br><input type="checkbox"/> Water Marks (B1)<br><input type="checkbox"/> Sediment Deposits (B2)<br><input type="checkbox"/> Drift Deposits (B3)<br><input type="checkbox"/> Algal Mat or Crust (B4)<br><input type="checkbox"/> Iron Deposits (B5)<br><input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)<br><input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | <input type="checkbox"/> Water-Stained Leaves (B9)<br><input type="checkbox"/> Aquatic Fauna (B13)<br><input type="checkbox"/> True Aquatic Plants (B14)<br><input type="checkbox"/> Hydrogen Sulfide Odor (C1)<br><input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3)<br><input type="checkbox"/> Presence of Reduced Iron (C4)<br><input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)<br><input type="checkbox"/> Thin Muck Surface (C7)<br><input type="checkbox"/> Gauge or Well Data (D9)<br><input type="checkbox"/> Other (Explain in Remarks) |
| <b>Field Observations:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <b>Wetland Hydrology Present?</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Surface Water Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&lt; 0</u><br>Water Table Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>Saturation Present? Yes <input type="radio"/> No <input checked="" type="radio"/> Depth (inches): <u>&gt; 18</u><br>(includes capillary fringe)                                                                                                                                             | Yes <input type="radio"/> No <input checked="" type="radio"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Remarks:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |



# WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Des. No. 1382612 Heavy Haul Transportation Corridor City/County: Jeffersonville / Clark County Sampling Date: 5/7/14  
 Applicant/Owner: INDOT State: IN Sampling Point: DP36  
 Investigator(s): Briana Hope, Leah Boits Section, Township, Range: Clark's Grant #16  
 Landform (hillslope, terrace, etc.): Limestone Hills Local relief (concave, convex, none): none  
 Slope (%): 0.5 Lat: 38.3458 Long: 85.6682 Datum: D\_WGS\_1984  
 Soil Map Unit Name: Caneyville-Rock outcrop complex, 25 to 60 percent slopes (CcaG) NWI classification: N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☒ No ☐ (If no, explain in Remarks.)  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☒ No ☐  
 Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

## SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

|                                                                                               |                                                                                                     |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|
| Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No <input type="radio"/> | Is the Sampled Area within a Wetland? Yes <input type="radio"/> No <input checked="" type="radio"/> |
| Hydric Soil Present? Yes <input type="radio"/> No <input checked="" type="radio"/>            |                                                                                                     |
| Wetland Hydrology Present? Yes <input type="radio"/> No <input checked="" type="radio"/>      |                                                                                                     |
| Remarks:<br>This data point is representative of the upland conditions surrounding UNT 8      |                                                                                                     |

## VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u> )          | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------|------------------|-------------------|------------------|
| 1. <i>Acer negundo</i>                           | 25               | Yes               | FAC              |
| 2. <i>Platanus occidentalis</i>                  | 20               | Yes               | FACW             |
| 3. <i>Ulmus americana</i>                        | 5                | No                | FACW             |
| 4. <i>Prunus serotina</i>                        | 1                | No                | FACU             |
| 5. _____                                         |                  |                   |                  |
|                                                  | 51               | = Total Cover     |                  |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u> ) | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Fraxinus pennsylvanica</i>                 | 5                | Yes               | FACW             |
| 2. <i>Ulmus americana</i>                        | 5                | Yes               | FACW             |
| 3. <i>Rosa multiflora</i>                        | 5                | Yes               | FACU             |
| 4. _____                                         |                  |                   |                  |
| 5. _____                                         |                  |                   |                  |
|                                                  | 15               | = Total Cover     |                  |
| Herb Stratum (Plot size: <u>5 ft</u> )           | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Elymus virginicus</i>                      | 8                | Yes               | FACW             |
| 2. <i>Geum vernum</i>                            | 5                | Yes               | FACU             |
| 3. <i>Boehmeria cylindrica</i>                   | 3                | No                | OBL              |
| 4. <i>Sanicula canadensis</i>                    | 3                | No                | FACU             |
| 5. <i>Phacelia ranunculacea</i>                  | 3                | No                | FACW             |
| 6. <i>Carex blanda</i>                           | 3                | No                | FAC              |
| 7. _____                                         |                  |                   |                  |
| 8. _____                                         |                  |                   |                  |
| 9. _____                                         |                  |                   |                  |
| 10. _____                                        |                  |                   |                  |
|                                                  | 25               | = Total Cover     |                  |
| Woody Vine Stratum (Plot size: <u>15 ft</u> )    | Absolute % Cover | Dominant Species? | Indicator Status |
| 1. <i>Vitis riparia</i>                          | 6                | Yes               | FACW             |
| 2. <i>Parthenocissus quinquefolia</i>            | 4                | No                | FACU             |
|                                                  | 10               | = Total Cover     |                  |

**Dominance Test worksheet:**  
 Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)  
 Total Number of Dominant Species Across All Strata: 8 (B)  
 Percent of Dominant Species That Are OBL, FACW, or FAC: 75 (A/B)

**Prevalence Index worksheet:**  
 Total % Cover of: \_\_\_\_\_ Multiply by: \_\_\_\_\_  
 OBL species \_\_\_\_\_ x 1 = \_\_\_\_\_  
 FACW species \_\_\_\_\_ x 2 = \_\_\_\_\_  
 FAC species \_\_\_\_\_ x 3 = \_\_\_\_\_  
 FACU species \_\_\_\_\_ x 4 = \_\_\_\_\_  
 UPL species \_\_\_\_\_ x 5 = \_\_\_\_\_  
 Column Totals: 0 (A) \_\_\_\_\_ (B)  
 Prevalence Index = B/A = \_\_\_\_\_

**Hydrophytic Vegetation Indicators:**  
☐ 1 - Rapid Test for Hydrophytic Vegetation  
☒ 2 - Dominance Test is >50%  
☐ 3 - Prevalence Index is ≤3.0<sup>1</sup>  
☐ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)  
☐ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

**Hydrophytic Vegetation Present?** Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)

# SOIL

Sampling Point: DP36

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

| Depth<br>(inches) | Matrix        |    | Redox Features |   | Type <sup>1</sup> | Loc <sup>2</sup> | Texture    | Remarks |
|-------------------|---------------|----|----------------|---|-------------------|------------------|------------|---------|
|                   | Color (moist) | %  | Color (moist)  | % |                   |                  |            |         |
| 0-6               | 10YR 3/3      | 98 | 10YR 4/1       | 2 | D                 | M                | silty loam |         |
| 6-18              | 10YR 3/3      | 94 | 10YR 4/2       | 6 | D                 | M                | loamy silt |         |
|                   |               |    |                |   |                   |                  |            |         |
|                   |               |    |                |   |                   |                  |            |         |
|                   |               |    |                |   |                   |                  |            |         |
|                   |               |    |                |   |                   |                  |            |         |
|                   |               |    |                |   |                   |                  |            |         |

<sup>1</sup>Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.

<sup>2</sup>Location: PL=Pore Lining, M=Matrix.

## Hydric Soil Indicators:

- |                                                            |                                                     |
|------------------------------------------------------------|-----------------------------------------------------|
| <input type="checkbox"/> Histosol (A1)                     | <input type="checkbox"/> Sandy Gleyed Matrix (S4)   |
| <input type="checkbox"/> Histic Epipedon (A2)              | <input type="checkbox"/> Sandy Redox (S5)           |
| <input type="checkbox"/> Black Histic (A3)                 | <input type="checkbox"/> Stripped Matrix (S6)       |
| <input type="checkbox"/> Hydrogen Sulfide (A4)             | <input type="checkbox"/> Loamy Mucky Mineral (F1)   |
| <input type="checkbox"/> Stratified Layers (A5)            | <input type="checkbox"/> Loamy Gleyed Matrix (F2)   |
| <input type="checkbox"/> 2 cm Muck (A10)                   | <input type="checkbox"/> Depleted Matrix (F3)       |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6)    |
| <input type="checkbox"/> Thick Dark Surface (A12)          | <input type="checkbox"/> Depleted Dark Surface (F7) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1)          | <input type="checkbox"/> Redox Depressions (F8)     |
| <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3)      |                                                     |

## Indicators for Problematic Hydric Soils<sup>3</sup>:

- ☐ Coast Prairie Redox (A16)  
☐ Dark Surface (S7)  
☐ Iron-Manganese Masses (F12)  
☐ Very Shallow Dark Surface (TF12)  
☐ Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

## Restrictive Layer (if observed):

Type: \_\_\_\_\_  
Depth (inches): \_\_\_\_\_

Hydric Soil Present? Yes ☐ No ☒

Remarks:

# HYDROLOGY

## Wetland Hydrology Indicators:

Primary Indicators (minimum of one is required; check all that apply)

- |                                                                    |                                                                     |
|--------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> Surface Water (A1)                        | <input type="checkbox"/> Water-Stained Leaves (B9)                  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Fauna (B13)                        |
| <input type="checkbox"/> Saturation (A3)                           | <input type="checkbox"/> True Aquatic Plants (B14)                  |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)                 |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)              |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Thin Muck Surface (C7)                     |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Gauge or Well Data (D9)                    |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)   | <input type="checkbox"/> Other (Explain in Remarks)                 |

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)  
☐ Drainage Patterns (B10)  
☐ Dry-Season Water Table (C2)  
☐ Crayfish Burrows (C8)  
☐ Saturation Visible on Aerial Imagery (C9)  
☐ Stunted or Stressed Plants (D1)  
☐ Geomorphic Position (D2)  
☒ FAC-Neutral Test (D5)

## Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches): < 0  
 Water Table Present? Yes ☐ No ☒ Depth (inches): > 18  
 Saturation Present? Yes ☐ No ☒ Depth (inches): > 18  
 (includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☒

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

## Appendix C - Quality Assessment Forms

QHEI  
HHEI



# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 1

QHEI Score: 38

Stream &amp; Location: UNT 1, Heavy Haul (Des. 1382612) / Clark County, Indiana RM: Date: 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint  
River Code: STORET #: Lat./Long.: 38.32904 / 85.66987 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

| BEST TYPES                                                                                                     |    | POOL RIFFLE | OTHER TYPES                                  |    | POOL RIFFLE | ORIGIN                                            | QUALITY                                           |                                 |
|----------------------------------------------------------------------------------------------------------------|----|-------------|----------------------------------------------|----|-------------|---------------------------------------------------|---------------------------------------------------|---------------------------------|
| <input type="checkbox"/> BLDR /SLABS [10]                                                                      |    |             | <input type="checkbox"/> HARDPAN [4]         |    |             | <input checked="" type="checkbox"/> LIMESTONE [1] | <input type="checkbox"/> HEAVY [-2]               | Substrate<br>7<br>Maximum<br>20 |
| <input type="checkbox"/> BOULDER [9]                                                                           |    |             | <input type="checkbox"/> DETRITUS [3]        |    |             | <input type="checkbox"/> TILLS [1]                | <input checked="" type="checkbox"/> MODERATE [-1] |                                 |
| <input type="checkbox"/> COBBLE [8]                                                                            |    |             | <input type="checkbox"/> MUCK [2]            |    |             | <input type="checkbox"/> WETLANDS [0]             | <input type="checkbox"/> NORMAL [0]               |                                 |
| <input type="checkbox"/> GRAVEL [7]                                                                            | 5  |             | <input checked="" type="checkbox"/> SILT [2] | 70 |             | <input type="checkbox"/> HARDPAN [0]              | <input type="checkbox"/> FREE [1]                 |                                 |
| <input checked="" type="checkbox"/> SAND [6]                                                                   | 25 |             | <input type="checkbox"/> ARTIFICIAL [0]      |    |             | <input type="checkbox"/> SANDSTONE [0]            | <input type="checkbox"/> EXTENSIVE [-2]           |                                 |
| <input type="checkbox"/> BEDROCK [5]                                                                           |    |             |                                              |    |             | <input type="checkbox"/> RIP/RAP [0]              | <input checked="" type="checkbox"/> MODERATE [-1] |                                 |
| NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0] |    |             |                                              |    |             | SILT<br>EMBEDDEDNESS                              |                                                   |                                 |
| Comments                                                                                                       |    |             |                                              |    |             | <input type="checkbox"/> LACUSTURINE [0]          |                                                   |                                 |
|                                                                                                                |    |             |                                              |    |             | <input type="checkbox"/> SHALE [-1]               |                                                   |                                 |
|                                                                                                                |    |             |                                              |    |             | <input type="checkbox"/> COAL FINES [-2]          |                                                   |                                 |

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

|                                                                  |                                           | AMOUNT                                            |                                                         |
|------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> UNDERCUT BANKS [1]                      | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1]   | <input type="checkbox"/> EXTENSIVE >75% [11]            |
| <input checked="" type="checkbox"/> 2 OVERHANGING VEGETATION [1] | <input type="checkbox"/> ROOTWADS [1]     | <input type="checkbox"/> AQUATIC MACROPHYTES [1]  | <input checked="" type="checkbox"/> MODERATE 25-75% [7] |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]            | <input type="checkbox"/> BOULDERS [1]     | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] | <input type="checkbox"/> SPARSE 5-<25% [3]              |
| <input type="checkbox"/> ROOTMATS [1]                            |                                           |                                                   | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |
| Comments                                                         |                                           | Cover<br>Maximum<br>20                            | 9                                                       |

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                    | DEVELOPMENT                                  | CHANNELIZATION                                                | STABILITY                                        |                          |
|----------------------------------------------|----------------------------------------------|---------------------------------------------------------------|--------------------------------------------------|--------------------------|
| <input type="checkbox"/> HIGH [4]            | <input type="checkbox"/> EXCELLENT [7]       | <input type="checkbox"/> NONE [6]                             | <input type="checkbox"/> HIGH [3]                | Channel<br>Maximum<br>20 |
| <input type="checkbox"/> MODERATE [3]        | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]                        | <input checked="" type="checkbox"/> MODERATE [2] |                          |
| <input type="checkbox"/> LOW [2]             | <input type="checkbox"/> FAIR [3]            | <input type="checkbox"/> RECOVERING [3]                       | <input type="checkbox"/> LOW [1]                 |                          |
| <input checked="" type="checkbox"/> NONE [1] | <input checked="" type="checkbox"/> POOR [1] | <input checked="" type="checkbox"/> RECENT OR NO RECOVERY [1] |                                                  |                          |
| Comments                                     |                                              |                                                               |                                                  | 5                        |

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| EROSION                                               |                                                  | RIPARIAN WIDTH                                     |                                               | FLOOD PLAIN QUALITY                                                  |                                                            | CONSERVATION TILLAGE                                 |                                                  |
|-------------------------------------------------------|--------------------------------------------------|----------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------|------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------|
| <input checked="" type="checkbox"/> NONE / LITTLE [3] | <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> WIDE > 50m [4] | <input type="checkbox"/> MODERATE 10-50m [3]  | <input type="checkbox"/> FOREST, SWAMP [3]                           | <input checked="" type="checkbox"/> SHRUB OR OLD FIELD [2] | <input type="checkbox"/> CONSERVATION TILLAGE [1]    | <input type="checkbox"/> URBAN OR INDUSTRIAL [0] |
| <input type="checkbox"/> MODERATE [2]                 | <input type="checkbox"/> HEAVY / SEVERE [1]      | <input type="checkbox"/> NARROW 5-10m [2]          | <input type="checkbox"/> VERY NARROW < 5m [1] | <input checked="" type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] | <input type="checkbox"/> FENCED PASTURE [1]                | <input type="checkbox"/> MINING / CONSTRUCTION [0]   |                                                  |
| <input type="checkbox"/> NONE [0]                     |                                                  | <input type="checkbox"/> NONE [0]                  |                                               | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]                   |                                                            | Indicate predominant land use(s) past 100m riparian. |                                                  |
| Comments                                              |                                                  |                                                    |                                               |                                                                      |                                                            | Riparian<br>Maximum<br>10                            | 8                                                |

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                     |                                                                   | CHANNEL WIDTH                            |                                              | CURRENT VELOCITY                        |  | Recreation Potential<br>Primary Contact<br>Secondary Contact<br>(circle one and comment on back) |
|---------------------------------------------------|-------------------------------------------------------------------|------------------------------------------|----------------------------------------------|-----------------------------------------|--|--------------------------------------------------------------------------------------------------|
| Check ONE (ONLY!)                                 |                                                                   | Check ONE (Or 2 & average)               |                                              | Check ALL that apply                    |  |                                                                                                  |
| <input type="checkbox"/> > 1m [6]                 | <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            | <input type="checkbox"/> TORRENTIAL [-1] | <input checked="" type="checkbox"/> SLOW [1] |                                         |  | Pool /<br>Current<br>Maximum<br>12                                                               |
| <input type="checkbox"/> 0.7-<1m [4]              | <input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] | <input type="checkbox"/> VERY FAST [1]   | <input type="checkbox"/> INTERSTITIAL [-1]   |                                         |  |                                                                                                  |
| <input type="checkbox"/> 0.4-<0.7m [2]            | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input type="checkbox"/> FAST [1]        | <input type="checkbox"/> INTERMITTENT [-2]   |                                         |  |                                                                                                  |
| <input checked="" type="checkbox"/> 0.2-<0.4m [1] |                                                                   | <input type="checkbox"/> MODERATE [1]    | <input type="checkbox"/> EDDIES [1]          |                                         |  |                                                                                                  |
| <input type="checkbox"/> < 0.2m [0]               |                                                                   |                                          |                                              | Indicate for reach - pools and riffles. |  |                                                                                                  |
| Comments                                          |                                                                   |                                          |                                              |                                         |  |                                                                                                  |

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

| RIFFLE DEPTH                                         |                                             | RUN DEPTH                                                       |                                                               | RIFFLE / RUN SUBSTRATE                |                                         | RIFFLE / RUN EMBEDDEDNESS       |   |
|------------------------------------------------------|---------------------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------|---------------------------------------|-----------------------------------------|---------------------------------|---|
| <input type="checkbox"/> BEST AREAS > 10cm [2]       | <input type="checkbox"/> MAXIMUM > 50cm [2] | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]     | <input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] | <input type="checkbox"/> NONE [2]     | <input type="checkbox"/> LOW [1]        | Riffle /<br>Run<br>Maximum<br>8 | 0 |
| <input type="checkbox"/> BEST AREAS 5-10cm [1]       | <input type="checkbox"/> MAXIMUM < 50cm [1] | <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] |                                                               | <input type="checkbox"/> MODERATE [0] | <input type="checkbox"/> EXTENSIVE [-1] |                                 |   |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0] |                                             |                                                                 |                                                               |                                       |                                         |                                 |   |
| Comments                                             |                                             |                                                                 |                                                               |                                       |                                         |                                 |   |

6) GRADIENT ( 6.79 ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]  
DRAINAGE AREA ( 0.04 mi<sup>2</sup>)%POOL: 5 %GLIDE: 90  
%RUN: 5 %RIFFLE: 0  
Gradient  
Maximum  
10

6

## AJ SAMPLED REACH

Check ALL that apply

### METHOD STAGE

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER
- 1st-sample pass- 2nd  
☐ HIGH  
☐ UP  
☒ NORMAL  
☐ LOW  
☐ DRY

### DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

59

meters

### CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☒ 30%-<55%  
☐ 10%-<30%  
☐ <10%- CLOSED

### CLARITY

- 1st --sample pass-- 2nd  
☐ < 20 cm  
☐ 20-<40 cm  
☐ 40-70 cm  
☒ > 70 cm/ CTB  
☐ SECCHI DEPTH

- 1st \_\_\_\_\_ cm  
2nd \_\_\_\_\_ cm

### CJ RECREATION

AREA DEPTH  
POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

### BJ AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

### DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMOURED / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

### EJ ISSUES

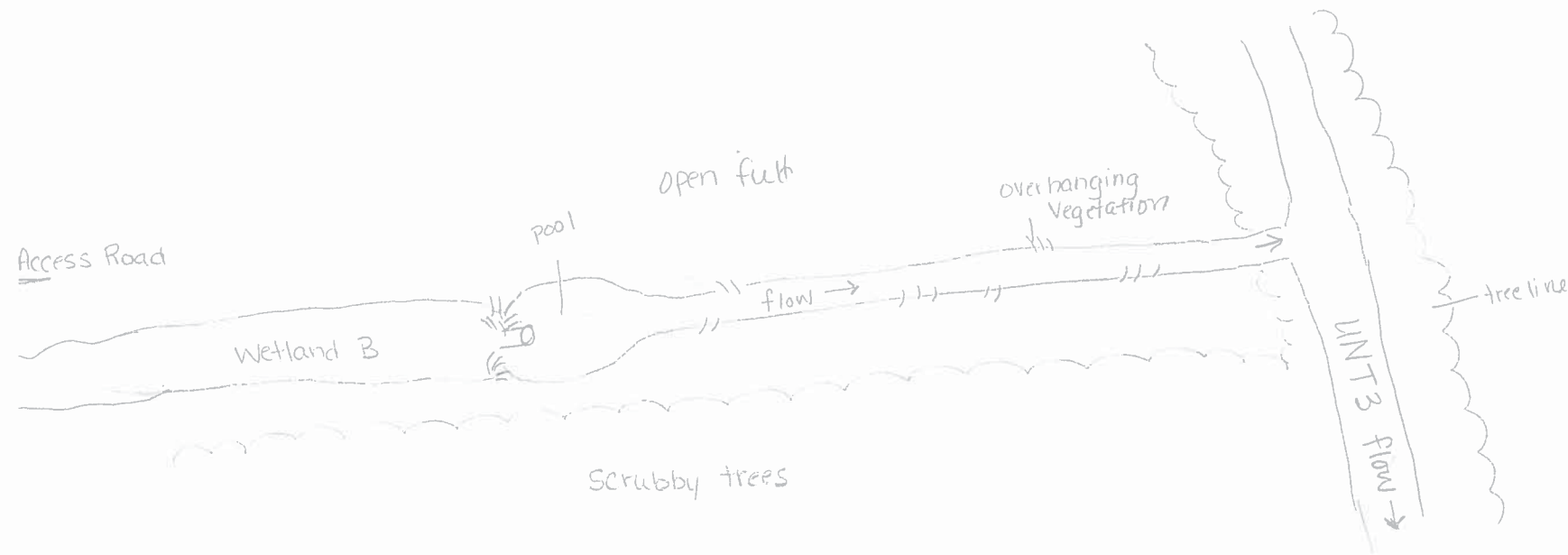
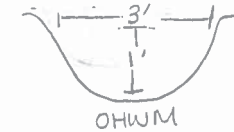
- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

### FJ MEASUREMENTS

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio

Legacy Tree:

## Stream Drawing:







# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 2

QHEI Score: 39.5

Stream &amp; Location: UNT 2, Heavy Haul (Des. 1382612) / Clark County, Indiana RM: Date: 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint  
River Code: STORET #: Lat./ Long.: 38.33001 / 85.67148 (NAD 83 - decimal) Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

| BEST TYPES                                                                                                     |                                      | OTHER TYPES                                                  |                                      | ORIGIN                                            |                               | QUALITY                                            |                              |
|----------------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------------------------|--------------------------------------|---------------------------------------------------|-------------------------------|----------------------------------------------------|------------------------------|
| <input type="checkbox"/> BLDR / SLABS [10]                                                                     | <input type="checkbox"/> POOL RIFFLE | <input type="checkbox"/> HARDPAN [4]                         | <input type="checkbox"/> POOL RIFFLE | <input checked="" type="checkbox"/> LIMESTONE [1] | <input type="checkbox"/> SILT | <input type="checkbox"/> HEAVY [-2]                | Substrate<br>7<br>Maximum 20 |
| <input type="checkbox"/> BOULDER [9]                                                                           | <input type="checkbox"/>             | <input type="checkbox"/> DETRITUS [3]                        | <input type="checkbox"/>             | <input type="checkbox"/> TILLS [1]                | <input type="checkbox"/>      | <input checked="" type="checkbox"/> MODERATE [-1]  |                              |
| <input type="checkbox"/> COBBLE [8]                                                                            | <input type="checkbox"/>             | <input type="checkbox"/> MUCK [2]                            | <input type="checkbox"/>             | <input type="checkbox"/> WETLANDS [0]             | <input type="checkbox"/>      | <input type="checkbox"/> NORMAL [0]                |                              |
| <input type="checkbox"/> GRAVEL [7]                                                                            | 10 20                                | <input checked="" type="checkbox"/> SILT [2]                 | 70 50                                | <input type="checkbox"/> HARDPAN [0]              | <input type="checkbox"/>      | <input type="checkbox"/> FREE [1]                  |                              |
| <input checked="" type="checkbox"/> SAND [6]                                                                   | 20 30                                | <input type="checkbox"/> ARTIFICIAL [0]                      | <input type="checkbox"/>             | <input type="checkbox"/> SANDSTONE [0]            | <input type="checkbox"/>      | <input checked="" type="checkbox"/> EXTENSIVE [-2] |                              |
| <input type="checkbox"/> BEDROCK [5]                                                                           |                                      | (Score natural substrates; ignore sludge from point-sources) |                                      | <input type="checkbox"/> RIP/RAP [0]              | <input type="checkbox"/>      | <input checked="" type="checkbox"/> MODERATE [-1]  |                              |
| NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0] |                                      |                                                              |                                      | <input type="checkbox"/> LACUSTURINE [0]          | <input type="checkbox"/>      | <input type="checkbox"/> NORMAL [0]                |                              |
| Comments                                                                                                       |                                      |                                                              |                                      | <input type="checkbox"/> SHALE [-1]               | <input type="checkbox"/>      | <input type="checkbox"/> NONE [1]                  |                              |
|                                                                                                                |                                      |                                                              |                                      | <input type="checkbox"/> COAL FINES [-2]          | <input type="checkbox"/>      |                                                    |                              |

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools. Check ONE (Or 2 &amp; average)

|                                                                  |                                           | AMOUNT                                            |                                                         |
|------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> UNDERCUT BANKS [1]                      | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1]   | <input type="checkbox"/> EXTENSIVE >75% [11]            |
| <input checked="" type="checkbox"/> 2 OVERHANGING VEGETATION [1] | <input type="checkbox"/> ROOTWADS [1]     | <input type="checkbox"/> AQUATIC MACROPHYTES [1]  | <input checked="" type="checkbox"/> MODERATE 25-75% [7] |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]            | <input type="checkbox"/> BOULDERS [1]     | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] | <input type="checkbox"/> SPARSE 5-<25% [3]              |
| <input type="checkbox"/> ROOTMATS [1]                            |                                           |                                                   | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |
| Comments                                                         |                                           | Cover<br>Maximum 20                               | 8                                                       |

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                   | DEVELOPMENT                                  | CHANNELIZATION                                                | STABILITY                                        |
|---------------------------------------------|----------------------------------------------|---------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> HIGH [4]           | <input type="checkbox"/> EXCELLENT [7]       | <input type="checkbox"/> NONE [6]                             | <input type="checkbox"/> HIGH [3]                |
| <input type="checkbox"/> MODERATE [3]       | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]                        | <input checked="" type="checkbox"/> MODERATE [2] |
| <input checked="" type="checkbox"/> LOW [2] | <input type="checkbox"/> FAIR [3]            | <input type="checkbox"/> RECOVERING [3]                       | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> NONE [1]           | <input checked="" type="checkbox"/> POOR [1] | <input checked="" type="checkbox"/> RECENT OR NO RECOVERY [1] |                                                  |
| Comments                                    |                                              | Channel<br>Maximum 20                                         | 6                                                |

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| EROSION                                          |                                                         | RIPARIAN WIDTH                                                              |                                                             | FLOOD PLAIN QUALITY |  |
|--------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------------------------|-------------------------------------------------------------|---------------------|--|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input type="checkbox"/> WIDE > 50m [4]                 | <input type="checkbox"/> FOREST, SWAMP [3]                                  | <input type="checkbox"/> CONSERVATION TILLAGE [1]           |                     |  |
| <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> MODERATE 10-50m [3] | <input checked="" type="checkbox"/> SHRUB OR OLD FIELD [2]                  | <input checked="" type="checkbox"/> URBAN OR INDUSTRIAL [0] |                     |  |
| <input type="checkbox"/> HEAVY / SEVERE [1]      | <input type="checkbox"/> NARROW 5-10m [2]               | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]                   | <input type="checkbox"/> MINING / CONSTRUCTION [0]          |                     |  |
|                                                  | <input type="checkbox"/> VERY NARROW < 5m [1]           | <input type="checkbox"/> FENCED PASTURE [1]                                 |                                                             |                     |  |
|                                                  | <input type="checkbox"/> NONE [0]                       | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]                          |                                                             |                     |  |
| Comments                                         |                                                         | Indicate predominant land use(s) past 100m riparian. Riparian<br>Maximum 10 |                                                             |                     |  |
|                                                  |                                                         | 6.5                                                                         |                                                             |                     |  |

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                     |                                                                   | CHANNEL WIDTH                            |                                              | CURRENT VELOCITY |                              | Recreation Potential<br>Primary Contact<br>Secondary Contact<br>(circle one and comment on back) |
|---------------------------------------------------|-------------------------------------------------------------------|------------------------------------------|----------------------------------------------|------------------|------------------------------|--------------------------------------------------------------------------------------------------|
| Check ONE (ONLY!)                                 | Check ONE (Or 2 & average)                                        | Check ALL that apply                     |                                              |                  |                              |                                                                                                  |
| <input type="checkbox"/> > 1m [6]                 | <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            | <input type="checkbox"/> TORRENTIAL [-1] | <input checked="" type="checkbox"/> SLOW [1] |                  | Pool / Current<br>Maximum 12 |                                                                                                  |
| <input type="checkbox"/> 0.7-<1m [4]              | <input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] | <input type="checkbox"/> VERY FAST [1]   | <input type="checkbox"/> INTERSTITIAL [-1]   |                  |                              |                                                                                                  |
| <input checked="" type="checkbox"/> 0.4-<0.7m [2] | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input type="checkbox"/> FAST [1]        | <input type="checkbox"/> INTERMITTENT [-2]   |                  |                              |                                                                                                  |
| <input type="checkbox"/> 0.2-<0.4m [1]            |                                                                   | <input type="checkbox"/> MODERATE [1]    | <input type="checkbox"/> EDDIES [1]          |                  |                              |                                                                                                  |
| <input type="checkbox"/> < 0.2m [0]               |                                                                   | Indicate for reach - pools and riffles.  |                                              |                  |                              |                                                                                                  |
| Comments                                          |                                                                   |                                          |                                              |                  |                              |                                                                                                  |

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

| RIFFLE DEPTH                                              |                                                        | RUN DEPTH                                                                  |                                                  | RIFFLE / RUN SUBSTRATE |  | RIFFLE / RUN EMBEDDEDNESS |                           |
|-----------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------|------------------------|--|---------------------------|---------------------------|
| <input type="checkbox"/> BEST AREAS > 10cm [2]            | <input type="checkbox"/> MAXIMUM > 50cm [2]            | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]                | <input type="checkbox"/> NONE [2]                |                        |  |                           | Riffle / Run<br>Maximum 8 |
| <input checked="" type="checkbox"/> BEST AREAS 5-10cm [1] | <input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <input type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]              | <input type="checkbox"/> LOW [1]                 |                        |  |                           |                           |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |                                                        | <input checked="" type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input checked="" type="checkbox"/> MODERATE [0] |                        |  |                           |                           |
| Comments                                                  |                                                        |                                                                            |                                                  |                        |  |                           |                           |

6) GRADIENT (ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]  
DRAINAGE AREA (0.06 mi<sup>2</sup>)  
%POOL: 5 %GLIDE: 50  
%RUN: 40 %RIFFLE: 5  
Gradient  
Maximum 10

## AJ SAMPLED REACH

Check ALL that apply

### METHOD

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER

### STAGE

- 1st-sample pass- 2nd  
☐ HIGH ☐  
☐ UP ☐  
☒ NORMAL ☒  
☐ LOW ☐  
☐ DRY ☐

### DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

60

meters

### CANOPY

- ☐ > 85%- OPEN  
☒ 55%-<85%  
☐ 30%-<55%  
☐ 10%-<30%  
☐ <10%- CLOSED

### CLARITY

- 1st --sample pass-- 2nd  
☐ < 20 cm ☐  
☐ 20-<40 cm ☐  
☐ 40-70 cm ☐  
☒ > 70 cm/ CTB ☐  
☐ SECCHI DEPTH ☐

- 1st \_\_\_\_\_ cm  
pass  
2nd \_\_\_\_\_ cm

### CJ RECREATION

AREA DEPTH

POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

### BJ AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

### DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

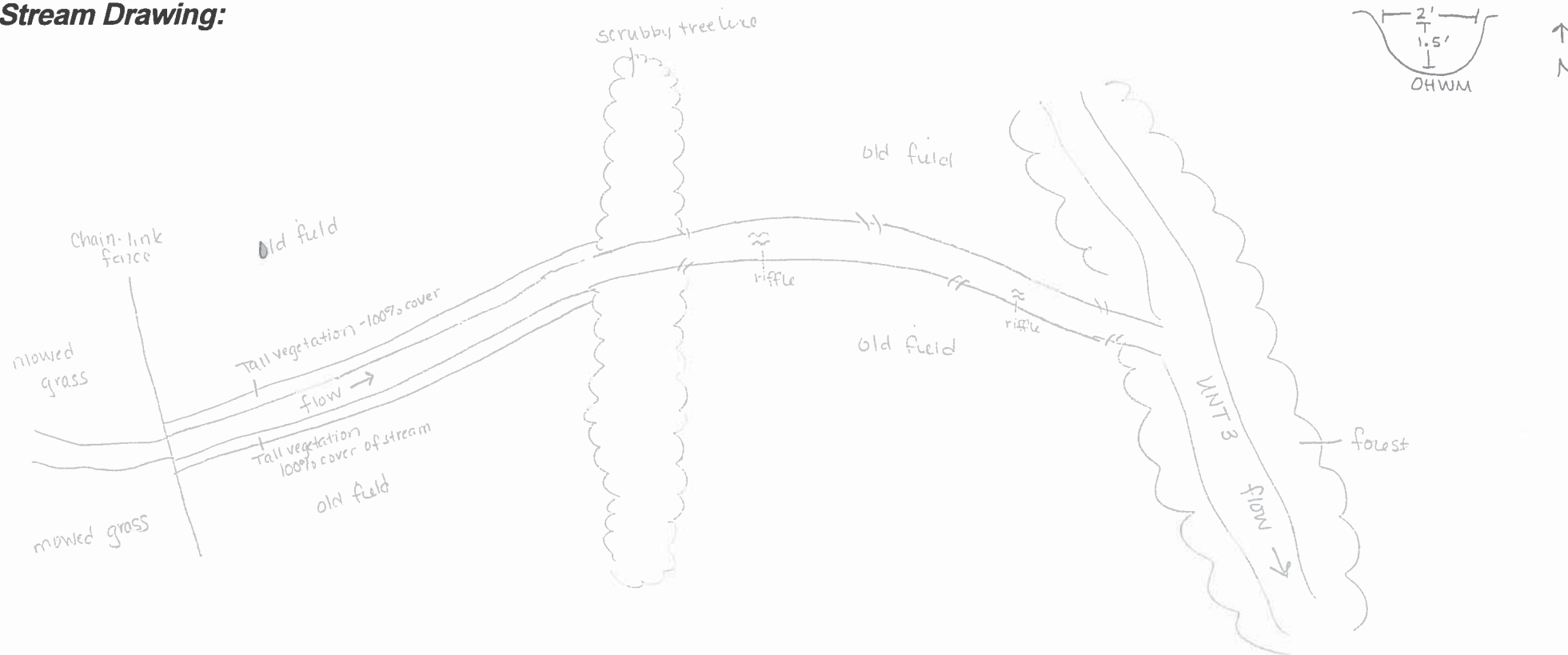
### EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

### FJ MEASUREMENTS

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio  
Legacy Tree:

## Stream Drawing:





# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 3

QHEI Score: 56.5

Stream &amp; Location: UNT 3, Heavy Haul (Des. 1382612) / Clark County, Indiana RM: Date: 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint  
River Code: STORET #: Lat./ Long.: 38.32976 / 85.67069 (NAD 83 - decimal) Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 &amp; average)

| BEST TYPES                                     |    | POOL RIFFLE |  | OTHER TYPES                             |    | POOL RIFFLE |  | ORIGIN                                            |  | QUALITY                                        |  | Substrate<br>14<br>Maximum 20 |
|------------------------------------------------|----|-------------|--|-----------------------------------------|----|-------------|--|---------------------------------------------------|--|------------------------------------------------|--|-------------------------------|
| <input type="checkbox"/> BLDR / SLABS [10]     |    |             |  | <input type="checkbox"/> HARDPAN [4]    |    |             |  | <input checked="" type="checkbox"/> LIMESTONE [1] |  | <input type="checkbox"/> HEAVY [-2]            |  |                               |
| <input type="checkbox"/> BOULDER [9]           |    |             |  | <input type="checkbox"/> DETRITUS [3]   |    |             |  | <input type="checkbox"/> TILLS [1]                |  | <input type="checkbox"/> MODERATE [-1]         |  |                               |
| <input type="checkbox"/> COBBLE [8]            | 10 | 20          |  | <input type="checkbox"/> MUCK [2]       |    |             |  | <input type="checkbox"/> WETLANDS [0]             |  | <input checked="" type="checkbox"/> NORMAL [0] |  |                               |
| <input checked="" type="checkbox"/> GRAVEL [7] | 20 | 20          |  | <input type="checkbox"/> SILT [2]       | 20 | 10          |  | <input type="checkbox"/> HARDPAN [0]              |  | <input type="checkbox"/> FREE [1]              |  |                               |
| <input type="checkbox"/> SAND [6]              | 50 | 50          |  | <input type="checkbox"/> ARTIFICIAL [0] |    |             |  | <input type="checkbox"/> SANDSTONE [0]            |  | <input type="checkbox"/> EXTENSIVE [-2]        |  |                               |
| <input type="checkbox"/> BEDROCK [5]           |    |             |  |                                         |    |             |  | <input type="checkbox"/> RIP/RAP [0]              |  | <input type="checkbox"/> MODERATE [-1]         |  |                               |
|                                                |    |             |  |                                         |    |             |  | <input type="checkbox"/> LACUSTURINE [0]          |  | <input checked="" type="checkbox"/> NORMAL [0] |  |                               |
|                                                |    |             |  |                                         |    |             |  | <input type="checkbox"/> SHALE [-1]               |  | <input type="checkbox"/> NONE [1]              |  |                               |
|                                                |    |             |  |                                         |    |             |  | <input type="checkbox"/> COAL FINES [-2]          |  |                                                |  |                               |

NUMBER OF BEST TYPES: ☐ 4 or more [2] sludge from point-sources) ☒ 3 or less [0]

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 &amp; average)

|                                                       |                                           |                                                   |                                                         |
|-------------------------------------------------------|-------------------------------------------|---------------------------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> UNDERCUT BANKS [1]           | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1]   | <input type="checkbox"/> EXTENSIVE >75% [11]            |
| <input type="checkbox"/> 1 OVERHANGING VEGETATION [1] | <input type="checkbox"/> ROOTWADS [1]     | <input type="checkbox"/> AQUATIC MACROPHYTES [1]  | <input checked="" type="checkbox"/> MODERATE 25-75% [7] |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input type="checkbox"/> BOULDERS [1]     | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] | <input type="checkbox"/> SPARSE 5-<25% [3]              |
| <input type="checkbox"/> ROOTMATS [1]                 |                                           |                                                   | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |

Comments

Cover Maximum 20 10

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                   | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY                                   |
|---------------------------------------------|----------------------------------------------|----------------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> HIGH [4]           | <input type="checkbox"/> EXCELLENT [7]       | <input type="checkbox"/> NONE [6]                  | <input type="checkbox"/> HIGH [3]           |
| <input type="checkbox"/> MODERATE [3]       | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input type="checkbox"/> MODERATE [2]       |
| <input checked="" type="checkbox"/> LOW [2] | <input checked="" type="checkbox"/> FAIR [3] | <input checked="" type="checkbox"/> RECOVERING [3] | <input checked="" type="checkbox"/> LOW [1] |
| <input type="checkbox"/> NONE [1]           | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |                                             |

Comments

Channel Maximum 20 9

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| EROSION                                          |                                                  | RIPARIAN WIDTH                                       |                                                         | FLOOD PLAIN QUALITY                                       |                                                            | CONSERVATION TILLAGE [1]                           |  |
|--------------------------------------------------|--------------------------------------------------|------------------------------------------------------|---------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------|--|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> WIDE > 50m [4]   | <input checked="" type="checkbox"/> MODERATE 10-50m [3] | <input checked="" type="checkbox"/> FOREST, SWAMP [3]     | <input checked="" type="checkbox"/> SHRUB OR OLD FIELD [2] | <input type="checkbox"/> URBAN OR INDUSTRIAL [0]   |  |
| <input checked="" type="checkbox"/> MODERATE [2] | <input type="checkbox"/> HEAVY / SEVERE [1]      | <input checked="" type="checkbox"/> NARROW 5-10m [2] | <input type="checkbox"/> VERY NARROW < 5m [1]           | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] | <input type="checkbox"/> FENCED PASTURE [1]                | <input type="checkbox"/> MINING / CONSTRUCTION [0] |  |
| <input type="checkbox"/> NONE [0]                |                                                  | <input type="checkbox"/> NONE [0]                    |                                                         | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]        |                                                            |                                                    |  |

Comments

Indicate predominant land use(s) past 100m riparian. Riparian Maximum 10 7

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                     |                                                                   | CHANNEL WIDTH                                    |                                              | CURRENT VELOCITY |  | Recreation Potential<br>Primary Contact<br>Secondary Contact<br>(circle one and comment on back) |
|---------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------|------------------|--|--------------------------------------------------------------------------------------------------|
| Check ONE (ONLY!)                                 | Check ONE (Or 2 & average)                                        | Check ALL that apply                             |                                              |                  |  |                                                                                                  |
| <input type="checkbox"/> > 1m [6]                 | <input checked="" type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2] | <input type="checkbox"/> TORRENTIAL [-1]         | <input checked="" type="checkbox"/> SLOW [1] |                  |  |                                                                                                  |
| <input type="checkbox"/> 0.7-<1m [4]              | <input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]            | <input type="checkbox"/> VERY FAST [1]           | <input type="checkbox"/> INTERSTITIAL [-1]   |                  |  |                                                                                                  |
| <input checked="" type="checkbox"/> 0.4-<0.7m [2] | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input type="checkbox"/> FAST [1]                | <input type="checkbox"/> INTERMITTENT [-2]   |                  |  |                                                                                                  |
| <input type="checkbox"/> 0.2-<0.4m [1]            |                                                                   | <input checked="" type="checkbox"/> MODERATE [1] | <input type="checkbox"/> EDDIES [1]          |                  |  |                                                                                                  |
| <input type="checkbox"/> < 0.2m [0]               |                                                                   |                                                  |                                              |                  |  |                                                                                                  |

Comments

Indicate for reach - pools and riffles.

Pool / Current Maximum 12 6

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 &amp; average).

☐ NO RIFFLE [metric=0]

| RIFFLE DEPTH                                              | RUN DEPTH                                              | RIFFLE / RUN SUBSTRATE                                                   | RIFFLE / RUN EMBEDDEDNESS                   | Riffle / Run<br>Maximum 8<br>4.5 |
|-----------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------|----------------------------------|
| <input type="checkbox"/> BEST AREAS > 10cm [2]            | <input type="checkbox"/> MAXIMUM > 50cm [2]            | <input checked="" type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]   | <input type="checkbox"/> NONE [2]           |                                  |
| <input checked="" type="checkbox"/> BEST AREAS 5-10cm [1] | <input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] | <input checked="" type="checkbox"/> LOW [1] |                                  |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |                                                        | <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]          | <input type="checkbox"/> MODERATE [0]       |                                  |
|                                                           |                                                        |                                                                          | <input type="checkbox"/> EXTENSIVE [-1]     |                                  |

Comments

6) GRADIENT (

DRAINAGE AREA

ft/mi)

☐ VERY LOW - LOW [2-4]☒ MODERATE [6-10]☐ HIGH - VERY HIGH [10-6]

%POOL: 15

%GLIDE: 25

%RUN: 40

%RIFFLE: 20

Gradient

Maximum 10

6

# AJ SAMPLED REACH

Check ALL that apply

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

## METHOD

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER

## STAGE

- 1st -sample pass- 2nd  
☐ HIGH ☐  
☐ UP ☐  
☒ NORMAL ☒  
☐ LOW ☐  
☐ DRY ☐

## DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

## CLARITY

- 1st --sample pass-- 2nd  
☐ < 20 cm ☐  
☐ 20-<40 cm ☐  
☐ 40-70 cm ☐  
☒ > 70 cm/ CTB ☐  
☐ SECCHI DEPTH ☐

60  
meters

## CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☐ 10%-<30%  
☒ <10%- CLOSED

- 1st \_\_\_\_\_ cm  
pass  
2nd \_\_\_\_\_ cm

## CJ RECREATION

AREA DEPTH  
POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

## BJ AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

## DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

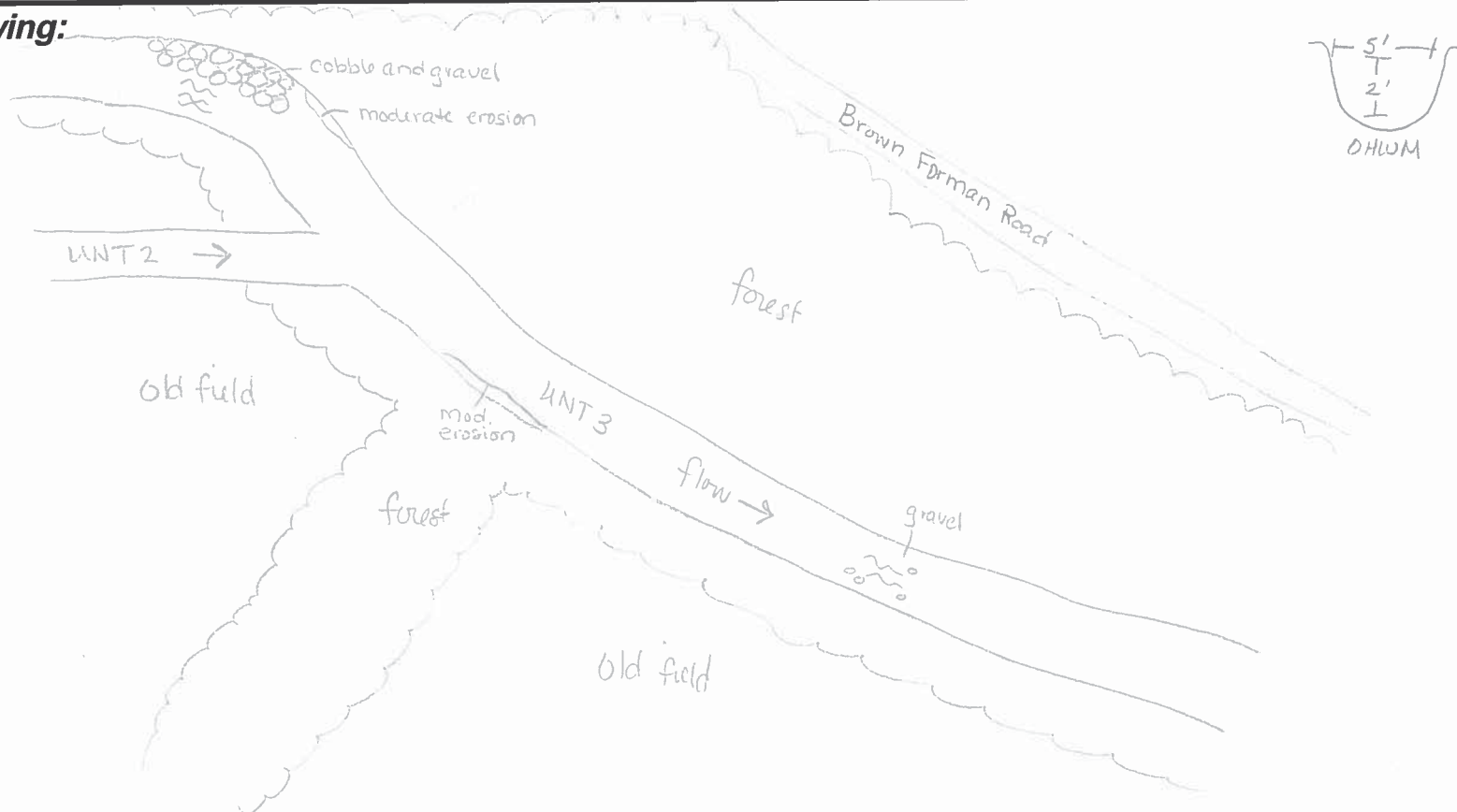
## EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

## FJ MEASUREMENTS

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio  
Legacy Tree:

## Stream Drawing:







# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 4

QHEI Score: 50.5

Stream &amp; Location: UNT 3, Heavy Haul (Des. 1382612) / Clark County, Indiana RM: Date: 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint  
River Code: STORET #: Lat./ Long.: 38.33295 / 85.67324 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

| BEST TYPES                                   |    | POOL RIFFLE                             |  | OTHER TYPES                                  |    | POOL RIFFLE                            |  | ORIGIN                                         |  | QUALITY                                                  |  |
|----------------------------------------------|----|-----------------------------------------|--|----------------------------------------------|----|----------------------------------------|--|------------------------------------------------|--|----------------------------------------------------------|--|
| <input type="checkbox"/> BLDR / SLABS [10]   |    | <input type="checkbox"/> HARDPAN [4]    |  | <input checked="" type="checkbox"/> SILT [2] | 50 | <input type="checkbox"/> LIMESTONE [1] |  | <input type="checkbox"/> HEAVY [-2]            |  | <div>Substrate</div> <div>11</div> <div>Maximum 20</div> |  |
| <input type="checkbox"/> BOULDER [9]         | 5  | <input type="checkbox"/> DETRITUS [3]   |  | <input type="checkbox"/> TILLS [1]           |    | <input type="checkbox"/> WETLANDS [0]  |  | <input type="checkbox"/> MODERATE [-1]         |  |                                                          |  |
| <input type="checkbox"/> COBBLE [8]          | 5  | <input type="checkbox"/> MUCK [2]       |  | <input type="checkbox"/> SANDSTONE [0]       |    | <input type="checkbox"/> RIP/RAP [0]   |  | <input checked="" type="checkbox"/> NORMAL [0] |  |                                                          |  |
| <input type="checkbox"/> GRAVEL [7]          | 10 | <input type="checkbox"/> ARTIFICIAL [0] |  | <input type="checkbox"/> LACUSTURINE [0]     |    | <input type="checkbox"/> SHALE [-1]    |  | <input type="checkbox"/> FREE [1]              |  |                                                          |  |
| <input checked="" type="checkbox"/> SAND [6] | 30 |                                         |  | <input type="checkbox"/> COAL FINES [-2]     |    |                                        |  | <input type="checkbox"/> EXTENSIVE [-2]        |  |                                                          |  |
| <input type="checkbox"/> BEDROCK [5]         |    |                                         |  |                                              |    |                                        |  | <input type="checkbox"/> MODERATE [-1]         |  |                                                          |  |

Check ONE (Or 2 & average)

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0]

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

| AMOUNT                                                |                                           |                                                   |
|-------------------------------------------------------|-------------------------------------------|---------------------------------------------------|
| Check ONE (Or 2 & average)                            |                                           |                                                   |
| <input type="checkbox"/> UNDERCUT BANKS [1]           | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1]   |
| <input type="checkbox"/> 1 OVERHANGING VEGETATION [1] | <input type="checkbox"/> ROOTWADS [1]     | <input type="checkbox"/> AQUATIC MACROPHYTES [1]  |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input type="checkbox"/> BOULDERS [1]     | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] |
| <input type="checkbox"/> ROOTMATS [1]                 |                                           |                                                   |

Channel Cover Maximum 20 9

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                        | DEVELOPMENT                                  | CHANNELIZATION                                                | STABILITY                             |
|--------------------------------------------------|----------------------------------------------|---------------------------------------------------------------|---------------------------------------|
| <input type="checkbox"/> HIGH [4]                | <input type="checkbox"/> EXCELLENT [7]       | <input type="checkbox"/> NONE [6]                             | <input type="checkbox"/> HIGH [3]     |
| <input checked="" type="checkbox"/> MODERATE [3] | <input checked="" type="checkbox"/> GOOD [5] | <input checked="" type="checkbox"/> RECOVERED [4]             | <input type="checkbox"/> MODERATE [2] |
| <input type="checkbox"/> LOW [2]                 | <input type="checkbox"/> FAIR [3]            | <input type="checkbox"/> RECOVERING [3]                       | <input type="checkbox"/> LOW [1]      |
| <input checked="" type="checkbox"/> NONE [1]     | <input checked="" type="checkbox"/> POOR [1] | <input checked="" type="checkbox"/> RECENT OR NO RECOVERY [1] |                                       |

Channel Maximum 20 9.5

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| RIPARIAN WIDTH                                        |                                                          | FLOOD PLAIN QUALITY                                           |                                                    |
|-------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------|----------------------------------------------------|
| <input checked="" type="checkbox"/> EROSION           | <input checked="" type="checkbox"/> WIDE > 50m [4]       | <input checked="" type="checkbox"/> FOREST, SWAMP [3]         | <input type="checkbox"/> CONSERVATION TILLAGE [1]  |
| <input checked="" type="checkbox"/> NONE / LITTLE [3] | <input type="checkbox"/> MODERATE 10-50m [3]             | <input type="checkbox"/> SHRUB OR OLD FIELD [2]               | <input type="checkbox"/> URBAN OR INDUSTRIAL [0]   |
| <input checked="" type="checkbox"/> MODERATE [2]      | <input type="checkbox"/> NARROW 5-10m [2]                | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]     | <input type="checkbox"/> MINING / CONSTRUCTION [0] |
| <input type="checkbox"/> HEAVY / SEVERE [1]           | <input checked="" type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> FENCED PASTURE [1]                   |                                                    |
|                                                       | <input checked="" type="checkbox"/> NONE [0]             | <input checked="" type="checkbox"/> OPEN PASTURE, ROWCROP [0] |                                                    |

Indicate predominant land use(s) past 100m riparian. Riparian Maximum 10 6

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                     |                                                                   | CHANNEL WIDTH                                    |                                              | CURRENT VELOCITY                                                                                                                    |  |
|---------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|--|
| <input type="checkbox"/> Check ONE (ONLY!)        | <input type="checkbox"/> Check ONE (Or 2 & average)               | <input type="checkbox"/> TORRENTIAL [-1]         | <input checked="" type="checkbox"/> SLOW [1] | <div>Recreation Potential</div> <div>Primary Contact</div> <div>Secondary Contact</div> <div>(circle one and comment on back)</div> |  |
| <input type="checkbox"/> > 1m [6]                 | <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            | <input type="checkbox"/> VERY FAST [1]           | <input type="checkbox"/> INTERSTITIAL [-1]   |                                                                                                                                     |  |
| <input type="checkbox"/> 0.7-<1m [4]              | <input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] | <input checked="" type="checkbox"/> FAST [1]     | <input type="checkbox"/> INTERMITTENT [-2]   |                                                                                                                                     |  |
| <input checked="" type="checkbox"/> 0.4-<0.7m [2] | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input checked="" type="checkbox"/> MODERATE [1] | <input type="checkbox"/> EDDIES [1]          |                                                                                                                                     |  |
| <input type="checkbox"/> 0.2-<0.4m [1]            |                                                                   |                                                  |                                              |                                                                                                                                     |  |

Indicate for reach - pools and riffles. Pool / Current Maximum 12 6

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

| RIFFLE DEPTH                                              |                                                        | RUN DEPTH                                                                |                                                  | RIFFLE / RUN SUBSTRATE          |  | RIFFLE / RUN EMBEDDEDNESS                                 |  |
|-----------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------|--------------------------------------------------|---------------------------------|--|-----------------------------------------------------------|--|
| <input type="checkbox"/> BEST AREAS > 10cm [2]            | <input type="checkbox"/> MAXIMUM > 50cm [2]            | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]              | <input type="checkbox"/> NONE [2]                | <div>NO RIFFLE [metric=0]</div> |  | <div>Riffle / Run</div> <div>Maximum 8</div> <div>3</div> |  |
| <input checked="" type="checkbox"/> BEST AREAS 5-10cm [1] | <input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] | <input type="checkbox"/> LOW [1]                 |                                 |  |                                                           |  |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |                                                        | <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]          | <input checked="" type="checkbox"/> MODERATE [0] |                                 |  |                                                           |  |

Comments

| 6) GRADIENT ( |  | DRAINAGE AREA |  | ft/mi) |  | mi <sup>2</sup> ) |  | VERY LOW - LOW [2-4] |  | MODERATE [6-10] |  | HIGH - VERY HIGH [10-6] |  | %POOL: 15 |  | %GLIDE: 25 |  | %RUN: 40 |  | %RIFFLE: 20 |  | Gradient Maximum 10 6 |  |
|---------------|--|---------------|--|--------|--|-------------------|--|----------------------|--|-----------------|--|-------------------------|--|-----------|--|------------|--|----------|--|-------------|--|-----------------------|--|
|---------------|--|---------------|--|--------|--|-------------------|--|----------------------|--|-----------------|--|-------------------------|--|-----------|--|------------|--|----------|--|-------------|--|-----------------------|--|



**AJ SAMPLED REACH**

Check ALL that apply

**METHOD**

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER

**STAGE**

- 1st -sample pass- 2nd  
☐ HIGH ☐  
☐ UP ☐  
☒ NORMAL ☒  
☐ LOW ☐  
☐ DRY ☐

**DISTANCE**

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

60

meters

**CANOPY**

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☒ 30%-<55%  
☐ 10%-<30%  
☐ <10%- CLOSED

**CLARITY**

- 1st --sample pass-- 2nd  
☐ < 20 cm ☐  
☐ 20-<40 cm ☐  
☐ 40-70 cm ☐  
☒ > 70 cm/ CTB ☐  
☐ SECCHI DEPTH ☐

- 1st \_\_\_\_\_ cm  
pass  
2nd \_\_\_\_\_ cm

**CJ RECREATION**

AREA DEPTH  
POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.  
Last precipitation: 2015-07-20, 0.02 inch

**BJ AESTHETICS**

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

**DJ MAINTENANCE**

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

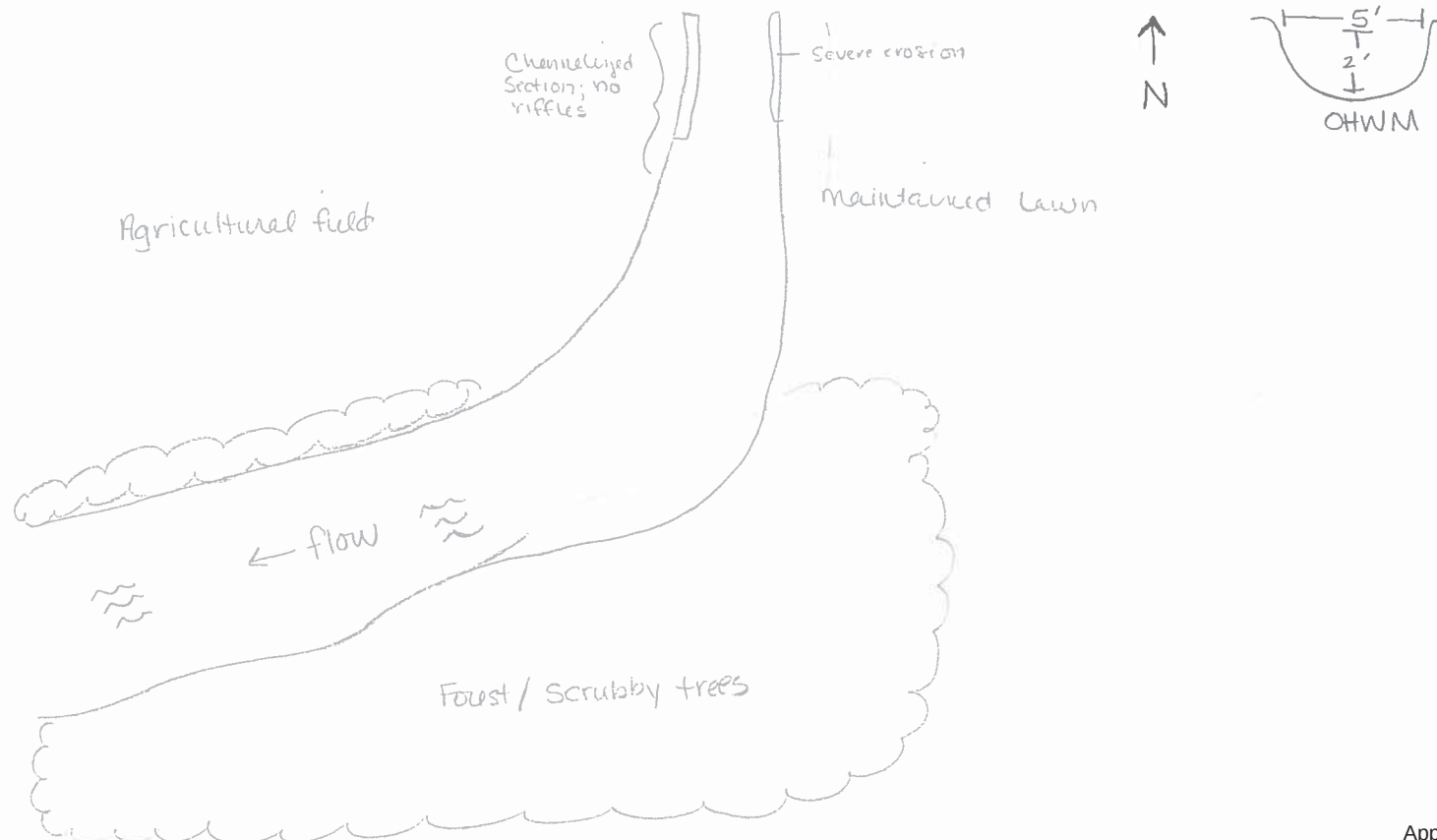
Circle some &amp; COMMENT

**EJ ISSUES**

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

**FJ MEASUREMENTS**

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio  
Legacy Tree:

**Stream Drawing:**



# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 5

QHEI Score: 59.5

Stream &amp; Location: UNT 4, Heavy Haul (Des. 1382612) / Clark County, Indiana RM: Date: 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint  
River Code: STORET #: Lat./ Long.: 38.33748 / 85.66907 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 &amp; average)

| BEST TYPES                                 |    | POOL RIFFLE |  | OTHER TYPES                                     |    | POOL RIFFLE |    | ORIGIN                                            |  | QUALITY                                        |                                                         |  |
|--------------------------------------------|----|-------------|--|-------------------------------------------------|----|-------------|----|---------------------------------------------------|--|------------------------------------------------|---------------------------------------------------------|--|
| <input type="checkbox"/> BLDR / SLABS [10] |    |             |  | <input checked="" type="checkbox"/> HARDPAN [4] |    | 40          | 35 | <input checked="" type="checkbox"/> LIMESTONE [1] |  | <input type="checkbox"/> HEAVY [-2]            | <div>Substrate</div> <div>9</div> <div>Maximum 20</div> |  |
| <input type="checkbox"/> BOULDER [9]       |    |             |  | <input type="checkbox"/> DETRITUS [3]           |    |             |    | <input type="checkbox"/> TILLS [1]                |  | <input type="checkbox"/> MODERATE [-1]         |                                                         |  |
| <input type="checkbox"/> COBBLE [8]        | 5  | 10          |  | <input type="checkbox"/> MUCK [2]               |    |             |    | <input type="checkbox"/> WETLANDS [0]             |  | <input checked="" type="checkbox"/> NORMAL [0] |                                                         |  |
| <input type="checkbox"/> GRAVEL [7]        | 10 | 10          |  | <input checked="" type="checkbox"/> SILT [2]    | 25 | 5           |    | <input type="checkbox"/> HARDPAN [0]              |  | <input type="checkbox"/> FREE [1]              |                                                         |  |
| <input type="checkbox"/> SAND [6]          | 15 | 15          |  | <input type="checkbox"/> ARTIFICIAL [0]         |    |             |    | <input type="checkbox"/> SANDSTONE [0]            |  | <input type="checkbox"/> EXTENSIVE [-2]        |                                                         |  |
| <input type="checkbox"/> BEDROCK [5]       | 5  | 25          |  |                                                 |    |             |    | <input type="checkbox"/> RIP/RAP [0]              |  | <input type="checkbox"/> MODERATE [-1]         |                                                         |  |
|                                            |    |             |  |                                                 |    |             |    | <input type="checkbox"/> LACUSTURINE [0]          |  | <input checked="" type="checkbox"/> NORMAL [0] |                                                         |  |
|                                            |    |             |  |                                                 |    |             |    | <input type="checkbox"/> SHALE [-1]               |  | <input type="checkbox"/> NONE [1]              |                                                         |  |
|                                            |    |             |  |                                                 |    |             |    | <input type="checkbox"/> COAL FINES [-2]          |  |                                                |                                                         |  |

NUMBER OF BEST TYPES: ☒ 4 or more [2] ☐ 3 or less [0] (Score natural substrates; ignore sludge from point-sources)

Comments

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 &amp; average)

|                                                       |                                           |                                                  |                                                         |
|-------------------------------------------------------|-------------------------------------------|--------------------------------------------------|---------------------------------------------------------|
| <input type="checkbox"/> UNDERCUT BANKS [1]           | <input type="checkbox"/> POOLS > 70cm [2] | <input type="checkbox"/> OXBOWS, BACKWATERS [1]  | <input checked="" type="checkbox"/> EXTENSIVE >75% [11] |
| <input type="2"/> OVERHANGING VEGETATION [1]          | <input type="checkbox"/> ROOTWADS [1]     | <input type="checkbox"/> AQUATIC MACROPHYTES [1] | <input type="checkbox"/> MODERATE 25-75% [7]            |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input type="checkbox"/> BOULDERS [1]     | <input type="2"/> LOGS OR WOODY DEBRIS [1]       | <input type="checkbox"/> SPARSE 5-<25% [3]              |
| <input type="checkbox"/> ROOTMATS [1]                 |                                           |                                                  | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |

Comments

Cover

Maximum 20

13

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                    | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY                             |
|----------------------------------------------|----------------------------------------------|----------------------------------------------------|---------------------------------------|
| <input checked="" type="checkbox"/> HIGH [4] | <input type="checkbox"/> EXCELLENT [7]       | <input checked="" type="checkbox"/> NONE [6]       | <input type="checkbox"/> HIGH [3]     |
| <input type="checkbox"/> MODERATE [3]        | <input checked="" type="checkbox"/> GOOD [5] | <input type="checkbox"/> RECOVERED [4]             | <input type="checkbox"/> MODERATE [2] |
| <input type="checkbox"/> LOW [2]             | <input checked="" type="checkbox"/> FAIR [3] | <input type="checkbox"/> RECOVERING [3]            | <input type="checkbox"/> LOW [1]      |
| <input type="checkbox"/> NONE [1]            | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |                                       |

Comments

Channel

Maximum 20

16

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| EROSION                                          |                                                  | RIPARIAN WIDTH                                     |                                               | FLOOD PLAIN QUALITY                                       |                                                 | CONSERVATION TILLAGE                             |                                                    |
|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|-------------------------------------------------|--------------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> WIDE > 50m [4] | <input type="checkbox"/> MODERATE 10-50m [3]  | <input checked="" type="checkbox"/> FOREST, SWAMP [3]     | <input type="checkbox"/> SHRUB OR OLD FIELD [2] | <input type="checkbox"/> URBAN OR INDUSTRIAL [0] | <input type="checkbox"/> MINING / CONSTRUCTION [0] |
| <input checked="" type="checkbox"/> MODERATE [2] | <input type="checkbox"/> HEAVY / SEVERE [1]      | <input type="checkbox"/> NARROW 5-10m [2]          | <input type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] | <input type="checkbox"/> FENCED PASTURE [1]     |                                                  |                                                    |
| <input type="checkbox"/> HEAVY / SEVERE [1]      |                                                  | <input type="checkbox"/> NONE [0]                  |                                               | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]        |                                                 |                                                  |                                                    |

Comments

Indicate predominant land use(s) past 100m riparian.

Riparian

Maximum 10

9

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

MAXIMUM DEPTH

Check ONE (ONLY!)

- ☐ > 1m [6]  
☐ 0.7-<1m [4]  
☐ 0.4-<0.7m [2]  
☐ 0.2-<0.4m [1]  
☒ < 0.2m [0]

CHANNEL WIDTH

Check ONE (Or 2 &amp; average)

- ☐ POOL WIDTH > RIFFLE WIDTH [2]  
☒ POOL WIDTH = RIFFLE WIDTH [1]  
☐ POOL WIDTH < RIFFLE WIDTH [0]

CURRENT VELOCITY

Check ALL that apply

- ☐ TORRENTIAL [-1] ☒ SLOW [1]  
☐ VERY FAST [1] ☐ INTERSTITIAL [-1]  
☐ FAST [1] ☐ INTERMITTENT [-2]  
☒ MODERATE [1] ☐ EDDIES [1]

Indicate for reach - pools and riffles.

Recreation Potential

Primary Contact

Secondary Contact

(circle one and comment on back)

Pool / Current

Maximum 12

3

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 &amp; average).

☐ NO RIFFLE [metric=0]

| RIFFLE DEPTH                                              | RUN DEPTH                                              | RIFFLE / RUN SUBSTRATE                                                     | RIFFLE / RUN EMBEDDEDNESS                   |
|-----------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> BEST AREAS > 10cm [2]            | <input type="checkbox"/> MAXIMUM > 50cm [2]            | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]                | <input type="checkbox"/> NONE [2]           |
| <input checked="" type="checkbox"/> BEST AREAS 5-10cm [1] | <input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]   | <input checked="" type="checkbox"/> LOW [1] |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |                                                        | <input checked="" type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input type="checkbox"/> MODERATE [0]       |
|                                                           |                                                        |                                                                            | <input type="checkbox"/> EXTENSIVE [-1]     |

Comments

Riffle / Run

Maximum 8

3.5

6) GRADIENT (ft/mi) ☐ VERY LOW - LOW [2-4] ☒ MODERATE [6-10] ☐ HIGH - VERY HIGH [10-6]  
DRAINAGE AREA (0.23 mi<sup>2</sup>)%POOL: 10 %GLIDE: 20  
%RUN: 45 %RIFFLE: 25

Gradient

Maximum 10

6

## AJ SAMPLED REACH

Check ALL that apply

### METHOD

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER

### STAGE

1st -sample pass- 2nd

- ☐ HIGH ☐  
☐ UP ☐  
☒ NORMAL ☒  
☐ LOW ☐  
☐ DRY ☐

### DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

60

meters

### CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☐ 10%-<30%  
☒ <10%- CLOSED

1st \_\_\_\_\_ cm  
pass  
2nd \_\_\_\_\_ cm

### CJ RECREATION

AREA DEPTH  
POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.  
Last precipitation: 2015-07-20, 0.02 inch

### BJ AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

### DJ MAINTENANCE

PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

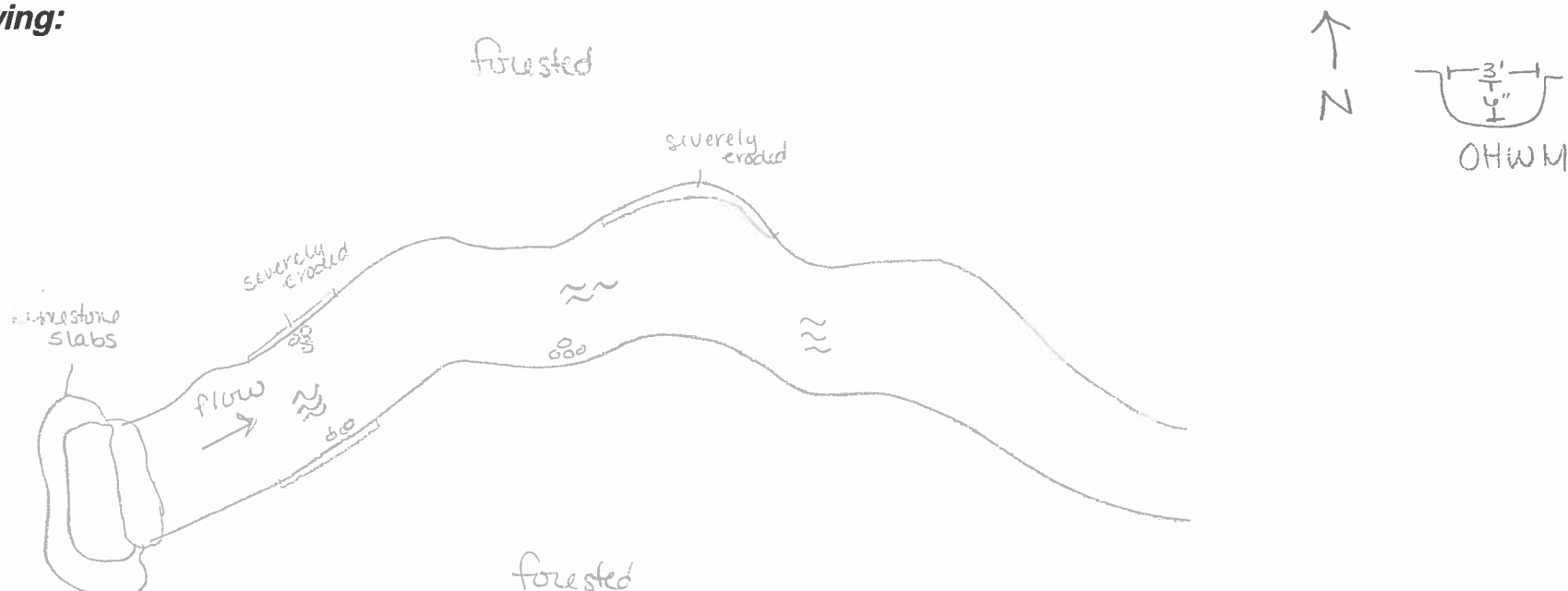
### EJ ISSUES

WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

### FJ MEASUREMENTS

$\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio  
Legacy Tree:

## Stream Drawing:





# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 6

QHEI Score: 57.5

Stream &amp; Location: UNT 5, Heavy Haul (Des. 1382612) / Clark County, Indiana RM: Date: 7 / 21 / 15

Scorers Full Name & Affiliation: Leah Boits, American Structurepoint  
River Code: STORET #: Lat./Long.: 38.34197 185.66974 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

| BEST TYPES                                                                                                     |    | POOL RIFFLE | OTHER TYPES                                                  |    | POOL RIFFLE | ORIGIN                                              | QUALITY                                        | Substrate<br>9<br>Maximum<br>20 |
|----------------------------------------------------------------------------------------------------------------|----|-------------|--------------------------------------------------------------|----|-------------|-----------------------------------------------------|------------------------------------------------|---------------------------------|
| <input type="checkbox"/> BLDR / SLABS [10]                                                                     |    |             | <input type="checkbox"/> HARDPAN [4]                         |    |             | <input checked="" type="checkbox"/> LIMESTONE [1]   | <input type="checkbox"/> HEAVY [-2]            |                                 |
| <input type="checkbox"/> BOULDER [9]                                                                           |    |             | <input type="checkbox"/> DETRITUS [3]                        | 5  | 5           | <input type="checkbox"/> TILLS [1]                  | <input type="checkbox"/> MODERATE [-1]         |                                 |
| <input type="checkbox"/> COBBLE [8]                                                                            |    |             | <input type="checkbox"/> MUCK [2]                            |    |             | <input type="checkbox"/> WETLANDS [0]               | <input checked="" type="checkbox"/> NORMAL [0] |                                 |
| <input type="checkbox"/> GRAVEL [7]                                                                            | 5  | 5           | <input checked="" type="checkbox"/> SILT [2]                 | 80 | 70          | <input type="checkbox"/> HARDPAN [0]                | <input type="checkbox"/> FREE [1]              |                                 |
| <input checked="" type="checkbox"/> SAND [6]                                                                   | 10 | 20          | <input type="checkbox"/> ARTIFICIAL [0]                      |    |             | <input type="checkbox"/> SANDSTONE [0]              | <input type="checkbox"/> EXTENSIVE [-2]        |                                 |
| <input type="checkbox"/> BEDROCK [5]                                                                           |    |             | (Score natural substrates; ignore sludge from point-sources) |    |             | <input type="checkbox"/> RIP/RAP [0]                | <input type="checkbox"/> MODERATE [-1]         |                                 |
| NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more [2] <input checked="" type="checkbox"/> 3 or less [0] |    |             |                                                              |    |             | <input checked="" type="checkbox"/> LACUSTURINE [0] | <input checked="" type="checkbox"/> NORMAL [0] |                                 |
| Comments                                                                                                       |    |             |                                                              |    |             | <input type="checkbox"/> SHALE [-1]                 | <input type="checkbox"/> NONE [1]              |                                 |
|                                                                                                                |    |             |                                                              |    |             | <input type="checkbox"/> COAL FINES [-2]            |                                                |                                 |

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools. Check ONE (Or 2 &amp; average)

|                                                       |                                            | AMOUNT                                                  |                              |
|-------------------------------------------------------|--------------------------------------------|---------------------------------------------------------|------------------------------|
| <input type="checkbox"/> UNDERCUT BANKS [1]           | <input type="checkbox"/> POOLS > 70cm [2]  | <input checked="" type="checkbox"/> EXTENSIVE >75% [11] | Cover<br>Maximum<br>20<br>13 |
| <input type="1"/> OVERHANGING VEGETATION [1]          | <input type="checkbox"/> ROOTWADS [1]      | <input type="checkbox"/> MODERATE 25-75% [7]            |                              |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input type="checkbox"/> BOULDERS [1]      | <input type="checkbox"/> SPARSE 5-<25% [3]              |                              |
| <input type="checkbox"/> ROOTMATS [1]                 | <input type="1"/> LOGS OR WOODY DEBRIS [1] | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |                              |
| Comments                                              |                                            |                                                         |                              |

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                        | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY                                        | Channel<br>Maximum<br>20<br>14 |
|--------------------------------------------------|----------------------------------------------|----------------------------------------------------|--------------------------------------------------|--------------------------------|
| <input type="checkbox"/> HIGH [4]                | <input type="checkbox"/> EXCELLENT [7]       | <input checked="" type="checkbox"/> NONE [6]       | <input type="checkbox"/> HIGH [3]                |                                |
| <input checked="" type="checkbox"/> MODERATE [3] | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input checked="" type="checkbox"/> MODERATE [2] |                                |
| <input type="checkbox"/> LOW [2]                 | <input checked="" type="checkbox"/> FAIR [3] | <input type="checkbox"/> RECOVERING [3]            | <input type="checkbox"/> LOW [1]                 |                                |
| <input type="checkbox"/> NONE [1]                | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |                                                  |                                |
| Comments                                         |                                              |                                                    |                                                  |                                |

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank & average)  
River right looking downstream

| EROSION                                          | RIPARIAN WIDTH                                     | FLOOD PLAIN QUALITY                                       | Riparian<br>Maximum<br>10<br>9 |
|--------------------------------------------------|----------------------------------------------------|-----------------------------------------------------------|--------------------------------|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input checked="" type="checkbox"/> WIDE > 50m [4] | <input checked="" type="checkbox"/> FOREST, SWAMP [3]     |                                |
| <input checked="" type="checkbox"/> MODERATE [2] | <input type="checkbox"/> MODERATE 10-50m [3]       | <input type="checkbox"/> SHRUB OR OLD FIELD [2]           |                                |
| <input type="checkbox"/> HEAVY / SEVERE [1]      | <input type="checkbox"/> NARROW 5-10m [2]          | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] |                                |
|                                                  | <input type="checkbox"/> VERY NARROW < 5m [1]      | <input type="checkbox"/> FENCED PASTURE [1]               |                                |
|                                                  | <input type="checkbox"/> NONE [0]                  | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]        |                                |
| Comments                                         |                                                    |                                                           |                                |

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                  | CHANNEL WIDTH                                                     | CURRENT VELOCITY                             | Recreation Potential<br>Primary Contact<br>Secondary Contact<br>(circle one and comment on back) |
|------------------------------------------------|-------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------------------------------------------------------|
| Check ONE (ONLY!)                              | Check ONE (Or 2 & average)                                        | Check ALL that apply                         |                                                                                                  |
| <input type="checkbox"/> > 1m [6]              | <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            | <input type="checkbox"/> TORRENTIAL [-1]     | Pool /<br>Current<br>Maximum<br>12<br>1                                                          |
| <input type="checkbox"/> 0.7-<1m [4]           | <input type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1]            | <input checked="" type="checkbox"/> SLOW [1] |                                                                                                  |
| <input type="checkbox"/> 0.4-<0.7m [2]         | <input checked="" type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0] | <input type="checkbox"/> VERY FAST [1]       |                                                                                                  |
| <input type="checkbox"/> 0.2-<0.4m [1]         |                                                                   | <input type="checkbox"/> INTERSTITIAL [-1]   |                                                                                                  |
| <input checked="" type="checkbox"/> < 0.2m [0] |                                                                   | <input type="checkbox"/> INTERMITTENT [-2]   |                                                                                                  |
| Comments                                       |                                                                   |                                              |                                                                                                  |

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

| RIFFLE DEPTH                                              | RUN DEPTH                                              | RIFFLE / RUN SUBSTRATE                                                     | RIFFLE / RUN EMBEDDEDNESS                   | Riffle /<br>Run<br>Maximum<br>8<br>3.5 |
|-----------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------|----------------------------------------|
| <input type="checkbox"/> BEST AREAS > 10cm [2]            | <input type="checkbox"/> MAXIMUM > 50cm [2]            | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]                | <input type="checkbox"/> NONE [2]           |                                        |
| <input checked="" type="checkbox"/> BEST AREAS 5-10cm [1] | <input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]   | <input checked="" type="checkbox"/> LOW [1] |                                        |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |                                                        | <input checked="" type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input type="checkbox"/> MODERATE [0]       |                                        |
| Comments                                                  |                                                        |                                                                            | <input type="checkbox"/> EXTENSIVE [-1]     |                                        |

6) GRADIENT (258 ft/mi) ☐ VERY LOW - LOW [2-4]  
DRAINAGE AREA (0.04 mi<sup>2</sup>) ☐ MODERATE [6-10]  
☒ HIGH - VERY HIGH [10-6]%POOL: 3 %GLIDE: 77  
%RUN: 15 %RIFFLE: 5Gradient  
Maximum  
10  
8

## AJ SAMPLED REACH

Check ALL that apply

### METHOD STAGE

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER
- 1st--sample pass-- 2nd
- ☐ HIGH  
☐ UP  
☒ NORMAL  
☐ LOW  
☐ DRY

### DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER
- 60  
meters
- CLARITY
- 1st --sample pass-- 2nd
- ☐ < 20 cm  
☐ 20-<40 cm  
☐ 40-70 cm  
☒ > 70 cm/ CTB  
☐ SECCHI DEPTH

### CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☐ 10%-<30%  
☒ <10%- CLOSED

### CJ RECREATION

AREA DEPTH  
POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

### BJ AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

### DJ MAINTENANCE

PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

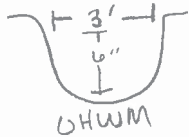
### EJ ISSUES

WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

### FJ MEASUREMENTS

$\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio  
Legacy Tree:

## Stream Drawing:







# Primary Headwater Habitat Evaluation Form

HHEI 1

17

HHEI Score (sum of metrics 1, 2, 3) :

SITE NAME/LOCATION **UNT 6, Heavy Haul (Des. 1382612) / Clark County, Indiana**SITE NUMBER \_\_\_\_\_ RIVER BASIN \_\_\_\_\_ DRAINAGE AREA (mi<sup>2</sup>) \_\_\_\_\_LENGTH OF STREAM REACH (ft) \_\_\_\_\_ LAT. **38.34143** LONG. \_\_\_\_\_ RIVER CODE \_\_\_\_\_ RIVER MILE \_\_\_\_\_DATE **07/21/15** SCORER **A. Hanner** COMMENTS \_\_\_\_\_**NOTE: Complete All Items On This Form - Refer to "Field Evaluation Manual for Ohio's PWH Streams" for Instructions****STREAM CHANNEL MODIFICATIONS:**☒ NONE / NATURAL CHANNEL ☐ RECOVERED ☐ RECOVERING ☐ RECENT OR NO RECOVERY

1. **SUBSTRATE** (Estimate percent of every type of substrate present. Check **ONLY** two predominant substrate **TYPE** boxes (Max of 32). Add total number of significant substrate types found (Max of 8). Final metric score is sum of boxes A & B.

| TYPE                                                     | PERCENT | TYPE                                                    | PERCENT |
|----------------------------------------------------------|---------|---------------------------------------------------------|---------|
| <input type="checkbox"/> BLDR SLABS [16 pts]             | 0%      | <input checked="" type="checkbox"/> SILT [3 pt]         | 85%     |
| <input type="checkbox"/> BOULDER (>256 mm) [16 pts]      | 0%      | <input type="checkbox"/> LEAF PACK/WOODY DEBRIS [3 pts] | 5%      |
| <input type="checkbox"/> BEDROCK [16 pt]                 | 0%      | <input type="checkbox"/> FINE DETRITUS [3 pts]          | 0%      |
| <input type="checkbox"/> COBBLE (65-256 mm) [12 pts]     | 0%      | <input type="checkbox"/> CLAY or HARDPAN [0 pt]         | 0%      |
| <input type="checkbox"/> GRAVEL (2-64 mm) [9 pts]        | 0%      | <input type="checkbox"/> MUCK [0 pts]                   | 0%      |
| <input checked="" type="checkbox"/> SAND (<2 mm) [6 pts] | 10%     | <input type="checkbox"/> ARTIFICIAL [3 pts]             | 0%      |

Total of Percentages of Bldr Slabs, Boulder, Cobble, Bedrock **0.00%**

(A)

100%

(B)

SCORE OF TWO MOST PREDOMINATE SUBSTRATE TYPES: **9**TOTAL NUMBER OF SUBSTRATE TYPES: **3****HHEI Metric Points**

Substrate Max = 40

**12**

A + B

2. **Maximum Pool Depth** (Measure the maximum pool depth within the 61 meter (200 ft) evaluation reach at the time of evaluation. Avoid plunge pools from road culverts or storm water pipes) (Check **ONLY** one box):

|                                                    |                                                                       |
|----------------------------------------------------|-----------------------------------------------------------------------|
| <input type="checkbox"/> > 30 centimeters [20 pts] | <input type="checkbox"/> > 5 cm - 10 cm [15 pts]                      |
| <input type="checkbox"/> > 22.5 - 30 cm [30 pts]   | <input type="checkbox"/> < 5 cm [5 pts]                               |
| <input type="checkbox"/> > 10 - 22.5 cm [25 pts]   | <input checked="" type="checkbox"/> NO WATER OR MOIST CHANNEL [0 pts] |

Pool Depth Max = 30

**0**

COMMENTS \_\_\_\_\_ MAXIMUM POOL DEPTH (centimeters): \_\_\_\_\_

3. **BANK FULL WIDTH** (Measured as the average of 3-4 measurements) (Check **ONLY** one box):

|                                                                     |                                                                     |
|---------------------------------------------------------------------|---------------------------------------------------------------------|
| <input type="checkbox"/> > 4.0 meters (> 13') [30 pts]              | <input type="checkbox"/> > 1.0 m - 1.5 m (> 3' 3" - 4' 8") [15 pts] |
| <input type="checkbox"/> > 3.0 m - 4.0 m (> 9' 7" - 13') [25 pts]   | <input checked="" type="checkbox"/> ≤ 1.0 m (≤ 3' 3") [5 pts]       |
| <input type="checkbox"/> > 1.5 m - 3.0 m (> 9' 7" - 4' 8") [20 pts] |                                                                     |

Bankfull Width Max=30

**5**COMMENTS \_\_\_\_\_ AVERAGE BANKFULL WIDTH (meters): **0.20****This information must also be completed****RIPARIAN ZONE AND FLOODPLAIN QUALITY** ☆NOTE: River Left (L) and Right (R) as looking downstream☆**RIPARIAN WIDTH**

| L                                   | R                                   | (Per Bank)     |
|-------------------------------------|-------------------------------------|----------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Wide >10m      |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Moderate 5-10m |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Narrow <5m     |
| <input type="checkbox"/>            | <input type="checkbox"/>            | None           |

COMMENTS \_\_\_\_\_

**FLOODPLAIN QUALITY**

| L                                   | R                                   | (Most Predominant per Bank)         |
|-------------------------------------|-------------------------------------|-------------------------------------|
| <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | Mature Forest, Wetland              |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Immature Forest, Shrub or Old Field |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Residential, Park, New Field        |
| <input type="checkbox"/>            | <input type="checkbox"/>            | Fenced Pasture                      |

| L                        | R                        |                        |
|--------------------------|--------------------------|------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | Conservation Tillage   |
| <input type="checkbox"/> | <input type="checkbox"/> | Urban or Industrial    |
| <input type="checkbox"/> | <input type="checkbox"/> | Open Pasture, Row Crop |
| <input type="checkbox"/> | <input type="checkbox"/> | Mining or Construction |

- FLOW REGIME** (At Time of Evaluation) (Check **ONLY** one box):

|                                                                             |                                                                                           |
|-----------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Stream Flowing                                     | <input checked="" type="checkbox"/> Moist Channel, isolated pools, no flow (Intermittent) |
| <input type="checkbox"/> Subsurface flow with isolated pools (Interstitial) | <input type="checkbox"/> Dry channel, no water (Ephemeral)                                |

COMMENTS Moist channel

- SINUOSITY** (Number of bends per 61 m (200 ft) of channel) (Check **ONLY** one box):

|                                          |                              |                              |                              |
|------------------------------------------|------------------------------|------------------------------|------------------------------|
| <input checked="" type="checkbox"/> None | <input type="checkbox"/> 1.0 | <input type="checkbox"/> 2.0 | <input type="checkbox"/> 3.0 |
| <input type="checkbox"/> 0.5             | <input type="checkbox"/> 1.5 | <input type="checkbox"/> 2.5 | <input type="checkbox"/> >3  |

**STREAM GRADIENT ESTIMATE**☐ Flat (0.5 ft/100 ft) ☐ Flat to Moderate ☐ Moderate (2 ft/100 ft) ☒ Moderate to Severe ☐ Severe (10 ft/100 ft)

**ADDITIONAL STREAM INFORMATION (This Information Must Also be Completed):**

QHEI PERFORMED? - ☐ Yes ☒ No QHEI Score \_\_\_\_\_ (If Yes, Attach Completed QHEI Form)

**DOWNSTREAM DESIGNATED USE(S)**

☐ WWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ CWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_  
☐ EWH Name: \_\_\_\_\_ Distance from Evaluated Stream \_\_\_\_\_

**MAPPING: ATTACH COPIES OF MAPS, INCLUDING THE ENTIRE WATERSHED AREA. CLEARLY MARK THE SITE LOCATION**

USGS Quadrangle Name: Jeffersonville NRCS Soil Map Page: \_\_\_\_\_ NRCS Soil Map Stream Order 1  
County: Clark Township / City: Utica Township/Jeffersonville

**MISCELLANEOUS**

Base Flow Conditions? (Y/N): Y Date of last precipitation: 07/20/15 Quantity: 0.02

Photograph Information: Photos 69-70

Elevated Turbidity? (Y/N): N Canopy (% open): 10%

Were samples collected for water chemistry? (Y/N): N (Note lab sample no. or id. and attach results) Lab Number: \_\_\_\_\_

Field Measures: Temp (°C) \_\_\_\_\_ Dissolved Oxygen (mg/l) \_\_\_\_\_ pH (S.U.) \_\_\_\_\_ Conductivity (µmhos/cm) \_\_\_\_\_

Is the sampling reach representative of the stream (Y/N) Y If not, please explain: \_\_\_\_\_

Additional comments/description of pollution impacts: \_\_\_\_\_

**BIOTIC EVALUATION**

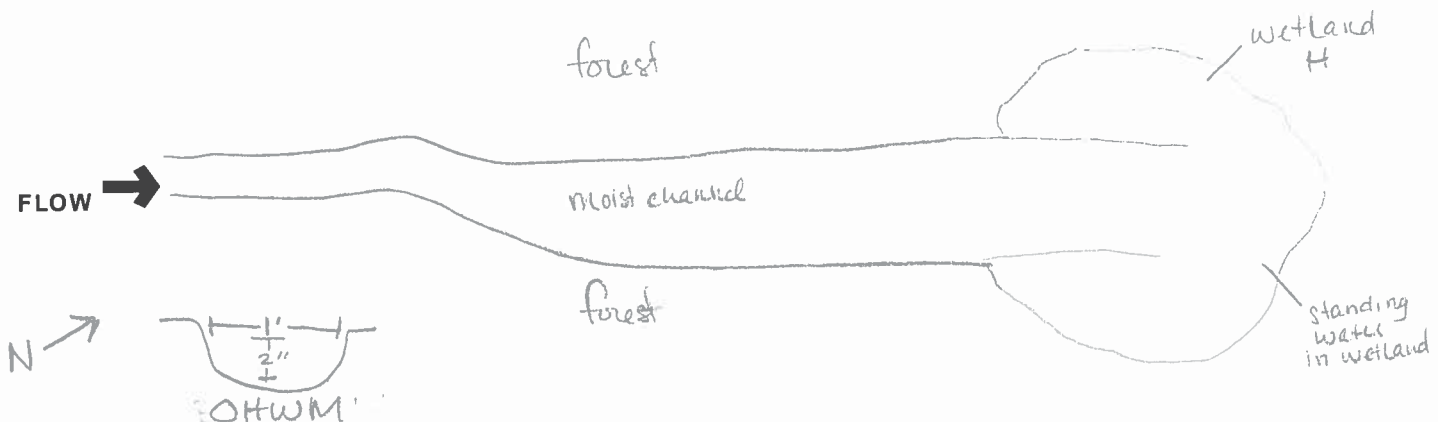
Performed? (Y/N): N (If Yes, Record all observations. Voucher collections optional. NOTE: all voucher samples must be labeled with the site ID number. Include appropriate field data sheets from the Primary Headwater Habitat Assessment Manual)

Fish Observed? (Y/N) N Voucher? (Y/N) N Salamanders Observed? (Y/N) N Voucher? (Y/N) N  
Frogs or Tadpoles Observed? (Y/N) N Voucher? (Y/N) N Aquatic Macroinvertebrates Observed? (Y/N) N Voucher? (Y/N) N

Comments Regarding Biology: \_\_\_\_\_

**DRAWING AND NARRATIVE DESCRIPTION OF STREAM REACH (This must be completed):**

Include important landmarks and other features of interest for site evaluation and a narrative description of the stream's location





# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 7

QHEI Score: 62.5

Stream &amp; Location: UNT 7, Heavy Haul (Des. 1382612) / Clark County, Indiana RM: Date: 7 / 21 / 15

Scorers Full Name &amp; Affiliation: Rick Paul, American Structurepoint

River Code: STORET #: Lat./Long.: 38.34197 185.66974 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

| BEST TYPES                                                                                                                        |    | POOL RIFFLE | OTHER TYPES                                     |    | POOL RIFFLE | ORIGIN                                            | QUALITY                                        |
|-----------------------------------------------------------------------------------------------------------------------------------|----|-------------|-------------------------------------------------|----|-------------|---------------------------------------------------|------------------------------------------------|
| <input type="checkbox"/> BLDR / SLABS [10]                                                                                        |    |             | <input checked="" type="checkbox"/> HARDPAN [4] | 50 | 50          | <input checked="" type="checkbox"/> LIMESTONE [1] | <input type="checkbox"/> HEAVY [-2]            |
| <input type="checkbox"/> BOULDER [9]                                                                                              |    |             | <input type="checkbox"/> DETRITUS [3]           | 0  | 5           | <input type="checkbox"/> TILLS [1]                | <input type="checkbox"/> MODERATE [-1]         |
| <input type="checkbox"/> COBBLE [8]                                                                                               | 5  | 10          | <input type="checkbox"/> MUCK [2]               |    |             | <input type="checkbox"/> WETLANDS [0]             | <input checked="" type="checkbox"/> NORMAL [0] |
| <input type="checkbox"/> GRAVEL [7]                                                                                               | 5  | 10          | <input checked="" type="checkbox"/> SILT [2]    | 30 | 20          | <input type="checkbox"/> HARDPAN [0]              | <input type="checkbox"/> FREE [1]              |
| <input type="checkbox"/> SAND [6]                                                                                                 | 10 | 5           | <input type="checkbox"/> ARTIFICIAL [0]         |    |             | <input type="checkbox"/> SANDSTONE [0]            | <input type="checkbox"/> EXTENSIVE [-2]        |
| <input type="checkbox"/> BEDROCK [5]                                                                                              |    |             |                                                 |    |             | <input type="checkbox"/> RIP/RAP [0]              | <input type="checkbox"/> MODERATE [-1]         |
| (Score natural substrates; ignore sludge from point-sources)                                                                      |    |             |                                                 |    |             | <input type="checkbox"/> LACUSTURINE [0]          | <input checked="" type="checkbox"/> NORMAL [0] |
| NUMBER OF BEST TYPES: <input type="checkbox"/> 4 or more <input checked="" type="checkbox"/> 3 or less <input type="checkbox"/> 0 |    |             |                                                 |    |             | <input type="checkbox"/> SHALE [-1]               | <input type="checkbox"/> NONE [1]              |
| Comments                                                                                                                          |    |             |                                                 |    |             | <input type="checkbox"/> COAL FINES [-2]          |                                                |

Check ONE (Or 2 & average)

SILT

EMBEDDEDNESS

Substrate 7 Maximum 20

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

|                                                                  |                                                      | AMOUNT                                                       |                                                         |
|------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------|
| <input checked="" type="checkbox"/> UNDERCUT BANKS [1]           | <input checked="" type="checkbox"/> POOLS > 70cm [2] | <input checked="" type="checkbox"/> OXBOWS, BACKWATERS [1]   | <input checked="" type="checkbox"/> EXTENSIVE >75% [11] |
| <input checked="" type="checkbox"/> OVERHANGING VEGETATION [1]   | <input checked="" type="checkbox"/> ROOTWADS [1]     | <input checked="" type="checkbox"/> AQUATIC MACROPHYTES [1]  | <input type="checkbox"/> MODERATE 25-75% [7]            |
| <input checked="" type="checkbox"/> SHALLOWS (IN SLOW WATER) [1] | <input checked="" type="checkbox"/> BOULDERS [1]     | <input checked="" type="checkbox"/> LOGS OR WOODY DEBRIS [1] | <input type="checkbox"/> SPARSE 5-<25% [3]              |
| <input checked="" type="checkbox"/> ROOTMATS [1]                 |                                                      |                                                              | <input type="checkbox"/> NEARLY ABSENT <5% [1]          |

Check ONE (Or 2 & average)

Cover 16 Maximum 20

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                                   | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY                                        |
|---------------------------------------------|----------------------------------------------|----------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> HIGH [4]           | <input type="checkbox"/> EXCELLENT [7]       | <input type="checkbox"/> NONE [6]                  | <input type="checkbox"/> HIGH [3]                |
| <input type="checkbox"/> MODERATE [3]       | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input checked="" type="checkbox"/> MODERATE [2] |
| <input checked="" type="checkbox"/> LOW [2] | <input checked="" type="checkbox"/> FAIR [3] | <input checked="" type="checkbox"/> RECOVERING [3] | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> NONE [1]           | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |                                                  |

Comments

Channel 10 Maximum 20

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| EROSION                                          |                                                  | RIPARIAN WIDTH                                     |                                               | FLOOD PLAIN QUALITY                                       |                                                 |
|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|-------------------------------------------------|
| <input type="checkbox"/> NONE / LITTLE [3]       | <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> WIDE > 50m [4] | <input type="checkbox"/> MODERATE 10-50m [3]  | <input checked="" type="checkbox"/> FOREST, SWAMP [3]     | <input type="checkbox"/> SHRUB OR OLD FIELD [2] |
| <input checked="" type="checkbox"/> MODERATE [2] | <input type="checkbox"/> HEAVY / SEVERE [1]      | <input type="checkbox"/> NARROW 5-10m [2]          | <input type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] | <input type="checkbox"/> FENCED PASTURE [1]     |
| <input type="checkbox"/> HEAVY / SEVERE [1]      |                                                  | <input type="checkbox"/> NONE [0]                  |                                               | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]        |                                                 |

Indicate predominant land use(s) past 100m riparian.

Conservation Tillage [1]  
Urban or Industrial [0]  
Mining / Construction [0]

Riparian 9 Maximum 10

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                | CHANNEL WIDTH                                                     | CURRENT VELOCITY                                 | Recreation Potential                                                     |
|----------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------|
| Check ONE (ONLY!)                            | Check ONE (Or 2 & average)                                        | Check ALL that apply                             | Primary Contact<br>Secondary Contact<br>(circle one and comment on back) |
| <input checked="" type="checkbox"/> > 1m [6] | <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            | <input type="checkbox"/> TORRENTIAL [-1]         |                                                                          |
| <input type="checkbox"/> 0.7-<1m [4]         | <input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] | <input checked="" type="checkbox"/> SLOW [1]     |                                                                          |
| <input type="checkbox"/> 0.4-<0.7m [2]       | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input type="checkbox"/> VERY FAST [1]           |                                                                          |
| <input type="checkbox"/> 0.2-<0.4m [1]       |                                                                   | <input type="checkbox"/> INTERSTITIAL [-1]       |                                                                          |
| <input type="checkbox"/> < 0.2m [0]          |                                                                   | <input type="checkbox"/> FAST [1]                |                                                                          |
|                                              |                                                                   | <input checked="" type="checkbox"/> MODERATE [1] |                                                                          |
|                                              |                                                                   | <input type="checkbox"/> EDDIES [1]              |                                                                          |

Indicate for reach - pools and riffles.

Pool / Current 9 Maximum 12

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

| RIFFLE DEPTH                                              | RUN DEPTH                                              | RIFFLE / RUN SUBSTRATE                                                     | RIFFLE / RUN EMBEDDEDNESS                        |
|-----------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> BEST AREAS > 10cm [2]            | <input checked="" type="checkbox"/> MAXIMUM > 50cm [2] | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]                | <input type="checkbox"/> NONE [2]                |
| <input checked="" type="checkbox"/> BEST AREAS 5-10cm [1] | <input type="checkbox"/> MAXIMUM < 50cm [1]            | <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]   | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |                                                        | <input checked="" type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input checked="" type="checkbox"/> MODERATE [0] |
|                                                           |                                                        |                                                                            | <input type="checkbox"/> EXTENSIVE [-1]          |

Check ONE (Or 2 & average).

NO RIFFLE [metric=0]

Riffle / Run 3.5 Maximum 8

6) GRADIENT (66.3 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☒ HIGH - VERY HIGH [10-6]%POOL: 5 %GLIDE: 45  
%RUN: 45 %RIFFLE: 5

Gradient 8 Maximum 10

## AJ SAMPLED REACH

Check ALL that apply

### METHOD STAGE

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER
- 1st-sample pass- 2nd  
☐ HIGH  
☐ UP  
☒ NORMAL  
☐ LOW  
☐ DRY

### DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER
- 37.5  
meters
- CLARITY  
1st --sample pass-- 2nd  
☐ < 20 cm  
☒ 20-<40 cm  
☐ 40-70 cm  
☐ > 70 cm/ CTB  
☐ SECCHI DEPTH

### CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☒ 10%-<30%  
☐ <10%- CLOSED

### CJ RECREATION

AREA DEPTH  
POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

### BJ AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

### DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

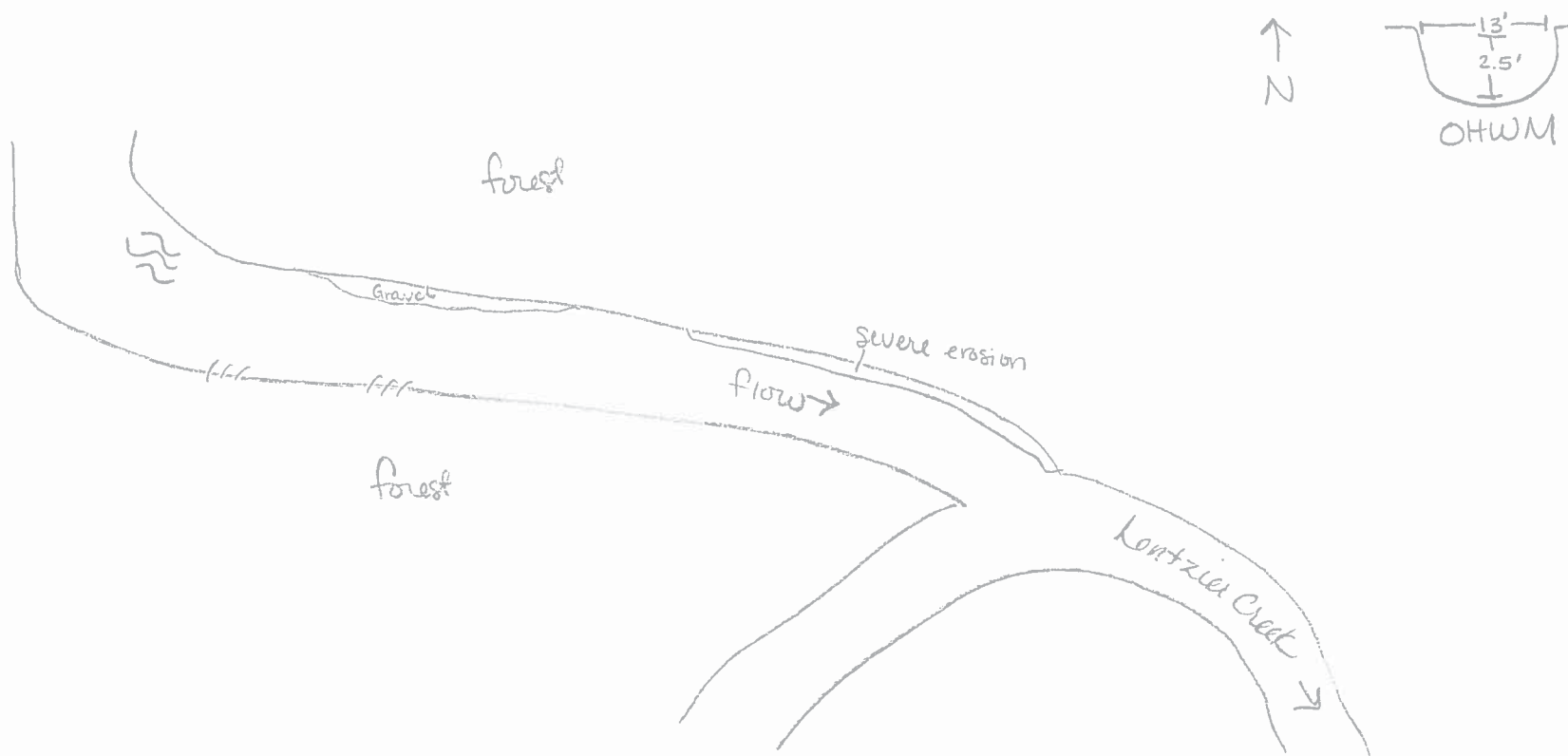
### EJ ISSUES

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

### FJ MEASUREMENTS

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone x<sup>2</sup> width  
entrench. ratio  
Legacy Tree:

## Stream Drawing:



**Stream & Location:** UNT 8, Heavy Haul (Des. 1382612) / Clark County, Indiana **RM:** . **Date:** 7 / 21 / 15

|                    |  |   |   |                  |                                          |                                                                                 |                                 |                          |
|--------------------|--|---|---|------------------|------------------------------------------|---------------------------------------------------------------------------------|---------------------------------|--------------------------|
| <b>River Code:</b> |  | - | - | <b>STORET #:</b> | <b>Lat. / Long.:</b> 38.34473 / 85.66794 | <b>Scorers Full Name &amp; Affiliation:</b> Leah Boits, American Structurepoint | <b>Office verified location</b> | <input type="checkbox"/> |
|--------------------|--|---|---|------------------|------------------------------------------|---------------------------------------------------------------------------------|---------------------------------|--------------------------|

**1] SUBSTRATE** Check **ONLY** Two substrate **TYPE BOXES**;  
estimate % or note every type present

Check ONE (Or 2 & average)

| BEST TYPES                   |                  | POOL RIFFLE                                       |       | OTHER TYPES                                                  |                | POOL RIFFLE |       | ORIGIN                              |                 | QUALITY                             |                |
|------------------------------|------------------|---------------------------------------------------|-------|--------------------------------------------------------------|----------------|-------------|-------|-------------------------------------|-----------------|-------------------------------------|----------------|
| <input type="checkbox"/>     | BLDR /SLABS [10] | _____                                             | _____ | <input checked="" type="checkbox"/>                          | HARDPAN [4]    | 50          | 60    | <input checked="" type="checkbox"/> | LIMESTONE [1]   | <input type="checkbox"/>            | HEAVY [-2]     |
| <input type="checkbox"/>     | BOULDER [9]      | _____                                             | _____ | <input type="checkbox"/>                                     | DETRITUS [3]   | _____       | _____ | <input type="checkbox"/>            | TILLS [1]       | <input type="checkbox"/>            | MODERATE [-1]  |
| <input type="checkbox"/>     | COBBLE [8]       | 5                                                 | 5     | <input type="checkbox"/>                                     | MUCK [2]       | _____       | _____ | <input type="checkbox"/>            | WETLANDS [0]    | <input checked="" type="checkbox"/> | NORMAL [0]     |
| <input type="checkbox"/>     | GRAVEL [7]       | 5                                                 | 15    | <input checked="" type="checkbox"/>                          | SILT [2]       | 25          | 10    | <input type="checkbox"/>            | HARDPAN [0]     | <input type="checkbox"/>            | FREE [1]       |
| <input type="checkbox"/>     | SAND [6]         | 15                                                | 10    | <input type="checkbox"/>                                     | ARTIFICIAL [0] | _____       | _____ | <input type="checkbox"/>            | SANDSTONE [0]   | <input type="checkbox"/>            | EXTENSIVE [-2] |
| <input type="checkbox"/>     | BEDROCK [5]      | _____                                             | _____ | (Score natural substrates; ignore sludge from point-sources) |                |             |       | <input type="checkbox"/>            | RIP/RAP [0]     | <input type="checkbox"/>            | MODERATE [-1]  |
| <b>NUMBER OF BEST TYPES:</b> |                  | <input type="checkbox"/> 4 or more [2]            |       |                                                              |                |             |       | <input type="checkbox"/>            | LACUSTURINE [0] | <input checked="" type="checkbox"/> | NORMAL [0]     |
| <i>Comments</i>              |                  | <input checked="" type="checkbox"/> 3 or less [0] |       |                                                              |                |             |       | <input type="checkbox"/>            | SHALE [-1]      | <input type="checkbox"/>            | NONE [1]       |
|                              |                  |                                                   |       |                                                              |                |             |       | <input type="checkbox"/>            | COAL FINES [-2] |                                     |                |

*Substrate*

7

*Maximum*  
20

**2) INSTREAM COVER** Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

**AMOUNT**  
Check ONE (Or 2 & average)  
☐ EXTENSIVE >75% [11]

|                                          |                              |                                       |                                                |
|------------------------------------------|------------------------------|---------------------------------------|------------------------------------------------|
| <u>    </u> UNDERCUT BANKS [1]           | <u>    </u> POOLS > 70cm [2] | <u>    </u> OXBOWS, BACKWATERS [1]    | <input type="checkbox"/> MODERATE 25-75% [7]   |
| <u>  2  </u> OVERHANGING VEGETATION [1]  | <u>  1  </u> ROOTWADS [1]    | <u>    </u> AQUATIC MACROPHYTES [1]   | <input type="checkbox"/> SPARSE 5-<25% [3]     |
| <u>    </u> SHALLOWS (IN SLOW WATER) [1] | <u>    </u> BOULDERS [1]     | <u>  1  </u> LOGS OR WOODY DEBRIS [1] | <input type="checkbox"/> NEARLY ABSENT <5% [1] |
| <u>  1  </u> ROOTMATS [1]                |                              |                                       |                                                |

**Comments**

**Cover**

Maximum 12

**31 CHANNEL MORPHOLOGY** Check ONE in each category (Or 2 & average)

| SINUOSITY                                   | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY                                   |
|---------------------------------------------|----------------------------------------------|----------------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> HIGH [4]           | <input type="checkbox"/> EXCELLENT [7]       | <input type="checkbox"/> NONE [6]                  | <input type="checkbox"/> HIGH [3]           |
| <input type="checkbox"/> MODERATE [3]       | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input type="checkbox"/> MODERATE [2]       |
| <input checked="" type="checkbox"/> LOW [2] | <input type="checkbox"/> FAIR [3]            | <input checked="" type="checkbox"/> RECOVERING [3] | <input checked="" type="checkbox"/> LOW [1] |
| <input type="checkbox"/> NONE [1]           | <input checked="" type="checkbox"/> POOR [1] | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |                                             |

Comments \_\_\_\_\_

Channel Maximum **7**

**4) BANK EROSION AND RIPARIAN ZONE** Check ONE in each category for **EACH BANK** (Or 2 per bank & average)

|                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                        |                                                         |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|
| River right looking downstream<br><br><b>EROSION</b><br><input type="checkbox"/> <input type="checkbox"/> NONE / LITTLE [3]<br><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> MODERATE [2]<br><input type="checkbox"/> <input type="checkbox"/> HEAVY / SEVERE [1] | <b>RIPARIAN WIDTH</b><br><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> WIDE > 50m [4]<br><input type="checkbox"/> <input type="checkbox"/> MODERATE 10-50m [3]<br><input type="checkbox"/> <input type="checkbox"/> NARROW 5-10m [2]<br><input type="checkbox"/> <input type="checkbox"/> VERY NARROW < 5m [1]<br><input type="checkbox"/> <input type="checkbox"/> NONE [0] | <b>FLOOD PLAIN QUALITY</b><br><input checked="" type="checkbox"/> <input checked="" type="checkbox"/> FOREST, SWAMP [3]<br><input type="checkbox"/> <input type="checkbox"/> SHRUB OR OLD FIELD [2]<br><input type="checkbox"/> <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1]<br><input type="checkbox"/> <input type="checkbox"/> FENCED PASTURE [1]<br><input type="checkbox"/> <input type="checkbox"/> OPEN PASTURE, ROWCROP [0] | <input type="checkbox"/> <input type="checkbox"/> CONSERVATION TILLAGE [1]<br><input type="checkbox"/> <input type="checkbox"/> URBAN OR INDUSTRIAL [0]<br><input type="checkbox"/> <input type="checkbox"/> MINING / CONSTRUCTION [0] | Indicate predominant land use(s)<br>past 100m riparian. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|

**Comments**

**Riparian**  
 Maximum  
 10

9

### 51 POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                     |                                                                   | CHANNEL WIDTH                            |                                              | CURRENT VELOCITY     |  | Recreation Potential             |  |
|---------------------------------------------------|-------------------------------------------------------------------|------------------------------------------|----------------------------------------------|----------------------|--|----------------------------------|--|
| Check ONE (ONLY!)                                 |                                                                   | Check ONE (Or 2 & average)               |                                              | Check ALL that apply |  | Primary Contact                  |  |
| <input type="checkbox"/> > 1m [6]                 | <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            | <input type="checkbox"/> TORRENTIAL [-1] | <input checked="" type="checkbox"/> SLOW [1] |                      |  | Secondary Contact                |  |
| <input type="checkbox"/> 0.7-<1m [4]              | <input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] | <input type="checkbox"/> VERY FAST [1]   | <input type="checkbox"/> INTERSTITIAL [-1]   |                      |  | (circle one and comment on back) |  |
| <input type="checkbox"/> 0.4-<0.7m [2]            | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input type="checkbox"/> FAST [1]        | <input type="checkbox"/> INTERMITTENT [-2]   |                      |  |                                  |  |
| <input checked="" type="checkbox"/> 0.2-<0.4m [1] |                                                                   | <input type="checkbox"/> MODERATE [1]    | <input type="checkbox"/> EDDIES [1]          |                      |  |                                  |  |
| <input type="checkbox"/> < 0.2m [0]               |                                                                   | Indicate for reach - pools and riffles.  |                                              |                      |  |                                  |  |
| Comments                                          |                                                                   |                                          |                                              |                      |  | Pool / Current Maximum 12        |  |

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species; Check ONE (Or 2 & average).

| SPRIFLE DEPTH                                                      | RUN DEPTH                                              | RIFFLE / RUN SUBSTRATE                                                   | RIFFLE / RUN EMBEDDEDNESS                                                                                                                                                                                                         |
|--------------------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> BEST AREAS > 10cm [2]                     | <input type="checkbox"/> MAXIMUM > 50cm [2]            | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]              | <input type="checkbox"/> NONE [2]                                                                                                                                                                                                 |
| <input type="checkbox"/> BEST AREAS 5-10cm [1]                     | <input checked="" type="checkbox"/> MAXIMUM < 50cm [1] | <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1] | <input type="checkbox"/> LOW [1]                                                                                                                                                                                                  |
| <input checked="" type="checkbox"/> BEST AREAS < 5cm<br>[metric=0] |                                                        | <input type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0]          | <input checked="" type="checkbox"/> MODERATE [0]                                                                                                                                                                                  |
| Comments                                                           |                                                        |                                                                          | <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> Riffle / Run<br/>Maximum </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px 15px; font-size: 24px;">2</div> </div> |

6] **GRADIENT** (ft/mi) ☐ VERY LOW - LOW [2-4] %POOL: 5 %GLIDE: 65 **Gradient** 6  
**DRAINAGE AREA** (sq ft) ☐ MODERATE [6-10] %RUN: 25 %RIFFLE: 5 **Maximum** 10  
☒ HIGH - VERY HIGH [10-6]



**AJ SAMPLED REACH**

Check ALL that apply

**METHOD**

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER

**STAGE**

1st-sample pass- 2nd

- ☐ HIGH ☐  
☐ UP ☐  
☒ NORMAL ☒  
☐ LOW ☐  
☐ DRY ☐

**DISTANCE**

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

37.5

meters

**CANOPY**

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☒ 10%-<30%  
☐ <10%- CLOSED

**CLARITY**

1st --sample pass-- 2nd

- ☐ < 20 cm ☐  
☒ 20-<40 cm ☐  
☐ 40-70 cm ☐  
☐ > 70 cm/ CTB ☐  
☐ SECCHI DEPTH ☐

1st \_\_\_\_\_ cm

pass

2nd \_\_\_\_\_ cm

**CJ RECREATION**

AREA DEPTH

POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.

Last precipitation: 2015-07-20, 0.02 inch

**BJ AESTHETICS**

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

**DJ MAINTENANCE**

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCURED  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

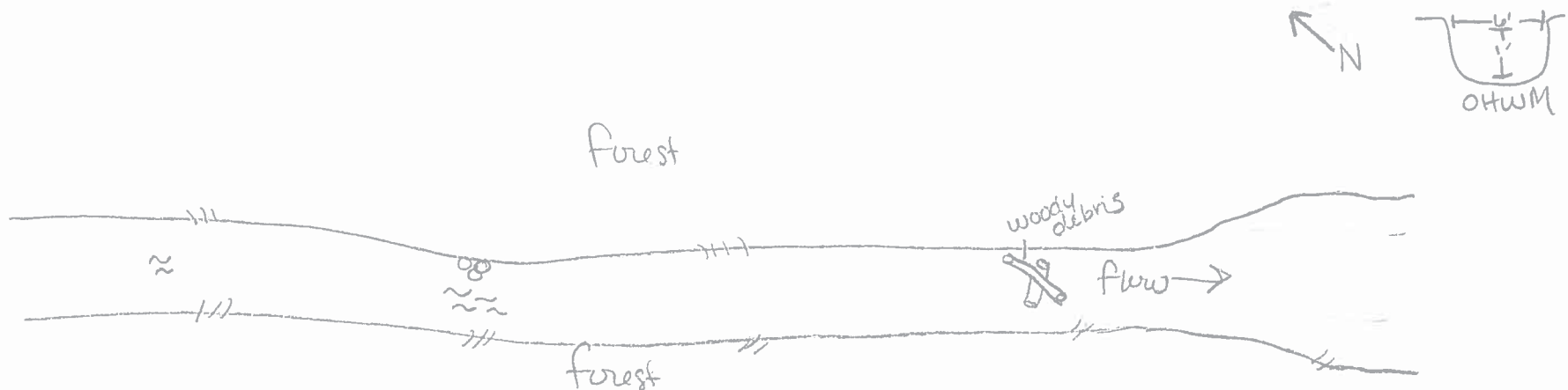
Circle some &amp; COMMENT

**EJ ISSUES**

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

**FJ MEASUREMENTS**

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio  
Legacy Tree:

**Stream Drawing:**



# Qualitative Habitat Evaluation Index and Use Assessment Field Sheet

QHEI 9

QHEI Score: 63.5

Stream &amp; Location: Lentzier Creek, Heavy Haul (Des. 1382612) / Clark County, Indiana

RM: Date: 7 / 21 / 15

Scorers Full Name &amp; Affiliation: Leah Bolts, American Structurepoint

River Code: STORET #: Lat./ Long.: 38.34473 / 85.66794 Office verified location ☐

1) SUBSTRATE Check ONLY Two substrate TYPE BOXES; estimate % or note every type present

Check ONE (Or 2 &amp; average)

| BEST TYPES                                 |    | POOL RIFFLE |  | OTHER TYPES                                                  |    | POOL RIFFLE |  | ORIGIN                                            |  | QUALITY                                        |  |
|--------------------------------------------|----|-------------|--|--------------------------------------------------------------|----|-------------|--|---------------------------------------------------|--|------------------------------------------------|--|
| <input type="checkbox"/> BLDR / SLABS [10] |    |             |  | <input checked="" type="checkbox"/> HARDPAN [4]              | 55 | 60          |  | <input checked="" type="checkbox"/> LIMESTONE [1] |  | <input type="checkbox"/> HEAVY [-2]            |  |
| <input type="checkbox"/> BOULDER [9]       |    |             |  | <input type="checkbox"/> DETRITUS [3]                        |    |             |  | <input type="checkbox"/> TILLS [1]                |  | <input type="checkbox"/> MODERATE [-1]         |  |
| <input type="checkbox"/> COBBLE [8]        | 5  | 15          |  | <input type="checkbox"/> MUCK [2]                            |    |             |  | <input type="checkbox"/> WETLANDS [0]             |  | <input checked="" type="checkbox"/> NORMAL [0] |  |
| <input type="checkbox"/> GRAVEL [7]        | 5  | 10          |  | <input checked="" type="checkbox"/> SILT [2]                 | 25 | 10          |  | <input type="checkbox"/> HARDPAN [0]              |  | <input type="checkbox"/> FREE [1]              |  |
| <input type="checkbox"/> SAND [6]          | 10 | 5           |  | <input type="checkbox"/> ARTIFICIAL [0]                      |    |             |  | <input type="checkbox"/> SANDSTONE [0]            |  | <input type="checkbox"/> EXTENSIVE [-2]        |  |
| <input type="checkbox"/> BEDROCK [5]       |    |             |  |                                                              |    |             |  | <input type="checkbox"/> RIP/RAP [0]              |  | <input type="checkbox"/> MODERATE [-1]         |  |
|                                            |    |             |  | (Score natural substrates; ignore sludge from point-sources) |    |             |  | <input type="checkbox"/> LACUSTURINE [0]          |  | <input checked="" type="checkbox"/> NORMAL [0] |  |
|                                            |    |             |  |                                                              |    |             |  | <input type="checkbox"/> SHALE [-1]               |  | <input type="checkbox"/> NONE [1]              |  |
|                                            |    |             |  |                                                              |    |             |  | <input type="checkbox"/> COAL FINES [-2]          |  |                                                |  |

NUMBER OF BEST TYPES: ☐ 4 or more [2] ☒ 3 or less [0]

Comments

Substrate Maximum 20

7

2) INSTREAM COVER Indicate presence 0 to 3: 0-Absent; 1-Very small amounts or if more common of marginal quality; 2-Moderate amounts, but not of highest quality or in small amounts of highest quality; 3-Highest quality in moderate or greater amounts (e.g., very large boulders in deep or fast water, large diameter log that is stable, well developed rootwad in deep / fast water, or deep, well-defined, functional pools.

AMOUNT

Check ONE (Or 2 &amp; average)

|                                                                |   |                                           |   |                                                   |  |
|----------------------------------------------------------------|---|-------------------------------------------|---|---------------------------------------------------|--|
| <input type="checkbox"/> UNDERCUT BANKS [1]                    | 2 | <input type="checkbox"/> POOLS > 70cm [2] |   | <input type="checkbox"/> OXBOWS, BACKWATERS [1]   |  |
| <input checked="" type="checkbox"/> OVERHANGING VEGETATION [1] | 1 | <input type="checkbox"/> ROOTWADS [1]     |   | <input type="checkbox"/> AQUATIC MACROPHYTES [1]  |  |
| <input type="checkbox"/> SHALLOWS (IN SLOW WATER) [1]          |   | <input type="checkbox"/> BOULDERS [1]     | 1 | <input type="checkbox"/> LOGS OR WOODY DEBRIS [1] |  |
| <input type="checkbox"/> ROOTMATS [1]                          |   |                                           |   |                                                   |  |

Comments

Cover Maximum 20

12

3) CHANNEL MORPHOLOGY Check ONE in each category (Or 2 &amp; average)

| SINUOSITY                             | DEVELOPMENT                                  | CHANNELIZATION                                     | STABILITY                                        |
|---------------------------------------|----------------------------------------------|----------------------------------------------------|--------------------------------------------------|
| <input type="checkbox"/> HIGH [4]     | <input type="checkbox"/> EXCELLENT [7]       | <input checked="" type="checkbox"/> NONE [6]       | <input type="checkbox"/> HIGH [3]                |
| <input type="checkbox"/> MODERATE [3] | <input type="checkbox"/> GOOD [5]            | <input type="checkbox"/> RECOVERED [4]             | <input checked="" type="checkbox"/> MODERATE [2] |
| <input type="checkbox"/> LOW [2]      | <input checked="" type="checkbox"/> FAIR [3] | <input type="checkbox"/> RECOVERING [3]            | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> NONE [1]     | <input type="checkbox"/> POOR [1]            | <input type="checkbox"/> RECENT OR NO RECOVERY [1] |                                                  |

Comments

Channel Maximum 20

14

4) BANK EROSION AND RIPARIAN ZONE Check ONE in each category for EACH BANK (Or 2 per bank &amp; average)

| EROSION                                     |                                                  | RIPARIAN WIDTH                                     |                                               | FLOOD PLAIN QUALITY                                       |                                                 | CONSERVATION TILLAGE                               |  |
|---------------------------------------------|--------------------------------------------------|----------------------------------------------------|-----------------------------------------------|-----------------------------------------------------------|-------------------------------------------------|----------------------------------------------------|--|
| <input type="checkbox"/> NONE / LITTLE [3]  | <input checked="" type="checkbox"/> MODERATE [2] | <input checked="" type="checkbox"/> WIDE > 50m [4] | <input type="checkbox"/> MODERATE 10-50m [3]  | <input checked="" type="checkbox"/> FOREST, SWAMP [3]     | <input type="checkbox"/> SHRUB OR OLD FIELD [2] | <input type="checkbox"/> CONSERVATION TILLAGE [1]  |  |
| <input type="checkbox"/> HEAVY / SEVERE [1] |                                                  | <input type="checkbox"/> NARROW 5-10m [2]          | <input type="checkbox"/> VERY NARROW < 5m [1] | <input type="checkbox"/> RESIDENTIAL, PARK, NEW FIELD [1] | <input type="checkbox"/> FENCED PASTURE [1]     | <input type="checkbox"/> URBAN OR INDUSTRIAL [0]   |  |
|                                             |                                                  | <input type="checkbox"/> NONE [0]                  |                                               | <input type="checkbox"/> OPEN PASTURE, ROWCROP [0]        |                                                 | <input type="checkbox"/> MINING / CONSTRUCTION [0] |  |

Comments

Indicate predominant land use(s) past 100m riparian.

Riparian Maximum 10

9

5) POOL / GLIDE AND RIFFLE / RUN QUALITY

| MAXIMUM DEPTH                                   |                                                                   | CHANNEL WIDTH                                    |                                            | CURRENT VELOCITY |  | Recreation Potential<br>Primary Contact<br>Secondary Contact<br>(circle one and comment on back) |
|-------------------------------------------------|-------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------|------------------|--|--------------------------------------------------------------------------------------------------|
| Check ONE (ONLY!)                               | Check ONE (Or 2 & average)                                        | Check ALL that apply                             |                                            |                  |  |                                                                                                  |
| <input type="checkbox"/> > 1m [6]               | <input type="checkbox"/> POOL WIDTH > RIFFLE WIDTH [2]            | <input type="checkbox"/> TORRENTIAL [-1]         | <input type="checkbox"/> SLOW [1]          |                  |  |                                                                                                  |
| <input checked="" type="checkbox"/> 0.7-<1m [4] | <input checked="" type="checkbox"/> POOL WIDTH = RIFFLE WIDTH [1] | <input type="checkbox"/> VERY FAST [1]           | <input type="checkbox"/> INTERSTITIAL [-1] |                  |  |                                                                                                  |
| <input type="checkbox"/> 0.4-<0.7m [2]          | <input type="checkbox"/> POOL WIDTH < RIFFLE WIDTH [0]            | <input checked="" type="checkbox"/> FAST [1]     | <input type="checkbox"/> INTERMITTENT [-2] |                  |  |                                                                                                  |
| <input type="checkbox"/> 0.2-<0.4m [1]          |                                                                   | <input checked="" type="checkbox"/> MODERATE [1] | <input type="checkbox"/> EDDIES [1]        |                  |  |                                                                                                  |
| <input type="checkbox"/> < 0.2m [0]             |                                                                   | Indicate for reach - pools and riffles.          |                                            |                  |  |                                                                                                  |

Comments

Pool / Current Maximum 12

7

Indicate for functional riffles; Best areas must be large enough to support a population of riffle-obligate species:

Check ONE (Or 2 &amp; average).

☐ NO RIFFLE [metric=0]

| RIFFLE DEPTH                                              | RUN DEPTH                                              | RIFFLE / RUN SUBSTRATE                                                     | RIFFLE / RUN EMBEDDEDNESS                        |
|-----------------------------------------------------------|--------------------------------------------------------|----------------------------------------------------------------------------|--------------------------------------------------|
| <input checked="" type="checkbox"/> BEST AREAS > 10cm [2] | <input checked="" type="checkbox"/> MAXIMUM > 50cm [2] | <input type="checkbox"/> STABLE (e.g., Cobble, Boulder) [2]                | <input type="checkbox"/> NONE [2]                |
| <input type="checkbox"/> BEST AREAS 5-10cm [1]            | <input type="checkbox"/> MAXIMUM < 50cm [1]            | <input checked="" type="checkbox"/> MOD. STABLE (e.g., Large Gravel) [1]   | <input type="checkbox"/> LOW [1]                 |
| <input type="checkbox"/> BEST AREAS < 5cm [metric=0]      |                                                        | <input checked="" type="checkbox"/> UNSTABLE (e.g., Fine Gravel, Sand) [0] | <input checked="" type="checkbox"/> MODERATE [0] |
|                                                           |                                                        |                                                                            | <input type="checkbox"/> EXTENSIVE [-1]          |

Comments

Riffle / Run Maximum 8

4.5

6) GRADIENT ( 22.1 ft/mi) ☐ VERY LOW - LOW [2-4] ☐ MODERATE [6-10] ☒ HIGH - VERY HIGH [10-6]%POOL: 10 %GLIDE: 30  
%RUN: 50 %RIFFLE: 10

Gradient Maximum 10

## A) SAMPLED REACH

Check ALL that apply

### METHOD

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER

### STAGE

- 1st -sample pass- 2nd  
☐ HIGH ☐  
☐ UP ☐  
☒ NORMAL ☒  
☐ LOW ☐  
☐ DRY ☐

### DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

### CLARITY

- 1st --sample pass-- 2nd  
☐ < 20 cm ☐  
☒ 20-<40 cm ☐  
☐ 40-70 cm ☐  
☐ > 70 cm/ CTB ☐  
☐ SECCHI DEPTH ☐

### CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☒ 10%-<30%  
☐ <10%- CLOSED

### C) RECREATION

AREA DEPTH

POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

Comment RE: Reach consistency/ Is reach typical of stream?, Recreation/ Observed - Inferred, Other/ Sampling observations, Concerns, Access directions, etc.  
Last precipitation: 2015-07-20, 0.02 inch

### B) AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

### D) MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCURED  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

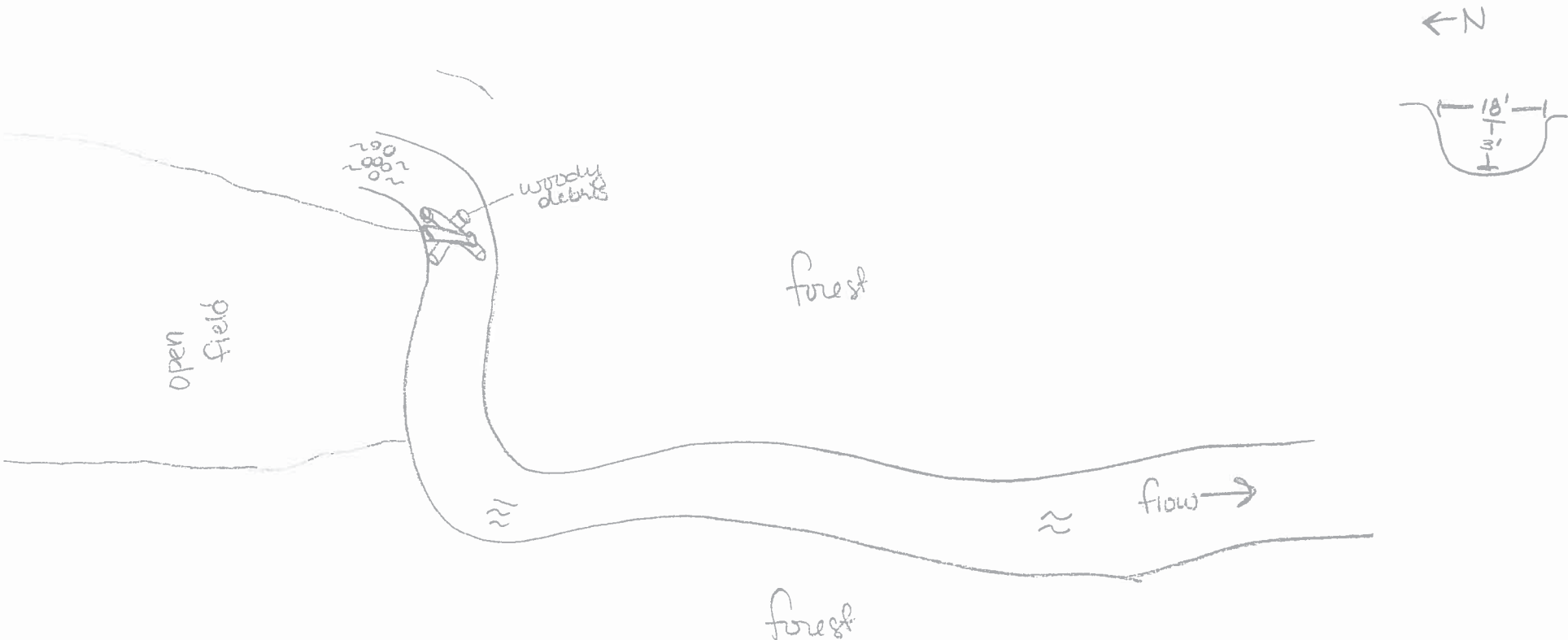
### E) ISSUES

- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

### F) MEASUREMENTS

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone x<sup>2</sup> width  
entrench. ratio  
Legacy Tree:

## Stream Drawing:





# AJ SAMPLED REACH

Check ALL that apply

## METHOD

- ☐ BOAT  
☒ WADE  
☐ L. LINE  
☐ OTHER

## STAGE

1st-sample pass- 2nd

- ☐ HIGH ☐  
☐ UP ☐  
☒ NORMAL ☒  
☐ LOW ☐  
☐ DRY ☐

## DISTANCE

- ☐ 0.5 Km  
☐ 0.2 Km  
☐ 0.15 Km  
☐ 0.12 Km  
☐ OTHER

60

meters

## CANOPY

- ☐ > 85%- OPEN  
☐ 55%-<85%  
☐ 30%-<55%  
☒ 10%-<30%  
☐ <10%- CLOSED

## CLARITY

1st --sample pass-- 2nd

- ☐ < 20 cm  
☒ 20-<40 cm  
☐ 40-70 cm  
☐ > 70 cm/ CTB  
☐ SECCHI DEPTH

1st \_\_\_\_\_ cm

pass

2nd \_\_\_\_\_ cm

## CJ RECREATION

AREA DEPTH

POOL: ☐ >100ft<sup>2</sup> ☐ >3ft

## BJ AESTHETICS

- ☐ NUISANCE ALGAE  
☐ INVASIVE MACROPHYTES  
☐ EXCESS TURBIDITY  
☐ DISCOLORATION  
☐ FOAM / SCUM  
☐ OIL SHEEN  
☐ TRASH / LITTER  
☐ NUISANCE ODOR  
☐ SLUDGE DEPOSITS  
☐ CSOs/SSOs/OUTFALLS

## DJ MAINTENANCE

- PUBLIC / PRIVATE / BOTH / NA  
ACTIVE / HISTORIC / BOTH / NA  
YOUNG-SUCCESSION-OLD  
SPRAY / SNAG / REMOVED  
MODIFIED / DIPPED OUT / NA  
LEVEED / ONE SIDED  
RELOCATED / CUTOFFS  
MOVING-BEDLOAD-STABLE  
ARMoured / SLUMPS  
ISLANDS / SCoured  
IMPOUNDED / DESICCATED  
FLOOD CONTROL / DRAINAGE

Circle some & COMMENT

## EJ ISSUES

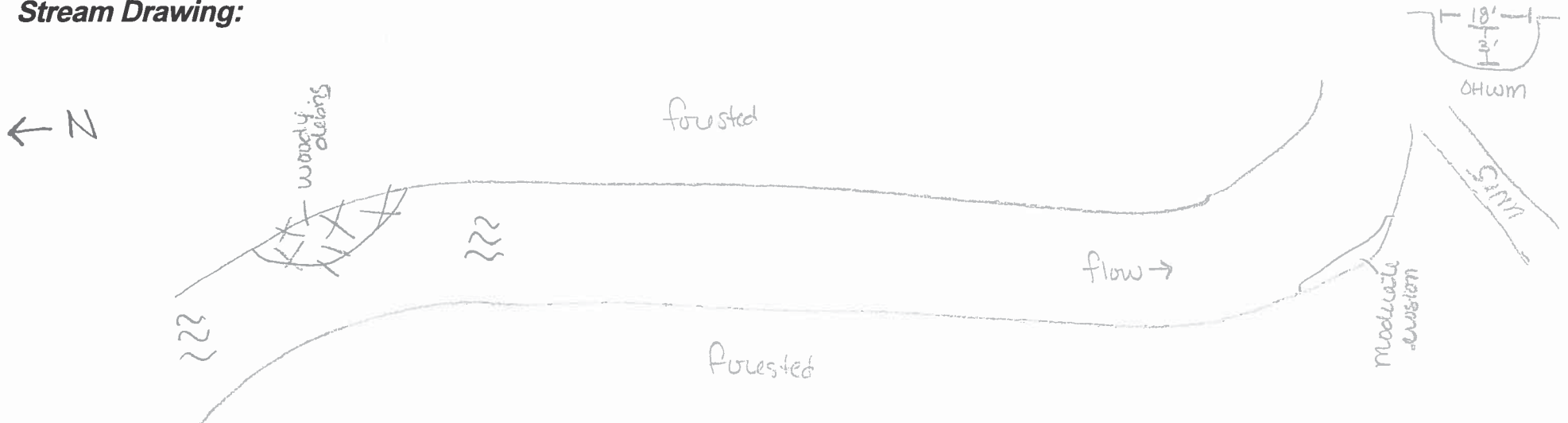
- WWTP / CSO / NPDES / INDUSTRY  
HARDENED / URBAN / DIRT&GRIME  
CONTAMINATED / LANDFILL  
BMPs-CONSTRUCTION-SEDIMENT  
LOGGING / IRRIGATION / COOLING  
BANK / EROSION / SURFACE  
FALSE BANK / MANURE / LAGOON  
WASH H<sub>2</sub>O / TILE / H<sub>2</sub>O TABLE  
ACID / MINE / QUARRY / FLOW  
NATURAL / WETLAND / STAGNANT  
PARK / GOLF / LAWN / HOME  
ATMOSPHERE / DATA PAUCITY

## FJ MEASUREMENTS

- $\bar{x}$  width  
 $\bar{x}$  depth  
max. depth  
 $\bar{x}$  bankfull width  
bankfull  $\bar{x}$  depth  
W/D ratio  
bankfull max. depth  
floodprone  $x^2$  width  
entrench. ratio

Legacy Tree:

## Stream Drawing:





## **Appendix D - Mapping**

**Figure 1 – Indiana State Highway Map**

**Figure 2 – USGS Topographic Mapping – Jeffersonville Quadrangle**

**Figure 3 – 1974 Clark County Soil Survey**

**Figure 4 – Clark County Mapped Soils - SURGO**

**Figure 5 – National Wetland Inventory & FEMA 100-Year Floodplain Map**

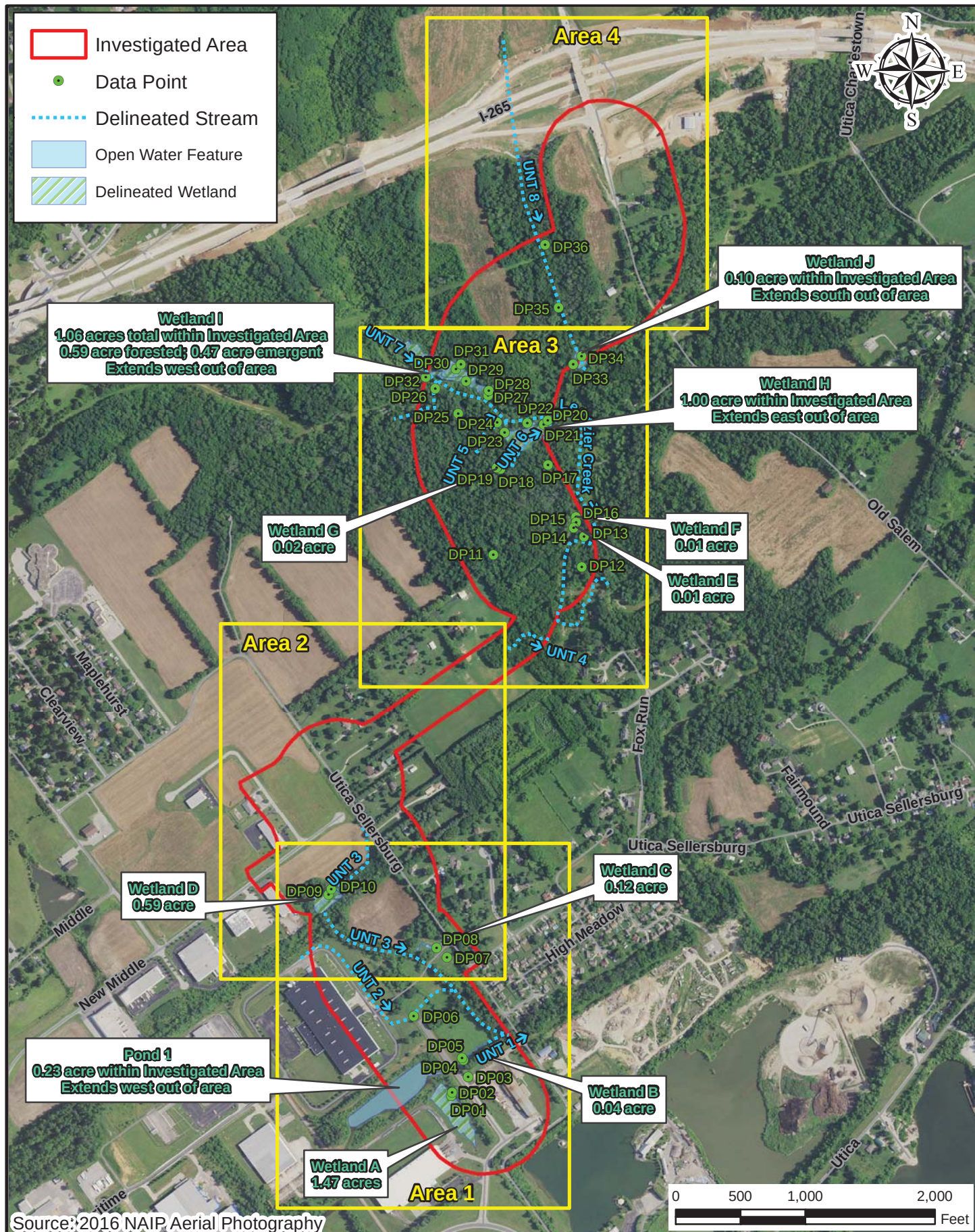
**Figure 6 – 2005 Aerial Photography**

**Figure 7 – Field Investigation and Photo Location Maps**

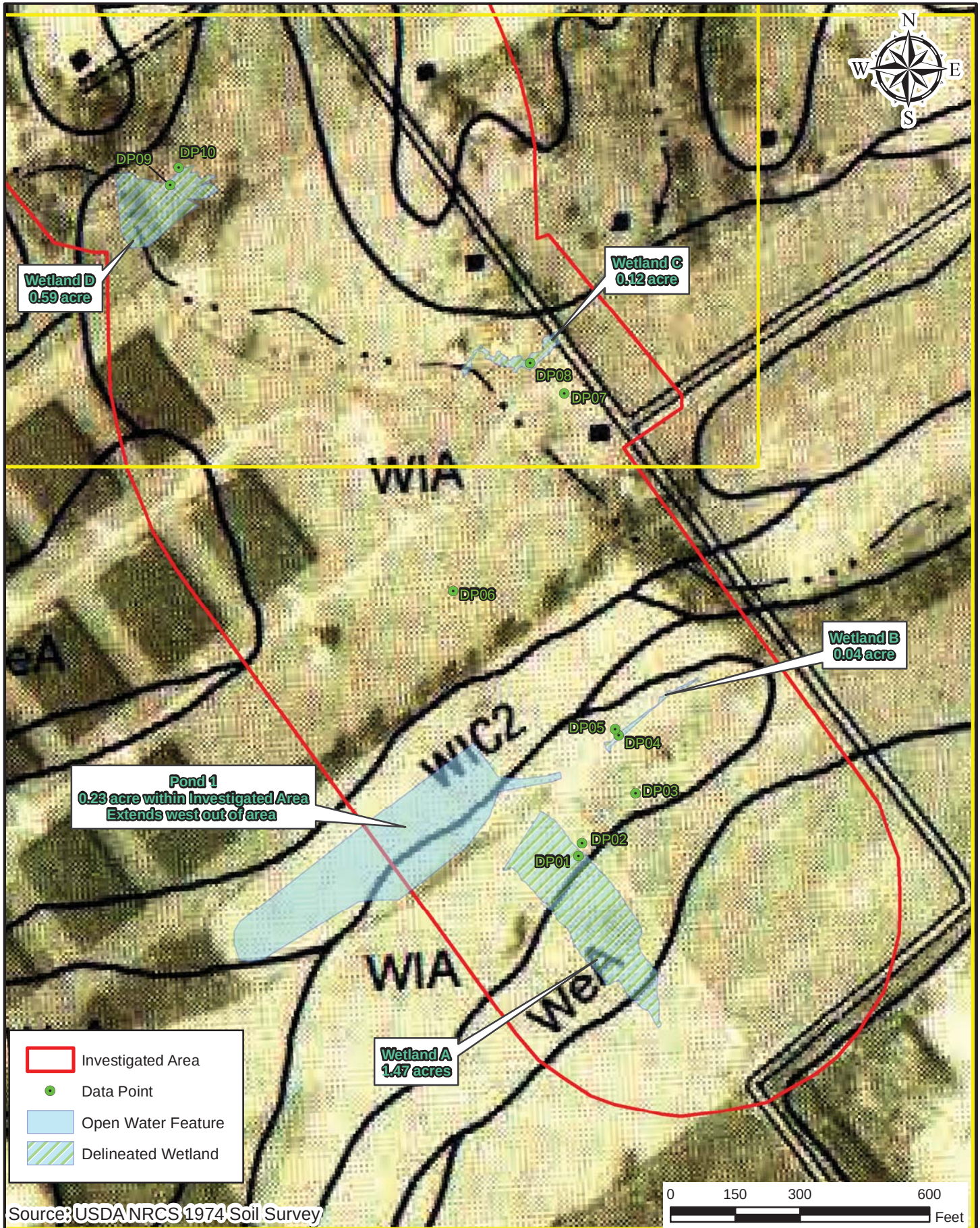
**Figure 8 – Regional Supplement Map**

Figures 1 and 2 found in Appendix B of the environmental document





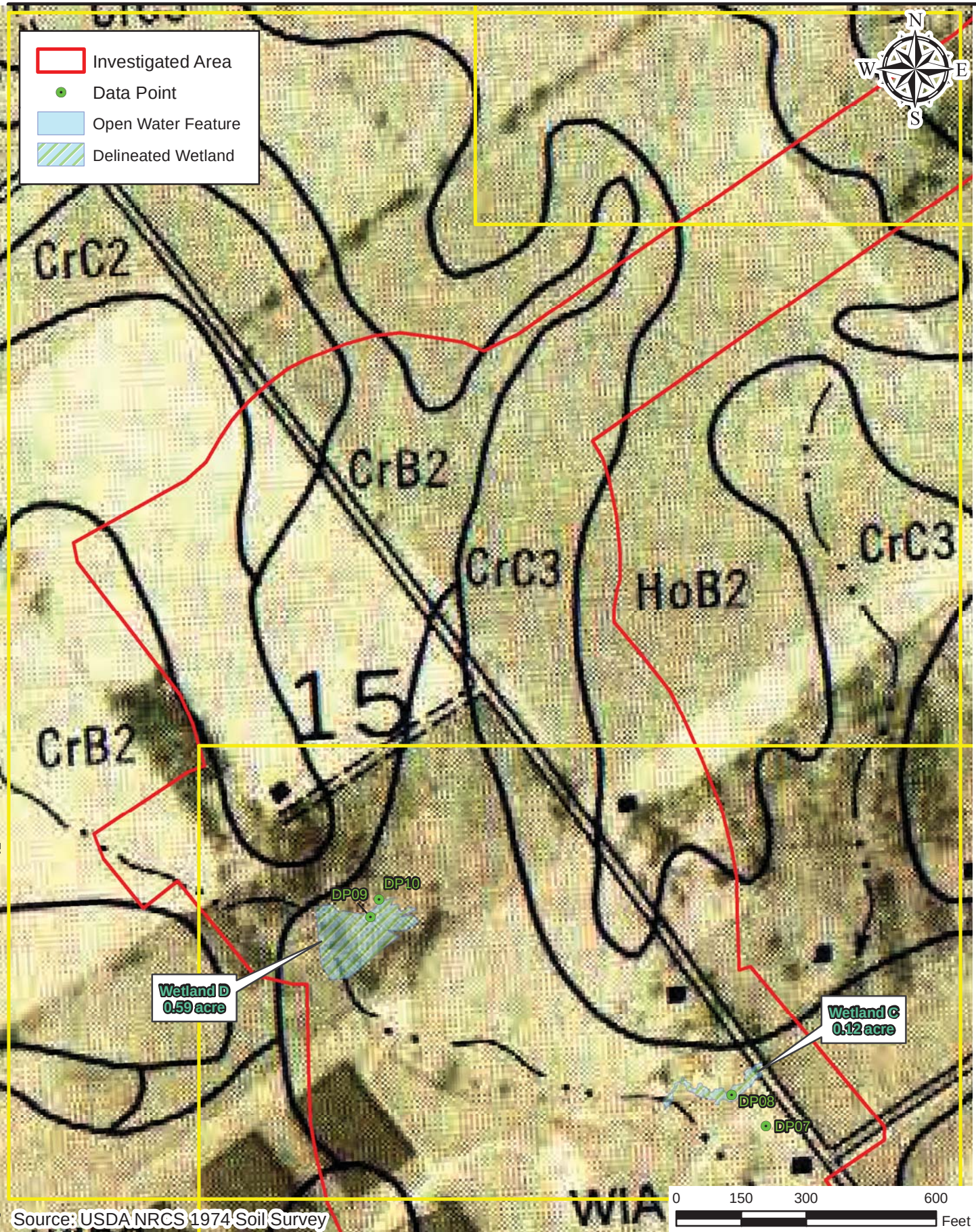




Source: USDA NRCS 1974 Soil Survey



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**Figure 3. 1974 Clark County  
Soil Survey - Area 2 of 4**

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

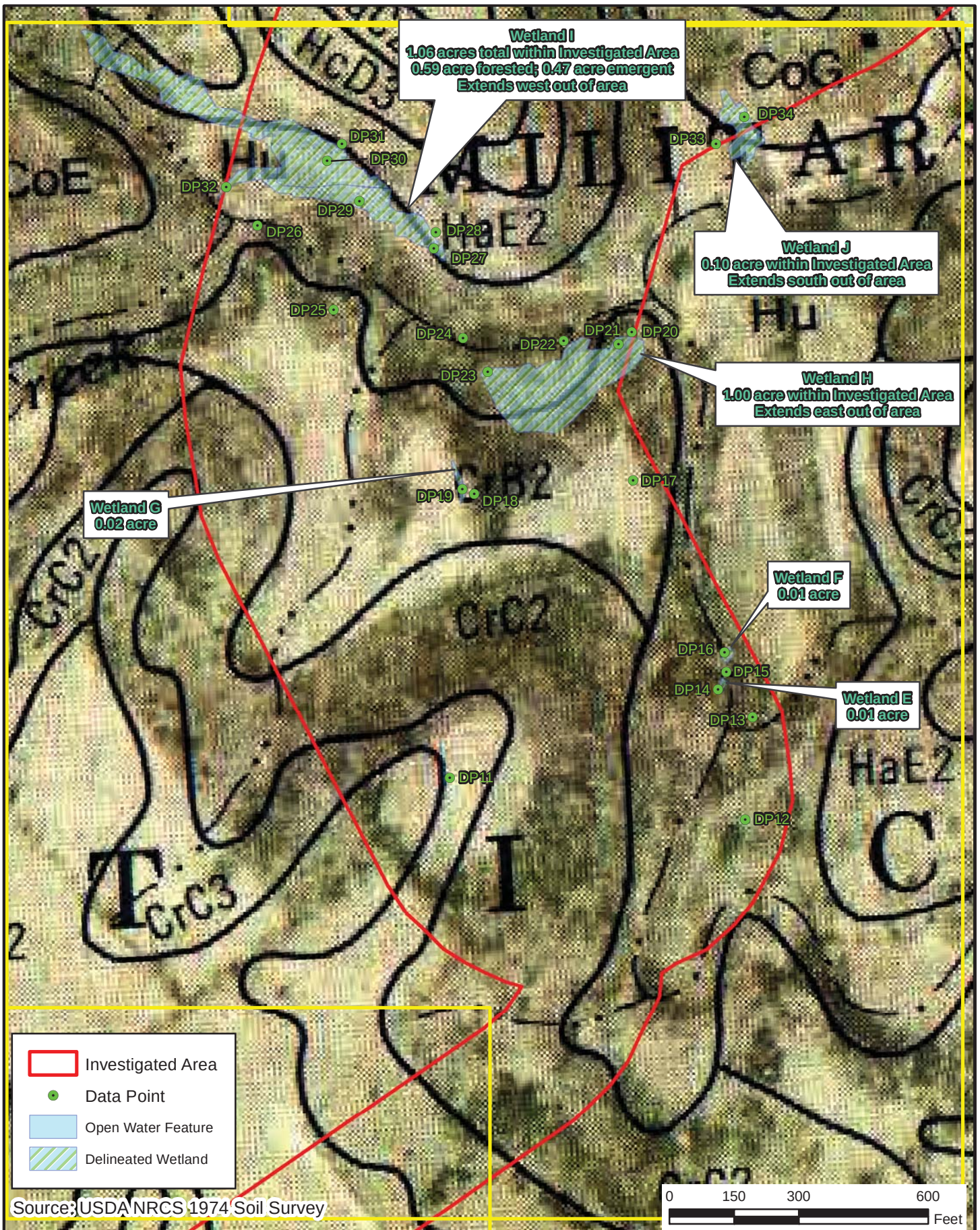
**Heavy Haul Transportation Corridor  
Des. No. 1382612**

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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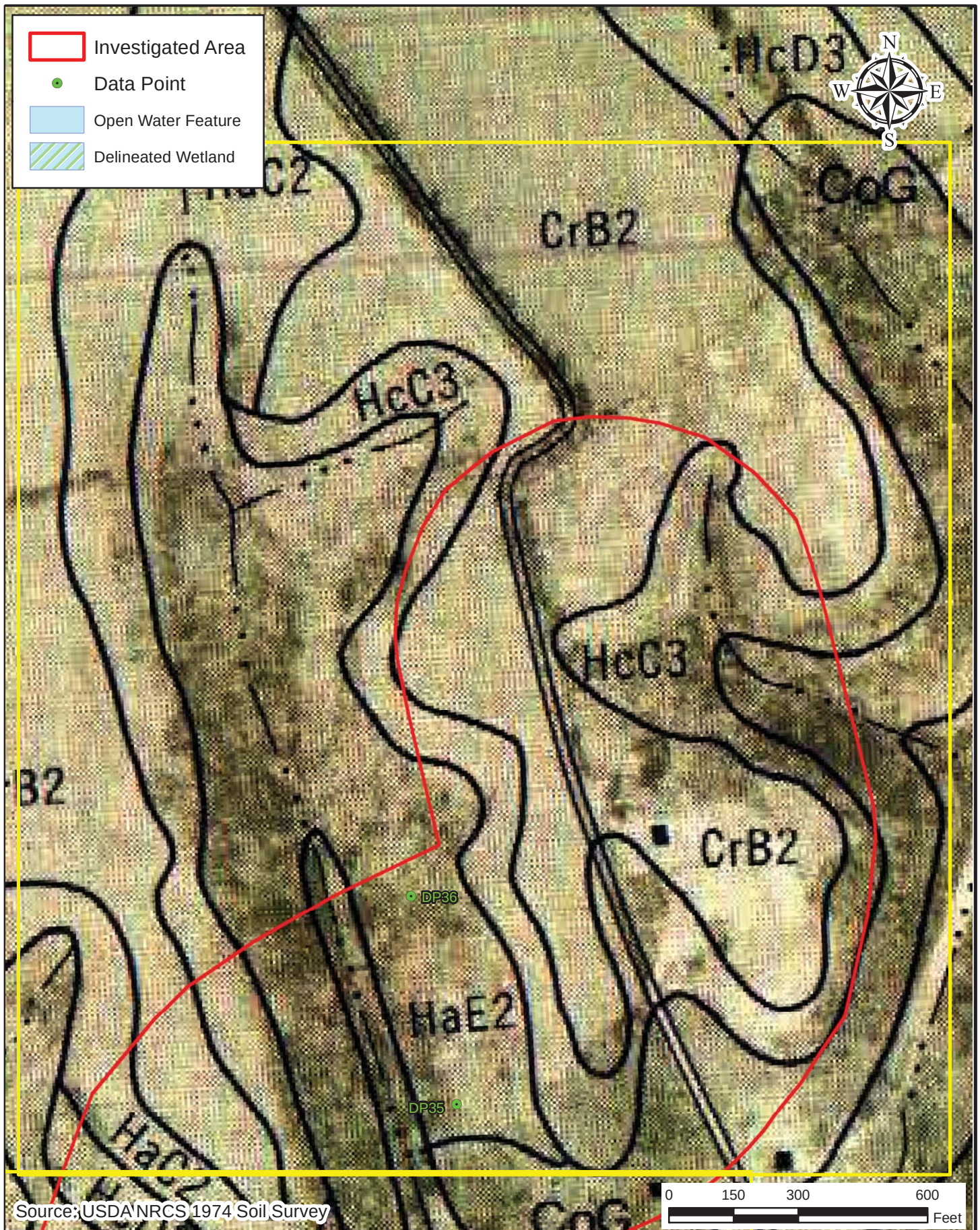


Figure 3. 1974 Clark County  
Soil Survey - Area 4 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor  
Des. No. 1382612

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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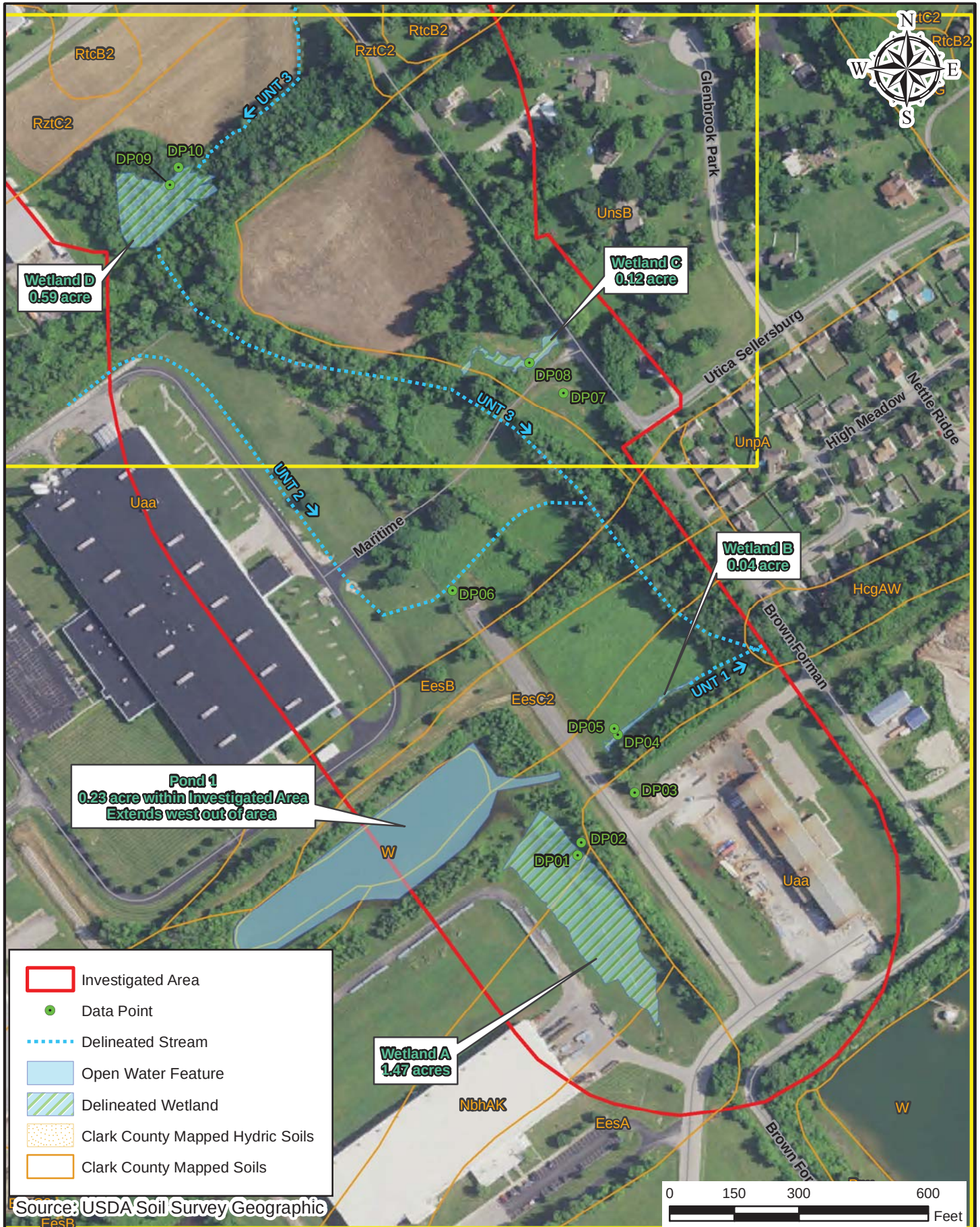


Figure 4. Clark County Mapped Soils, SSURGO - Area 1 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor  
Des. No. 1382612

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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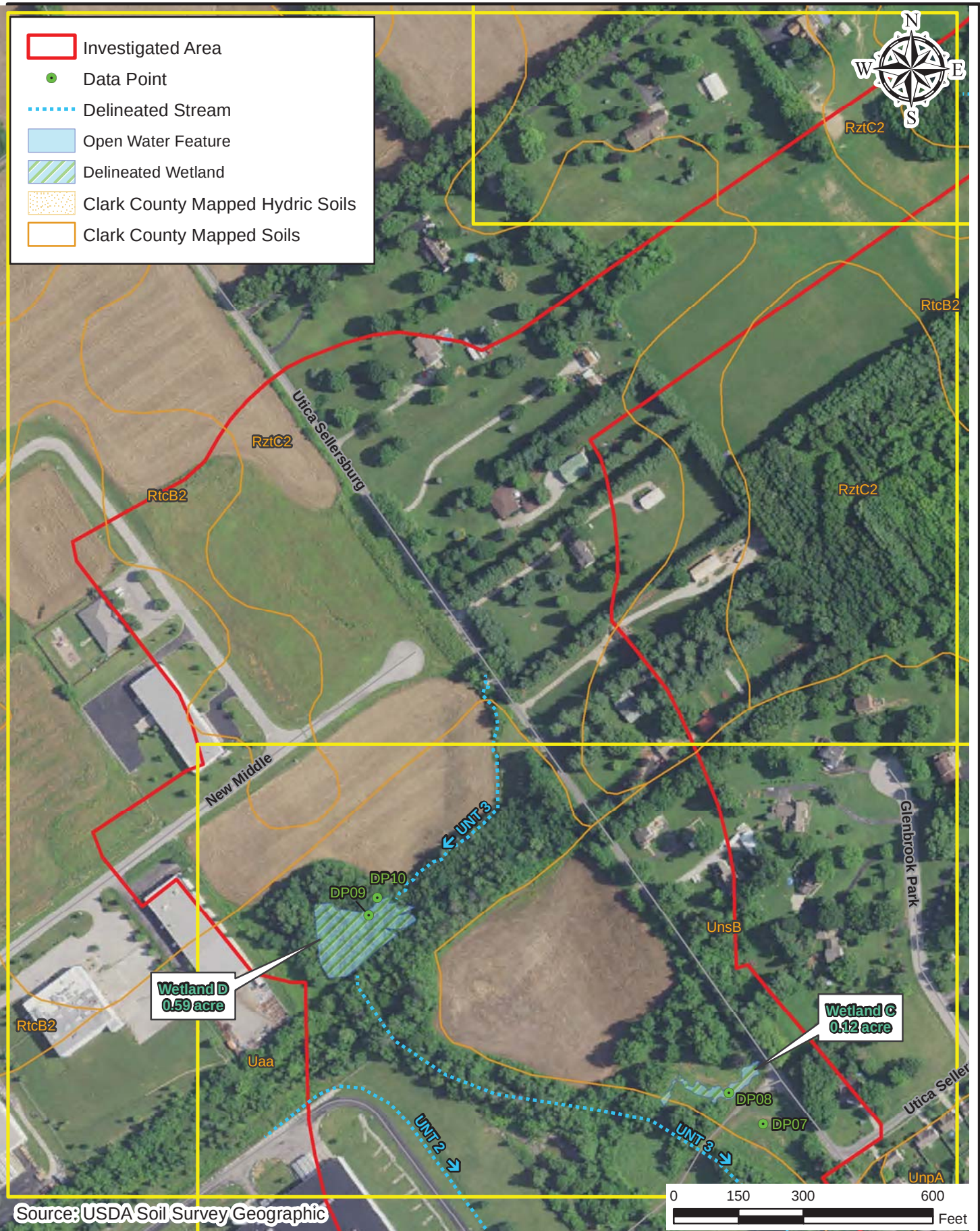


Figure 4. Clark County Mapped Soils, SSURGO - Area 2 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor  
Des. No. 1382612

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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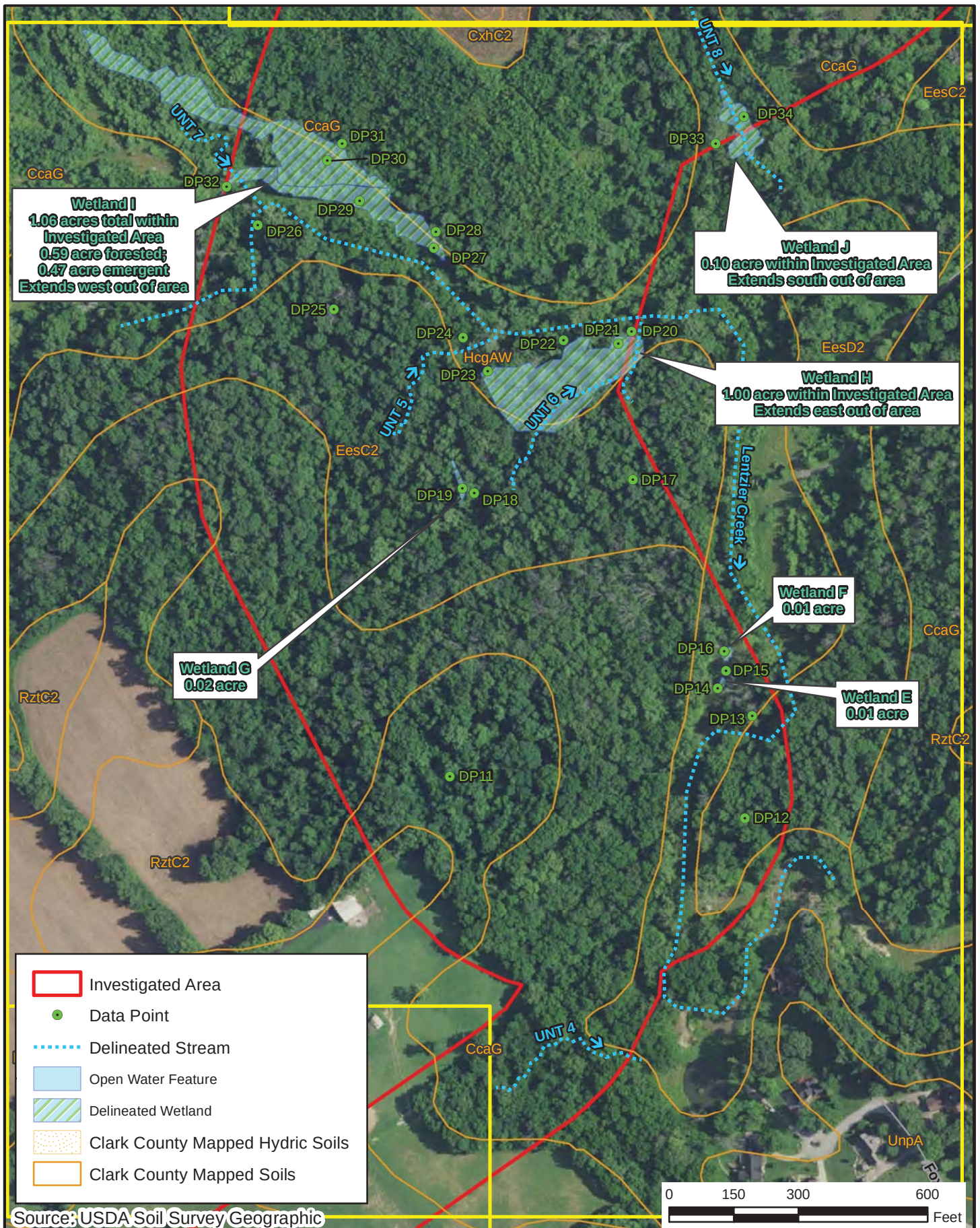


Figure 4. Clark County Mapped Soils, SSUGO - Area 3 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor  
Des. No. 1382612

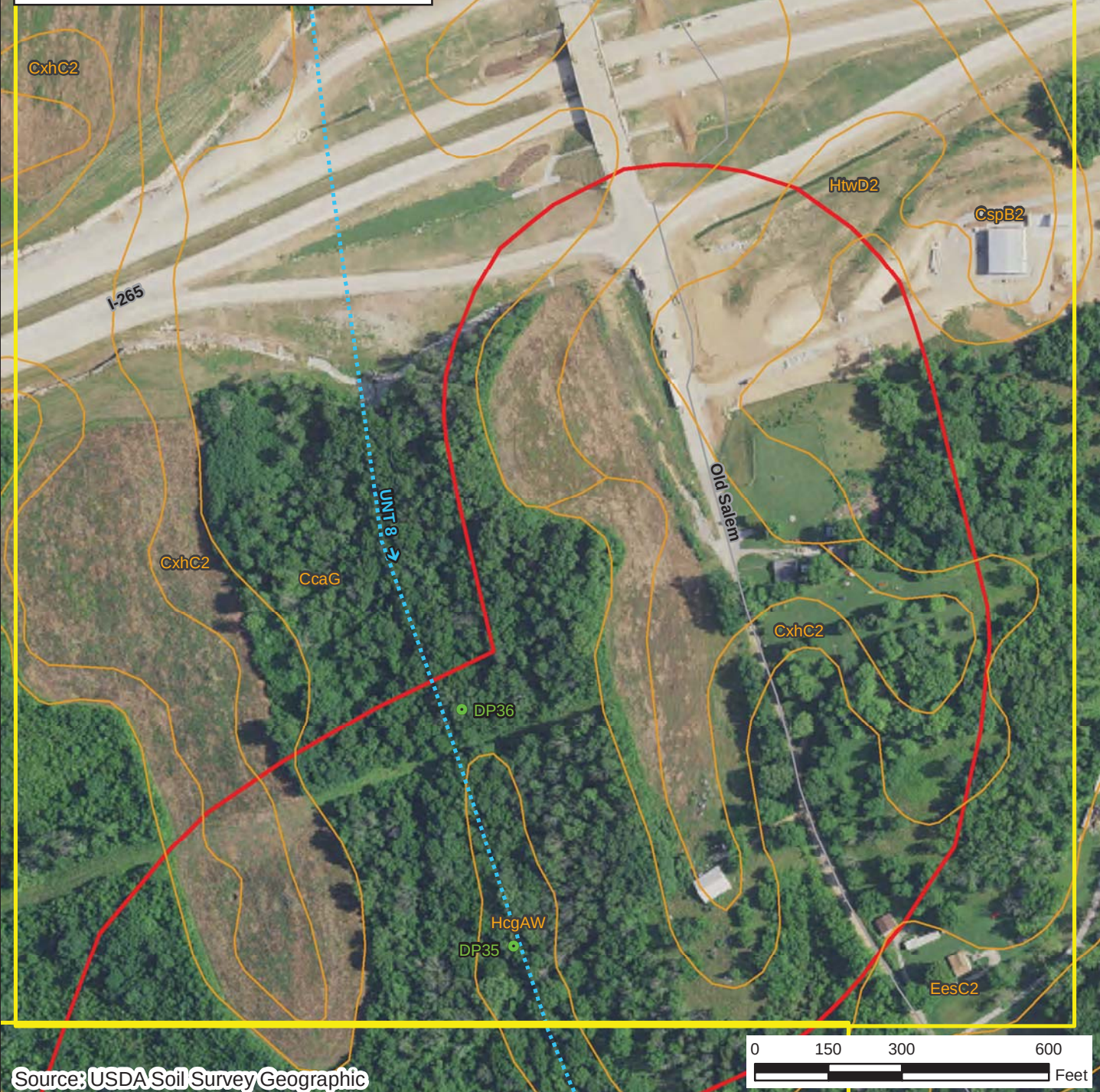
Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

Appendix E  
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- Investigated Area
- Data Point
- ⋯ Delineated Stream
- Open Water Feature
- Delineated Wetland
- Clark County Mapped Hydric Soils
- Clark County Mapped Soils



Source: USDA Soil Survey Geographic



**Figure 4. Clark County Mapped Soils, SSURGO - Area 4 of 4**

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

**Heavy Haul Transportation Corridor  
Des. No. 1382612**

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

Appendix E  
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# Map Unit Legend

Clark County, Indiana

| Map symbol | Map unit name                                                                            |
|------------|------------------------------------------------------------------------------------------|
| AddA       | Avonburg silt loam, 0 to 2 percent slopes                                                |
| AddB2      | Avonburg silt loam, 2 to 4 percent slopes, eroded                                        |
| BbhA       | Bartle silt loam, 0 to 2 percent slopes                                                  |
| BcrAQ      | Beanblossom silt loam, 1 to 3 percent slopes, rarely flooded                             |
| BcrAW      | Beanblossom silt loam, 1 to 3 percent slopes, occasionally flooded, very brief duration  |
| BdoA       | Bedford silt loam, 0 to 2 percent slopes                                                 |
| BdoB       | Bedford silt loam, 2 to 6 percent slopes                                                 |
| BfbC2      | Blocher, soft bedrock substratum-Weddel silt loams, 6 to 12 percent slopes, eroded       |
| BfcC3      | Blocher, soft bedrock substratum-Weddel complex, 6 to 12 percent slopes, severely eroded |
| BnyD3      | Bonnell clay loam, 12 to 22 percent slopes, severely eroded                              |
| BobE5      | Bonnell-Hickory clay loams, 15 to 30 percent slopes, gullied                             |
| BodAW      | Bonnie silt loam, 0 to 1 percent slopes, occasionally flooded, very brief duration       |
| BvoG       | Brownstown-Gilwood silt loams, 25 to 75 percent slopes                                   |
| CcaG       | Caneyville-Rock outcrop complex, 25 to 60 percent slopes                                 |
| CkkB2      | Cincinnati silt loam, 2 to 6 percent slopes, eroded                                      |
| CldC2      | Cincinnati-Blocher silt loams, 6 to 12 percent slopes, eroded                            |
| CldC3      | Cincinnati-Blocher silt loams, 6 to 12 percent slopes, severely eroded                   |
| ClfA       | Cobbsfork silt loam, 0 to 1 percent slopes                                               |
| ComC       | Coolville silt loam, 6 to 12 percent slopes                                              |
| ConC3      | Coolville-Rarden complex, 6 to 12 percent slopes, severely eroded                        |
| ConD       | Coolville-Rarden complex, 12 to 18 percent slopes                                        |
| CspA       | Crider silt loam, 0 to 2 percent slopes                                                  |
| CspB2      | Crider silt loam, 2 to 6 percent slopes, eroded                                          |
| CtrB2      | Crider silt loam, karst, undulating, eroded                                              |
| CtwB       | Crider-Bedford-Navilleton silt loams, 2 to 6 percent slopes                              |
| CwaAQ      | Cuba silt loam, 0 to 2 percent slopes, rarely flooded                                    |
| CxgC3      | Crider-Haggatt complex, 6 to 12 percent slopes, severely eroded                          |
| CxhC2      | Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded                                |
| CxmC2      | Crider-Haggatt silt loams, karst, rolling, eroded                                        |
| CxnC3      | Crider-Haggatt complex, karst, rolling, severely eroded                                  |
| DbrG       | Deam silty clay loam, 20 to 55 percent slopes                                            |
| DdsAW      | Dearborn silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration     |
| DfnA       | Dubois silt loam, 0 to 2 percent slopes                                                  |
| DtvC2      | Deputy-Trappist silt loams, 6 to 12 percent slopes, eroded                               |
| EbpD2      | Eden silty clay loam, 12 to 25 percent slopes, eroded                                    |
| EesA       | Elkinsville-Millstone silt loams, 0 to 2 percent slopes                                  |
| EesB       | Elkinsville-Millstone silt loams, 2 to 6 percent slopes                                  |
| EesC2      | Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded                         |
| EesD2      | Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded                        |
| EesFQ      | Elkinsville-Millstone silt loams, 18 to 40 percent slopes, rarely flooded                |
| EsaG       | Eden silty clay loam, 25 to 60 percent slopes, very rocky                                |
| GgbG       | Gilwood-Brownstown silt loams, 25 to 75 percent slopes                                   |
| GgfD       | Gilwood-Wrays silt loams, 6 to 18 percent slopes                                         |
| GgfE2      | Gilwood-Wrays silt loams, 12 to 25 percent slopes, eroded                                |
| GmaG       | Gnawbone-Kurtz silt loams, 20 to 60 percent slopes                                       |
| GyaD2      | Grayford silt loam, 12 to 25 percent slopes, eroded                                      |
| GyaD3      | Grayford silt loam, 12 to 25 percent slopes, severely eroded                             |
| GyaD5      | Grayford silt loam, 12 to 25 percent slopes, gullied                                     |
| GykD2      | Grayford silt loam, karst, hilly, eroded                                                 |



# Map Unit Legend

Clark County, Indiana

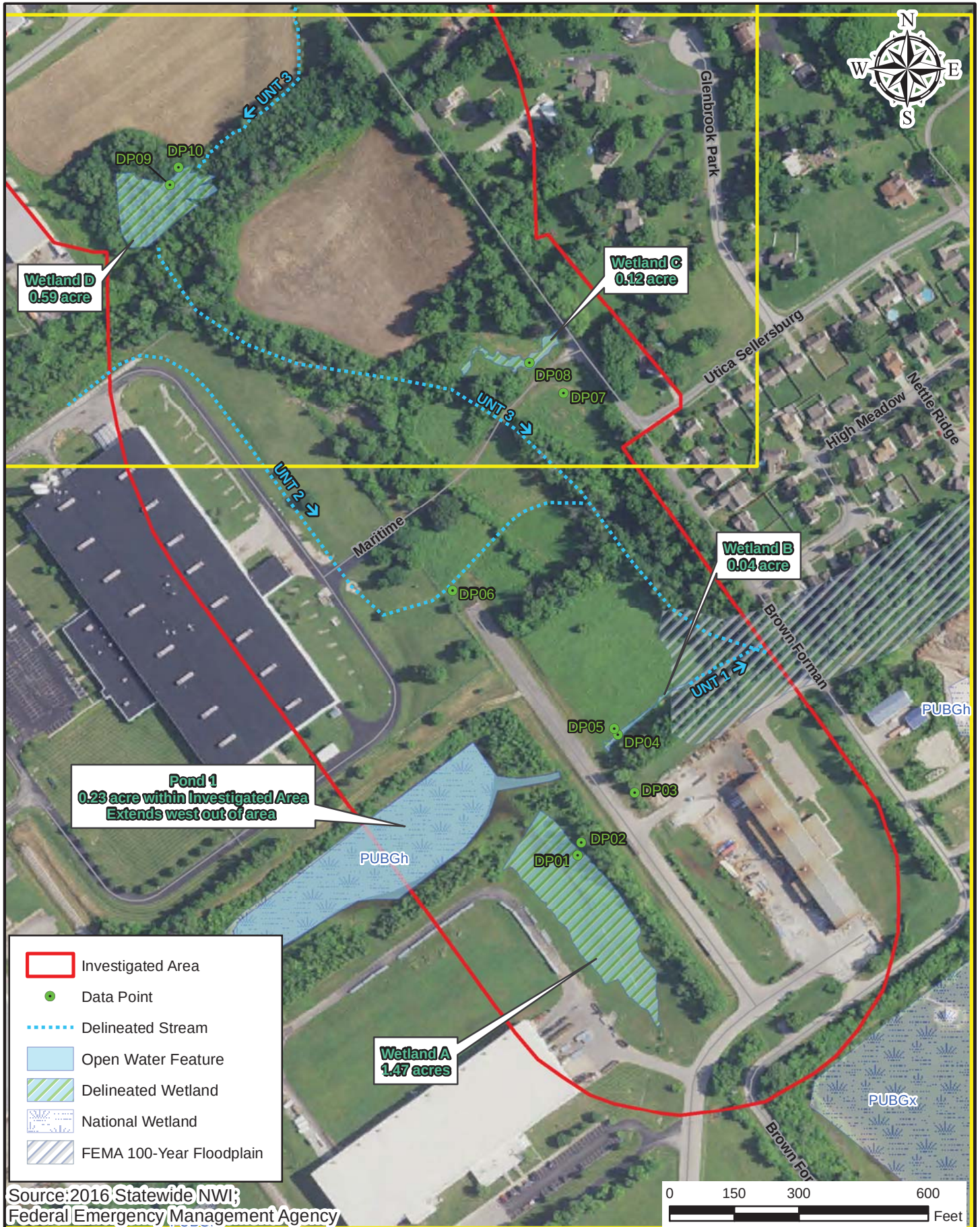
| Map symbol | Map unit name                                                                                  |
|------------|------------------------------------------------------------------------------------------------|
| GykD3      | Grayford silt loam, karst, hilly, severely eroded                                              |
| HcaA       | Hatfield silt loam, 0 to 2 percent slopes                                                      |
| HccB2      | Haubstadt silt loam, 2 to 6 percent slopes, eroded                                             |
| HcdC2      | Haubstadt-Shircliff silt loams, 6 to 15 percent slopes, eroded                                 |
| HceC3      | Haubstadt-Shircliff complex, 6 to 15 percent slopes, severely eroded                           |
| HcgAH      | Haymond silt loam, 0 to 2 percent slopes, frequently flooded, brief duration                   |
| HcgAV      | Haymond silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration              |
| HcgAW      | Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration            |
| HerE       | Hickory-Bonnell complex, 12 to 25 percent slopes                                               |
| HtwD2      | Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded                                 |
| HtzD3      | Haggatt-Caneyville complex, 12 to 25 percent slopes, severely eroded                           |
| HufAK      | Huntington silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration              |
| HuhD2      | Haggatt-Caneyville silt loams, karst, hilly, eroded                                            |
| HujD3      | Haggatt-Caneyville complex, karst, hilly, severely eroded                                      |
| JaeB2      | Jennings silt loam, 2 to 6 percent slopes, eroded                                              |
| JafC2      | Jennings-Blocher, hard bedrock substratum, silt loams, 6 to 12 percent slopes, eroded          |
| JafC3      | Jennings-Blocher, hard bedrock substratum, silt loams, 6 to 12 percent slopes, severely eroded |
| KxkC2      | Knobcreek-Navilleton silt loams, 6 to 12 percent slopes, eroded                                |
| KxlC3      | Knobcreek-Haggatt-Caneyville complex, 6 to 12 percent slopes, severely eroded                  |
| KxlE3      | Knobcreek-Haggatt-Caneyville complex, 12 to 25 percent slopes, severely eroded                 |
| KxmE2      | Knobcreek-Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded                       |
| KxoC2      | Knobcreek-Navilleton-Haggatt silt loams, karst, rolling, eroded                                |
| KxpD2      | Knobcreek-Haggatt-Caneyville silt loams, karst, hilly, eroded                                  |
| LpoAK      | Lindside silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration                |
| McgC2      | Markland silt loam, 6 to 12 percent slopes, eroded                                             |
| McngQ      | Markland silt loam, 18 to 50 percent slopes, rarely flooded                                    |
| McpC3      | Markland silty clay loam, 6 to 12 percent slopes, severely eroded                              |
| McuDQ      | Markland silty clay loam, 12 to 25 percent slopes, severely eroded, rarely flooded             |
| MdqDQ      | Markland silt loam, 12 to 25 percent slopes, eroded, rarely flooded                            |
| MhuA       | McGary silt loam, 0 to 2 percent slopes                                                        |
| MhyA       | Medora silt loam, 0 to 2 percent slopes                                                        |
| MhyB2      | Medora silt loam, 2 to 6 percent slopes, eroded                                                |
| MhyC2      | Medora silt loam, 6 to 12 percent slopes, eroded                                               |
| MhyC3      | Medora silt loam, 6 to 12 percent slopes, severely eroded                                      |
| MsvA       | Montgomery silty clay loam, 0 to 1 percent slopes                                              |
| NaaA       | Nabb silt loam, 0 to 2 percent slopes                                                          |
| NaaB2      | Nabb silt loam, 2 to 6 percent slopes, eroded                                                  |
| NbhAK      | Newark silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration                  |
| OfbAW      | Oldenburg loam, 0 to 2 percent slopes, occasionally flooded, very brief duration               |
| PcrB2      | Pekin silt loam, 2 to 6 percent slopes, eroded                                                 |
| PcrC2      | Pekin silt loam, 6 to 12 percent slopes, eroded                                                |
| PcrC3      | Pekin silt loam, 6 to 12 percent slopes, severely eroded                                       |
| PhaA       | Peoga silt loam, 0 to 1 percent slopes                                                         |
| Pml        | Pits, quarry                                                                                   |
| Ppu        | Pits, sand and gravel                                                                          |
| RblD3      | Rarden silty clay loam, 12 to 18 percent slopes, severely eroded                               |
| RbmD5      | Rarden silty clay, 6 to 18 percent slopes, gullied                                             |
| RptG       | Rohan-Jessietown complex, 25 to 60 percent slopes, rocky                                       |
| RtcA       | Ryker silt loam, 0 to 2 percent slopes                                                         |

# Map Unit Legend

Clark County, Indiana

| Map symbol | Map unit name                                                                                               |
|------------|-------------------------------------------------------------------------------------------------------------|
| RtcB2      | Ryker silt loam, 2 to 6 percent slopes, eroded                                                              |
| RzrB2      | Ryker silt loam, karst, undulating, eroded                                                                  |
| RztC2      | Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded                                                   |
| RztC3      | Ryker-Grayford silt loams, 6 to 12 percent slopes, severely eroded                                          |
| RzvC2      | Ryker-Grayford silt loams, karst, rolling, eroded                                                           |
| RzvC3      | Ryker-Grayford silt loams, karst, rolling, severely eroded                                                  |
| SceB2      | Scottsburg silt loam, 2 to 4 percent slopes, eroded                                                         |
| SfyB       | Shircliff silt loam, 2 to 6 percent slopes                                                                  |
| SoaB       | Spickert silt loam, 2 to 6 percent slopes                                                                   |
| SodB       | Spickert silt loam, terrace, 1 to 4 percent slopes                                                          |
| SolC2      | Spickert-Wrays silt loams, 6 to 12 percent slopes, eroded                                                   |
| StaAQ      | Steff silt loam, 0 to 2 percent slopes, rarely flooded                                                      |
| StdAQ      | Stendal silt loam, 0 to 2 percent slopes, rarely flooded                                                    |
| StdAW      | Stendal silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration                         |
| ThaC2      | Trappist silt loam, 6 to 12 percent slopes, eroded                                                          |
| ThbC3      | Trappist silty clay loam, 6 to 12 percent slopes, severely eroded                                           |
| ThbD5      | Trappist silty clay loam, 6 to 18 percent slopes, gullied                                                   |
| ThcD3      | Trappist-Rohan complex, 12 to 25 percent slopes, severely eroded                                            |
| ThdD       | Trappist-Rohan silt loams, 12 to 25 percent slopes                                                          |
| TsaC3      | Trappist-Deputy complex, 6 to 12 percent slopes, severely eroded                                            |
| Uaa        | Udorthents, cut and filled                                                                                  |
| UaoAK      | Udifluvents, cut and filled-Urban land complex, 0 to 2 percent slopes, occasionally flooded, brief duration |
| UedA       | Urban land-Aquents, clayey substratum, complex, lake plain, 0 to 3 percent slopes                           |
| UndAY      | Urban land-Udifluvents complex, leveed, 0 to 2 percent slopes                                               |
| UngB       | Urban land-Udarents, fragipan substratum, complex, till plain, 0 to 12 percent slopes                       |
| UnkB       | Urban land-Udarents, silty substratum, complex, terrace, 0 to 6 percent slopes                              |
| UnpA       | Urban land-Udarents, loamy substratum, complex, terrace, 0 to 3 percent slopes                              |
| UnsB       | Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes                              |
| W          | Water                                                                                                       |
| WaaAV      | Wakeland silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration                          |
| WaaAW      | Wakeland silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration                        |
| WedB2      | Weddel silt loam, 2 to 6 percent slopes, eroded                                                             |
| WhcD       | Wellrock-Gnawbone silt loams, 6 to 20 percent slopes                                                        |
| WnmA       | Whitcomb silt loam, 0 to 2 percent slopes                                                                   |
| WokAV      | Wilbur silt loam, 0 to 2 percent slopes, frequently flooded, very brief duration                            |
| WokAW      | Wilbur silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration                          |
| WprAW      | Wirt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration                                 |





**Figure 5. NWI and FEMA 100-Year Floodplain - Area 1 of 4**

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

**Heavy Haul Transportation Corridor  
Des. No. 1382612**

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

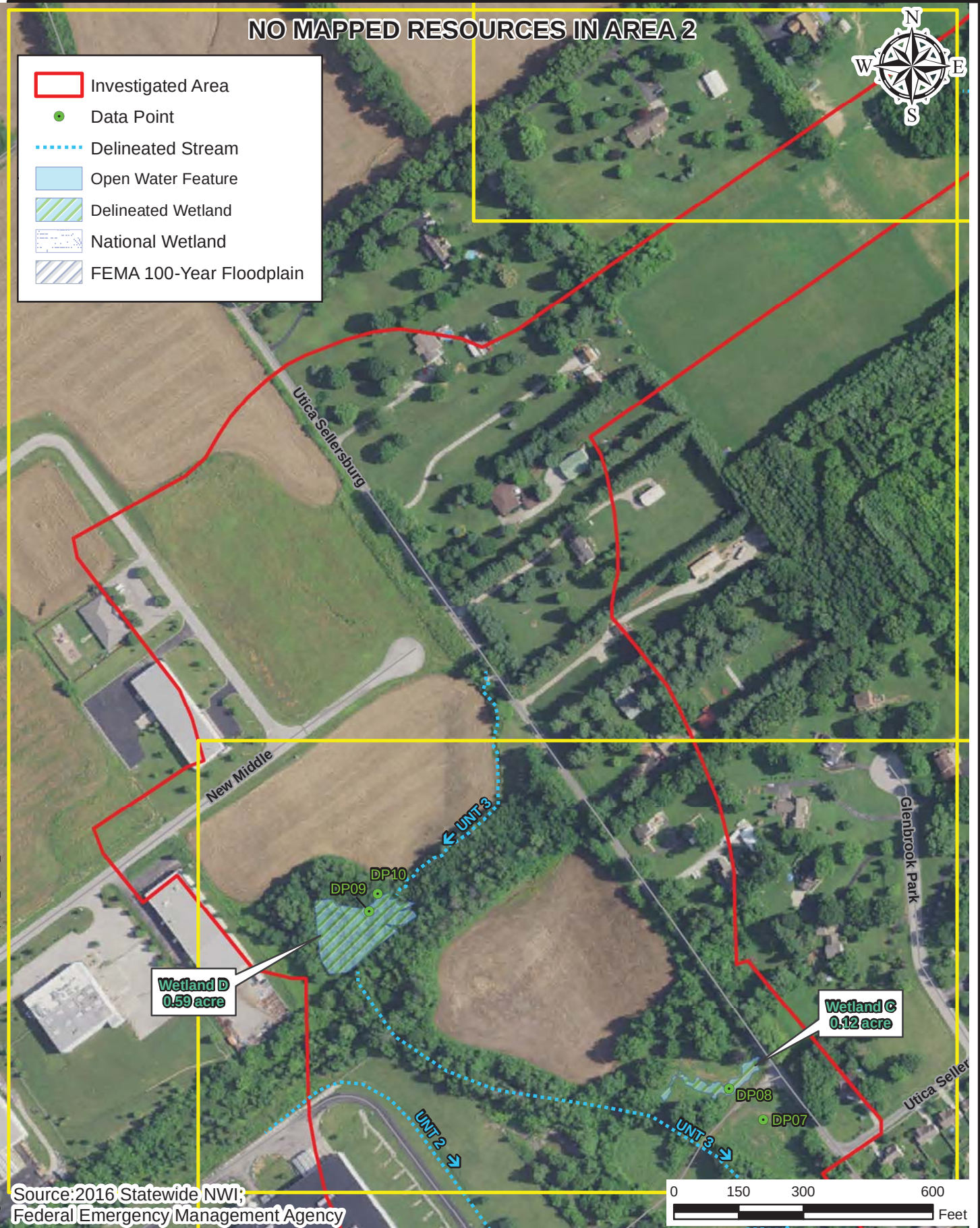
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# NO MAPPED RESOURCES IN AREA 2



- Investigated Area
- Data Point
- ..... Delineated Stream
- Open Water Feature
- Delineated Wetland
- National Wetland
- FEMA 100-Year Floodplain



Source: 2016 Statewide NWI;  
Federal Emergency Management Agency



Figure 5. NWI and FEMA  
100-Year Floodplain - Area 2 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

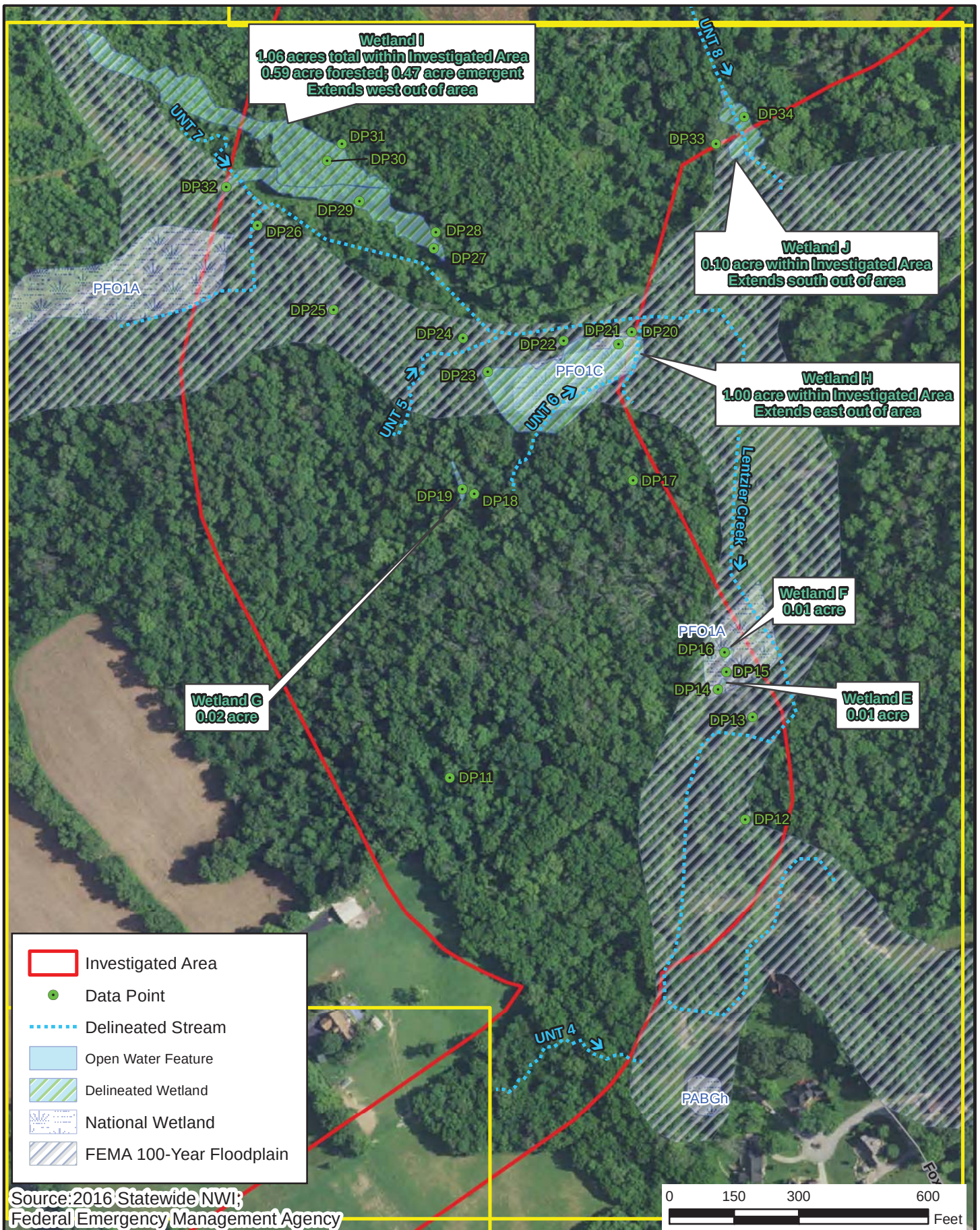
Heavy Haul Transportation Corridor  
Des. No. 1382612

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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**Figure 5. NWI and FEMA  
100-Year Floodplain - Area 3 of 4**

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

**Heavy Haul Transportation Corridor  
Des. No. 1382612**

Location: Jeffersonville  
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County: Clark  
State: Indiana

Date: 02/01/2017

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- Investigated Area
- Data Point
- ⋯ Delineated Stream
- Open Water Feature
- Delineated Wetland
- National Wetland
- FEMA 100-Year Floodplain



Source: 2016 Statewide NWI;  
Federal Emergency Management Agency



**Figure 5. NWI and FEMA  
100-Year Floodplain - Area 4 of 4**

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

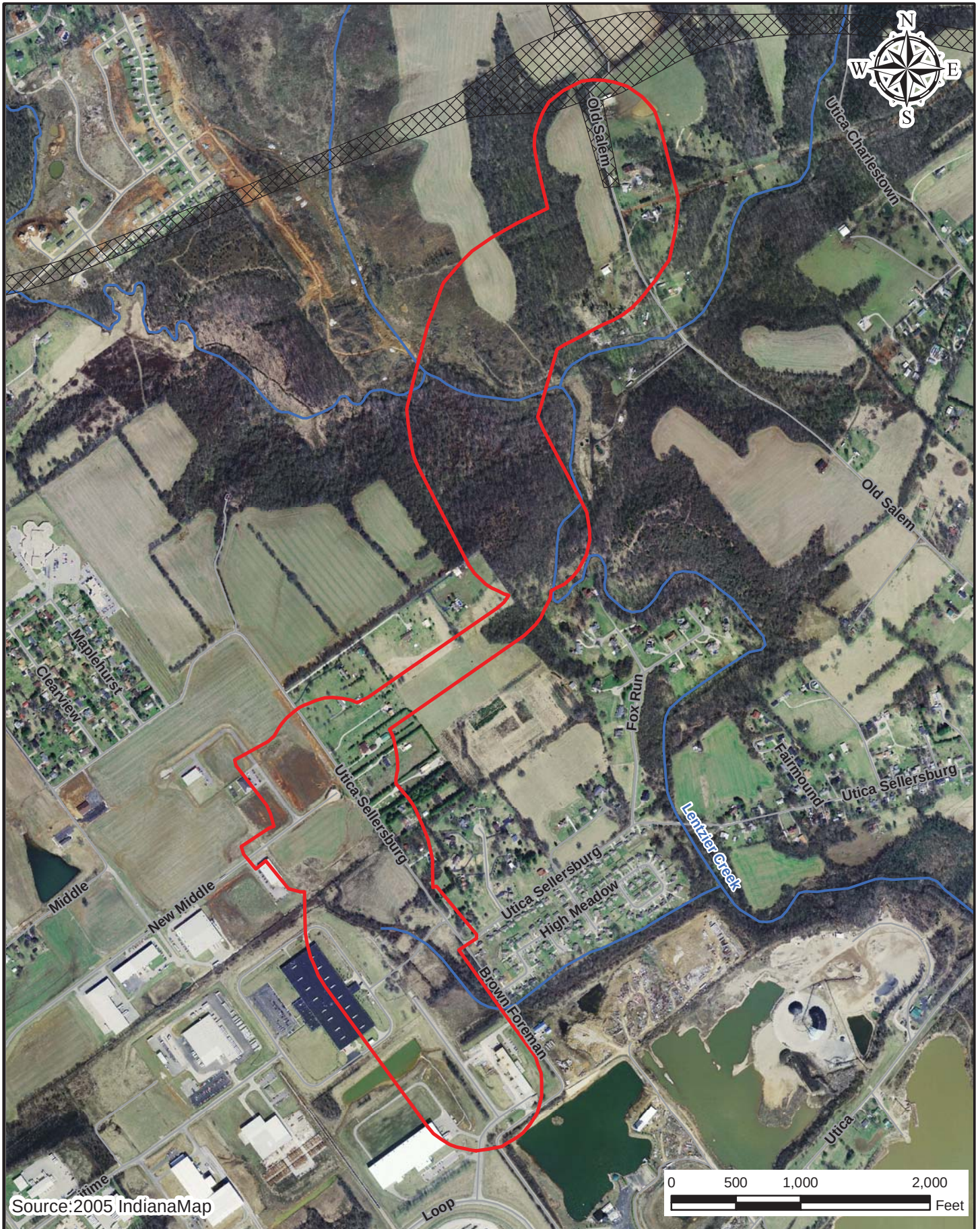
**Heavy Haul Transportation Corridor  
Des. No. 1382612**

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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### Figure 6. 2005 Aerial Photography

Indiana Department of Transportation  
Central Office  
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Indianapolis, Indiana 46204

### Heavy Haul Transportation Corridor Des. No. 1382612

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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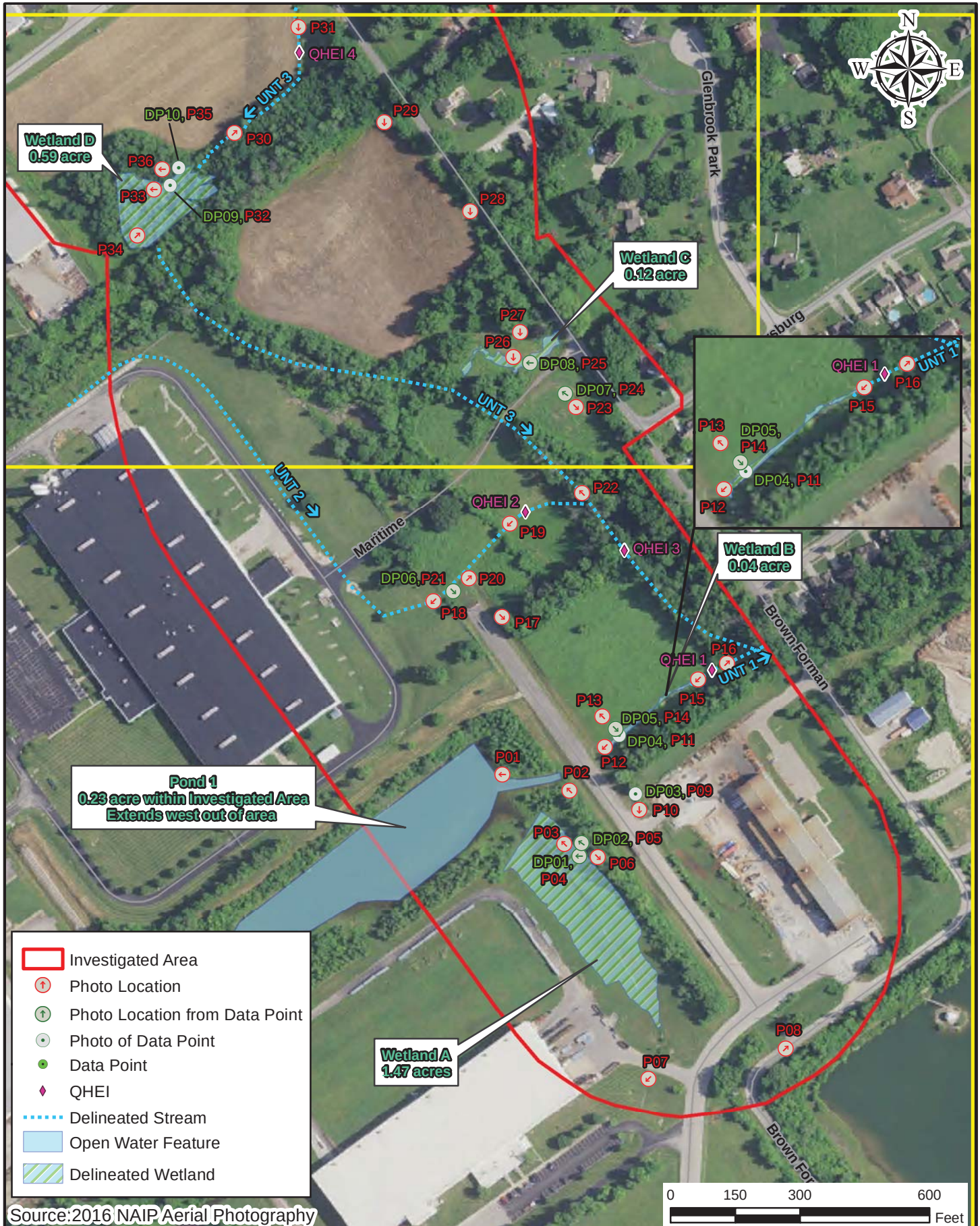


Figure 7. Field Investigation and Photo Location Map - Area 1 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor  
Des. No. 1382612

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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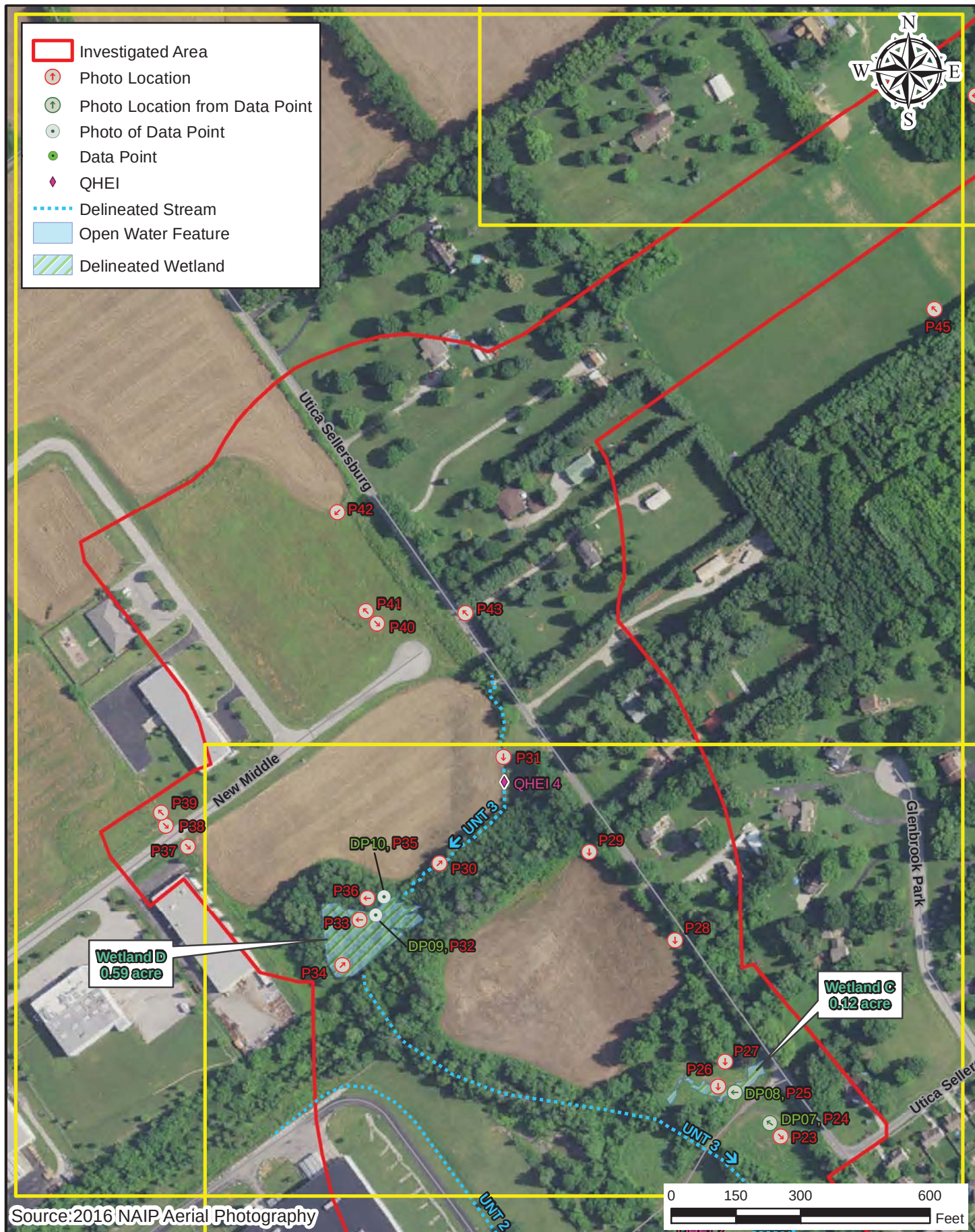


Figure 7. Field Investigation and Photo Location Map - Area 2 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor  
Des. No. 1382612

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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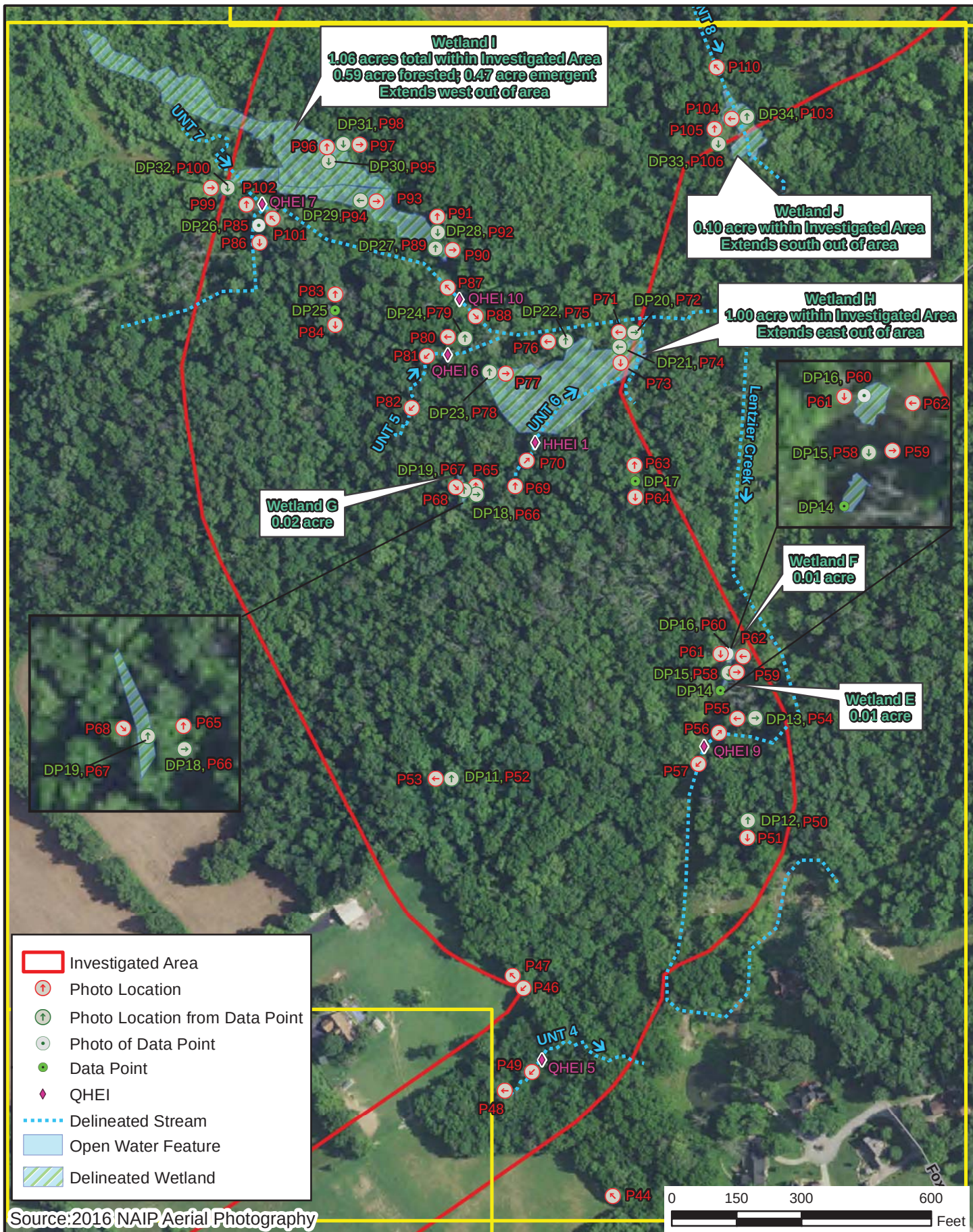


Figure 7. Field Investigation and Photo Location Map - Area 3 of 4

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Transportation Corridor  
Des. No. 1382612

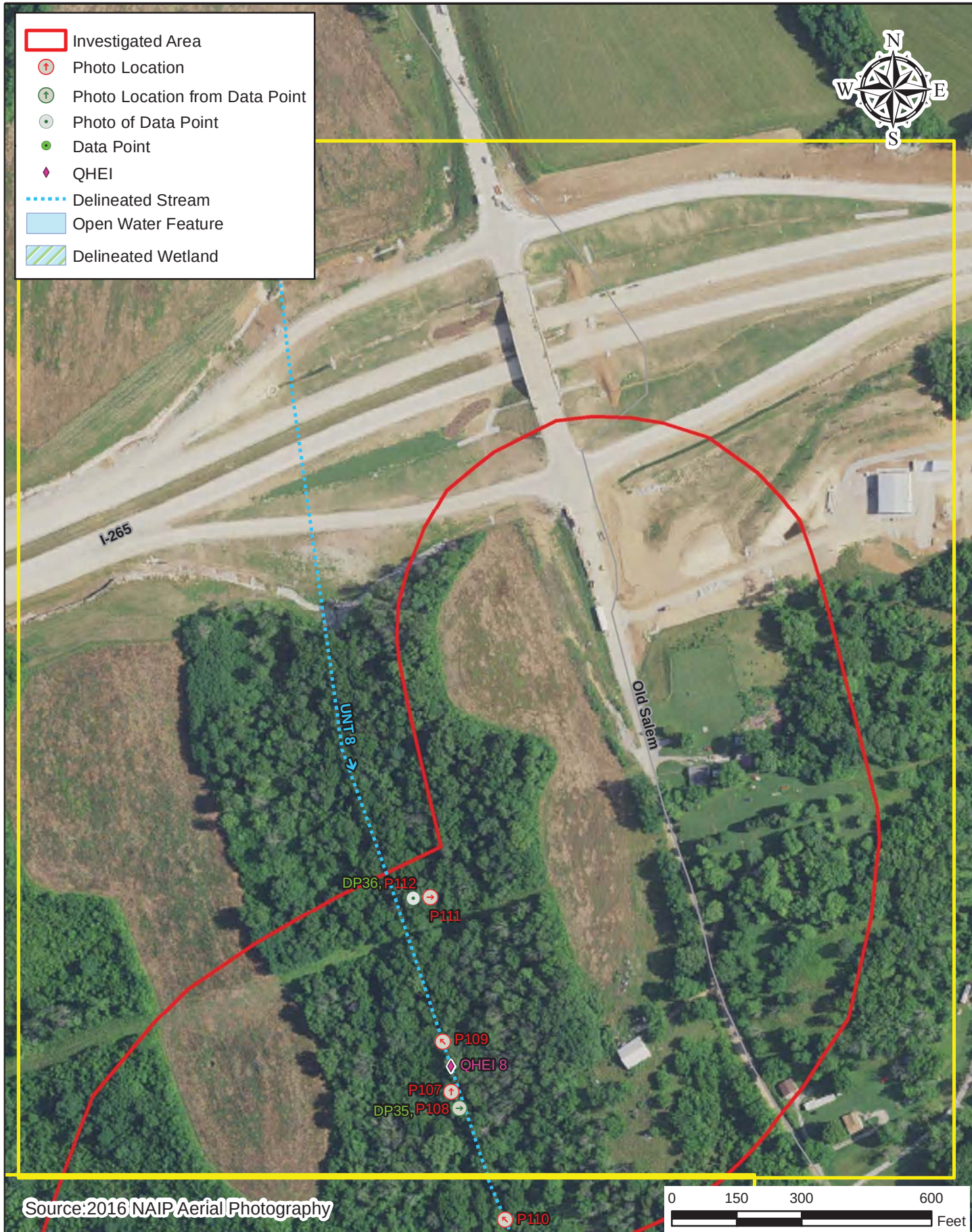
Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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- Investigated Area
- ↑ Photo Location
- ① Photo Location from Data Point
- ⊙ Photo of Data Point
- Data Point
- ◆ QHEI
- ⋯ Delineated Stream
- Open Water Feature
- Delineated Wetland



Source: 2016 NAIP Aerial Photography



**Figure 7. Field Investigation and Photo Location Map - Area 4 of 4**

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

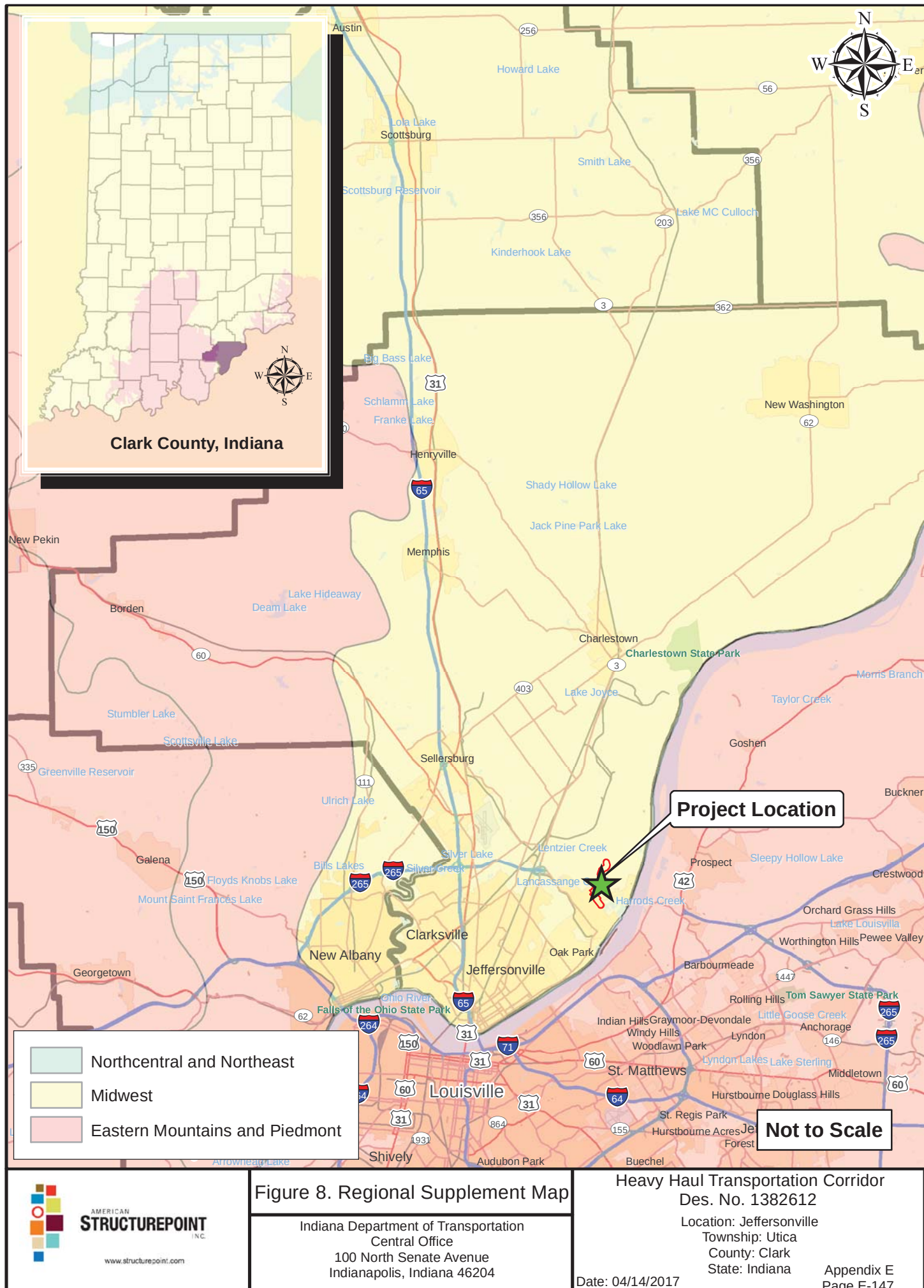
**Heavy Haul Transportation Corridor  
Des. No. 1382612**

Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 02/01/2017

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## Appendix E - Photographs

**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 1. Looking west toward Pond 1





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 3. Looking northwest from DP01 within Wetland A





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 5. Looking northwest from DP02 toward the upland area surrounding Wetland A





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 7. Looking southwest from south of Wetland A toward constructed drainage





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 9. Looking at DP03 (non-wetland datapoint)





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 11. Looking at DP04 within Wetland B



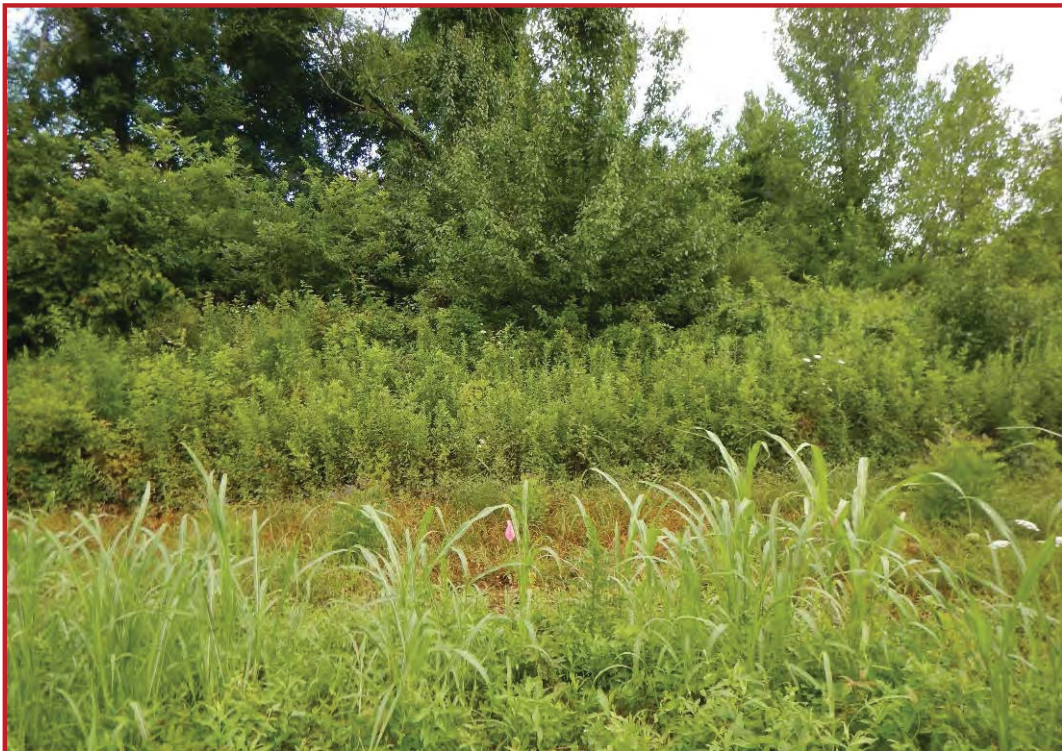


**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 13. Looking northwest from DP05 toward the upland area surrounding Wetland B (Wetland B on right side of photo)





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 15. Looking southwest toward the beginning of UNT 1 adjacent to Wetland B





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 17. Looking southeast along northbound lanes of Access Road





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 19. Looking southwest along UNT 2 from QHEI 2 location





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 21. Looking southeast from DP06 toward Access Road





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 23. Looking southeast from DP07 toward the upland area surrounding Wetland C





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 25. Looking west from DP08 toward Wetland C





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**

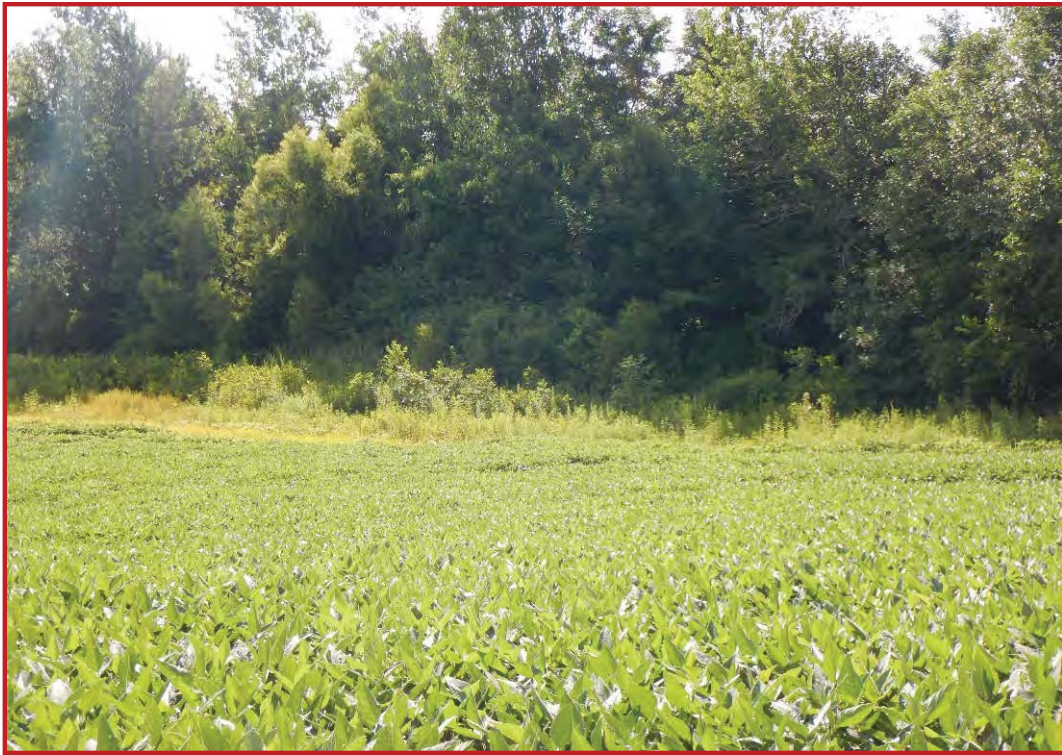


Photo 27. Looking south from Utica Sellersburg Road toward Wetland C





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**

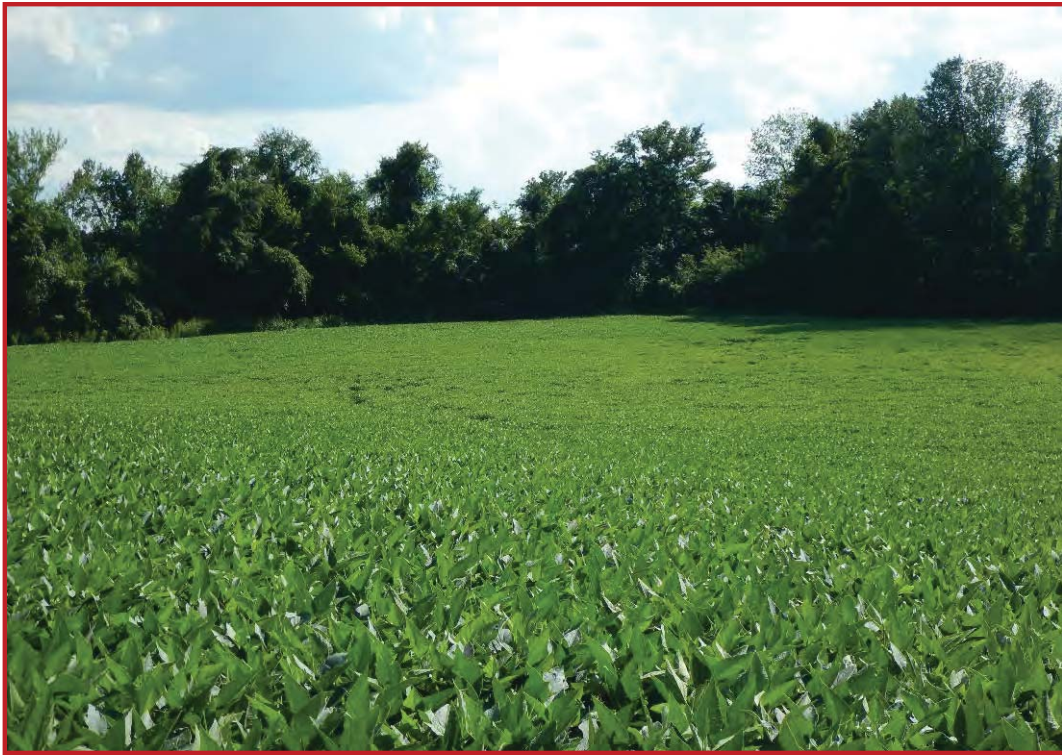
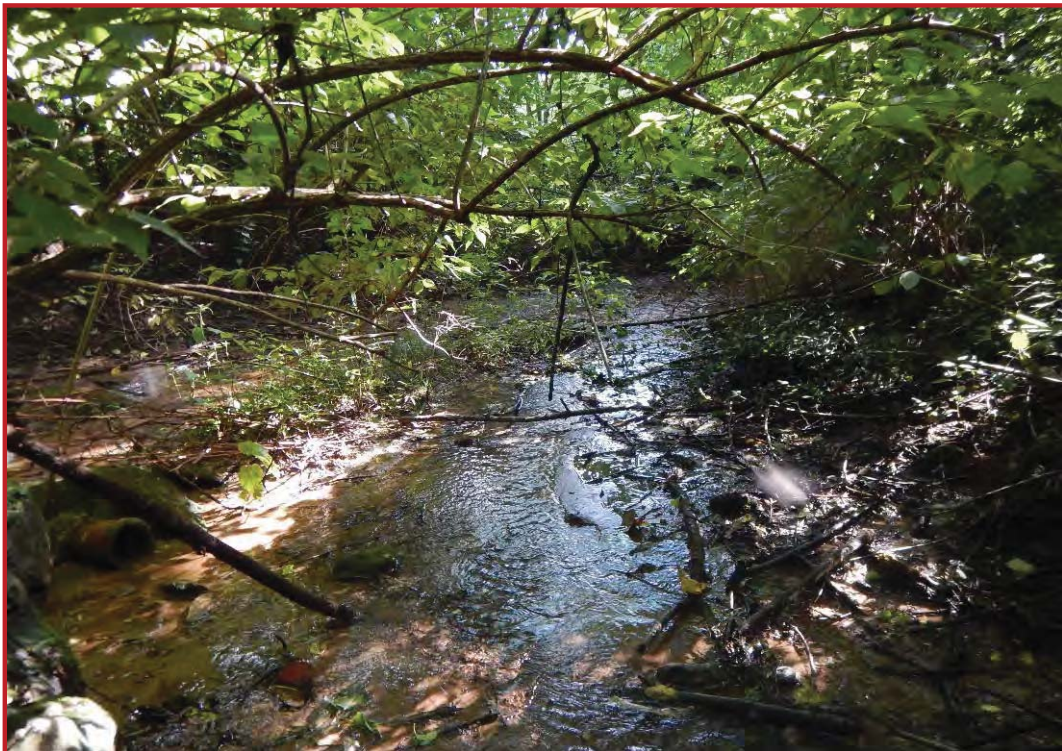


Photo 29. Looking south, from west of Utica Sellersburg Drive, toward UNT 3





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 31. Looking south toward UNT 3, north of the woodline and Wetland D





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 33. Looking west from DP09 toward Wetland D





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 35. Looking at DP10 and the upland area surrounding Wetland D





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**

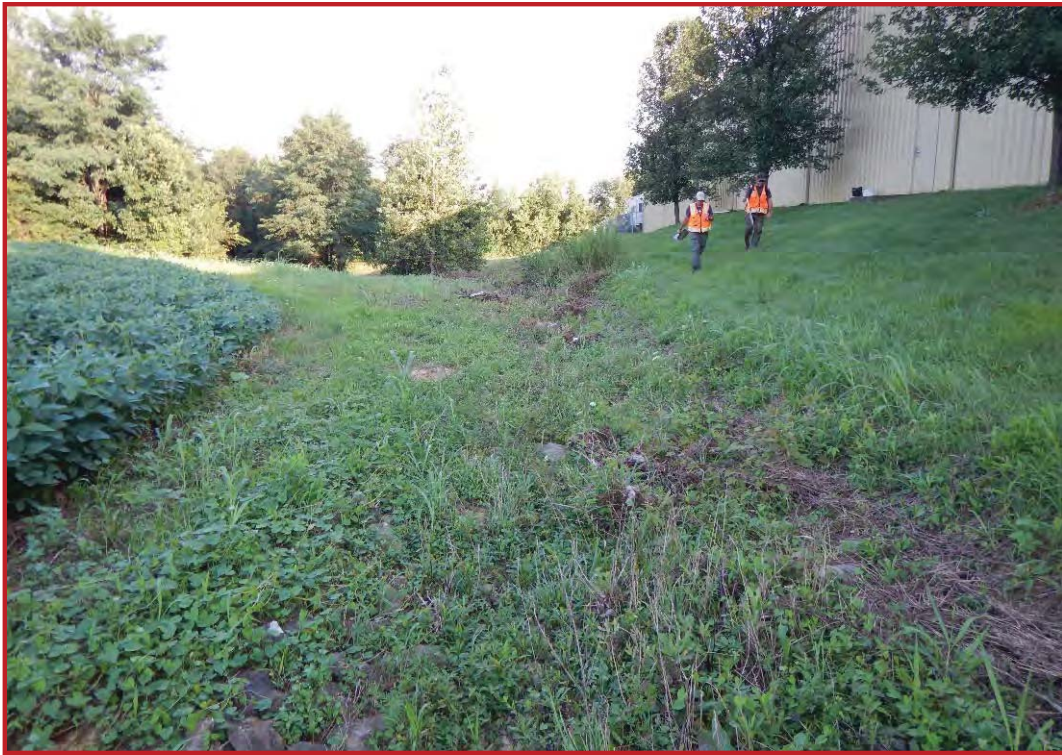


Photo 37. Looking southeast along non-wetland ditch.





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 39. Looking northwest along riprapped ditch, north of New Middle Road





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 41. Looking northwest toward agricultural field from north of New Middle Road cul-de-sac

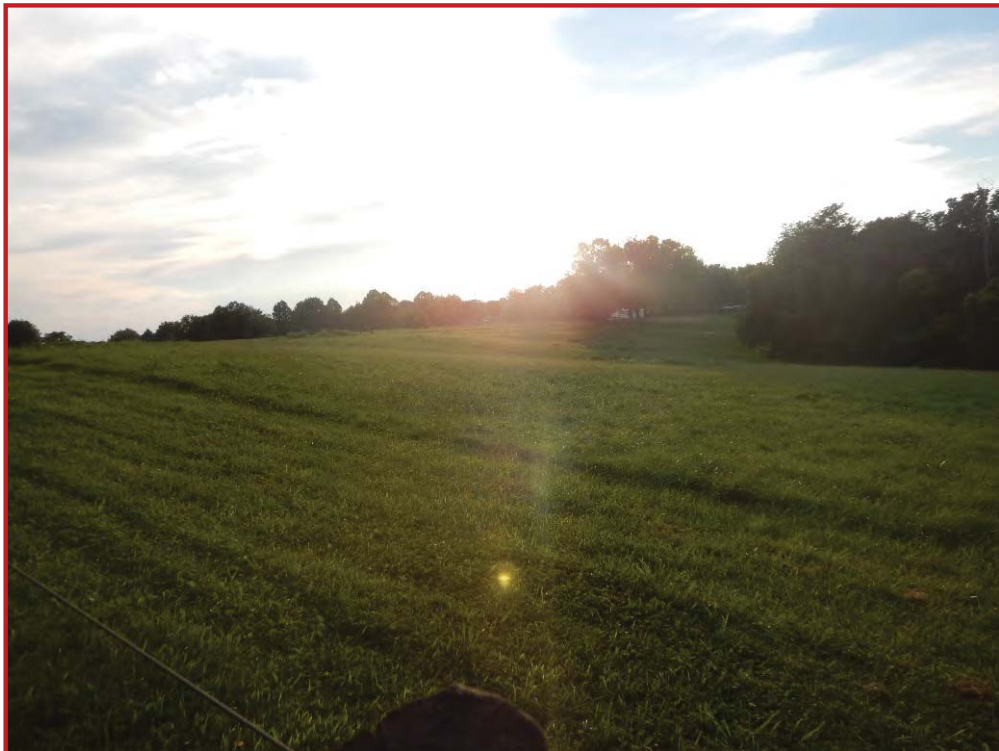


**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 43. Looking northwest along Utica Sellersburg Road, east of New Middle Road cul-de-sac





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 45. Looking northwest across the project corridor from near the center of the investigated area





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 47. Looking northwest across the project corridor from near the center of the investigated area (December 19, 2016)





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**

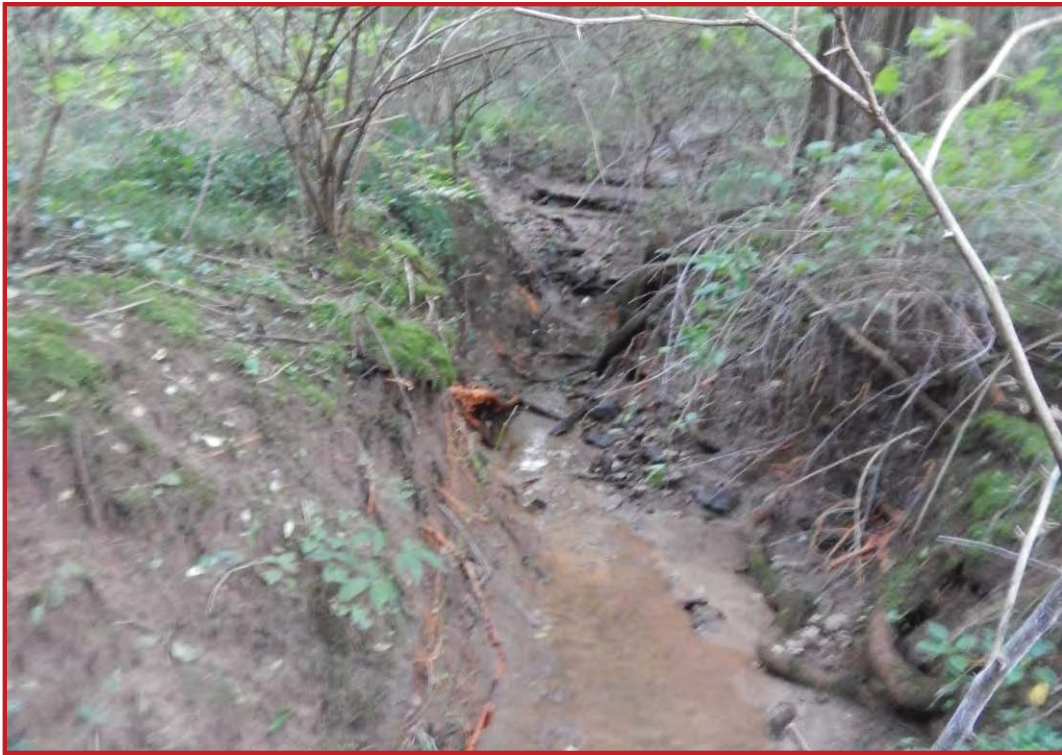


Photo 49. Looking upstream (southwest) along UNT 4



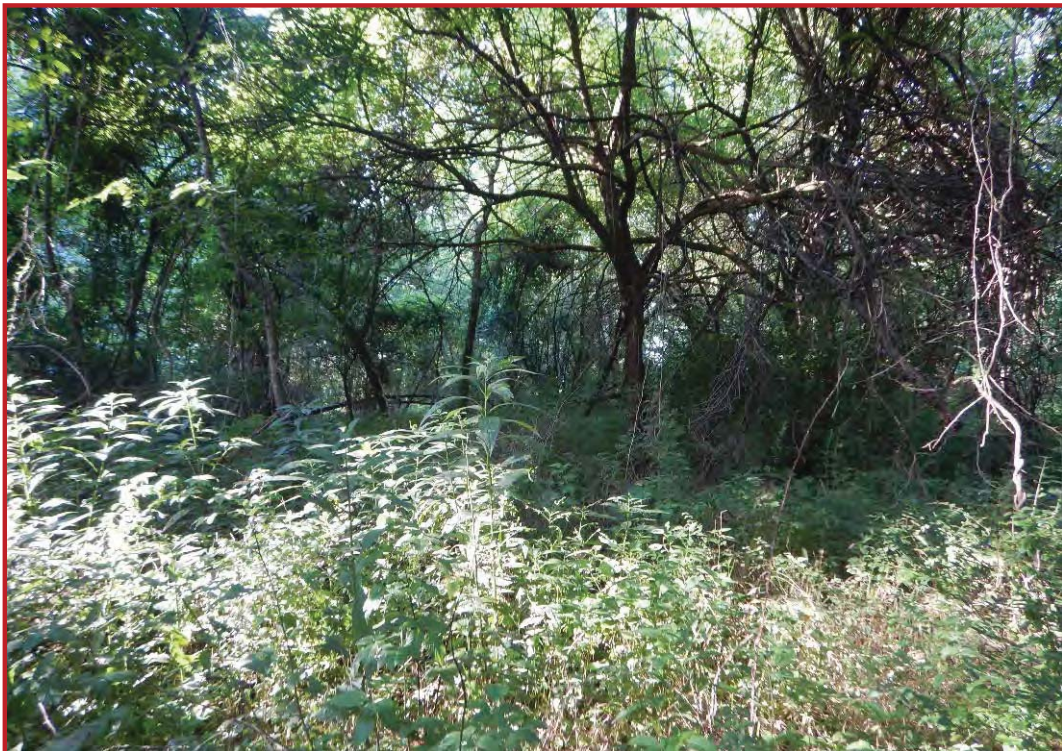


**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 51. Looking south from DP12, east of Lentzier Creek





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 53. Looking west from DP11, west of Lentzier Creek





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 55. Looking west from DP13, west of Lentzier Creek





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 57. Looking southwest (downstream) along Lentzier Creek from QHEI 9 location near the center of the investigated area





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 59. Looking east from DP15 toward the upland area surrounding Wetlands E and F





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 61. Looking south from DP16 toward Wetlands E (background) and F (foreground)



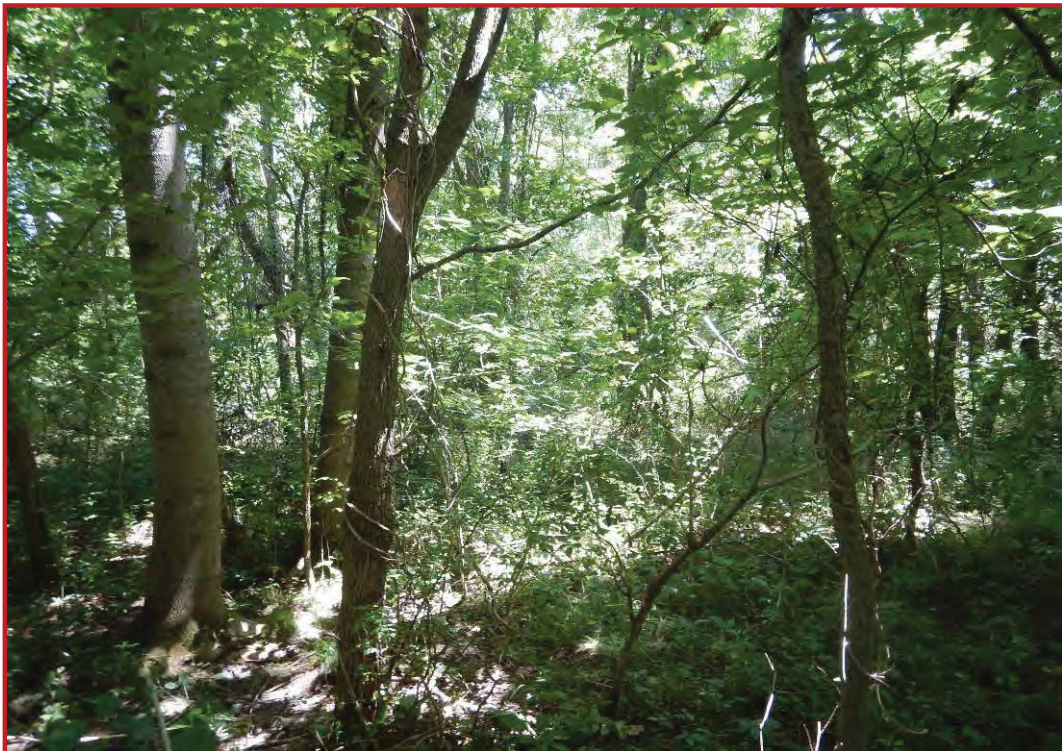


**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 63. Looking north from DP17, south of Wetland H





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 65. Looking north from DP18 toward the upland area surrounding Wetland G





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 67. Looking north from DP19 toward Wetland G





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 69. Looking north (downstream) from the start of UNT 6





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 71. Looking west from DP20 toward the upland area surrounding Wetland H





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 73. Looking south from DP21 toward Wetland H





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 75. Looking north from DP22 toward the upland area surrounding Wetland H





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 77. Looking east from DP23 toward Wetland H





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 79. Looking north from DP24, north of UNT 5





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 81. Looking southwest (upstream) along UNT 5 near QHEI 6 location





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 83. Looking north from DP25, south of Lentzier Creek





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**

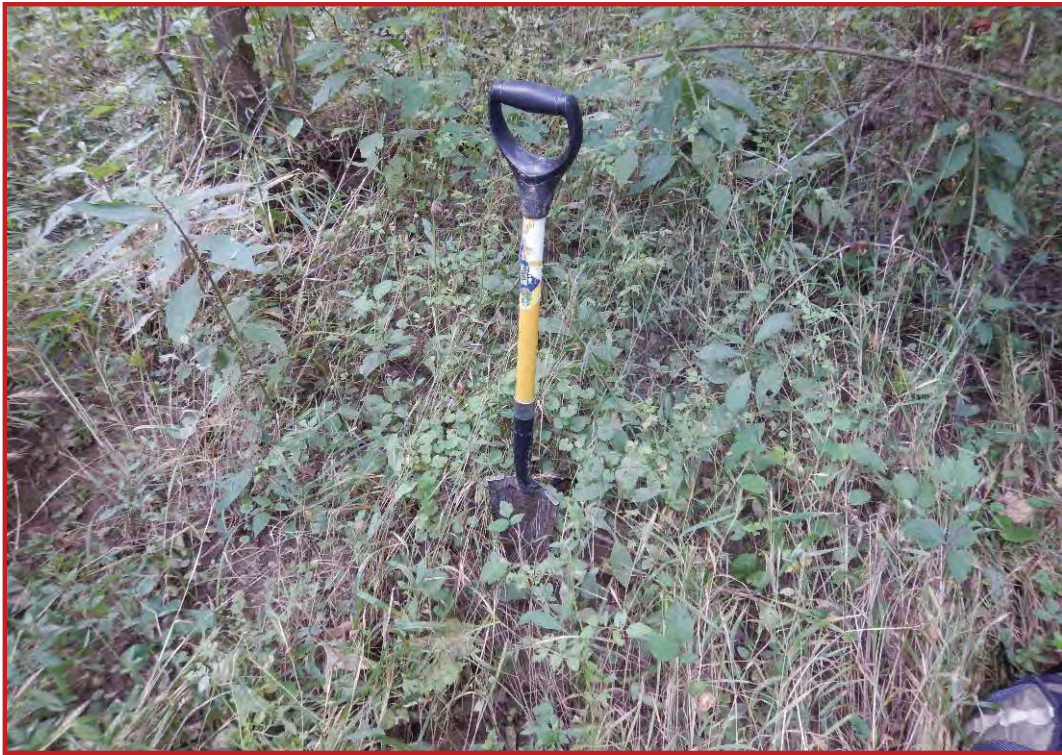


Photo 85. Looking at DP26, east of Lentzier Creek and Wetland I





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 87. Looking northwest (upstream) along Lentzier Creek from QHEI 10 location





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 89. Looking north from DP27 toward the emergent portion of Wetland I





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 91. Looking north from DP28 toward the upland area surrounding the emergent portion of Wetland I





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 93. Looking east from DP29 toward the emergent portion of Wetland I





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 95. Looking south from DP30 toward the forested portion of Wetland I





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 97. Looking east from DP31 toward the upland area surrounding the forested portion of Wetland I





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 99. Looking east from DP32 toward the emergent portion of Wetland I





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 101. Looking northwest toward the UNT 7 confluence with  
Lentzier Creek from QHEI 7 location





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 103. Looking north from DP34 toward Wetland J



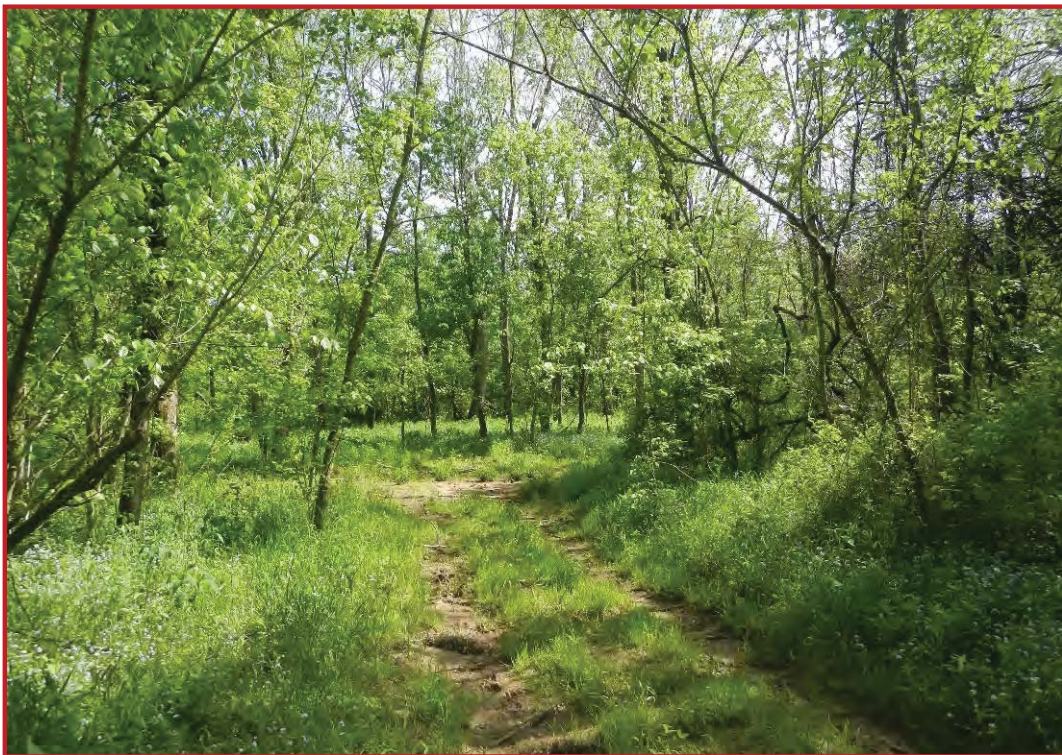


**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 105. Looking north from DP33 toward the upland area surrounding Wetland J



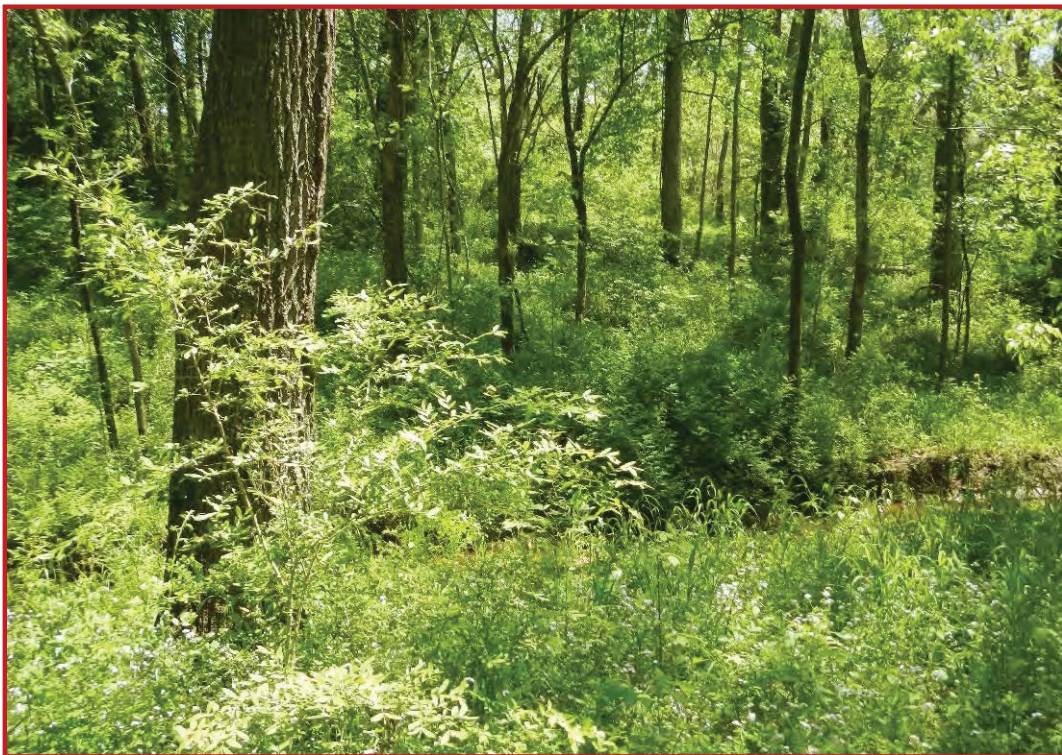


**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 107. Looking north from DP35, west of UNT 8





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 109. Looking northwest (upstream) along UNT 8 near QHEI 8 location





**Heavy Haul Transportation Corridor – Des. No. 1382612**

**May 6 & 7, 2014 & July 21, 2015**



Photo 111. Looking east from DP36, east of UNT 8





## **Appendix F - Preliminary Jurisdictional Determination**

**Appendix 2 - PRELIMINARY JURISDICTIONAL DETERMINATION (PJD) FORM****BACKGROUND INFORMATION****A. REPORT COMPLETION DATE FOR PJD:** June 9, 2017**B. NAME AND ADDRESS OF PERSON REQUESTING PJD:** Monica Del Real, American Structurepoint, Inc.**C. DISTRICT OFFICE, FILE NAME, AND NUMBER:****D. PROJECT LOCATION(S) AND BACKGROUND INFORMATION:****(USE THE TABLE BELOW TO DOCUMENT MULTIPLE AQUATIC RESOURCES AND/OR AQUATIC RESOURCES AT DIFFERENT SITES)**State: **IN** County/parish/borough: **Clark** City: **Jeffersonville**

Center coordinates of site (lat/long in degree decimal format):

Lat.: **38.337842** Long.: **-85.668723**Universal Transverse Mercator: **16S 616346 4244138 UTM**Name of nearest waterbody: **Lentzier Creek****E. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):**☐ Office (Desk) Determination. Date:☐ Field Determination. Date(s):**TABLE OF AQUATIC RESOURCES IN REVIEW AREA WHICH "MAY BE" SUBJECT TO REGULATORY JURISDICTION.**

| Site number | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/404) |
|-------------|----------------------------|-----------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
| Wetland A   | 38.32752                   | -85.67099                   | 1.47 acres                                                                                   | Wetland                                                         | Section 404                                                                                               |
| Wetland B   | 38.32877                   | -85.67042                   | 0.04 acre                                                                                    | Wetland                                                         | Section 404                                                                                               |
| Wetland C   | 38.33096                   | -85.67155                   | 0.12 acre                                                                                    | Wetland                                                         | Section 404                                                                                               |
| Wetland D   | 38.33205                   | -85.67445                   | 0.59 acre                                                                                    | Wetland                                                         | Section 404                                                                                               |
| Wetland E   | 38.33982                   | -85.66754                   | 0.01 acre                                                                                    | Wetland                                                         | Section 404                                                                                               |
| Wetland F   | 38.34001                   | -85.66751                   | 0.01 acre                                                                                    | Wetland                                                         | Section 404                                                                                               |



| Site number    | Latitude (decimal degrees) | Longitude (decimal degrees) | Estimated amount of aquatic resource in review area (acreage and linear feet, if applicable) | Type of aquatic resource (i.e., wetland vs. non-wetland waters) | Geographic authority to which the aquatic resource "may be" subject (i.e., Section 404 or Section 10/4040) |
|----------------|----------------------------|-----------------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Wetland G      | 38.34116                   | -85.66964                   | 0.02 acre                                                                                    | Wetland                                                         | Section 404                                                                                                |
| Wetland H      | 38.34177                   | -85.66876                   | 1.00 acre                                                                                    | Wetland                                                         | Section 404                                                                                                |
| Wetland I      | 38.34319                   | -85.67087                   | 1.06 acres                                                                                   | Wetland                                                         | Section 404                                                                                                |
| Wetland J      | 38.34343                   | -85.66734                   | 0.10 acre                                                                                    | Wetland                                                         | Section 404                                                                                                |
| Pond 1         | 38.32815                   | -85.67215                   | 1.31 acres                                                                                   | Non-Wetland Waters                                              | Section 404                                                                                                |
| Lentzier Creek | 38.34209                   | -85.66905                   | 2,081 linear feet                                                                            | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 1          | 38.32903                   | -85.66988                   | 195 linear feet                                                                              | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 2          | 38.32938                   | -85.67263                   | 1,489 linear feet                                                                            | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 3          | 38.33089                   | -85.67251                   | 2,452 linear feet                                                                            | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 4          | 38.33762                   | -85.66877                   | 404 linear feet                                                                              | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 5          | 38.34196                   | -85.66992                   | 413 linear feet                                                                              | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 6          | 38.34153                   | -85.66893                   | 406 linear feet                                                                              | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 7          | 38.34316                   | -85.67144                   | 123 linear feet                                                                              | Non-Wetland Waters                                              | Section 404                                                                                                |
| UNT 8          | 38.34383                   | -85.66754                   | 1,012 linear feet                                                                            | Non-Wetland Waters                                              | Section 404                                                                                                |

- 1) The Corps of Engineers believes that there may be jurisdictional aquatic resources in the review area, and the requestor of this PJD is hereby advised of his or her option to request and obtain an approved JD (AJD) for that review area based on an informed decision after having discussed the various types of JDs and their characteristics and circumstances when they may be appropriate.
- 2) In any circumstance where a permit applicant obtains an individual permit, or a Nationwide General Permit (NWP) or other general permit verification requiring "pre-construction notification" (PCN), or requests verification for a non-reporting NWP or other general permit, and the permit applicant has not requested an AJD for the activity, the permit applicant is hereby made aware that: (1) the permit applicant has elected to seek a permit authorization based on a PJD, which does not make an official determination of jurisdictional aquatic resources; (2) the applicant has the option to request an AJD before accepting the terms and conditions of the permit authorization, and that basing a permit authorization on an AJD could possibly result in less compensatory mitigation being required or different special conditions; (3) the applicant has the right to request an individual permit rather than accepting the terms and conditions of the NWP or other general permit authorization; (4) the applicant can accept a permit authorization and thereby agree to comply with all the terms and conditions of that permit, including whatever mitigation requirements the Corps has determined to be necessary; (5) undertaking any activity in reliance upon the subject permit authorization without requesting an AJD constitutes the applicant's acceptance of the use of the PJD; (6) accepting a permit authorization (e.g., signing a proffered individual permit) or undertaking any activity in reliance on any form of Corps permit authorization based on a PJD constitutes agreement that all aquatic resources in the review area affected in any way by that activity will be treated as jurisdictional, and waives any challenge to such jurisdiction in any administrative or judicial compliance or enforcement action, or in any administrative appeal or in any Federal court; and (7) whether the applicant elects to use either an AJD or a PJD, the JD will be processed as soon as practicable. Further, an AJD, a proffered individual permit (and all terms and conditions contained therein), or individual permit denial can be administratively appealed pursuant to 33 C.F.R. Part 331. If, during an administrative appeal, it becomes appropriate to make an official determination whether geographic jurisdiction exists over aquatic resources in the review area, or to provide an official delineation of jurisdictional aquatic resources in the review area, the Corps will provide an AJD to accomplish that result, as soon as is practicable. This PJD finds that there "*may be*" waters of the U.S. and/or that there "*may be*" navigable waters of the U.S. on the subject review area, and identifies all aquatic features in the review area that could be affected by the proposed activity, based on the following information:



**SUPPORTING DATA. Data reviewed for PJD (check all that apply)**

Checked items should be included in subject file. Appropriately reference sources below where indicated for all checked items:

- ☒ Maps, plans, plots or plat submitted by or on behalf of the PJD requestor:  
Map: \_\_\_\_\_.
- ☒ Data sheets prepared/submitted by or on behalf of the PJD requestor.  
☐ Office concurs with data sheets/delineation report.  
☐ Office does not concur with data sheets/delineation report. Rationale: \_\_\_\_\_.
- ☐ Data sheets prepared by the Corps: \_\_\_\_\_.
- ☐ Corps navigable waters' study: \_\_\_\_\_.
- ☐ U.S. Geological Survey Hydrologic Atlas: \_\_\_\_\_.  
☐ USGS NHD data.  
☐ USGS 8 and 12 digit HUC maps.
- ☒ U.S. Geological Survey map(s). Cite scale & quad name: 1:24,000 Jeffersonville Quadrangle.
- ☒ Natural Resources Conservation Service Soil Survey. Citation: USDA NRCS 1974 Soil Survey.
- ☐ National wetlands inventory map(s). Cite name: \_\_\_\_\_.
- ☒ State/local wetland inventory map(s): 2016 Statewide NWI.
- ☒ FEMA/FIRM maps: FEMA 100-Year Floodplain.
- ☐ 100-year Floodplain Elevation is: \_\_\_\_\_.(National Geodetic Vertical Datum of 1929)
- ☒ Photographs: ☒ Aerial (Name & Date): 2005 IndianaMap; 2016 NAIP.  
or ☒ Other (Name & Date): Wetland Delineation Report photolog.
- ☐ Previous determination(s). File no. and date of response letter: \_\_\_\_\_.
- ☐ Other information (please specify): \_\_\_\_\_.

**IMPORTANT NOTE: The information recorded on this form has not necessarily been verified by the Corps and should not be relied upon for later jurisdictional determinations.**

\_\_\_\_\_  
Signature and date of  
Regulatory staff member  
completing PJD



8/14/2017

\_\_\_\_\_  
Signature and date of  
person requesting PJD  
(REQUIRED, unless obtaining  
the signature is impracticable)<sup>1</sup>

<sup>1</sup> Districts may establish timeframes for requestor to return signed PJD forms. If the requestor does not respond within the established time frame, the district may presume concurrence and no additional follow up is necessary prior to finalizing an action.

**From:** Bowman, Sandra A  
**To:** [Boits, Leah](#)  
**Cc:** [Rehder, Crystal](#); [Kang, Li](#); [Mathas, Marlene](#); [Hope, Briana](#); [Johnson, Paul](#); [Bales, Ronald](#); [Heustis, Ronald](#); [Hilden, Laura](#); [michelle.allen@dot.gov](mailto:michelle.allen@dot.gov); [Andrews, Jeff](#); [Phillabaum, Richard](#); [Meyer, Michele](#); [Simpson, Garrett](#)  
**Subject:** RE: HHTC (Des. No. 1382612) - Karst Report  
**Date:** Wednesday, January 03, 2018 1:59:07 PM  
**Attachments:** [image002.png](#)  
[image003.png](#)  
[image004.png](#)  
[image005.png](#)  
[image006.png](#)  
[image007.png](#)  
[image008.png](#)

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Leah,

The report is approved as revised. I saved the feature inventory table from the original version for our files (not for public release).

I will drop it in the project folder on ProjectWise.

Have a great start to 2018!

Sandy

---

**From:** Boits, Leah [<mailto:lboits@structurepoint.com>]  
**Sent:** Tuesday, January 02, 2018 12:31 PM  
**To:** Bowman, Sandra A <[SBowman@indot.IN.gov](mailto:SBowman@indot.IN.gov)>  
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Sandy,

The revised Karst Report has been uploaded to our sharefile site for your review and approval: <https://structurepoint.sharefile.com/d-sef0b926f53c4af7a>. Please note that all comments received were addressed and a response to comments document is saved in the same folder, and an email from the INDOT project manager addressing the question about SR 265/I-265 has also been uploaded. Please let me know if you have any issues accessing the documents or need additional information.



# Karst Features Evaluation Heavy Haul Transportation Corridor (Des. No. 1382612)

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**Indiana Department of Transportation**  
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**November 17, 2017 (revised December 29, 2017)**



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## 1.0 Introduction

The Indiana Department of Transportation (INDOT), in partnership with the Federal Highway Administration (FHWA), the Indiana Economic Development Corporation, the Ports of Indiana, the Board of Commissioners of Clark County, the City of Jeffersonville Redevelopment Commission, and the River Ridge Development Authority (RRDA), is developing a federal-aid road project to improve connectivity for the Ports of Indiana-Jeffersonville (Port) with other regional transportation assets. The proposed project is located in Utica Township, Clark County, Indiana.

The area is located on the Jeffersonville and Charlestown USGS 7.5 Minute Quadrangle Maps in Tracts 6-7, 14-17, 24-27, 38-40, and 52-53 and is within the Louisville Metropolitan Planning Area (LMPA), which consists of nine counties in Kentucky (Jefferson, Oldham, Trimble, Henry, Shelby, Spencer, Nelson, Bullit and Meade) and four Indiana counties (Washington, Harrison, Floyd and Clark). Preliminary corridor studies have identified an approximately 1.3-mile wide corridor between the Port of Indiana, Jeffersonville and State Road (SR) 265 to establish roadway alignment alternatives for the project. The alternatives are currently being developed and evaluated within the project corridor based upon environmental studies and coordination.

The need for the proposed project is due to the current and predicted rapid industrial and commercial development in the area that would result in a significant increase in volume of heavy haul vehicles mixing with local traffic. This growth, combined with the lack of connectivity and suitable roadways for heavy haul vehicles in the area, indicates a need for the proposed project.

The purpose of the proposed project is to provide a heavy haul vehicle route that completes a continuous connection between the River Ridge Commerce Center (RRCC) and the Port of Indiana via the new SR 265/Old Salem Road interchange. Such a facility would also limit likely damages to the town of Utica's infrastructure by diverting a majority of the traffic traveling southbound from the new interchange around the town center along a continuous route to a new connection with New Middle Road. The presence of a continuous heavy haul route would also address providing an alternative route capable of handling heavy truck traffic to accessing the Port and RRCC from SR 265. The preferred project corridor, consists of the construction of a two-lane road designed to "heavy haul" specifications which consists of a more robust pavement section to withstand the heavier vehicles. The proposed road would have a design speed of 35 miles per hour with two 13-foot travel lanes and 11-foot shoulders. The road would likely be constructed on new alignment at a total length of approximately 1.75 miles.

A desk-top analysis (Red Flag Investigation) was conducted as part of the preliminary environmental evaluation of the project corridor. This analysis determined the project is located near known sinkhole areas and several mapped sinkhole locations are within the project study area. Noting the potential location of the project within a karst region of Indiana, as defined by the mapped presence of karst features in the study area, an investigation of karst features, as outlined by the Karst Memorandum of Understanding (Karst MOU), was performed to identify and characterize karst features in the study area and to evaluate potential impacts due to the proposed project.

### **1.1 Indiana Karst Memorandum of Understanding**

The Karst memorandum of understanding (MOU) was entered into by the Indiana Department of Transportation (INDOT), the Indiana Department of Natural Resources (IDNR), the Indiana Department of Environmental Management (IDEM), and the U.S. Fish and Wildlife Service (USFWS) on October 13, 1993, and establishes the basic processes and guidelines for identifying karst features, minimizing impacts to karst features, and establishing mitigation measures or best management practices (BMPs), where applicable. Although the study area is not located within the “Karst areas of the State”, as defined in the MOU, there are known karst features within the project vicinity. Therefore, this investigation was conducted to identify and accurately locate all karst features within the study area, and document that all surface runoff or other potential impacts to identified karst features are treated with similar measures included in the MOU. A copy of the Karst MOU is provided in Appendix E.

### **1.2 Purpose of Investigation**

Although the study area is not specifically located within the “Karst regions of the State”, as defined in the MOU, there are known karst features within the project vicinity, specifically within the Silurian-aged Louisville Limestone and Salamonie Dolomite. Because the project is located within areas with mapped features, an investigation is required by the Karst MOU to identify the existence of karst features within the proposed project limits and determine the impacts from the proposed project on identified karst features. The purpose of this investigation is to comply with the requirements of the Karst MOU.

### **1.3 Study Methods**

Methods used during this investigation were consistent with the procedures outlined in the 1993 Indiana Karst MOU. Specifically, the following process was observed:

- Determine the location of karst features, including sinkholes, caves, underground streams and other related karst features, and characterize their relationship prior to proposed alterations or construction,
- Research public and private information sources for information relative to karst features,
- Conduct a field check of karst and cave features that appear during the research task and identify any additional karst features within the proposed project limits, and
- Identify drainage areas, and the land use within the drainage area, for each sinkhole or karst feature.

### **1.4 Project Area Characteristics**

The overall study area generally extends north from the Port of Indiana (Utica) to the State Road 265/Old Salem Road interchange (Exhibits 1 -3). The overall study area provided the general limits of the desk-top study of the project characteristics, namely literature reviews, regional and local geology and historic aerial photography review. Within the overall study area, a 300 foot wide area around the alignment alternatives under consideration for the project, including their anticipated construction limits was investigated in detail (investigated area).

The study area is a combination of forest, open grass, industrial, and farmed areas. The forested areas are generally on steep slopes with few existing roads or other development. Lentzier Creek and several tributaries are located within the study area.



## 1.5 Literature Review

Literature sources reviewed as part of this investigation included:

- LIDAR-based 2-foot contours from the Clark County GIS,
- Historical aerial photography (1940, 1955, 1960, and 1968) available from the Indiana Historical Aerial Photo Index (<http://igs.indiana.edu/IHAPI/>),
- Soil Survey of Clark and Floyd Counties, Indiana (USDA-SCS, 1974),
- IndianaMAP GIS data (cave entrance density, sinkhole areas and sinking-stream basins, karst springs, karst areas, and karst area dye points),
- Bedrock mapping of Clark County (Gray, 1987),
- Habitats and Ecological Communities of Indiana (Whitaker Jr. and Amlaner Jr., 2012),
- The Devastation and Recovery of Caves and Karst Affected by Industrialization (Lewis, 1996),
- Accelerated Erosion Due to Industrial Waste (Wickwire, 1947),
- Dye Trace Monitoring and Karst Feature Investigation (Linebach and Funkhouser, 2013).

A review of regional karst data, as published by Powel et al. (2002), shows the dynamic connection of the karst aquifer network in southern Indiana. No karst dye points or lines, as mapped by the IGS, are located near the study area. No known caves are located within the study area and Indiana Map indicates the cave density is zero. However, according to Indiana Map, three (3) sinkholes are located within the study area based on the 2011 Sinkhole Inventory – See Exhibit 4.

Several sinkholes and caves were discovered by Wickwire (1947) and Lewis (1996) during a study performed northeast of the study area, near Jenny Lind Run. According to Wickwire (1947), several caves, less than 1-mile long, and 12 to 15 sinkholes per square mile were observed during this investigation (Wickwire, 1947). This karst area is reported by Wickwire (1947), Whitaker Jr. and Amlaner Jr. (2012), and Lewis (1996), to have been modified by the discharge of up to 32,000 gallons per minute of acidic effluent by the Indiana Army Ammunition Plant (INAAP) during the 1940s and 1950s. The karst investigations performed by Wickwire (1947) and Lewis (1996) did not extend to the study area; however, according to bedrock geology maps (Gray, 1987) the geology of the northern portion of the study area is consistent with the Wickwire and Lewis investigated areas.

Linebach and Funkhouser (2013) performed dye tracing on the Indiana Arsenal Ammunition Plant (INAAP), north of the study area. These investigations included several dye traces on the INAAP property to determine subsurface flow routes on the INAAP property. Results of the dye trace investigations showed the subsurface flow was typically confined by local topographic divides. Moreover, typical flow paths were relatively short (<2 miles) and dye recovery was relatively rapid (within 24 hours). Subsurface flow was toward established surface streams, particularly Lentzier Creek, which flows through the INAAP property.

Based on topographic and regional hydrogeologic data, groundwater flow including subsurface flow within karst terrain, likely occurs in a southerly direction; however, karst terrain can result in erratic subsurface flow conditions due to solution cavities and fracture plains in the limestone bedrock. Precise flow patterns in the subsurface have not been documented.

## **2.0 Geologic, Hydrologic and Geomorphic Setting**

### **2.1 Physiography**

The study area resides in the Charlestown Hills division of the Southern Hills and Lowlands Physiographic Region (Gray, 2000) – see Exhibit 4. This section is bounded on the west by the Knobstone Escarpment, separating it from the Norman Upland. The Charlestown Hills section is characterized by low hills with thin and scattered till deposits. This entire section was glaciated (pre-Wisconsin glacial epochs); however, glacial influence on the landform is relatively minor (Gray, 2000).

### **2.2 Regional and Local Geologic Setting**

Surficial deposits within the project area largely consist of a thin veneer of till overlying bedrock in the northern portion of the project area (Exhibit 5). A review of IDNR Water Well records within the study area indicates the thickness of till overlying the bedrock varies from less than 5-feet in the River Ridge area, to over 20-feet north of Utica-Sellersburg Road. Soils were primarily comprised of red, yellow, and brown clays with some sand and gravel. Upon field reconnaissance, bedrock outcrops were identified at the surface in several locations throughout the northern portion of the study area.

Relatively thick sequences of undifferentiated outwash and recent alluvial deposits comprise the surficial geology in the south, adjacent to the Ohio River (Exhibit 5). The thickness of the unconsolidated deposits in the southern portion of the project area (just north of Utica-Sellersburg Road to the Ohio River) ranges from 50 to over 100 feet thick (Gray, 1983). A review of IDNR water well records within the study area indicates bedrock ranges from approximately 60-feet below ground surface (ft-bgs) to over 120 ft-bgs.

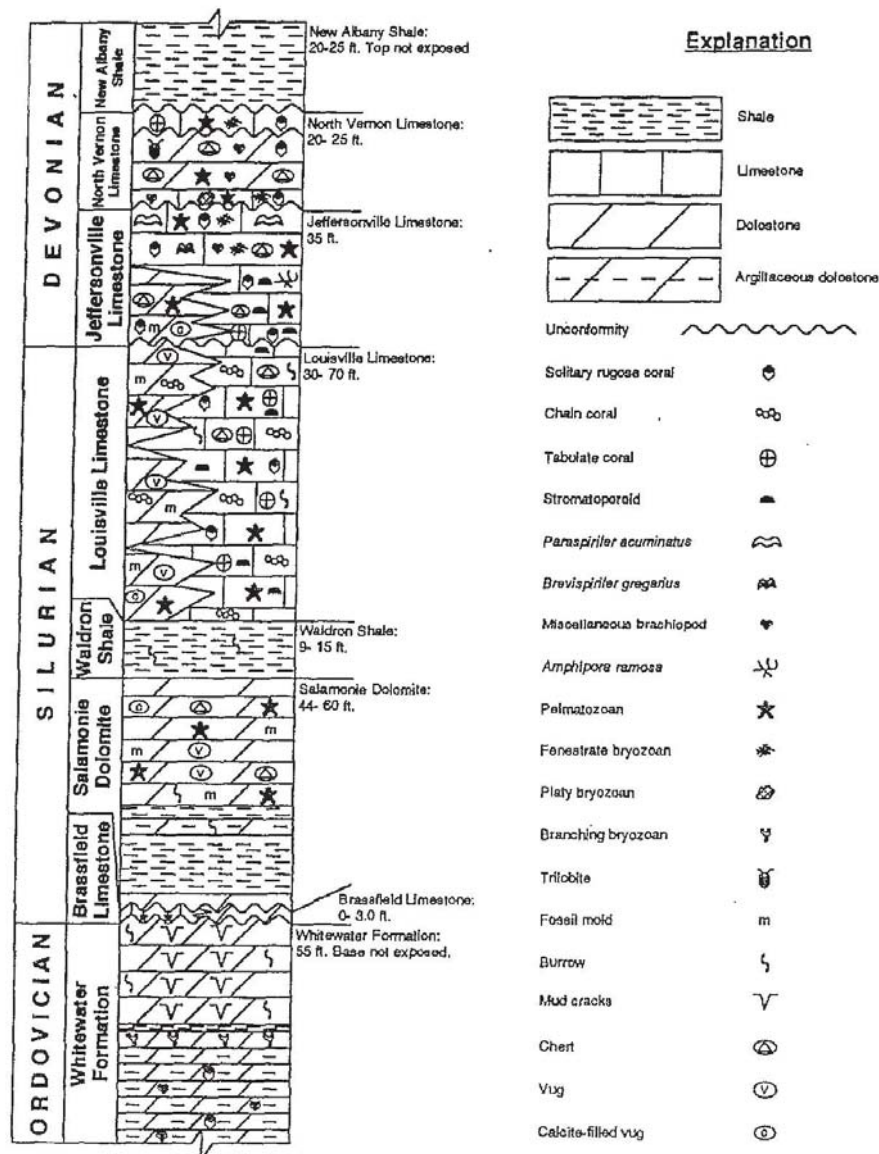
The underlying bedrock formations mapped in the study area consist of , Devonian-age Muscatatuck Group (primarily Jeffersonville and North Vernon Limestones), Silurian-age Louisville Limestone and Silurian-age Bainbridge Group (Salamonie Dolomite and Brassfield Limestone). Figure 1 below provides a stratigraphic section of the bedrock formations in the project area, as modified from Hendricks (1995).

As shown on Exhibit 6, Silurian-age Bainbridge Group rocks area exposed within the entrenched valley of Lentzier creek and its tributaries. Principal formations include Salamonie Dolomite, which is a pure dolomite ranging from 26-50 feet thick (upper Laurel Member), and is relatively resistant to dissolution (Hendricks, 1995; Linebach-Funkhouser, 2013). Overlying the Salamonie is the Waldron Shale, described locally as a dolomitic-clay shale which is highly erodible (Linebach-Funkhouser, 2013). Erosion of the Waldron may facilitate subsurface flow. Above the Bainbridge Group rocks, is the Silurian-age Louisville Limestone, which has noted development of karst, including cave entrances, sinkholes and swallets (Linebach-Funkhouser, 2013). The Louisville Limestone, and overlying Muscatatuck Group rocks (principally the Devonian-age Jeffersonville Limestone) appear to be present at higher elevations, forming the hills and ridges surrounding the valley of Lentzier Creek and its tributaries.

Based on site geologic conditions observed during site reconnaissance, both shale and limestone outcrop on site. Karst features were documented from the desktop review of site conditions, and observed in multiple locations on site, suggesting karst feature development is primarily in the lower sections of the Louisville and Jeffersonville Limestones, and underlain by more resistant rocks, namely the Waldron Shale and Salamonie Dolomite. Extensive karst development is unlikely throughout the project area.



**Figure 1: Composite Stratigraphic Column of the study area showing formation names, gross lithologies, apparent thickness and major faunal types (modified from Hendricks, 1995)**



## 2.3 Soils

A review of mapping included in the 1974 Soil Survey of Clark and Floyd Counties (USDA-SCS, 1974) was conducted to identify potential karst features within the project area. Although several small depressions/sinkholes are noted in the general vicinity of the project, no sinkholes or other depressions were specifically identified within the project area. Review of the soil series maps also provided information regarding potential spring locations, based on mapped intermittent streams; however, no springs were specifically identified on the Soil Series maps within the project area.

The NRCS Web Soil Survey was reviewed to identify soils within the project area. Crider Silt Loam soils, as noted in the Soil Survey (UDSA\_SCS, 1974) are typical in areas of karst development, comprise 1.9% of the total project area. These soils are noted in the northern portion of the project area – primarily in the vicinity of the north project terminus (Exhibit 7).

| <b>Table 1: Mapped Soil within the Study Area (from: NRCS Web Soil Survey)</b><br><a href="http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx">http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx</a> (accessed 04/10/2017) |                                                                                     |                              |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------|
| <b>Map Unit Symbol</b>                                                                                                                                                                                                                          | <b>Map Unit Name</b>                                                                | <b>Percent of Study Area</b> |
| CcaG                                                                                                                                                                                                                                            | Caneyville-Rock outcrop complex, 25 to 60 percent slopes                            | 17.2                         |
| CspB2                                                                                                                                                                                                                                           | Crider silt loam, 2 to 6 percent slopes, eroded                                     | 1.9                          |
| CxhC2                                                                                                                                                                                                                                           | Crider-Haggatt silt loams, 6 to 12 percent slopes, eroded                           | 3.0                          |
| EesA                                                                                                                                                                                                                                            | Elkinsville-Millstone silt loams, 0 to 2 percent slopes                             | 4.7                          |
| EesB                                                                                                                                                                                                                                            | Elkinsville-Millstone silt loams, 2 to 6 percent slopes                             | 1.4                          |
| EesC2                                                                                                                                                                                                                                           | Elkinsville-Millstone silt loams, 6 to 12 percent slopes, eroded                    | 3.6                          |
| EesD2                                                                                                                                                                                                                                           | Elkinsville-Millstone silt loams, 12 to 18 percent slopes, eroded                   | 0.6                          |
| GykD2                                                                                                                                                                                                                                           | Grayford silt loam, karst, hilly, eroded                                            | 0.3                          |
| HcgAW                                                                                                                                                                                                                                           | Haymond silt loam, 0 to 2 percent slopes, occasionally flooded, very brief duration | 5.2                          |
| HtwD2                                                                                                                                                                                                                                           | Haggatt-Caneyville silt loams, 12 to 25 percent slopes, eroded                      | 4.1                          |
| HtzD3                                                                                                                                                                                                                                           | Haggatt-Caneyville complex, 12 to 25 percent slopes, severely eroded                | 0.8                          |
| HufAK                                                                                                                                                                                                                                           | Huntington silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration   | 1.4                          |
| MdqDQ                                                                                                                                                                                                                                           | Markland silt loam, 12 to 25 percent slopes, eroded, rarely flooded                 | 0.6                          |
| NbhAK                                                                                                                                                                                                                                           | Newark silt loam, 0 to 2 percent slopes, occasionally flooded, brief duration       | 0.6                          |
| Ppu                                                                                                                                                                                                                                             | Pits, sand and gravel                                                               | 5.5                          |
| RtcB2                                                                                                                                                                                                                                           | Ryker silt loam, 2 to 6 percent slopes, eroded                                      | 7.2                          |
| RztC2                                                                                                                                                                                                                                           | Ryker-Grayford silt loams, 6 to 12 percent slopes, eroded                           | 11.0                         |
| Uaa                                                                                                                                                                                                                                             | Udorthents, cut and filled                                                          | 16.2                         |
| UnpA                                                                                                                                                                                                                                            | Urban land-Udarents, loamy substratum, complex, terrace, 0 to 3 percent slopes      | 7.1                          |
| UnsB                                                                                                                                                                                                                                            | Urban land-Udarents, clayey substratum, complex, hills, 2 to 10 percent slopes      | 1.8                          |
| W                                                                                                                                                                                                                                               | Water                                                                               | 6.1                          |



## **2.4 Hydrology and Hydrogeology**

The project area is located within the drainage area of Lentzier Creek. According to the IDNR (1975), Lentzier Creek has a total drainage area of 8.34 square miles (5,337.6 acres). No stream gauging data is available for Lentzier Creek to report average daily stream flow. The calculated 100-year flood discharge is reported as greater than 2,300 cubic feet per second (CFS) (IDNR, *undated*).

No residential or industrial water supply wells were identified within the investigated corridor of the alignments currently under consideration. Wells identified within the overall study area on the IDNR Water Well Record database were drilled in the 1960s and 1980s (see Exhibit 5). The study area is mostly served by the City of Jeffersonville Municipal Utilities. No significant water withdrawal facilities were identified within the study area.

## **2.5 Available Mapping**

Topographic mapping for the study area provided general locations of possible surface depressions, indicated by closed contours. Four locations of potential sinkholes or karst windows were identified from the topographic mapping review (see Exhibit 8).

IndianaMap GIS data indicated three sinkholes near the study area. However, no sinkholes were identified by IndianaMap within the investigated area. No other mapped karst areas were identified within the study area (see Exhibit 4).

## **2.6 Agency Coordination**

Early coordination with appropriate natural resources agencies was initiated in April 2016. Responses received from the Indiana Geological Survey (IGS), Indiana Department of Natural Resources (IDNR) and the US Fish & Wildlife Service (USFWS) all noted the presence of karst resources within the proposed project limits. Responses received from both IDNR and USFWS recommended an assessment of karst features be conducted for the project area pursuant to the 1993 Karst MOU. Copies of relevant agency coordination responses are provided in Appendix C.

Following approval of this Karst Investigation by INDOT, this assessment will be reviewed by the Karst MOU agencies (IDNR, USFWS and Indiana Department of Environmental Management). Any suggested updates or revisions from these agencies will be incorporated into the report. Moreover, it is anticipated a project-specific Mitigation and Monitoring Plan (MMP) will be prepared outlining the specific karst feature mitigation measures to be implemented during and following construction, as well as any required construction and post-construction monitoring. The Karst MMP will be incorporated into the project special provisions.

## **2.7 Field Reconnaissance**

Field reconnaissance within the study area was conducted on April 22 – 23, and May 6, 2014, as well as on December 19, 2016, and on April 11, 2017. The area was surveyed for apparent karst features (sinkholes, springs, sinking streams, and cave entrances) along the length of the corridor, centered along the proposed alignments, from the I-265/Old Salem Road Interchange to the town of Utica near Port Road. The investigated corridor includes three alternate routes currently under consideration for the HHTC, each of which consists of the construction limits. Identified karst features were photo-documented, and the

locations of each feature were mapped using a hand-held, sub-meter accuracy GPS unit. Feature locations were also noted on aerial maps, and measurements of feature dimensions and notes regarding the features were recorded. A photo log compiled from the field reconnaissance is included in Appendix B.



## 3.0 Identified Karst Features

### 3.1 Regional Features

Several sinkholes and caves were discovered by Wickwire (1947) and Lewis (1995) during a study concerning the effects of discharging waste water and acid into the Jenny Lind Run (northeast of the study area) and a manmade channel of connected sinks. According to Wickwire (1947), several caves, less than 1-mile long, were discovered in the area near the Jenny Lind Run. Lewis (1995) reported four caves on the Indiana Army Ammunition Plant (INAAP) grounds. Additionally, 12 to 15 sinkholes per square mile were observed during the Wickwire (1947) study. This karst area is reported by Wickwire (1947), Whitaker Jr. and Amlaner Jr. (2012), and Lewis (1996), to have been modified by the discharge of up to 32,000 gallons per minute of acidic effluent (pH = 2.3). Specifically, over the years of operation of the INAAP, approximately 1941 through 1945 and 1950 through 1953, the acidic effluent was discharged into the Jenny Lind Run and would disappear in swallets and reappear in springs. This caused dissolution of the surrounding bedrock and entrenched the stream as much as 8 feet (Wickwire, 1947 and Lewis, 1995). Whitaker Jr. and Amlaner Jr. (2012) summarized that the biota in the caves injected with effluent were permanently altered and only some of the biota had recovered.

### 3.2 Features Identified within the Study Area

A total of thirty-six (36) Karst features were identified within the overall study area, including two (2) swallets, nine (9) sinkholes and twenty-five (25) springs. No caves/cave entrances were identified during the field reconnaissance or in the background research. Swallets, or swallow holes, are defined as concentrated inflows of water from upland sources (typically overland flow) that sink underground (Ford and Williams, 1989). Within the proposed Heavy Haul project area the swallets were identified as distinct openings into the underlying bedrock within intermittent stream channels. Sinkholes, or dolines, are any small to intermediate enclosed depression formed in karstic rock (e.g., limestone) and are generally circular to subcircular in plan form (Ford and Williams, 1989). Based on the characteristics of the sinkholes identified in the Heavy Haul project area, these depressions appear to be formed by solution or suffusion, where surface soils and rock are eroded into underlying solution-enlarged fractures. Evidence of collapse type sinkholes (collapse of surface rock/soil into a subsurface conduit) was not observed. Springs are discreet emergence points for groundwater discharging to the surface (Ritter, 1978), typically through openings in exposed bedrock such as fractures or joints, or through soil.

Twenty (20) of the features identified are located within the investigated corridor, as shown on Exhibits 9-11. Tables 2 and 3 provide a summary of all features identified, including estimated drainage areas (for insurgence features) and surrounding land use. Site/Feature photographs are provided in Appendix B and additional information, including UTM coordinates of the identified karst features, are provided in Table 6 in Appendix B.

#### 3.2.1. Insurgence Feature Summary

Insurgence features, including sinkholes and swallets identified within the HHTC study area are described below and summarized in Table 2. Within the overall study area, nine (9) sinkholes and two (2) swallets were identified (Exhibit 10). Of these identified features, one (1) sinkhole (SI-9) would be directly impacted by alternate F. Alternate DE and HH is anticipated to impact a portion of the drainage areas for two sinkholes (SI-1 and SI-8) and two (2) swallets (SW-1 and SW-2), as shown on Exhibit 10. The features are located

outside the proposed construction limits of Alternates DE and HH. Further discussion of feature impacts is provided in Section 4 of this report.

Feature SI-1 is a 20-foot diameter, 10 – 12 foot deep sinkhole located within the investigated corridor. An 8 – 12 inch eye/throat is located on the southwest wall of feature SI-1. A mower deck was located on the east wall of SI-1 (Photo 1).

Feature SI-2 is a relatively large sinkhole located in a farm field within the investigated corridor, approximately 1,700-feet southwest of the proposed I-265 / Salem Road interchange. Feature SI-2 is a conical sinkhole approximately 18-feet in diameter and 10-feet in depth with no obvious bedrock exposure. A 1-foot eye/throat is located on the eastern wall of feature SI-2 (Photo 2).

Feature SI-3 is a small cover subsidence sinkhole located within lawn/pasture area adjacent to the east of the investigated corridor, within the study area. This feature is a soil cover collapse sinkhole within a minor drainage way adjacent to the east of Old Salem Road (Photo 3).

Feature SI-4 is a 4-foot wide depression with a 1-foot diameter pit or opening, visible down to approximately 10-foot depth. This feature is located 1,150-feet east of the investigated corridor, in the northeast portion of the study area (Photo 4).

Feature SI-5 is a large diameter (30-feet) subsidence, approximately 3-feet deep. This feature has no exposed bedrock or throat, and is overgrown with vegetation. Feature SI-5 is located approximately 950-feet east of the investigated corridor, in the northeast portion of the study area (Photo 5).

Feature SI-6 is a 6-foot diameter soil subsidence that is approximately 3-feet deep. The subsidence area associated with feature SI-6 is located under a tree, and appears to continue 4-5-feet underground to the southeast. This feature is located 75 feet to the west of the investigated corridor (Photo 6).

Feature SI-7 is located approximately 90-feet southwest of Old Salem Road and is outside of the investigated corridor. This feature is a soil subsidence that is approximately 4-5 feet in diameter (Photo 7).

Feature SI-8 is a small sinkhole located within the investigated corridor, approximately 1,700-feet northeast of Utica-Sellersburg Road. This feature is a 4-foot wide, 3-foot long sinkhole that extends to 20-inch depth. A visible throat extending approximately 8-inches exists within SI-8, and was filled with soil and vegetation debris upon inspection (Photo 8).

Feature SI-9 is a large sinkhole approximately 20-feet long and 15-feet wide. This feature has an unknown depth as it was filled with yard debris (brush, stumps, etc.) at the time of the field inspection. Feature SI-9 is located within the investigated corridor, approximately 1,300-feet northeast of Utica-Sellersburg Road (Photo 9).

Feature SW-1 is a sink/swallet feature approximately 6-8 inches in diameter. This feature is an opening in the bed of an intermittent stream located within the investigated corridor. Based on field observations, approximately 80% of the stream flow enters SW-1 at this location (Photo 10).



Feature SW-2 is a sink/swallet feature that is a 2-foot deep opening in bedrock, approximately 6-inches wide and 12-inches long. This feature is located in an intermittent stream bed within the investigated corridor (Photo 11).

| Table 2: Sinkhole/Insurgence Feature Summary |                 |       |          |       |                 |               |                   |           |                 |                         |
|----------------------------------------------|-----------------|-------|----------|-------|-----------------|---------------|-------------------|-----------|-----------------|-------------------------|
| Feature No.                                  | Dimensions (ft) |       |          |       | Eye/Throat Data |               |                   |           | Drainage Area   |                         |
|                                              | Length          | Width | Diameter | Depth | Present? (Y/N)  | Diameter (in) | Relative Position | Direction | Total Area (ac) | Land Use                |
| SI-1                                         | 15              | 15    | 20       | 12    | Y               | 8-12          | SW                | W         | 3.00            | Forested                |
| SI-2                                         | 17              | 18    | NA       | 11    | Y               | 12            | NA                | E         | 0.71            | Agricultural            |
| SI-3                                         | 10              | 2     | 3        | 2     | N               | NA            | NA                | NA        | 0.79            | Residential / Forested  |
| SI-4                                         | 1               | 4     | 1        | 10    | Y               | NA            | NA                | NA        | 0.55            | Agricultural / Forested |
| SI-5                                         | NA              | NA    | 30       | 3     | N               | NA            | NA                | NA        | 1.60            | Forested                |
| SI-6                                         | 6               | 2     | 6        | 3     | Y               | NA            | NA                | SE        | 0.75            | Forested                |
| SI-7                                         | NA              | NA    | NA       | NA    | N               | NA            | NA                | NA        | 4.94            | Agricultural / Forested |
| SI-8*                                        | 3               | 4     | 3.5      | 1.66  | Y               | 6             | NW                | N         | 5.37            | Agricultural / Forested |
| SI-9                                         | 20              | 15    | 17       | NA    | NA              | NA            | NA                | NA        | 0.47            | Residential             |
| SW-1*                                        | 0.5             | 0.5   | 0.5      | NA    | Y               | NA            | NA                | W         | 5.37            | Agricultural / Forested |
| SW-2*                                        | 1               | 0.5   | 0.75     | 2     | Y               | NA            | NA                | NW        | 5.37            | Agricultural / Forested |
| Total Drainage Area (ac)                     |                 |       |          |       |                 |               |                   |           | 18.18           |                         |

NA = Not Available / Not Applicable

\* = Overlapping drainage areas

### 3.2.2 Springs/Emergence Feature Summary

Twenty-five (25) springs were identified within the HHTC study area; fourteen (14) springs are within the investigated corridor (Exhibit 11). In general, the springs identified are ephemeral in nature, with estimated discharge rate typically less than 1 gallon per minute (gpm). In general, spring discharge rates were measured using a 16 ounce container and timed until the container filled. In some cases, flow rates were estimated based on a comparison to other measured spring flows.

Springs within the project area are generally located along side slopes and at heads of ephemeral drainage ways, adjacent to surface streams. In addition, the springs identified appear to be located at the base of Muscatatuck Group and underlain by Bainbridge Group carbonates (Salamonie Dolomite). As noted in Section 2.2, the Salamonie Dolomite is relatively resistant to dissolution and likely serves as an impeding layer, where infiltrating groundwater runs along the bedrock surface and discharges where surface topography allows. Site photographs for springs identified in the study area are included in Appendix B, and individual spring descriptions are provided below and summarized in Table 3.

Features SP-1 and SP-2 are ephemeral spring seeps along bedrock bedding planes within the investigated corridor. Both SP-1 and SP-2 have flow of less than 0.1 gallon per minute (gpm) (Photos 12 and 13).

Feature SP-3 is an ephemeral spring in an incised ravine within the investigated corridor. This feature produces less than 0.1 gpm which eventually flows into the Lentzier Creek (Photo 14).

Feature SP-4 is an ephemeral spring with a 60-inch undercut head within a ravine located in the investigated corridor. Approximately 0.1 – 0.2 gpm of flow results from this spring, which eventually flows into the Lentzier Creek (Photo 15).

Feature SP-5 is an ephemeral spring along a 4 - 5-foot exposed bedrock ledge that extends approximately 8 – 12-inches from the surface. This feature is located within the investigated corridor. Less than 0.1 gpm of flow was observed during the field investigation (Photo 16).

Feature SP-6 is an ephemeral spring along a 10-foot long exposed bedrock ledge. This feature is located within the investigated corridor. Less than 0.1 gpm of flow was observed during the field investigation (Photo 17).

Feature SP-7 is an ephemeral spring along a 20 – 30-foot long exposed bedrock ledge. This feature is located within the investigated corridor. Less than 0.1 gpm of flow was observed during the field investigation (Photo 18).

Feature SP-8 is a spring located within a 12-inch conduit in bedrock. This spring is located within an incised ravine, and extends at least 4-feet into bedrock, with flow estimated at approximately 5 gpm. Feature SP-8 is located within the investigated corridor (Photo 19 and 20).

Feature SP-9 is a small spring/emergence feature with 1-2 gpm of flow that emerges from the soil at the base of a slope within the investigated corridor. Some bedrock cobbles were observed in the vicinity of SP-9 (Photo 21).

Feature SP-10 is a 4-inch wide spring located below a bedrock shelf in the slope of a gully within the investigated corridor. This feature was observed to have 3-4 gpm of flow (Photo 22).

Feature SP-11 is a point emergence spring located approximately 650-feet west of Old Salem Road and is within the investigated corridor (Photo 23). Flow emerging from the spring was estimated at 2-3 gpm.

Feature SP-12 is an ephemeral spring located below a culvert on the west side of Utica-Sellersburg Road, within the investigated corridor (Photo 24). This feature was observed with flow less than 0.1 gpm.

Feature SP-13 is a spring with a 15 – 20-foot emergence along a bedrock bedding plane on the west side of Utica Sellersburg Road. SP-13 was observed flowing at 10 – 20 gpm. This feature is located within the investigated corridor (Photo 25).



Feature SP-14 is a point emergence spring with soil piping feature with flow estimated at 3-5 gpm. This feature is located within the investigated corridor, approximately 300-feet southeast of Utica-Sellersburg Road (Photo 26).

Feature SP-15 is an ephemeral spring with exposed bedrock. This feature is located in the northeast portion of the study area, approximately 850-feet northeast of the investigated corridor (Photo 27). No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-16 is a 4-foot wide ephemeral spring along a bedrock bedding plane with flow estimated at approximately 1 gpm. This feature is located approximately 140-feet east of the investigated corridor (Photo 28).

Feature SP-17 is an ephemeral spring that emerges from the soil along a stream valley with flow estimated at less than 1 gpm. This feature is located outside of the investigated corridor, approximately 160-feet east (Photo 29).

Feature SP-18 is an ephemeral spring located within an ephemeral channel. This spring emerges from the base of a bedrock outcrop approximately 1.5-feet high, and is located 1,000-feet east of the investigated corridor (Photo 30). No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-19 is an ephemeral spring that emerges from the south bank of an ephemeral channel with flow estimated at approximately 1 gpm. This spring emerges from the top of a bedrock bedding plane, and is located on the eastern side of the study area, 2,000-feet east of the investigated corridor (Photo 31).

Feature SP-20 is an ephemeral spring that emerges in a channel bank along a bedrock bedding plane with flow estimated at approximately 1 gpm. Feature SP-20 is located approximately 1,700-feet southeast of the investigated corridor (Photo 32).

Feature SP-21 is an ephemeral spring that emerges from a 2-foot wide opening at the base of a bedrock bedding plane outcrop. This feature is located approximately 1,750-feet southeast of the investigated corridor (Photo 33). No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-22 is an ephemeral spring approximately 90-feet west of the investigated corridor. This feature is indicated by a slight depression and erosion around the feature. Exposed limestone bedrock was noted around the edges of the depression (Photo 34). No flow was observed emerging from the spring during the field reconnaissance.

Feature SP-23 is an ephemeral spring located approximately 150-feet west of the northern portion of the investigated corridor. This feature was not flowing during the time of investigation, but evidence of minor groundwater seepage within the head-cut was observed (Photo 35).

Feature SP-24 is a spring located approximately 525-feet southeast of the investigated corridor. This feature was observed as a point emergence spring flowing at 4 -5 gpm. Spring SP-24 appeared to be sourced from a bedrock bedding plane (Photo 36).

Feature SP-25 is a spring located approximately 1,300-feet southeast of the investigated corridor. This feature is located on the up-stream side of a ponded wetland, and was observed flowing at 5 gpm. No obvious bedrock exposure was observed near SP-25 (Photo 37).

| <b>Table 3: Springs/Emergence Feature Summary</b> |                               |                             |
|---------------------------------------------------|-------------------------------|-----------------------------|
| <b>Feature No.</b>                                | <b>Characteristics</b>        |                             |
|                                                   | <b>Emergence Opening Size</b> | <b>Estimated Flow (gpm)</b> |
| <b>SP-1</b>                                       | 20'                           | <0.1                        |
| <b>SP-2</b>                                       | 4'                            | <0.1                        |
| <b>SP-3</b>                                       | 8'                            | <0.1-0.2                    |
| <b>SP-4</b>                                       | 60"                           | 0.1-0.2                     |
| <b>SP-5</b>                                       | 4-5'                          | <0.1-0.2                    |
| <b>SP-6</b>                                       | 10'                           | <0.1                        |
| <b>SP-7</b>                                       | 20-30'                        | <0.1                        |
| <b>SP-8</b>                                       | 12"                           | 5                           |
| <b>SP-9</b>                                       | 3-4"                          | 1-2                         |
| <b>SP-10</b>                                      | 4"                            | 3-4                         |
| <b>SP-11</b>                                      | NA                            | 2-3                         |
| <b>SP-12</b>                                      | NA                            | <0.1                        |
| <b>SP-13</b>                                      | 15-20'                        | 10-20                       |
| <b>SP-14</b>                                      | NA                            | 3-5                         |
| <b>SP-15</b>                                      | 1-2'                          | 0                           |
| <b>SP-16</b>                                      | 6"                            | 1                           |
| <b>SP-17</b>                                      | NA                            | <1                          |
| <b>SP-18</b>                                      | NA                            | 0                           |
| <b>SP-19</b>                                      | NA                            | 1                           |
| <b>SP-20</b>                                      | NA                            | 1                           |
| <b>SP-21</b>                                      | 6"                            | 0                           |
| <b>SP-22</b>                                      | NA                            | 0                           |
| <b>SP-23</b>                                      | NA                            | 0                           |
| <b>SP-24</b>                                      | 10'                           | 4-5                         |
| <b>SP-25</b>                                      | 12"                           | 5                           |

NA = Not Available



### **3.2.3 Cave Feature Summary**

No caves were identified within the study area and investigated corridor.

### **3.2.4 Features within Alternate Alignment DE**

A total of three (3) karst features are located within the proposed construction limits of Alternate DE, namely springs SP-2, SP-3, and SP-11.

In addition to the three (3) springs, a portion of the drainage areas/watershed areas for features SI-1, SI-8, SW-1, and SW-2 are included within the construction limits of Alternative Route DE. Feature SI-1 is a relatively large subsidence (suffosion) sinkhole (See Photo 2 in Appendix B). Suffosion sinkholes (or dolines) form where seepage through thick unconsolidated regolith over karst rocks (Ford and Williams, 1989). The seepage of water through the regolith removes the fine sediment of the regolith into the underlying fractures and solution enlarged conduits. Features SW-1 and SW-2 are relatively small (less than 1' diameter) swallet features located within a stream bed just outside the proposed construction limits.

### **3.2.5 Features within Alternate Alignment F**

Three (3) karst features are located within the construction limits of alignment Alternate F, namely springs SP-2 and SP-11, as well as SI-9 (sinkhole).

### **3.2.6 Features within Alternate Alignment HH**

Three (3) karst features are located within the construction limits of the alignment Alternate HH, namely springs SP-2, SP-4, and SP-11.

In addition to the three (3) springs, a portion of the drainage areas/watershed areas for features SI-1, SI-8, SW-1, and SW-2 are included within the construction limits of Alternative Route HH.

## 4.0 Impacts to Karst Features

### 4.1 Identified Feature Impacts

In general, avoidance of karst features is the preferred mechanism to protect sensitive habitat for flora and fauna associated with karst features. Based on the proposed roadway alignment and field observations in the study area, avoidance of all features present within the study area is not feasible. The study area is located within a karst geomorphic setting, and all alignments considered would impact extant features. As proposed, the recommended alignments appear to have avoided direct impacts to a significant number of karst features in the study area.

Typical impacts to karst features from the proposed roadway may include the following:

- Permanent closure/destruction of the feature (loss of habitat or natural drainage function)
- Routing of highway runoff into the feature (contamination of surface and groundwater, accelerating dissolution/subsidence)
- Excess sedimentation due to erosion or runoff
- Loss of habitat or fragmentation of habitat
- Exposure of the feature due to clearing (inducing vandalism)

### 4.2 General and Specific Mitigation Measures

General measures to avoid or minimize impacts to the affected karst features include the following:

1. BMPs should be incorporated into the design of the roadway improvements to minimize runoff generated by construction to be directed toward the identified features. Erosion control treatments should be installed surrounding the topographic depressions at the highest closed contour. Use of temporary earthen berms with rip rap armor is highly recommended. Where possible, the existing vegetation surrounding features should be maintained throughout construction, including a minimum 10-foot buffer measured from the rim, or highest closed contour, surrounding the depression. The buffer area and depression should be fenced for the duration of construction.
2. Material storage and staging areas, as well as equipment storage, maintenance and re-fueling areas should not be located within the drainage area of karst features.
3. An Emergency Response Plan should be prepared for project construction which includes a site-specific Spill Response Plan. IDEM should be provided a copy of the Emergency Response Plan and the locations of mapped karst features within the project area.
4. A low salt and no spray strategy should be implemented prior to project completion. This strategy may include the use of road signs that indicate the no spray zone.
5. Signage throughout the corridor is recommended to alert the public and users to report all spills – these recommended signs should include the Indiana Department of Environmental Management (IDEM) toll-free spill line phone number. In addition, coordination with the IDEM office of Land



Management to facilitate development of an emergency response plan, including locations of potentially affected sinkholes and springs in case of a release on the proposed roadway.

Table 5 provides a summary of impacted karst features within the proposed Alternative Routes DE, F, and HH, along with proposed feature treatment and/or mitigation measures.

| <b>Table 5</b><br><b>Summary of Impacts to Karst Features and Recommended Measures for Avoidance and/or Mitigation</b> |                              |                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feature #</b>                                                                                                       | <b>Impacted Area (acres)</b> | <b>Recommended Treatment/Mitigation Measure(s)</b>                                                                                                                                                                                                                                                                                                                                  |
| <b>Alternative DE</b>                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                     |
| SP-2                                                                                                                   | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway.</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                    |
| SP-3                                                                                                                   | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway;</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                    |
| SP-11                                                                                                                  | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway;</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                    |
| SI-1                                                                                                                   | 2.19                         | <ol style="list-style-type: none"> <li>1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction;</li> <li>2. Re-vegetate the impacted drainage area immediately following construction;</li> <li>3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole</li> </ol> |
| SI-8                                                                                                                   | 1.61                         | <ol style="list-style-type: none"> <li>1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction;</li> <li>2. Re-vegetate the impacted drainage area immediately following construction;</li> <li>3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole</li> </ol> |
| SW-1                                                                                                                   |                              | Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction                                                                                                                                                                                                                                                          |
| SW-2                                                                                                                   |                              | Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction                                                                                                                                                                                                                                                          |

| <b>Table 5</b><br><b>Summary of Impacts to Karst Features and Recommended Measures for Avoidance and/or Mitigation</b> |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feature #</b>                                                                                                       | <b>Impacted Area (acres)</b> | <b>Recommended Treatment/Mitigation Measure(s)</b>                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Alternative F</b>                                                                                                   |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SP-2                                                                                                                   | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway;</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                                                                            |
| SP-11                                                                                                                  | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                                                                             |
| SI-9                                                                                                                   | 0.24                         | <ol style="list-style-type: none"> <li>1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction;</li> <li>2. Re-vegetate the impacted drainage area immediately following construction;</li> <li>3. Close sinkhole using aggregate cap to perpetuate recharge from non-roadway runoff, or if sinkhole is under proposed pavement, close with concrete cap.</li> </ol> |
| <b>Alternative HH</b>                                                                                                  |                              |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| SP-2                                                                                                                   | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway;</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                                                                            |
| SP-4                                                                                                                   | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway;</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                                                                            |
| SP-11                                                                                                                  | NA                           | <ol style="list-style-type: none"> <li>1. Small spring box with outlet to adjacent drainageway;</li> <li>2. Install appropriate erosion and sediment control measures to minimize sediment movement to the spring during construction</li> </ol>                                                                                                                                                                                            |



| <b>Table 5</b><br><b>Summary of Impacts to Karst Features and Recommended Measures for Avoidance and/or Mitigation</b> |                              |                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------------------------------------------------------------------------------------------------------------|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Feature #</b>                                                                                                       | <b>Impacted Area (acres)</b> | <b>Recommended Treatment/Mitigation Measure(s)</b>                                                                                                                                                                                                                                                                                                                                  |
| SI-1                                                                                                                   | 0.69                         | <ol style="list-style-type: none"> <li>1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction;</li> <li>2. Re-vegetate the impacted drainage area immediately following construction;</li> <li>3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole</li> </ol> |
| SI-8                                                                                                                   | 0.31                         | <ol style="list-style-type: none"> <li>1. Install appropriate erosion and sediment control measures to minimize sediment movement to the sinkhole during construction;</li> <li>2. Re-vegetate the impacted drainage area immediately following construction;</li> <li>3. Install appropriately sized culverts under roadway embankment to facilitate runoff to sinkhole</li> </ol> |
| SW-1                                                                                                                   |                              | Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction                                                                                                                                                                                                                                                          |
| SW-2                                                                                                                   |                              | Install appropriate erosion and sediment control measures to minimize sediment movement to the swallet during construction                                                                                                                                                                                                                                                          |

NA = Not Applicable

## 5.0 Recommendations for Feature Protection and Mitigation

### 5.1 Feature Protection During Construction

Throughout construction, installation of erosion control treatments surrounding individual features is recommended. In particular, filter berms should be installed around the highest closed contour of sinkhole depressions (see Detail 5 in Appendix D). Existing vegetation around the features should be maintained for the duration of construction.

Silt fencing or other appropriate sediment control features should be installed adjacent to stream channels, particularly Lentzier Creek and UNT 11, to minimize siltation or release of contaminants to downstream karst features.

### 5.2 Management of Post-Construction Runoff

In general, management of post-construction runoff should be implemented by the installation of side ditches to collect surface runoff from the roadway and embankments. All side drainage ditches should be directed to existing surface streams (Lentzier Creek and un-named tributaries to Lentzier Creek) throughout the length of the proposed project. Discharge of roadway runoff into existing karst features (e.g., sinkholes) is not recommended.

#### 5.2.1 Sinkhole Treatments

Treatments for sinkholes within the project generally fall into two basic categories, namely sinkholes to be left in place that are outside the proposed construction limits and sinkholes to be permanently closed.

##### Sinkholes Left In Place

The objective for sinkholes that will be left in place (no disturbance) is to minimize changes to the volume of surface water that enters a sinkhole, as increased flow may disturb the underground hydrology and/or increase the potential for accelerated enlargement of the feature. To the extent possible, the surface water flow should be maintained at pre-development volumes. Pre-existing concentrated flow channels should be stabilized, but should not otherwise be altered.

Drainage areas of Features SI-1, SI-8, SI-9, SW-1, and SW-2 are anticipated to be affected, based on the proposed alignments. Where the proposed roadway extends over the mapped sinkhole/swallet drainage areas (e.g., SI-1, SI-2, SW-2 and SW-1 on Alternates DE and HH), flow to the features should be maintained via culverts or other drainage structures and allowed to continue down-gradient to the feature.

Placement of a vegetated buffer a minimum of 25 feet wide measured from the rim of the sinkhole, or highest closed contour surrounding the depression, is recommended for all sinkholes left in place, within the proposed right-of-way. The buffer area should be extended laterally to control development of concentrated flow channels entering the sinkhole. The width of the vegetated buffer should be established and maintained in accordance with the type of buffer vegetation selected. It is further recommended that sinkholes left in place and the surrounding buffer be fenced.

Vegetation of the buffer areas should include a mixture of native grasses, wildflowers, and native shrub and hardwood tree species, as recommended by the IDNR-Division of Fish and Wildlife. Seeding should not include any varieties of Tall Fescue or other non-native plants, such as crown-vetch. All slopes 3:1 or greater



should be protected by installation of erosion control blankets. “Do Not Mow or Spray” signs should be posted within the right-of-way area, particularly near maintained sinkholes.

#### Sinkhole Closure

Sinkholes located within the proposed pavement and drainage areas should be permanently closed to prevent future collapse and surface runoff from entering the subsurface. At these features, soils, loose rock, trash, and other materials should be removed. The resulting excavation should be backfilled with a graded aggregate or concrete cap – see Details 1 and 2, Appendix D. Sinkholes under or adjacent to pavement are recommended to be treated with a concrete cap to maintain structural integrity of the roadway. Aggregate caps are recommended in areas outside of pavement to maintain some level of recharge to the subsurface karst groundwater system.

#### **5.2.2 Springs**

Springs identified in the project area were identified as ephemeral, with the exception of features SP-8, SP-9, SP-10, SP-11, SP-13, SP-14, SP-24, and SP-25, which had flowing water at the time of the investigation in excess of 1 gpm. The springs and fissures noted are surface expressions of the subsurface water level and release water to surface drainage during precipitation events. Therefore, permanent closure of identified springs and fissures is not recommended.

Treatment of existing springs within proposed fill areas should include installation of appropriately sized pipe or box culverts to extend the drainage beyond the right-of-way (see Details 3 and 4, Appendix D). The culvert should follow the existing drainage channel to maintain existing drainage patterns. Springs located within construction limits of the Alternative Routes include Features SP-2, SP-3, SP-4, and SP-11. It is recommended adequate drainage be provided to allow flow from these features during storm events to be routed to the proposed side ditch.

#### **5.2.3 Caves**

No caves were identified within the study area.

## 6.0 Conclusions and Recommendations

The proposed Heavy Haul Route alternate alignments were investigated for the presence of karst features within the proposed roadway project area. The proposed roadway is located on the south-side of Bloomington, Clark County, Indiana, an area characterized by mature karst topography.

A total of nine (9) karst features were identified within the proposed construction limits of alternate alignments DE, F and HH, consisting of three sinkholes, two swallets and four springs. The associated drainage areas of sinkholes SI-1 and SI-8 and swallets SW-1 and SW-2 are anticipated to be affected by proposed Alternate DE. Approximately 2.19 acres of the drainage area of feature SI-1, and 1.61 acres of drainage area for features SI-8, SW-1 and SW-2 will be impacted by Alternate DE. These impacts can be mitigated with installation of appropriately sized drainage structures under the roadway to facilitate drainage to the features. Three small springs (SP-2, SP-3 and SP-11) will be affected by alternate DE; however, these impacts can be mitigated by placement of spring boxes to allow continuation of flow emerging from the springs.

Alternate F will impact one sinkhole (SI-9); based on the location of the sinkhole, it is anticipated this feature will be capped. Alternate F will also affect two springs (SW-2 and SW-11); however, these impacts can be mitigated by placement of spring boxes to allow continuation of flow emerging from these springs.

Alternate HH will impact the associated drainage areas of sinkholes SI-1 and SI-8 and swallets SW-1 and SW-2. Approximately 0.69 acre of the drainage area of feature SI-1, and 0.31 acre of drainage area for features SI-8, SW-1 and SW-2 will be impacted. As discussed for Alternate DE, these impacts can be mitigated with installation of appropriately sized drainage structures under the roadway to facilitate drainage to the features. Three small springs (SP-2, SP-4 and SP-11) will also be affected by alternate HH; however, these impacts can be mitigated by placement of spring boxes to allow continuation of flow emerging from the springs.

Additional investigations prior to the development of final design of the Heavy Haul route is recommended, including geotechnical and subsurface geophysical surveys of the selected alignment to determine the presence of potential buried karst features which may affect the stability of the roadway and on-going maintenance and operations. Where sinkholes are overlain by glacially-derived soils, subsidence can occur even with no apparent surface expression prior to the collapse. Loess and glacial till are susceptible to soil piping upward due to their fine-grained matrix. Soil piping occurs when soil erosion begins at a seepage exit point (void or fracture in underlying bedrock) and erodes backwards, supporting a “pipe” or “roof” along the way. In addition, placement of impervious surface modifies surface runoff, infiltration and recharge patterns. In this, runoff can be concentrated in an area which may induce infiltration to a buried sinkhole or fracture causing the feature to destabilize. Construction within karst areas may increase the potential for destabilizing buried features during excavation and rock-cutting activities.

Dye trace analysis of the proposed project area is not recommended, as no caves or significant springs supporting sensitive habitat were identified in the study area. Based on the distribution of resurgence features and springs throughout the study area, it is apparent the spring discharge is primarily supplied from diffuse recharge through the overlying soil rather than discrete sources such as sinkholes. Therefore, design of an effective dye-trace investigation is impractical.



General recommendations to minimize the impacts to karst features include:

- Use erosion and sediment control measures, including temporary earthen berms to control sediment from construction zones entering sinkholes (See Appendix D, Detail 5);
- Bare and disturbed areas within sinkhole drainage areas should be re-vegetated as soon as practical following construction with a mixture of grasses (excluding all varieties of tall fescue), legumes, and native shrubs and hardwood tree species;
- Where possible, the existing vegetation surrounding features should be maintained throughout construction, including a minimum 10-foot buffer measured from the rim, or highest closed contour, surrounding the depression;
- All sinkholes and surrounding buffer areas should be fenced for the duration of construction;  
Closure or repair of sinkholes within the project limits, particularly at feature SI-9 (Alternate F), should use an aggregate or concrete cap. A typical detail for these treatment measures is provided in Appendix D (Details 1 and 2);
- If the proposed drainage design is modified to use existing karst features, a full-scale pollutant loading calculation should be performed to estimate the potential loads anticipated for the specific karst feature and dye-tracing should be performed to determine flow paths from these features;
- A low salt and no spray strategy should be implemented, including the use of road signs that indicate the no spray zone;
- An Emergency Response Plan, including a site-specific Spill Response Plan, will be developed prior to the start of project construction to identify response protocols if a spill occurs during construction;
- Material storage and staging areas, as well as equipment storage, maintenance and re-fueling areas should not be located within the drainage area of any karst features; and
- Use of structural BMPs (e.g., water quality filters and hydrodynamic devices) should be considered at the stormwater outfalls to surface streams in the area to minimize pollutant loading and contain releases from spills.

## 7.0 References

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- Wickwire, G. T., 1947, Accelerated Erosion Due to Industrial Waste, Proceedings of the Indiana Academy of Science, pp 161-168.



This Karst Features Evaluation Report, prepared for the proposed Heavy Haul Route, in Clark County, Indiana was prepared by Paul A. Johnson, a Licensed Professional Geologist in the State of Indiana (Indiana License # 1881).

Certified  
By:

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Date:

December 29, 2017

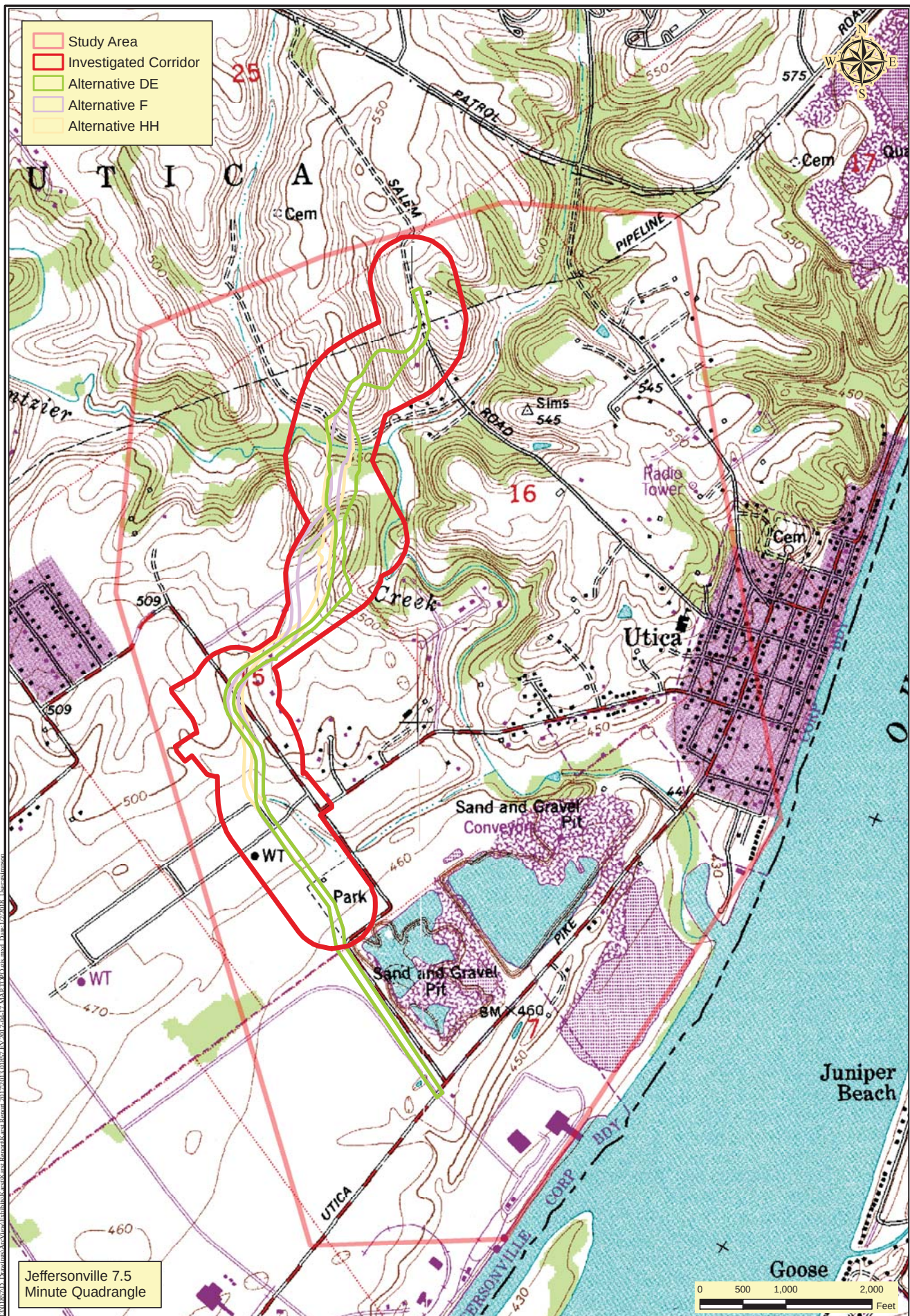
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## Appendix A – Exhibits

See Appendix A for State Location Map





Jeffersonville 7.5  
Minute Quadrangle

0 500 1,000 2,000  
Feet



## Exhibit 2: USGS Topographic Map

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation  
Des. No. 1382612

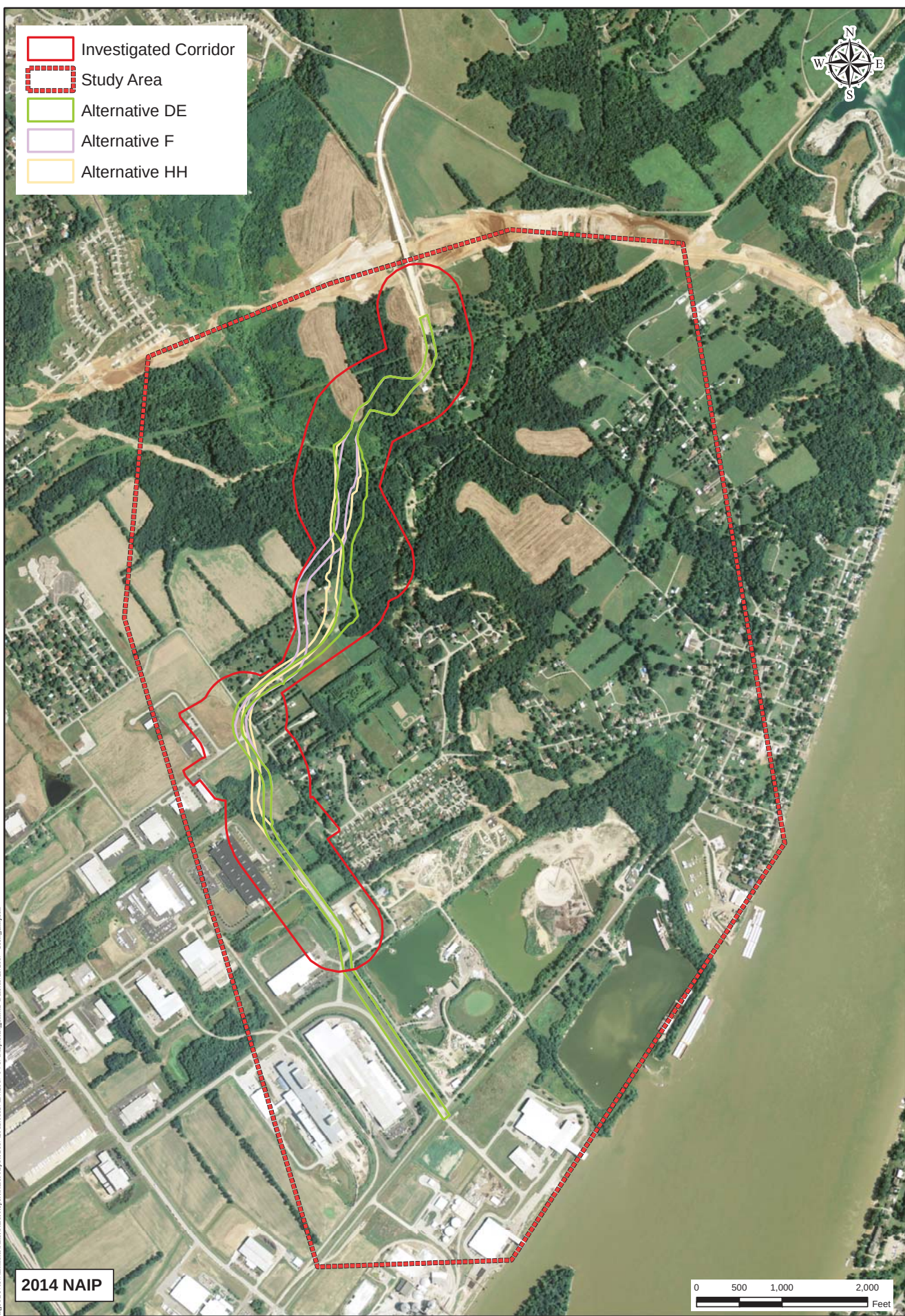
Location: Jeffersonville  
Township: Utica  
County: Clark  
State: Indiana

Date: 11/21/2017

Appendix E  
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- Investigated Corridor
- Study Area
- Alternative DE
- Alternative F
- Alternative HH



2014 NAIP



### Exhibit 3: Aerial Site Map

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation  
Des. No. 1382612

Location: Jeffersonville  
and Utica  
Township: Utica  
County: Clark

Date: 11/21/2017

Appendix E  
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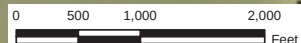
B:\p1\20130857.D, Drawings\ArcView\Exhibits\Karst\Report\Karst Report 2017\2013 0857 EV\2017-04-17 Map\_Site plan.dwg Date: 11/21/2017 User: jstapson



- Investigated Corridor
- Alternative DE
- ✱ Indiana Geological Survey - Mapped Sinkholes
- Study Area
- Alternative F
- Alternative HH
- Southern Hills and Lowlands Physiographic Division



2014 NAIP



#### Exhibit 4: Aerial Map - Physiography

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation  
Des. No. 1382612

Location: Jeffersonville  
and Utica  
Township: Utica  
County: Clark

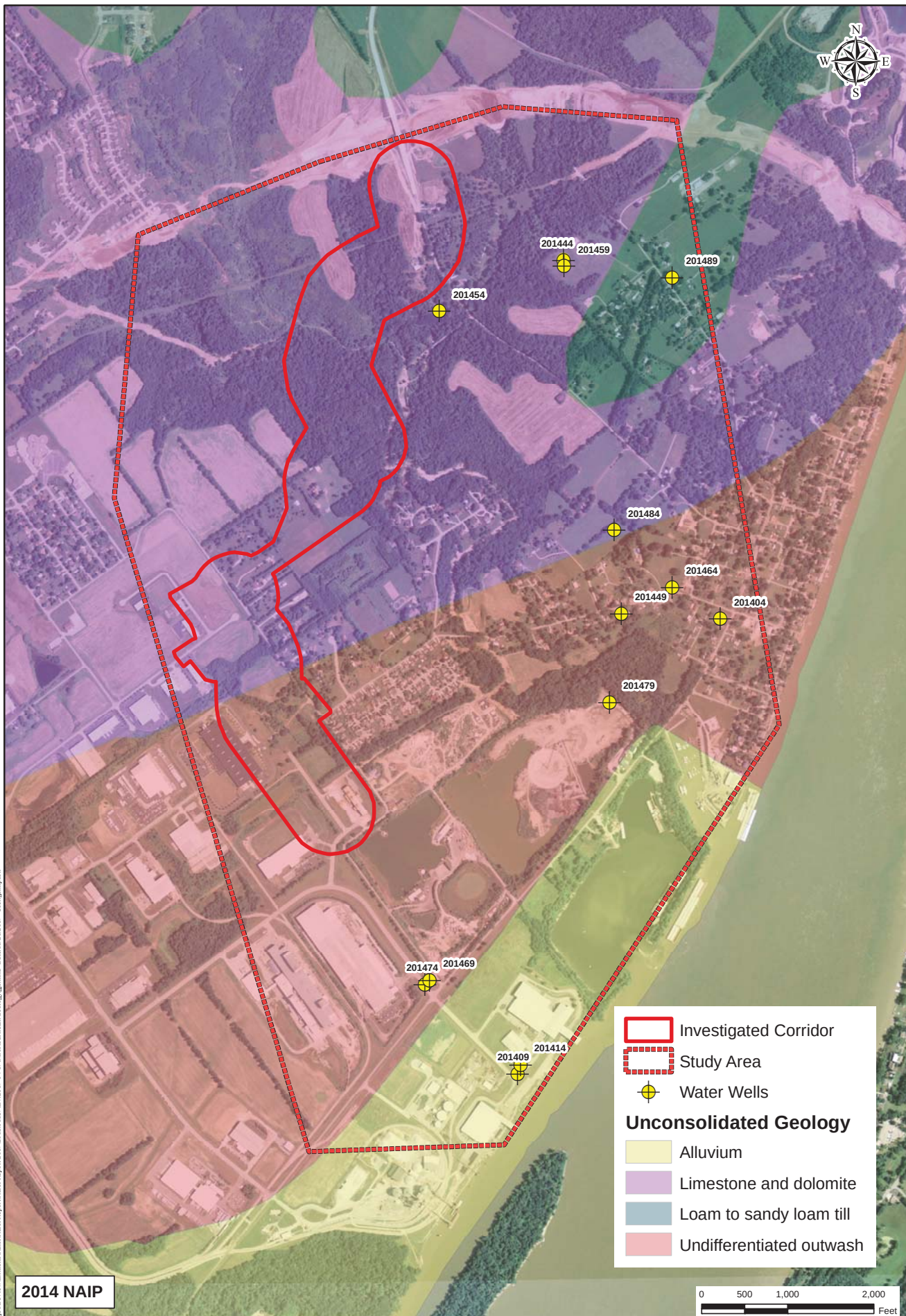
Date: 11/21/2017

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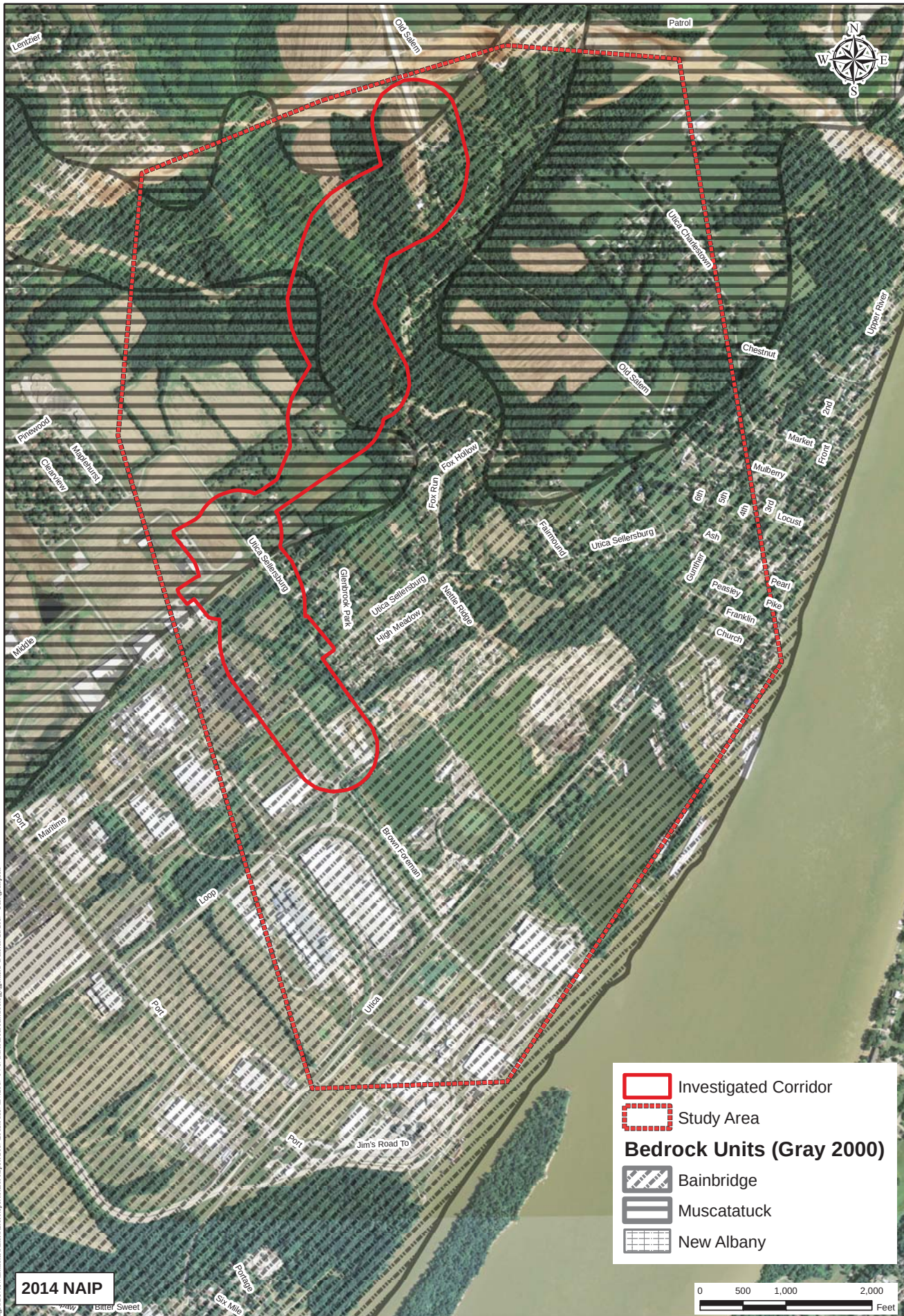


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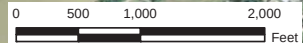
2014 NAIP



Exhibit 6: Bedrock Geologic Map

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

 Investigated Corridor  
 Study Area  
**Bedrock Units (Gray 2000)**  
 Bainbridge  
 Muscatatuck  
 New Albany



Heavy Haul Karst Features Evaluation  
Des. No. 1382612  
Location: Jeffersonville  
and Utica  
Township: Utica  
County: Clark  
Date: 11/21/2017  
Appendix E  
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-  Investigated Corridor
-  Study Area
-  Alternative DE
-  Alternative F
-  Alternative HH
-  2-foot Topographic Contours



2014 NAIP



### Exhibit 8: Topographic Map

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation  
Des. No. 1382612

Location: Jeffersonville  
and Utica  
Township: Utica  
County: Clark

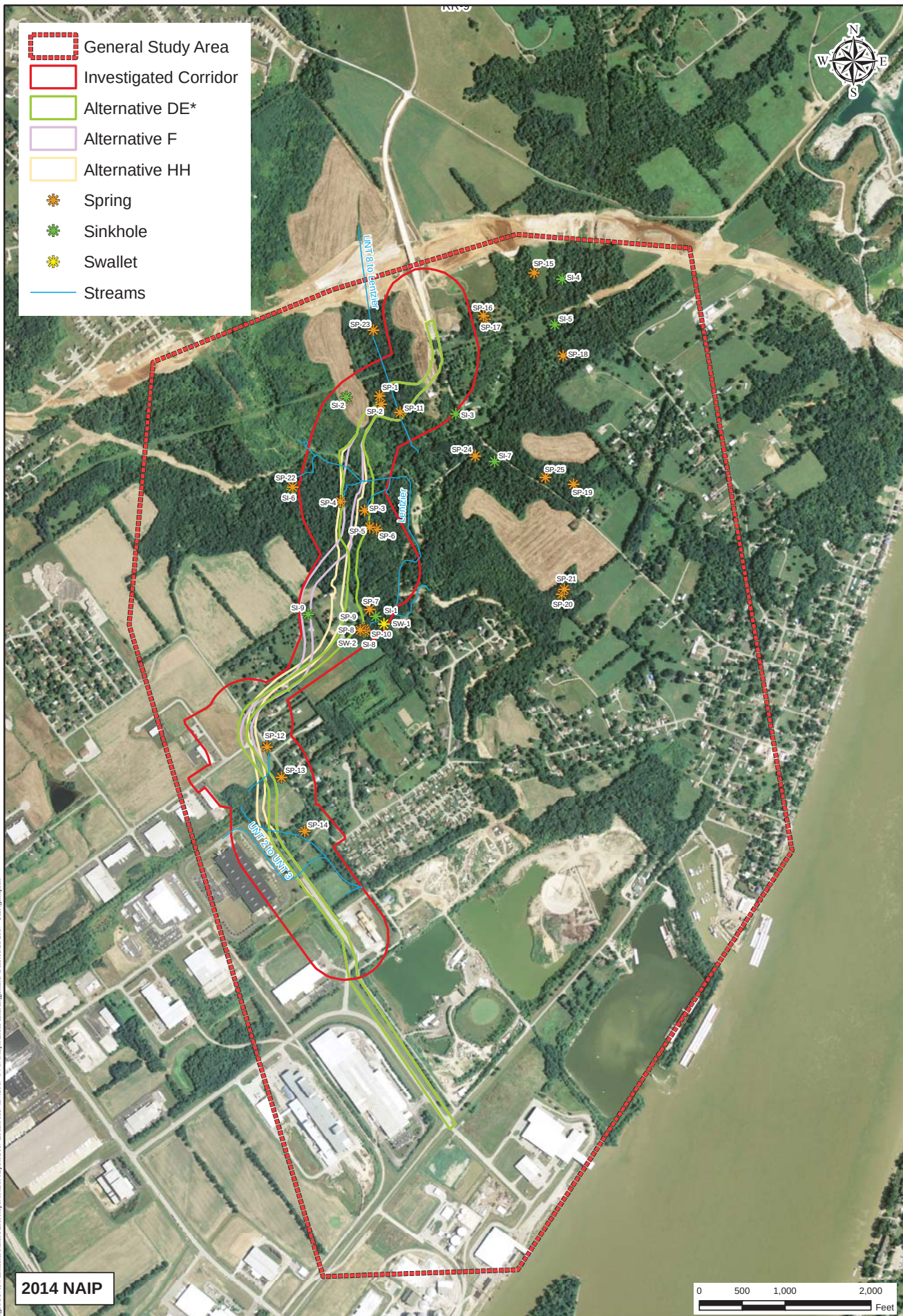
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Appendix E  
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- General Study Area
- Investigated Corridor
- Alternative DE\*
- Alternative F
- Alternative HH
- ✱ Spring
- ✱ Sinkhole
- ✱ Swallet
- Streams



2014 NAIP



### Exhibit 9: Identified Karst Features

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation  
Des. No. 1382612

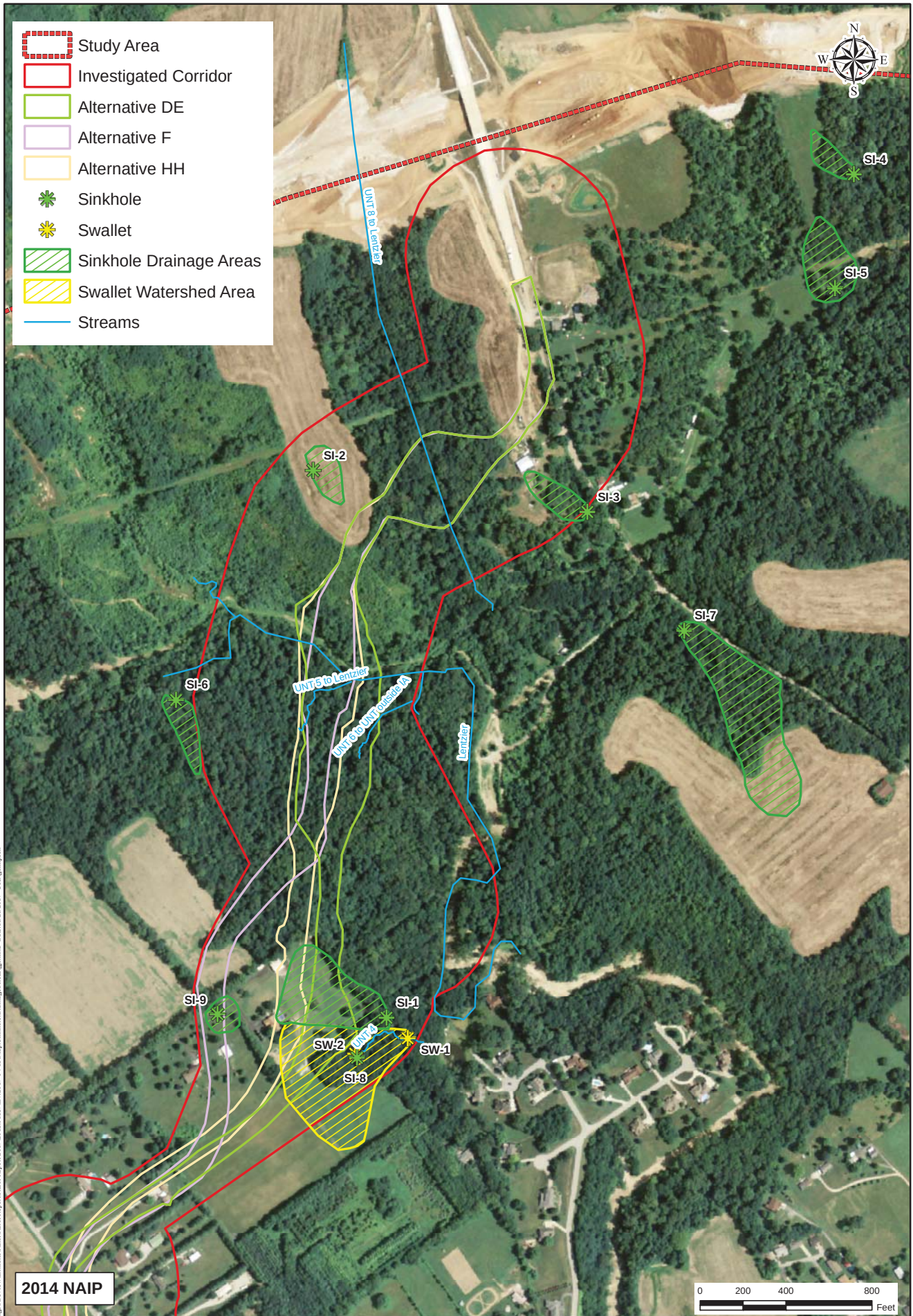
Location: Jeffersonville  
and Utica  
Township: Utica  
County: Clark

Date: 11/21/2017

Appendix E  
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-  Study Area
-  Investigated Corridor
-  Alternative DE
-  Alternative F
-  Alternative HH
-  Sinkhole
-  Swallet
-  Sinkhole Drainage Areas
-  Swallet Watershed Area
-  Streams



2014 NAIP



### Exhibit 10: Sinkhole/Insurgence Drainage Areas

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation  
Des. No. 1382612

Location: Jeffersonville  
and Utica  
Township: Utica  
County: Clark

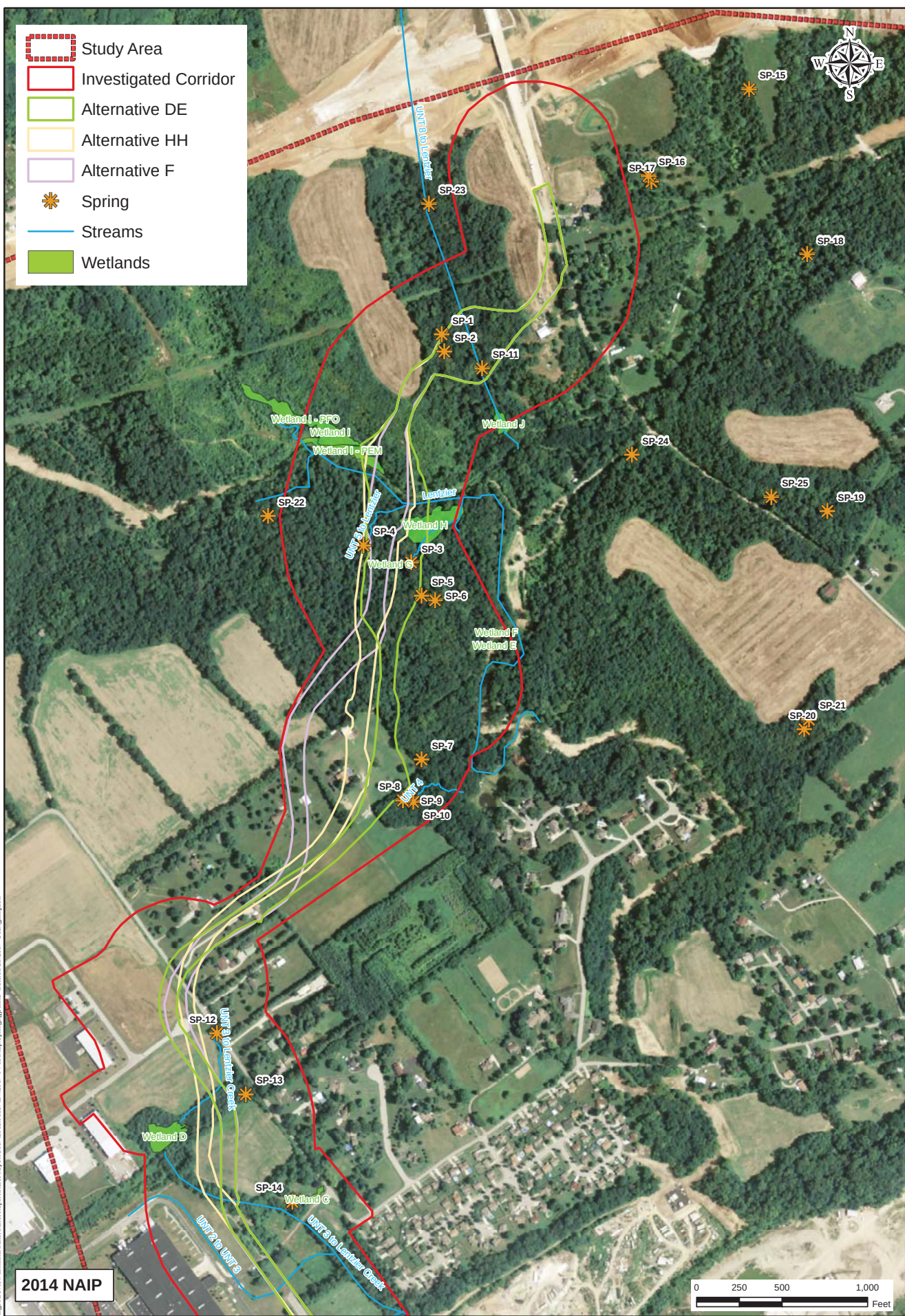
Date: 11/21/2017

Appendix E  
Page E-247

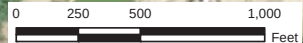
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-  Study Area
-  Investigated Corridor
-  Alternative DE
-  Alternative HH
-  Alternative F
-  Spring
-  Streams
-  Wetlands



2014 NAIP



### Exhibit 11: Spring/Emergence Features

Indiana Department of Transportation  
Central Office  
100 North Senate Avenue  
Indianapolis, Indiana 46204

Heavy Haul Karst Features Evaluation  
Des. No. 1382612

Location: Jeffersonville  
and Utica  
Township: Utica  
County: Clark

Date: 11/21/2017

Appendix E  
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## **Appendix B – Site/Feature Photographs**



# Heavy Haul Karst Features Evaluation

Des. No. 1382612

April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017

Project No. 2013.01857



Photo 1: Sinkhole SI-1.



Photo 2: Sinkhole SI-2



Photo 3: Sinkhole SI-3



Photo 4: Sinkhole SI-4.

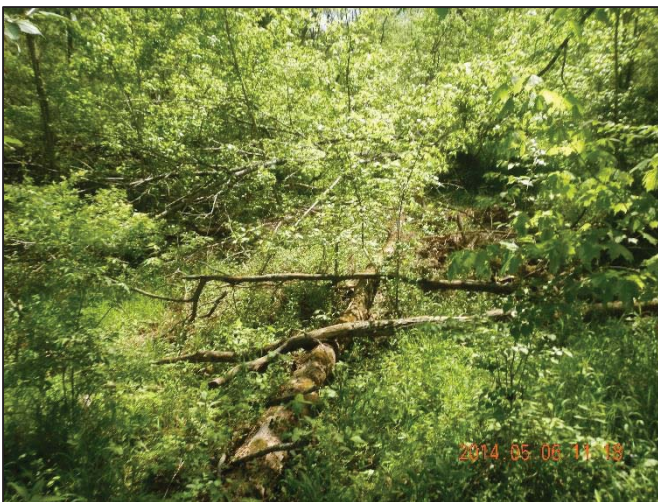


Photo 5: Sinkhole SI-5



Photo 6: Sinkhole SI-6



# Heavy Haul Karst Features Evaluation

Des. No. 1382612

April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017

Project No. 2013.01857



Photo 7: Sinkhole SI-7



Photo 8: Sinkhole SI-8



Photo 9: Sinkhole SI-9.



Photo 10: Swallet SW-1.



Photo 11: Swallet SW-2



Photo 12: Spring SP-1



# Heavy Haul Karst Features Evaluation

Des. No. 1382612

April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017

Project No. 2013.01857



Photo 13: Spring SP-2.



Photo 14: Spring SP-3.



Photo 15: Spring SP-4



Photo 16: Spring SP-5.



Photo 17: Spring SP-6.



Photo 18: Spring SP-7.



# Heavy Haul Karst Features Evaluation

Des. No. 1382612

April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017

Project No. 2013.01857



Photo 19: Spring SP-8.



Photo 20: Spring SP-8.



Photo 21: Spring SP-9.



Photo 22: Spring SP-10.



Photo 23: Spring SP-11.

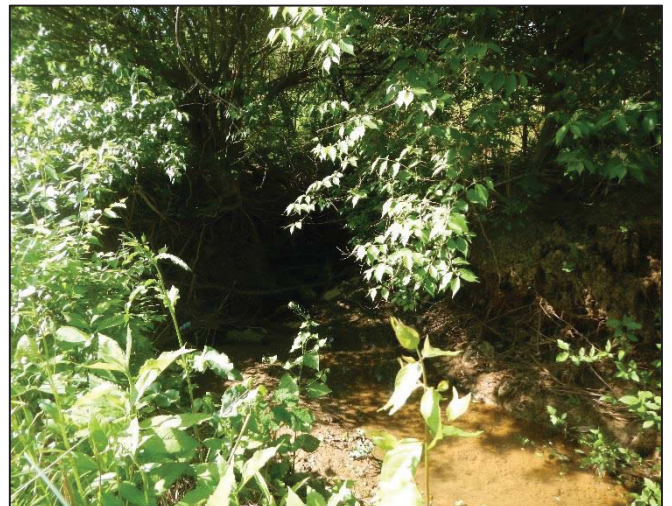


Photo 24: Spring SP-12.



# Heavy Haul Karst Features Evaluation

Des. No. 1382612

April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017

Project No. 2013.01857



Photo 25: Spring SP-13



Photo 26: Spring SP-14.



Photo 27: Spring SP-15.



Photo 28: Spring SP-16

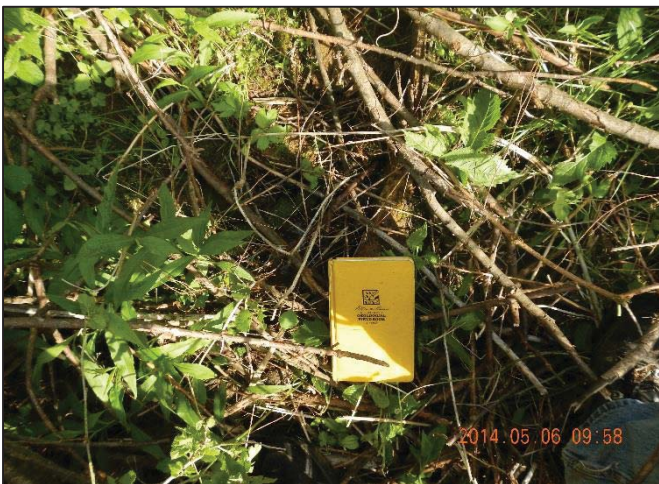


Photo 29: Spring SP-17.



Photo 30: Spring SP-18



# Heavy Haul Karst Features Evaluation

Des. No. 1382612

April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017

Project No. 2013.01857



Photo 31: Spring SP-19.



Photo 32: Spring SP-20.



Photo 33: Spring SP-21



Photo 34: Spring SP-22



Photo 35: Spring SP-23.



Photo 36: Spring SP-24.



# Heavy Haul Karst Features Evaluation

Des. No. 1382612

April 22, 23, 2014 - May 6, 2014 - December 19, 2016 – April 11, 2017

Project No. 2013.01857



Photo 37: Spring SP-25



Photo 38: Animal burrow



Photo 39: Interior of animal burrow



Photo 40: Interior length of animal burrow



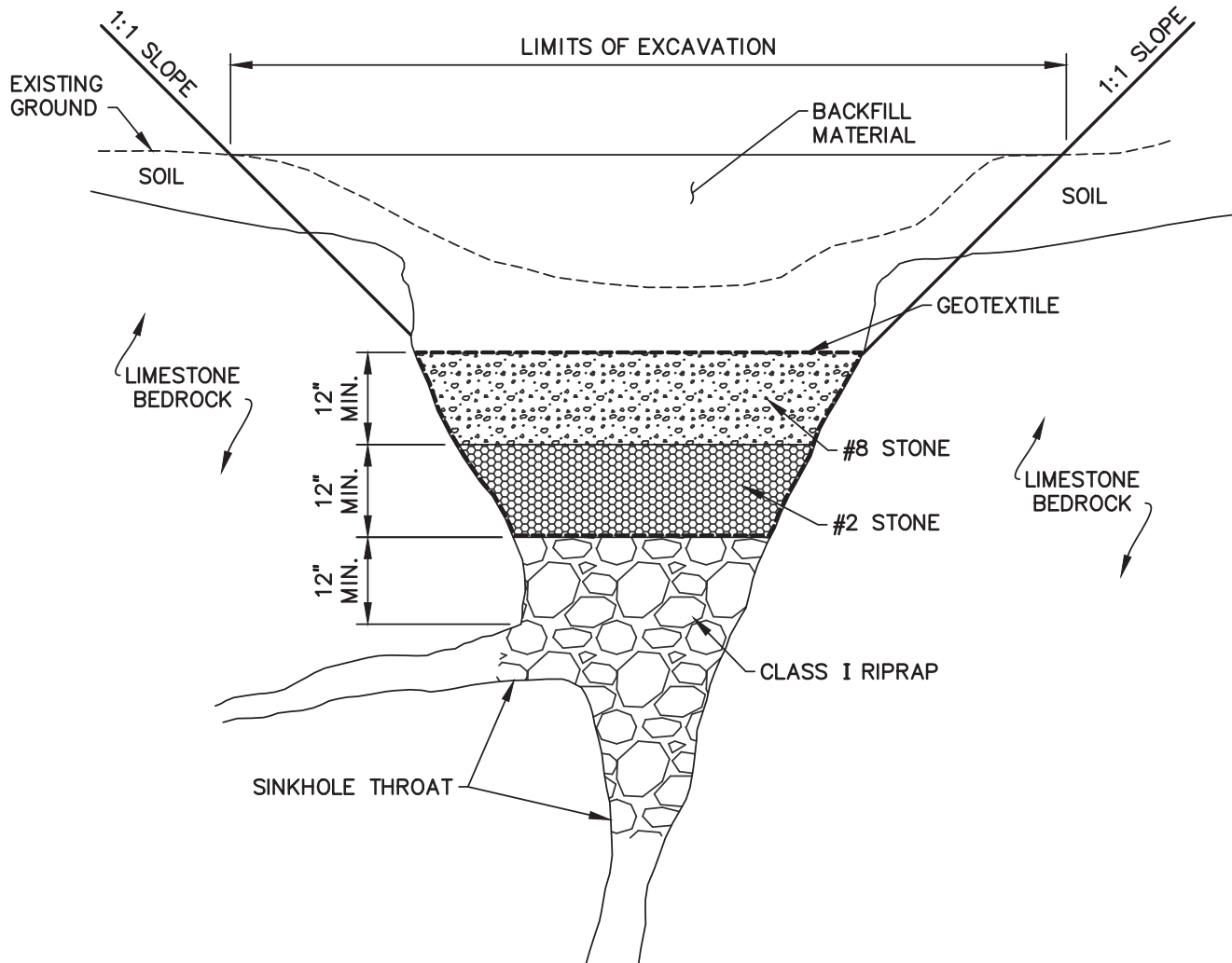
## **Appendix C – Agency Coordination**

See Appendix B of this document for coordination with IGS, IDNR, and USFWS

# Appendix D – Recommended Feature Treatment Details



PLOT SCALE: 1:1 EDIT DATE: 8/9/13 - 2:42 PM EDITED BY: J.GRIFFITH DRAWING FILE: P:\2013\01857\01857.DRAWINGS\ENVIRONMENTAL\2013.01857.EV.F3B.DWG



## TYPICAL SINKHOLE TREATMENT AGGREGATE CAP NOT TO SCALE

### Notes:

1. Contractor shall perform exploratory excavations to determine extent of the sinkhole throat prior to installing the treatment.
2. All loose and fragmented rock, soil, trash and debris shall be removed from the excavation, down to stable rock walls/surfaces at the sinkhole throat.
3. If during exploratory excavation, the sinkhole throat is determined to be greater than 36-inches, Class II Riprap shall be used in lieu of Class I Riprap.
4. Contractor shall overlap the ends of the geotextile material an minimum of 24-inches.

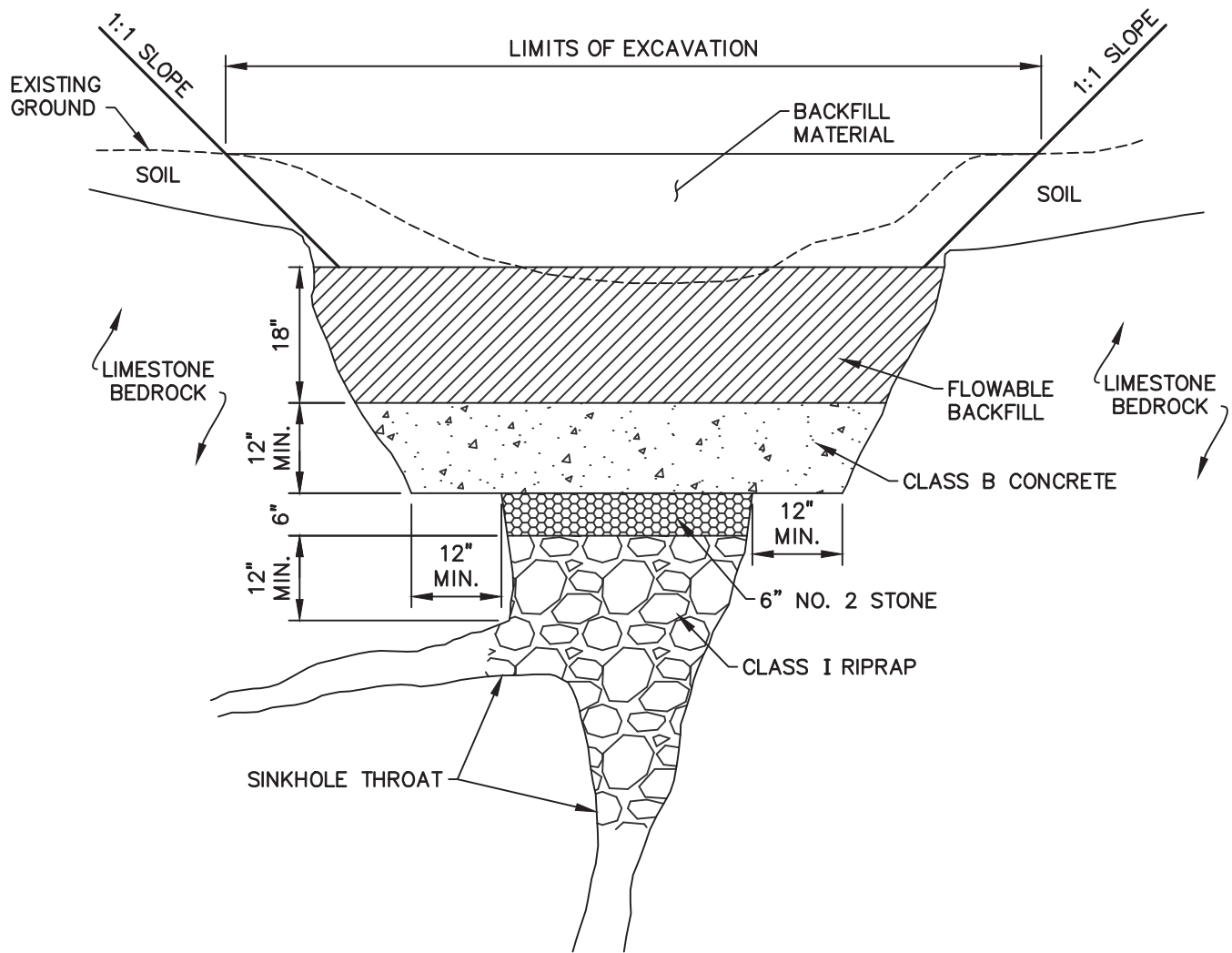
AMERICAN  
**STRUCTUREPOINT**  
INC.

### TYPICAL SINKHOLE TREATMENT AGGREGATE CAP

INDIANA DEPARTMENT OF TRANSPORTATION  
HEAVY HAUL ROUTE

DETAIL NO.:

1



TYPICAL SINKHOLE TREATMENT  
CONCRETE CAP  
NOT TO SCALE

Notes:

1. Contractor shall perform exploratory excavations to determine extent of the sinkhole throat prior to installing the treatment.
2. All loose and fragmented rock, soil, trash and debris shall be removed from the excavation, down to stable rock walls/surfaces at the sinkhole throat.
3. If during exploratory excavation, the sinkhole throat is determined to be greater than 36-inches, Class II Riprap shall be used in lieu of Class I Riprap.
4. Prior to placing concrete, all rock surfaces shall be free of soil and organic material.

**AMERICAN  
STRUCTUREPOINT  
INC.**

## TYPICAL SINKHOLE TREATMENT CONCRETE CAP

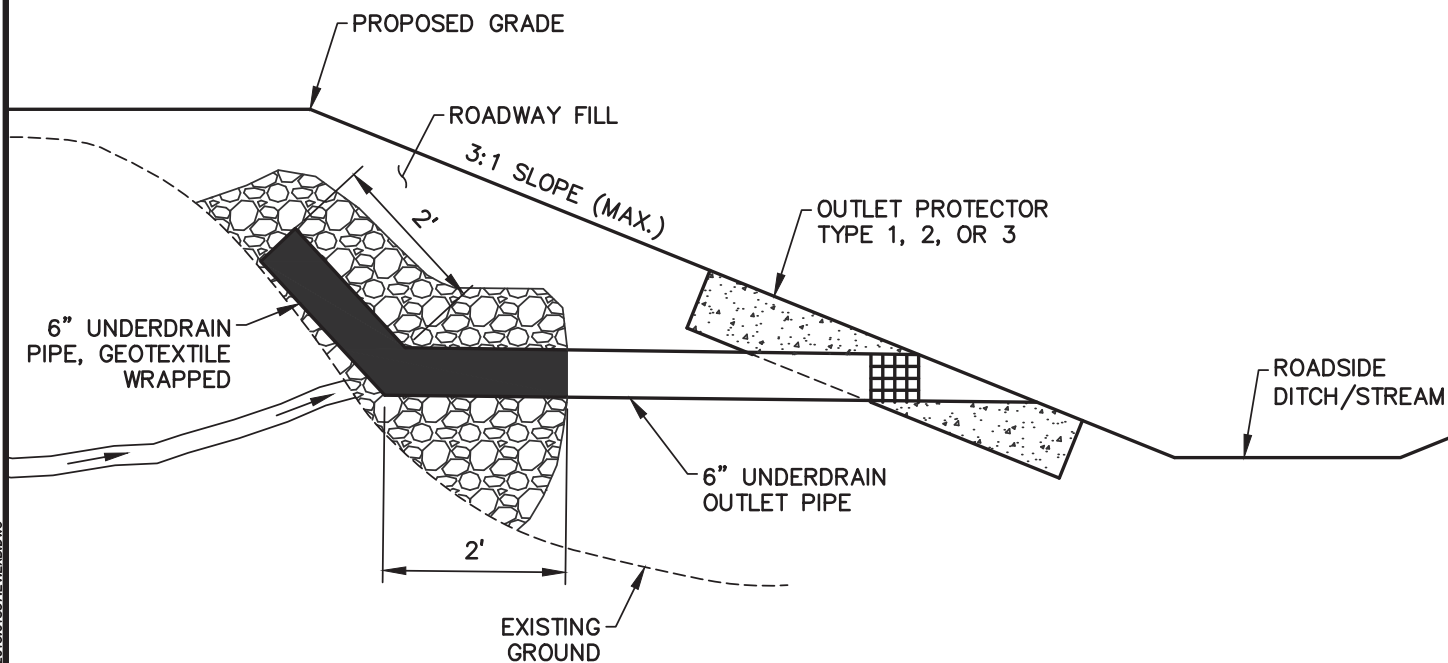
INDIANA DEPARTMENT OF TRANSPORTATION  
HEAVY HAUL ROUTE

DETAIL NO:

2



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**TYPICAL SPRING OR SEEP OUTLET**  
**(FLOW <5 GPM)**  
NOT TO SCALE

AMERICAN  
**STRUCTUREPOINT**  
INC.

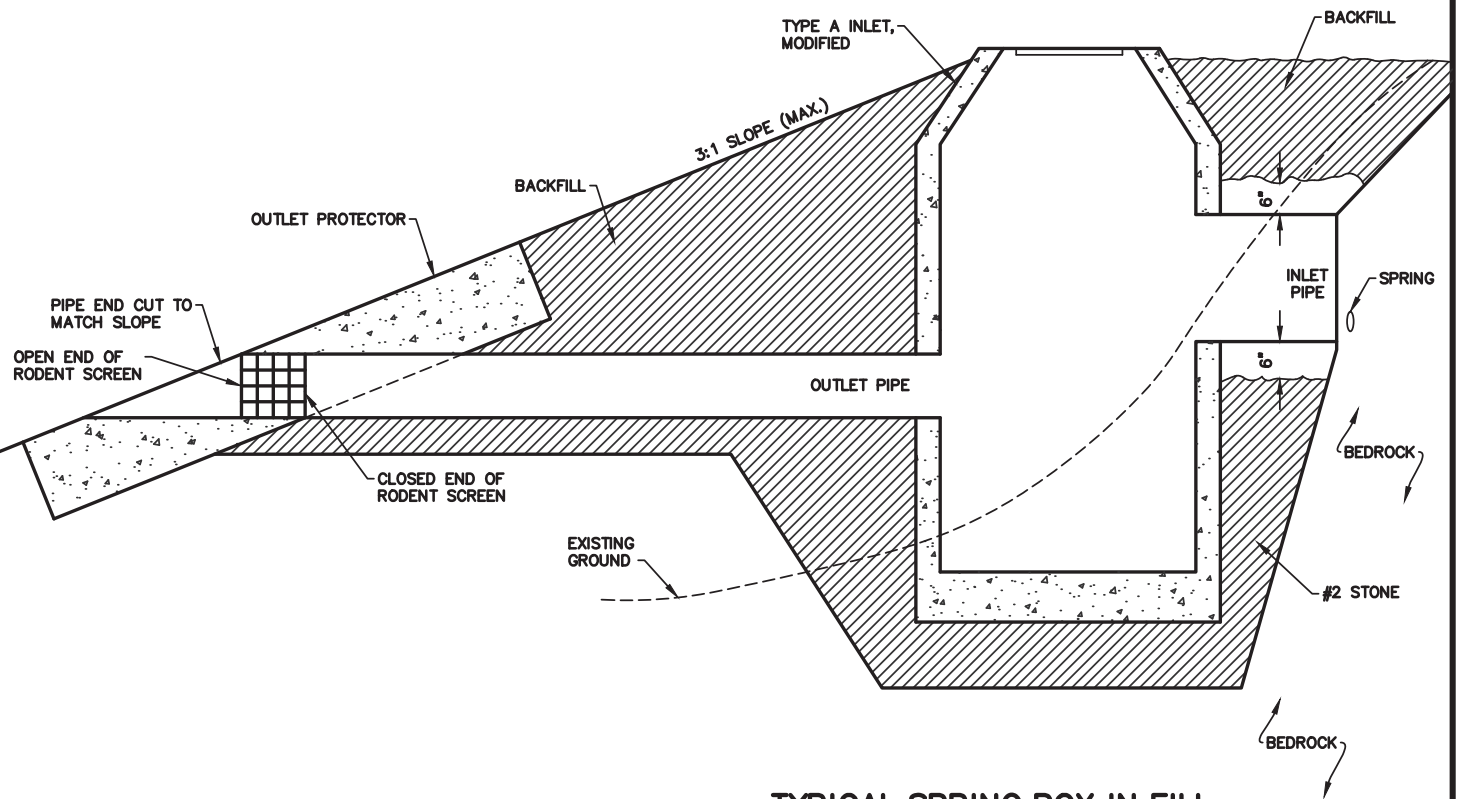
TYPICAL SPRING OR SEEP  
OUTLET (FLOW <5GPM)

INDIANA DEPARTMENT OF TRANSPORTATION  
HEAVY HAUL ROUTE

DETAIL NO.:

3

PLOT SCALE: 1:1 EDIT DATE: 8/9/13 - 2:42 PM EDITED BY: J.GRIFFITH DRAWING FILE: P:\2013\01857\01857.E\EXB.DWG



**TYPICAL SPRING BOX IN FILL  
SECTION DITCH (FLOW >5 GPM)**  
NOT TO SCALE

AMERICAN  
**STRUCTUREPOINT**  
INC.

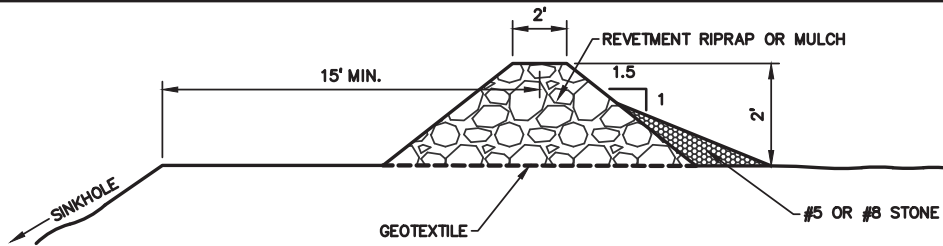
TYPICAL SPRING BOX FILL  
SECTION DITCH (FLOW >5 GPM)

INDIANA DEPARTMENT OF TRANSPORTATION  
HEAVY HAUL ROUTE

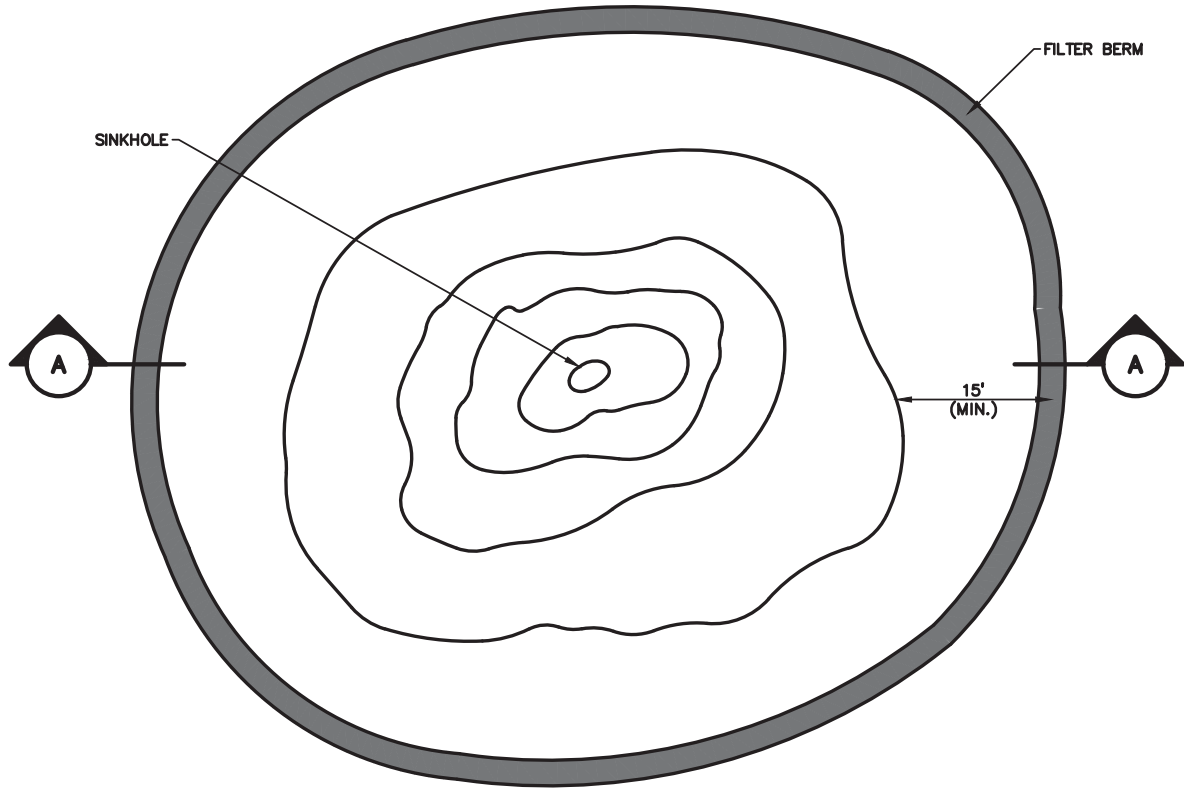
DETAIL NO.:

4

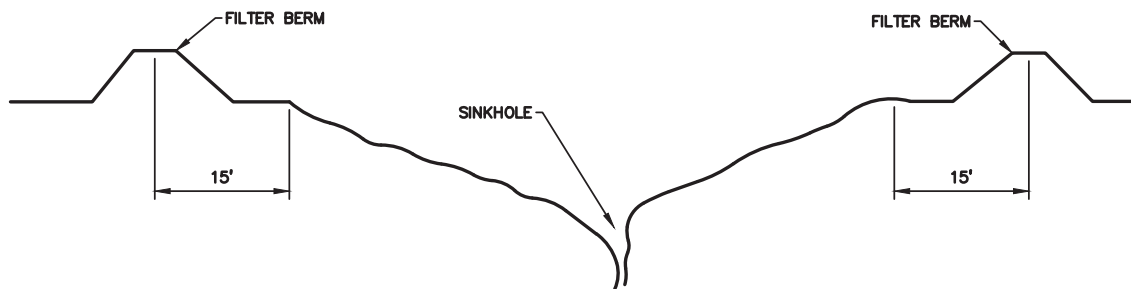




**TYPICAL FILTER BERM SECTION**  
NOT TO SCALE



**PLAN VIEW**



**SECTION A-A**

**TYPICAL FILTER BERM AT  
ADJACENT SINKHOLES**  
NOT TO SCALE

AMERICAN  
**STRUCTUREPOINT**  
INC.

TYPICAL FILTER BERM AT  
ADJACENT SINKHOLES

INDIANA DEPARTMENT OF TRANSPORTATION  
HEAVY HAUL ROUTE

DETAIL NO.:

**5**

## **Appendix E – Indiana Karst Memorandum of Understanding (1993)**



## Karst Geology

Karst landscapes are usually formed on limestone from the surface and subsurface removal of rock mass by dissolution of calcite or dolomite. This forms irregularities on the land surface. Karst areas normally have caves that developed as a result of dissolution along joints, bedding planes, or other openings. As ground water dissolves subsurface limestone, cave systems enlarge and eventually the overburden causes roofs of caves to collapse creating, on the surface, a bowl shaped land feature called a **sinkhole**. Sinkholes are a direct conduit to ground water. Because the dissolution along the joints and bedding planes, ground water can travel extremely fast relative to ground water in other types of aquifers. Adsorption to aquifer material, biological uptake, and microbial activity are a few processes that reduce ground water pollution. However, in a karst region, ground water flows through joints and along bedding planes much like water flows through pipes in our homes. This fast flow rate does not allow adsorption, microbial activity, or uptake processes to remove pollution from the ground water before it is pumped from the ground by a landowner. **Nearly all spills that occur in karst areas have the potential to be lethal to the animals that live in the cave systems.** If a project is located near a sinkhole or other karst feature, the regulatory agencies will require control of the drainage such that the acute and chronic criteria for surface water quality criteria are not exceeded.

Karst features exist in an area of southern Indiana. This area ranges from 10-50 miles wide and stretches from Crawfordsville to the Ohio River (see attached map). Much attention has been given by INDOT in the planning, design, and construction of road projects in the karst area. There are, however, certain responsibilities assigned to construction activities. INDOT has entered into a **Memorandum of Understanding** (attached) with other agencies in an effort to minimize any deleterious effects of construction projects in the karst area and to regulate certain activities in these areas. Included in this Memorandum of Understanding is a commitment from INDOT, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service to determine the location of sinkholes, caves, underground streams, and other related karst features and their relationship prior to determining the potential impacts of the proposed rehabilitations or construction.

Roadways typically have runoff such as salt and unknown spills that pollute soils near the road. In karst terrain, construction activities may cause soil releases to ground water via nearby sink holes. Excess silt introduced into a sink hole may seal a fissure system effectively removing means of draining the roadway. A wide range of toxic contaminants adhere to soils and may be liberated when soils are introduced into water. Contractors are required to have an erosion control plan, however, timely implementation of the plans are very important in the karst terrain. Maintenance of heavy machinery, such as oil changes, should be done in a designated area which should not be near the sinkhole. After adverse weather conditions, check erosion control measures for damage. The use of peat and other types of filters and wide grassy areas to catch and clean contaminants are some methods currently being used by INDOT to protect the groundwater. Likewise a project in a karst area might include the construction of

detention and/or retention basins. Regular inspections should be scheduled to ensure minimum and satisfactory compliance with the Memorandum of Understanding.

Clearing right-of-way, grading, excavation, tile drains, pesticide and herbicide treatment, and runoff from roadways are a few activities that may endanger the ground water quality in karst regions. It is important therefore, that you are aware of potential environmental impacts that could occur if construction activities were conducted in the usual manner. In addition to the possible lethal effects on wildlife, contamination of ground water used for drinking water could occur. Regular inspections should be scheduled to ensure minimum and satisfactory compliance with the Memorandum of Understanding, particularly erosion control features. Any sinkhole modification may result in the need for an EPA Injection Well Permit. The Division of Operations Support should be contacted in this event or to answer any questions concerning karst area activities.



## MEMORANDUM OF UNDERSTANDING

This memorandum of understanding is made and entered into this thirteenth day of October: 1993 between the Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management and the U.S. Fish and Wildlife Service for the purpose of delineating guidelines for construction of transportation projects in karst regions of the state.

Whereas, Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service wish to cooperate in the identification, study and treatment of drainage in karst regions related to the construction of transportation projects and,

Whereas, Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service accept responsibility to ensure the transportation needs of Indiana are met in an environmentally sensitive manner that protects the habitat of all species and,

Whereas, design and constructions practices must protect ground water quality, public health and safety, and the environment.

Whereas, Indiana Department of Natural Resources will conform to the terms and conditions of this MOU on their transportation projects. Likewise, it will be Indiana Department of Natural Resource's responsibility to provide standard biological review for project in the karst region.

Therefore, in consideration of the terms and conditions set forth herein the Indiana Department of Transportation, Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service agree as follows:

1. Indiana Department of Transportation in cooperation with the Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service shall determine the location of sinkholes, caves, underground streams, and other related karst features and their relationship prior to proposed alterations or construction in karst regions of the state. A consultant with expertise in karst geology/hydrology may assist in the identification and characterization of the karst features. The choice of the consultant retained by Indiana Department of Transportation will be subject to the review of Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service.

2. Tasks to accomplish this work will include:  
Research available from public and private sources for information relative to karst features.

Field check karst and cave features that appear from the first task and identify and additional karst features.

Prepare a draft report, with photographs and maps, drainage areas, and land use of that drainage area for each sinkhole or karst feature, dye-tracing and/or other geotechnical information to determine subsurface flow of water in the project area and surface water drainage patterns of the area. Calculations of estimates of annual pollutant loads from the highway and drainage within the right-of-way will be made, including prior to, during and post construction estimates. The design of the treatment of the karst features will take into consideration treatments necessary to meet the standards of the monitoring and maintenance plan.

That report will be used as a tool to assist in determining the proposed highway alignment. The intent of Indiana Department of Transportation is to avoid karst areas and use alternate drainage where possible.

3. Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service will be requested to review and comment on the findings at the early coordination phase of project development.

4. Indiana Department of Transportation, using the input from Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service will begin to formulate appropriate measures to offset unavoidable impacts to the karst features. It is understood by all parties that some of the methods proposed at this time will be generic and could be applied throughout the length of the corridor. Other methods may be specific to a particular cave or karst feature. Some of the approaches may require additional investigations to determine their necessity and/or their feasibility. A revised draft report will be prepared by Indiana Department of Transportation's consultant and provided to the Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service as part of the design review process.

5. Drainage entering from beyond the right-of-way will be treated according to the same process as drainage generated by the project.

6. As the project progresses further into the design phase, the Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service will be invited and will attend field checks and meetings dealing with efforts to negate or minimize adverse impacts.

7. Hazardous materials traps (HMT's) will be constructed at storm water outfalls and other locations that will protect karst features from spill contamination.

8. Indiana Department of Transportation agrees to develop a monitoring and maintenance plan for the affected karst features. Indiana Department of Natural Resources, Indiana Department of Environmental Management and the U.S. Fish and



Wildlife Service will be provided an opportunity to review this plan. The establishment of water quality and a point at which a standard is established for remediation will be a part of each monitoring plan. The results of the monitoring will be submitted to Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service on a regular basis.

9. A low salt, and no spray strategy will be developed for each future project. A signing strategy for these items will also be developed for each project.

10. Prior to acceptance of the final design plans an agreement will be developed which will set out the appropriate and practicable measures to offset unavoidable impacts to karst features. This agreement will be signed by the department director of Indiana Department of Natural Resources. The commissioner of Indiana Department of Environmental Management, the commissioner of Indiana Department of Transportation and the supervisor of the U.S. Fish and Wildlife Service Bloomington Indiana field office. The agreement will become a part of the contract documents for the project, will be discussed at the pre-construction conference and will be on file at the office of the project administrator.

11. Indiana Department of Transportation will assure that the terms of the agreement will be completed with all safeguards given to the karst area. Special provisions, which are binding provisions that are a part of the contract, will be included outlining the precautions to be taken. Construction and design strategies for handling karst features will be discussed with the contractor(s) and project administrator during the pre-construction conference. Project administrator shall ensure that the contractor is following the new erosion control standards that meet rule 5 of 327 IAC 15 and any special precautions outlined in the design plans that the sinkhole treatment is being handled correctly. The erosion control plan must be available at the project administrator's office. An emergency response plan will be made a part of the contract documents. In addition, the contract documents will contain a strategy for signing to alert the public to the fact that all types of spills are potentially hazardous to the karst environment. For Indiana Department of Transportation, this plan would be procedure 20 of the Field Operations Manual dated 6/24/92 (attached).

12. The location and nature of the sinkholes and drainage schematic will be provided to the Indiana Department of Environmental Management. They will provide the information to the appropriate local authorities and the hazmat teams. An emergency response plan will be followed. This constitutes procedure 20. Included in this information is an understanding that all types of spills are potentially hazardous to karst regions.

13. Indiana Department of Natural Resources, Indiana Department of Environmental Management, and the U.S. Fish and Wildlife Service personnel will monitor construction and maintenance to the agreed upon terms, as deemed necessary.

14. If during construction it is found that the mitigation agreement must be altered, all of the agencies will be contacted and agreement reached prior to work continuing in that specific area of the project. In order to not unduly delay projects, a two working days response time is needed from the resource agencies.

15. Treatments will be maintained during construction by means of a visual inspection on a weekly basis or after every rain. Corrective action will be taken as needed.

16. If after the above procedure is followed and a state/federal endangered/threatened species is found during construction, work in that area of the project will stop. The Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service will be immediately notified. The Indiana Department of Natural Resources and the U.S. Fish and Wildlife Service will promptly investigate the situation, advise the project administrator and assume responsibility for protecting the endangered species and taking the appropriate action.

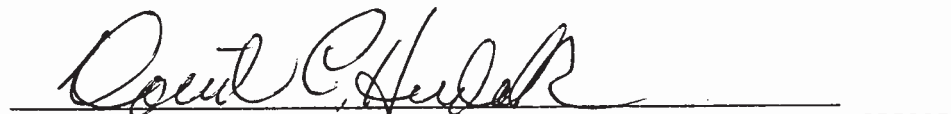
17. This document will be reviewed annually or more frequently at the request of any of the foregoing agencies.



  
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INDIANA DEPARTMENT OF NATURAL RESOURCES

  
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