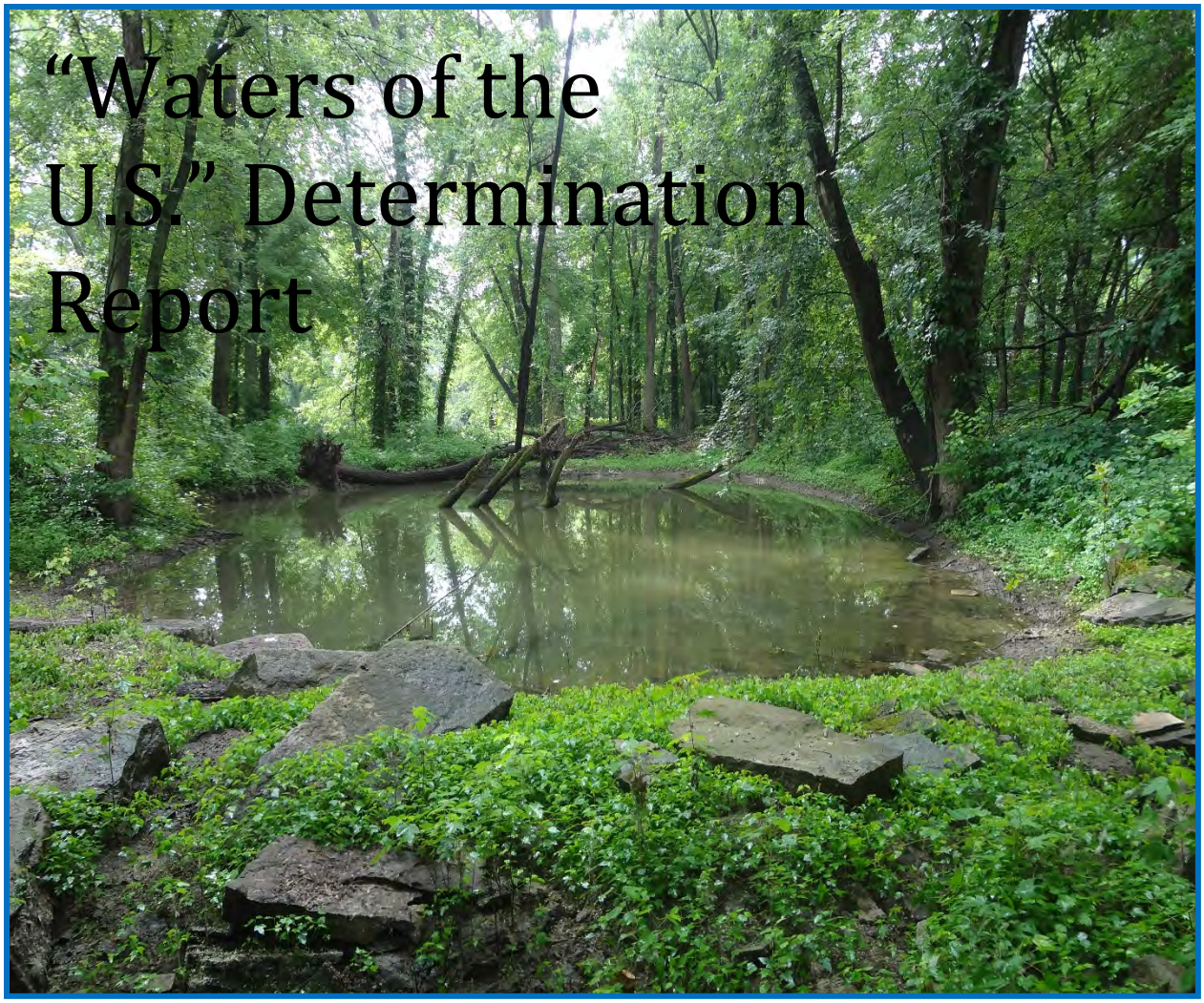

"Waters of the U.S." Determination Report

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August 23, 2016

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Professional Wetland Scientist

INVESTIGATION ALONG THE EAST FORK OF WHITE RIVER
CITY OF COLUMBUS, INDIANA

"Waters of the U.S." determination within the pre-determined study area.

WATERS OF THE U.S. DETERMINATION REPORT
Pre-Determined Study Area along the East Fork of White River
Located in the City of Columbus, Bartholomew County, Indiana

Prepared By: Butler, Fairman & Seufert, Inc.
Prepared For: CORE Planning Strategies, LLC

Date(s) of Field Investigation: June 15, 2016, August 9, 2016 and August 17, 2016

Project Location: Sections 23, 24, 25, and 26, Township 9 North, Range 5 East on the U.S. Geological Survey (USGS) Columbus, Indiana Quadrangle, within the City of Columbus, Bartholomew County, Indiana (see Figure 2)

Area of Investigation:

Butler, Fairman, and Seufert, Inc. in coordination with CORE Planning Strategies, LLC, created the study area for this "waters of United States" investigation. The area investigated is along the East Fork of White River near the southwestern limit of downtown Columbus, Indiana and includes the riparian corridors along both the west and east banks in addition to undeveloped areas within the pre-determined study area (see Figure 3).

All areas mapped as wetlands on the U.S. Fish and Wildlife Service's (USFWS) National Wetlands Inventory (NWI) map were investigated and sampling points (data points) were taken where wetland characteristics were observed and in any potential problem areas. Any drainage feature that displayed a defined channel and ordinary high water mark (OHWM) were considered potentially jurisdictional streams. Any water features that did not meet these criteria were not considered as streams.

Site(s) Background:

Prior to the field investigation, several reference materials were consulted to gain information about the site. The USGS quadrangle map and Light Detection and Ranging (LiDAR) survey was used to determine contours of the site and locate any water bodies in the area, as well as to provide a legal description of the area. The Soil Conservation Service's, now known as the Natural Resources Conservation Service (NRCS), 1976 Soil Survey of Bartholomew County was consulted to determine if the study area contained any soils listed in either the Hydric Soils of the United States manual or the State list of hydric soils along with a description of characteristics displayed by the mapped soil types of the area. The USFWS NWI map was used to find and classify any previously catalogued wetlands in the project area. The Indiana Department of Natural Resources' (IDNR) floodplain map was consulted to gain an understanding of historic flood locations and frequency. All of this information provided a background to the hydrologic regime of the area.

National Wetlands Inventory (NWI) Map

The following is a list of mapped wetlands located within the pre-determined study limits (see Figure 4).

East Fork White River (west bank)

- 55.0-acre, palustrine, forested, broad-leaved deciduous, temporarily flooded wetland (PFO1A) is mapped within the riparian zone north of the railroad bridge between the Driftwood River to the north, the East Fork of White River to the east, and agricultural fields to the west. This area is on city property.

- 5.5-acre, palustrine, scrub-shrub, broad-leaf deciduous, temporarily flooded, wetland (PSS1A) is mapped along the west side of the East Fork of White River between the SR 46 Bridge westbound bridge and the SR 46 eastbound bridge. This area is on city property.

- A small portion of an 80.0-acre, palustrine, forested, broad-leaved deciduous, temporarily flooded wetland (PFO1A) is mapped on the west side of the East Fork of White River near the southern limit of the study area. Only a portion of this mapped wetland occurs within the study area and is found on city property.

East Fork of White River (east bank)

- 3.75-acre, palustrine, forested, broad-leaved deciduous, temporarily flooded, wetland (PFO1A) is mapped between Mill Race Park Drive and the East Fork of White River, adjacent to the roadway and the river. This area is on city park property.

Soil Map Data

According to the NRCS's Web Soil Survey of Bartholomew County, Indiana (see Figures 6 – 8); the following soil type(s) are located within the proposed project area.

Map Abbreviation	Name	Hydric Soil Status
Ee (EcyAH)	Eel loam, 0-2% slopes Frequently flooded, brief duration	Not Hydric
Ge (GccAH)	Genesee loam, 0-2% slopes Frequently flooded, brief duration	Not Hydric
Md (MjjAH)	Medway silty clay loam, 0-2% slopes Frequently flooded, brief duration	Possible Hydric Inclusions (1% - 32%)
Ro (RtxAH)	Rossburg silt loam, 0-2% slopes Frequently flooded, brief duration	Possible Hydric Inclusions (1% - 32%)
Sh (SldAH)	Shoals silt loam, 0-2% slops Frequently flooded, brief duration	Possible Hydric Inclusions (1% - 32%)
Sz (SuoAH)	Stonelick fine sandy loam, 0-2% slopes Frequently flooded, brief duration	Not Hydric
Uaz	Udorthents, sandy	Not Hydric
Uby	Udorthents, loamy	Not Hydric

Ur (UenB)	Urban land – Fox complex, 2-6% slopes	Not Hydric

Summary of Findings:

There are three mapped waterways located near the study area. This is based on review of the USGS quadrangle map. These waterways are all mapped as perennial streams/rivers that all converge either within or near the study area. The first mapped waterway is the Driftwood River which flows from west to east and passes along the northwest boundary of the study area. It has a drainage area of approximately 1,150 square miles. The second mapped waterway is the Flatrock River, which flows from north to south and enters the study area from the north boundary. It has a drainage area of approximately 578 square miles. The Flatrock River and the Driftwood River merge at the northern study area limit and are renamed the East Fork of White River. The East Fork of White River then flows south, bisecting the study area. The third mapped waterway is Haw Creek which is located along the southeastern border of the study area. It flows into the East Fork of White River approximately 0.7 river mile south of the study limit boundary (see Figure 2). Most of the study area is within the Flatrock-Haw Watershed identified by the USGS Hydrologic Unit Code (HUC) 05120205. However, the Driftwood Watershed (HUC 05120204) and Flatrock-Haw Watershed (HUC 05120205) are confluent with the northern boundary of the Upper East Fork Watershed (HUC 05120206) just south of the study area.

Most of the study area is located within the regulated floodway of the East Fork of White River, including the contributing floodways of the Driftwood River, Flatrock River, and Haw Creek (see Figure 5). This position on the landscape is regularly flooded for brief periods of time. As a result, much of the study area is comprised of alluvial soils formed by years of sediment deposition. Further exasperating this condition is the presence of a low-head dam that has been in place since c.1903. This low-head dam occurs just downstream of the State Road 46 westbound bridge, and spans the entire width of the East Fork of White River. The presence of this dam has altered the hydrology of the area by increasing backwater, affected sediment transport, and changed the geophysical conditions of the East Fork of White River and nearby tributaries for several river miles upstream and downstream of the dam. As a result, the dam affects the immediate riparian corridors (transitional habitat zones between the terrestrial vegetated environment and the aquatic environment) along this section of the East Fork of White River by causing increased frequency of flooding and increased sediment deposition on the landscape. These factors help to assemble the vegetation community present within the study area.

The riparian corridor along the west bank of the East Fork of White River, comprising the bulk of the study area, is dominated by many of the species often found in an active floodplain forest habitat (riparian woodland). This includes an overstory consisting on silver maple (*Acer saccharinum*), boxelder (*Acer negundo*), eastern cottonwood (*Populus deltoides*), green ash (*Fraxinus pennsylvanica*), and American sycamore (*Platanus occidentalis*). Very few shrubs or small tree species are present in this environment. This is due to the dense coverage of canopy tree species and the frequent inundation that occurs. Herbaceous species such as Virginia wild rye (*Elymus virginicus*), reed canary grass (*Phalaris arundinacea*), stinging nettle (*Urtica dioica*), and great ragweed (*Ambrosia trifida*) dominate the forest floor. Other prevalent species observed within this portion of the study area included poison ivy (*Toxicodendron radicans*), wingstem (*Verbesina alternifolia*), and jumpseed (*Polygonum virginianum*). This area also included numerous drift deposits (woody and row crop debris piles), some areas of sparse ground vegetation, drainage ways, and heavy sediment deposition.

In order to investigate the study area, two environmental scientists worked in tandem and utilized the comprehensive wetland delineation method as outlined in the *1987 Corps of Engineers*

Wetland Delineation Manual as applied through the *Midwest Regional Supplement Ver. 2*. Transects were used to observe the terrestrial flora and for observations pertaining to wetland hydrology indicators and topography. The investigation surveyed all the areas with NWI-mapped wetlands along with all other non-developed parcels. There were several palustrine (inland) wetland areas discovered during the investigation. Once a positive wetland point was determined, the area was re-investigated using the routine determination method.

Wetland A, including Data Point 1 (DP1), is found within an NWI-mapped wetland. This wetland is a series of small, inter-connected backwater depression wetlands within the overlapping floodplains of the Driftwood River and the East Fork of White River. These depressions are dissimilar to the remaining riparian forest due to their lower contour on the landscape, lack of ground vegetation, and the presence of large drift deposits. Connecting these wetland areas were drainage ways that only flow during high water events, where the East Fork of White River blocks flow of the Flatrock River, thereby, forcing the extra water into an ephemeral channel[1] that passes through the riparian lowland. This channel is deeply incised and has substrate deposits consistent with stream channels including rounded gravel and small cobbles. At least three overland drainage ways from an adjacent agriculture field discharge into this overflow channel, contributing additional hydrology. As this hydrology flows east through the forest, it fills up its own channel until it reaches a large debris pile consisting of agricultural debris and woody material. At this point, the channel ends and fans out into the sparsely vegetated depressional areas within the forest that encompass Wetland A. The flow of the water slows greatly, yet it still follows the natural contour of the area, where it merges again just north of the railroad bridge over the East Fork of White River. At this point, it picks up velocity and due the presence of the low head dam, the water passes between the bridge's abutment and its first pier on the floodplain, passing over the riparian zone, under State Road 46 westbound bridge and joining the main channel of the East Fork of White River just downstream of the State Road 46 eastbound suspension bridge. The frequency and duration of this type of hydrologic movement has created a natural berm within the riparian zone, separating the overflow channel and the river. This natural berm contributes to the topography of the site, slowing the surface water flow in the backwater depressions, thus, only the lowest contours within the forest have sufficient hydrology, sustained long enough in the growing season to develop hydric soil indicators as described in the NRCS's *Field Indicators of Hydric Soils in the United States* manual. The remaining areas have higher elevations and do not have standing water for a lengthy period of time. As a result, DP1 is within a wetland complex named Wetland A which is much smaller than the NWI map illustrates (see Figures 4 and 9).

Outside the boundaries of Wetland 1 and the open water pond described later on as Wetland 2, the remaining areas along the western riparian zone of the East Fork of White River are non-wetland. Even though the area between the two State Road 46 bridges is mapped as a palustrine forested/shrub wetland, similar to the area north of the State Road 46 bridges, there are several significant differences between the two. First, the area between the State Road 46 bridges is within the former Columbus Old City Landfill Superfund site located within the study area along the west bank of the East Fork of White River. Its northern limit is the State Road 46 bridges and its southern limit is a large lake located approximately 1,900 feet south of the State Road 46 crossings. As part of the Superfund remediation, a soil cap ranging from 4 feet to 7 feet thick was placed over most the entire site. This cap covers much of that riparian area and as a result, altered the topography of the riparian zone. Second, and more importantly, this area is downstream of the low head dam. As a result, floodwaters are concentrated, velocity is increased, and it drains quickly once floodwaters recede, not allowing for any areas to pool. Third, the vegetation community is relatively uniform. It does not contain differing vegetation communities

[1] Ephemeral stream – A stream which flows only after rain or snow-melt and has no baseflow component.

based on topography like the forested area to the north that contains Wetland 1 and 2. Data Point 2 (DP2) was taken in this area. The result of the data shows that the vegetation community is hydrophytic. The area is dominated by eastern cottonwood (*Populus deltoides*) and silver maple (*Acer saccharinum*). However, the soil sample taken did not reveal any field indicators for hydric soils[2]. Considering the history of this site, its lack of field indicators, and its immediate adjacency to the East Fork of White River, DP2 was evaluated as potentially problematic hydric soils. According to the *Midwest Regional Supplement Ver. 2*, "fluvial sediments within floodplains may be problematic to evaluate hydric characteristics due to seasonal or annual deposition of new material, low iron content, and/or low organic content". Since the data points occur in the low terrace of the East Fork of White River valley, other parameters were considered in order to determine if DP2 is found in a problematic setting. Since DP2 did not contain adequate indicators of wetland hydrology but did contain hydrophytic vegetation, it was determined that this data point was not problematic. Further reasoning incudes the lack of sediment deposits or drift deposits within this sampling area. Since regular flood events occur within the area, which would allow for fluvial sediments to be deposited on a frequent to annual basis, then it stands to reason that evidence of sediment deposits or at least drift deposits would be present in the sampling area as they were in DP1 (see Data Sheet 1). Therefore, it should be concluded that some flood events occur along this section of the East Fork of White River and that when these events do occur, the flood water is trapped in the backwater area of DP1, contained within the shallow depressions found there. Once the flood recedes and the remaining water infiltrates, an aquitard[3] found within the depressions encompassing DP1, prevents these flood waters and/or direct precipitation from infiltrating. As a result, hydrology is prolonged within this depression, allowing for an anoxic[4] environment to occur within the root zone for a period sufficient within the growing season to create hydric soil indicators within the upper 16 inches of the soil profile. Therefore, the remaining areas within the low terrace are not wetland since they do not trap floodwaters for extended periods of time and do not show the soil indicators found at DP1. In addition, abrupt changes in the vegetation community around DP1 further illustrate the difference in soil chemistry as facilitated through differences in prolonged hydrology. This ecological filter has led to an obvious speciation within the area. This change in community originally observed on June 15, 2016 was substantiated as the boundary between wetland and non-wetland during observations made on August 17, 2016. Flood waters passing through the site at that time were inundating the sparsely vegetated areas and the transition zones comprised mainly of jumpseed (*Polygonum virginianum* and snakeroot (*Sanicula odorata*). Above the transition zone, mainly on minor slopes and the natural levee, stinging nettle (*Urtica dioica*) was dominant. This type of floristic composition gradient is not present in the riparian zone south of the State Road 46 bridges.

Wetland B (0.12-acre) is an excavated pond located immediately adjacent (within 20 feet) to the railroad bridge. This area is not within the wetlands illustrated on the NWI map. This depression contained greater than 3 feet of inundation, thus, making it an open-water wetland. It appears to be contained within its OHWM. It was likely a borrow pit used to construct the western spill slope of the adjacent railroad bridge. This feature appears to have a perched water table since its surface water elevation is several feet higher than that of the surface water elevation of the nearby East Fork of White River. Since the feature is an open-water type wetland and is contained within its banks, no data points were taken since the obvious boundary is within the pond's OHWM. See

[2] United States Department of Agriculture, Natural Resources Conservation Service. 2010. Field Indicators of Hydric Soils in the United States, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (Eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

[3] Aquitard – A water saturated sediment or rock whose permeability is so low it cannot transmit any useful amount of water.

[4] Anoxic – An environment in which there is no free oxygen atoms.

Figure 9 and Photo Sheet 2. Further, when the river is in flood stage, this pond is hydrologically linked to Wetland A, and the East Fork of White River, therefore, all of these features are jurisdictional under the Clean Water Act.

Wetlands C (0.02-acre) and D (0.09-acre) are small emergent depressions located next to each other on the former Columbus landfill site. Neither of these features were illustrated on the NWI-map. It appears that they formed as the result of surface water runoff from the partially improved gravel drive that occurs on the property. Water from the gravel road flows into these small depressions and then sits, unable to infiltrate into the soil column. Both of these depressions were dominated by obligate wetland species such as cattail (*Typha sp.*), spike rush (*Eleocharis sp.*), dark green bulrush (*Scirpus atrovirens*) and black willow (*Salix nigra*). See Photo Sheet 4. These areas are perched slightly above the surrounding landscape. Outside of their upper contours, the landscape begins to slope downhill slightly, ultimately leading to the floodplain terrace of the East Fork of White River which is approximately 200 feet away. Both of these small emergent wetlands are within the regulated floodway of the East Fork of White River, thus, they are hydrologically linked to the river, thereby making them jurisdictional under the Clean Water Act.

Conclusion and Recommendations:

There were three (3) rivers and four (4) wetlands identified during the field investigation for the Columbus River Front Study. All three waterways have defined channels, OHWMs, and apparent floodplains, making them jurisdictional "waters of the United States". All four (4) wetlands have a jurisdictional connection to "waters of the United States". Therefore, these wetlands should be considered jurisdictional under the Clean Water Act. The U.S. Army Corps of Engineers (USACE) have regulatory authority over all "waters of the United States". In addition, the Indiana Department of Environmental Management (IDEM) has jurisdiction over all "waters of the State of Indiana" including isolated wetlands. In addition, the majority of the study area falls within the regulated floodway as administered by the IDNR. Any disturbance within the regulated floodway requires permission from the IDNR and mitigation may be required.

No other locations within the study area exhibited the criteria to be classified as a "waters of the United States" at the time of the field investigation. It is recommended that coordination with the USACE, IDEM and the IDNR should occur prior to any construction, tree clearing or any other disturbance causing activity that is performed within the study area in order to verify the findings of this report.

Resource Summary Table

Stream/ Wetland Name	Photo Numbers	Latitude/ Longitude	OHWM width/depth	Actual USFWS/ USGS ID	Presence of Riffles/Pools	Functional Quality	Likely Water of the U.S.	Potential Stream Impact (ft.)
Flatrock River	No photo	39.206363; -85.935165	~ 200 ft. width/ ~6 ft. depth	Perennial	Yes	Average	**Yes**	Unknown
East Fork of White River	Photo 6	39.204366; -85.931554	~230 ft. width/ ~ 8 ft. depth	Perennial	Yes	Average	**Yes**	Unknown
Haw Creek	No photo	39.129934; -85.917377	~40 ft. width/ ~2 ft. depth	Perennial	Yes	Average	**Yes**	Unknown
Wetland 1	Photo 1	39.202002; -85.929592	n/a	PFO1A	n/a	Average	**Yes**	Unknown

Wetland 2	Photo 4	39.200293; -85.928356	n/a	PUBGx/ PFO1A	n/a	Average	**Yes**	Unknown
Wetland 3	Photo 7	39.193719; -85.921838	n/a	PEMC	n/a	Low	**Yes**	Unknown
Wetland 4	Photo 8	39.193528; -85.921706	6ft width/ 2ft depth	PEMC	n/a	Low	**Yes**	Unknown

References:

Chadde, Steven W. 2002. A Great Lakes Wetland Flora: A Complete Guide to the Aquatic and Wetland Plants of the Upper Midwest. 2nd ed. Laurium, MI. Pocketflora Press.

Cowardin, Lewis M., et al. 1979. Classifications of Wetlands and Deepwater Habitats of the United States. United States Fish and Wildlife Service. Office of Biological Services. Washington D.C. Publ. No. FWS/OBS-79/31.

Environmental Laboratory. 1987. Corps of Engineers Wetland Delineation Manual. U.S. Army Engineers Waterways Experiment Station. Vicksburg, MS. Tech Rpt. Y-87-1.

Hoggatt, Richard E. 1975. Drainage Areas of Indiana. U.S. Department of the Interior Geological Survey, Water Resources Division, in cooperation with the Indiana Department of Natural Resources, Division of Water.

Indiana Natural Resources Commission. Division of Hearings. 2007. "Roster of Indiana Waters Declared Navigable or Non-navigable".

Jackson, Marion T. 2004. 101 Trees of Indiana: A Field Guide. Bloomington, IN. Indiana University Press

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. *The National Wetland Plant List.* 2014 Update of Wetland Ratings. Phytoneuron: 2014-41: 1-42.

Mohlenbrock, Robert H. 2005. Aquatic and Standing Water Plants of the Central Midwest: Cyperaceae/Sedges. Carbondale, IL. Southern Illinois University Press.

Munsell Color. 2000. "Munsell Soil Color Charts". New Winsor, NY. Gretag-Macbeth Corporation.

Royer, France and Richard Dickinson. 1999. Weeds of the Northern U.S. and Canada. Edmonton, Alberta. University of Alberta Press.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at http://websoilsurvey.nrcs.usda.gov/ accessed [May 5, 2016].

Swink, Floyd and Gerould Wilhelm. 1994. Plants of the Chicago Region. 4th ed. Indianapolis. Indiana Academy of Science.

United States Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0), ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

United States Army Corps of Engineers Regulatory Guidance Letter No. 08-02. "Jurisdictional Determinations". June 26, 2008.

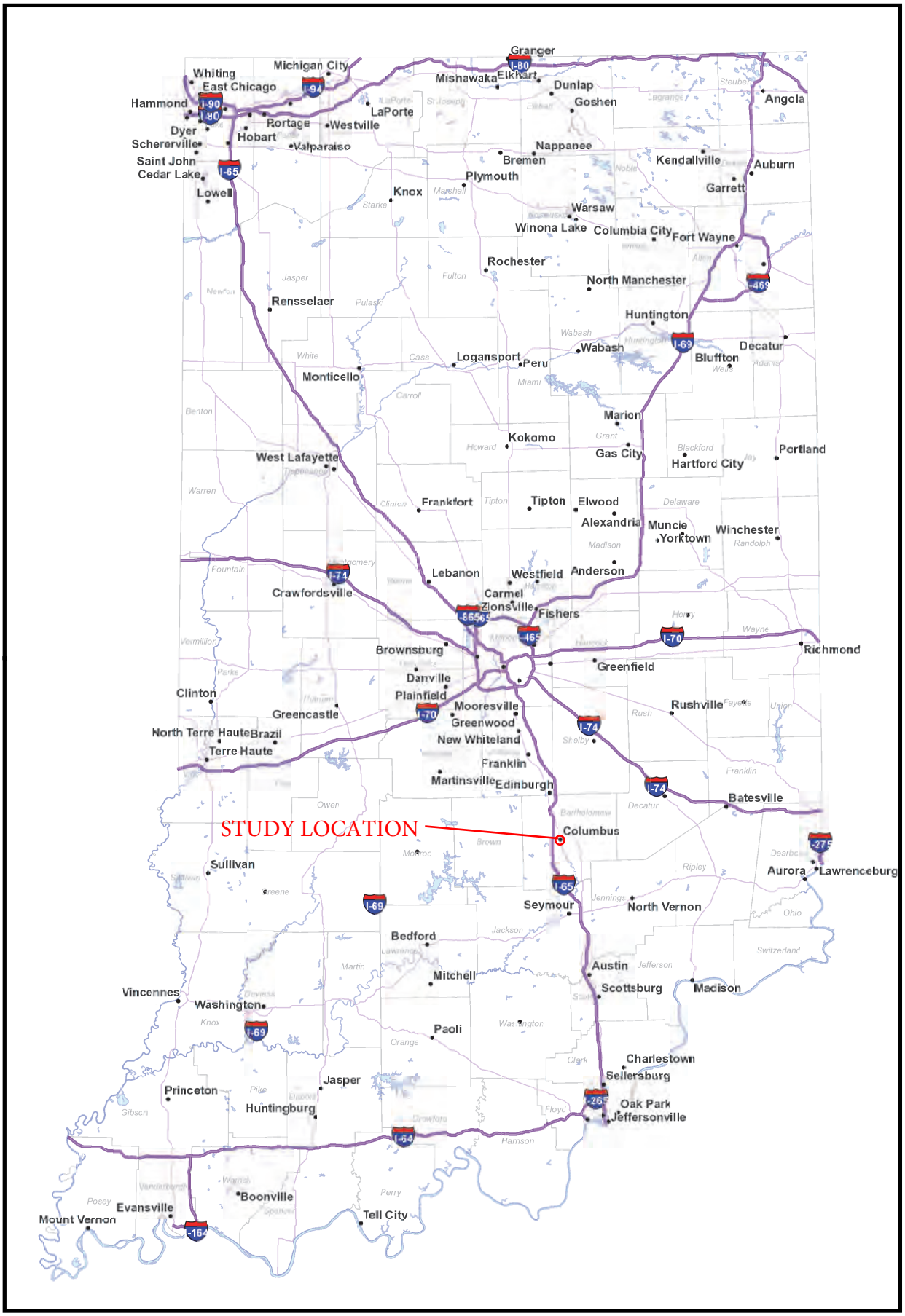
United States Department of Agriculture, Natural Resources Conservation Service. 2010. Field Indicators of Hydric Soils in the United States, Version 7.0. L.M. Vasilas, G.W. Hurt, and C.V. Noble (Eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

United States Department of Agriculture, Soil Conservation Service. 1991. Hydric Soils of the United States. Washington D.C. National Bulletin No. 1491.

United States Fish and Wildlife Service. Branch of Resource and Mapping Support "National Wetland Inventory of Bartholomew County, Indiana" [map]. Visual Scale. U.S. Fish and Wildlife Service Wetlands Mapper. Available online at http://www.fws.gov/wetlands/Data/Mapper.html/ accessed [May 5, 2016].

United States Geological Survey. "Columbus quadrangle, Indiana". 1:24,000. 7.5 Minute Series. Washington D.C.: USGS.

Weeks, Sally S. and Harmon P. Weeks. 2012. Shrubs and Woody Vines of Indiana and the Midwest: Identification, Wildlife Values, and Landscaping Use. West Lafayette, IN. Purdue University Press.



Legend

Map Source: Indiana Geological Survey (IGS), IndianaMap, ArcGIS Online (ESRI) World Imagery, ...

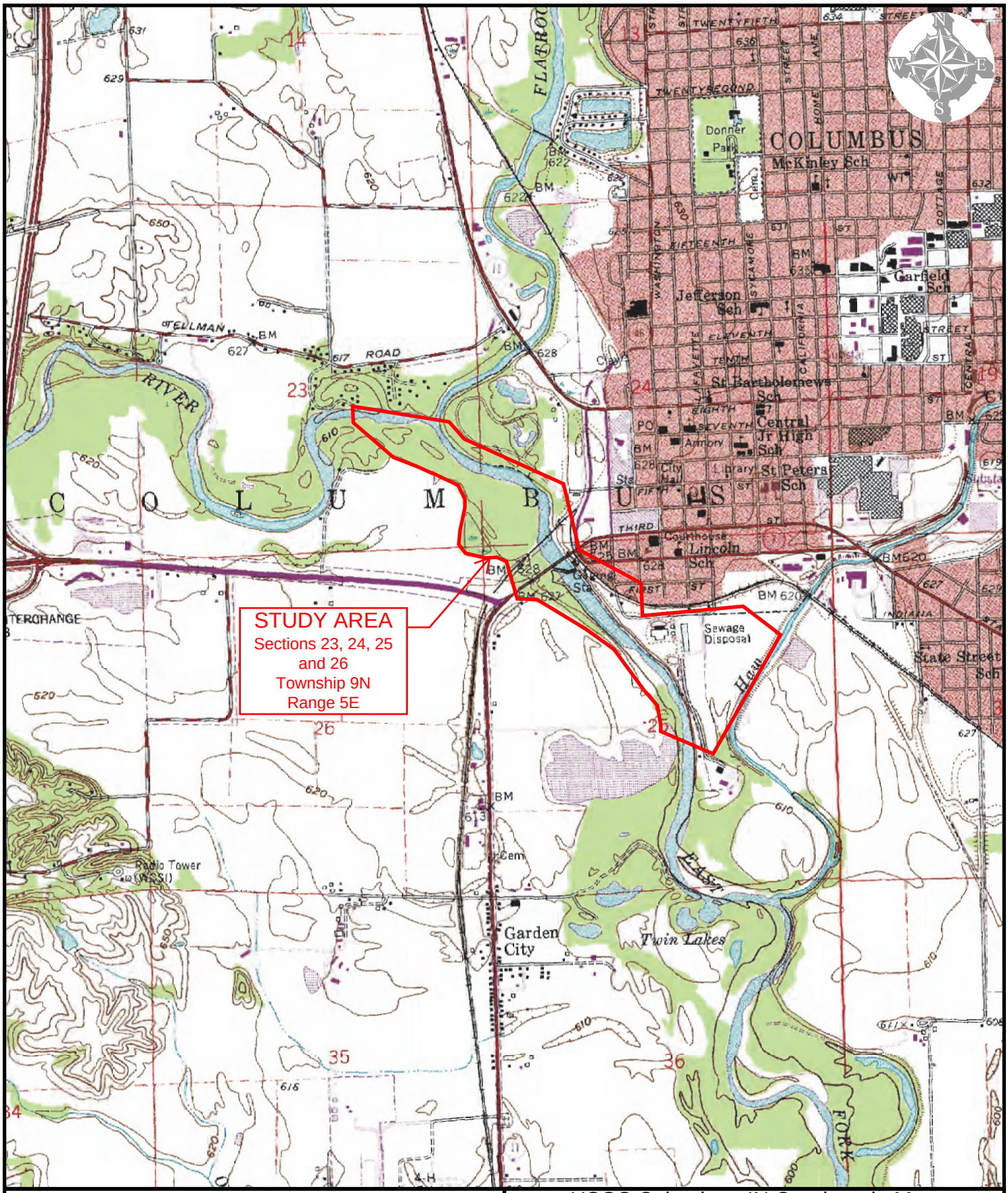
0 85,000 170,000 340,000 Feet

Butler Fairman Seufert
CIVIL ENGINEERS

State Map

Columbus River Front Study
City of Columbus
Bartholomew County, Indiana

Figure 1



0 500 1,000 2,000 Feet

Butler Fairman Seufert
CIVIL ENGINEERS

USGS Columbus, IN Quadrangle Map
Columbus River Front Study
City of Columbus
Bartholomew County, Indiana

Figure 2

Columbus Study for CORE Planning

Revised May 11, 2016

1:16,000

0 0.125 0.25 0.5 mi

0 0.2 0.4 0.8 km

Study Area

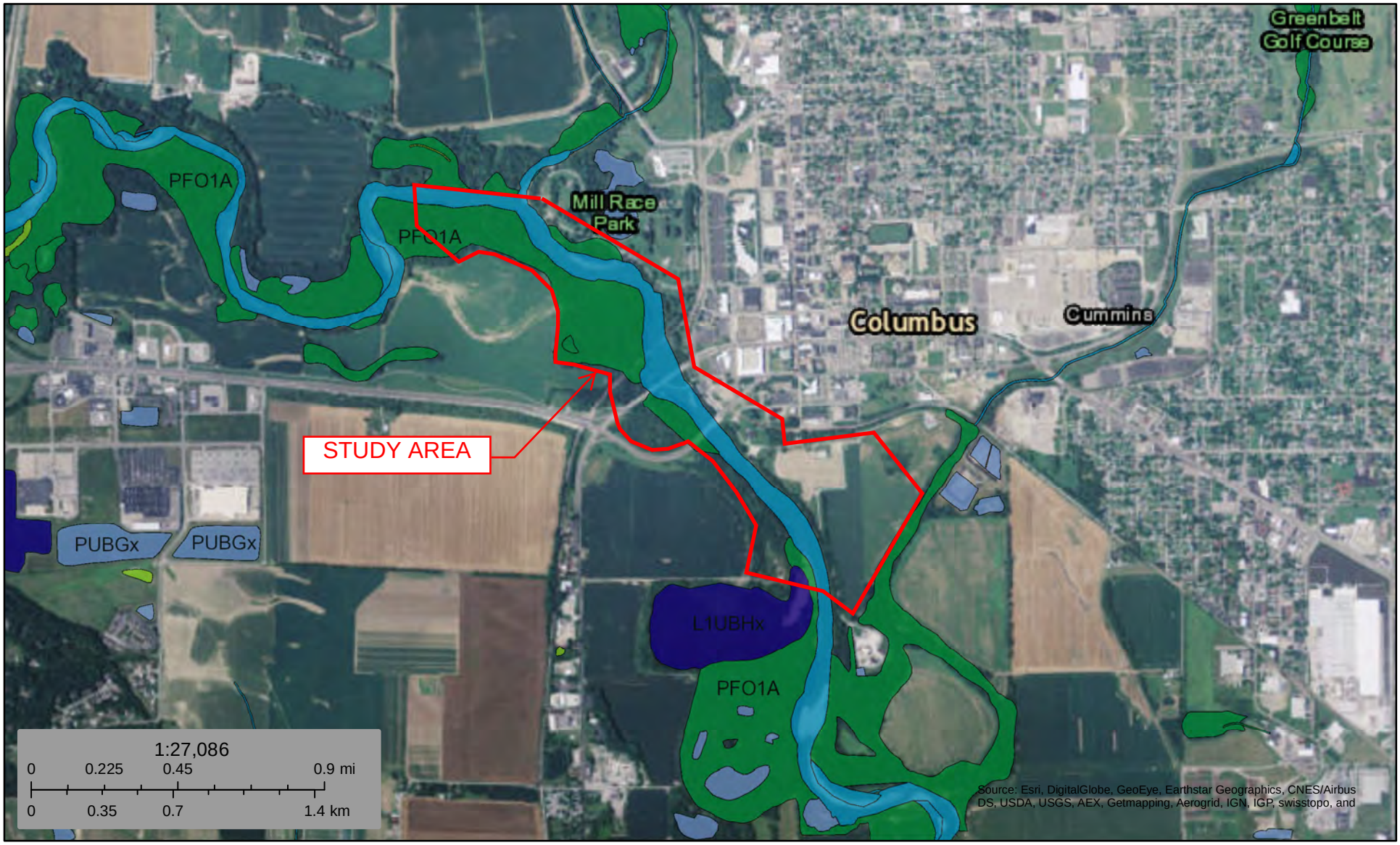
Indiana Spatial Data Portal, UITS, ESRI

Figure 3

BF&S

U.S. Fish and Wildlife Service
National Wetlands Inventory

Columbus River Front Study



August 9, 2016

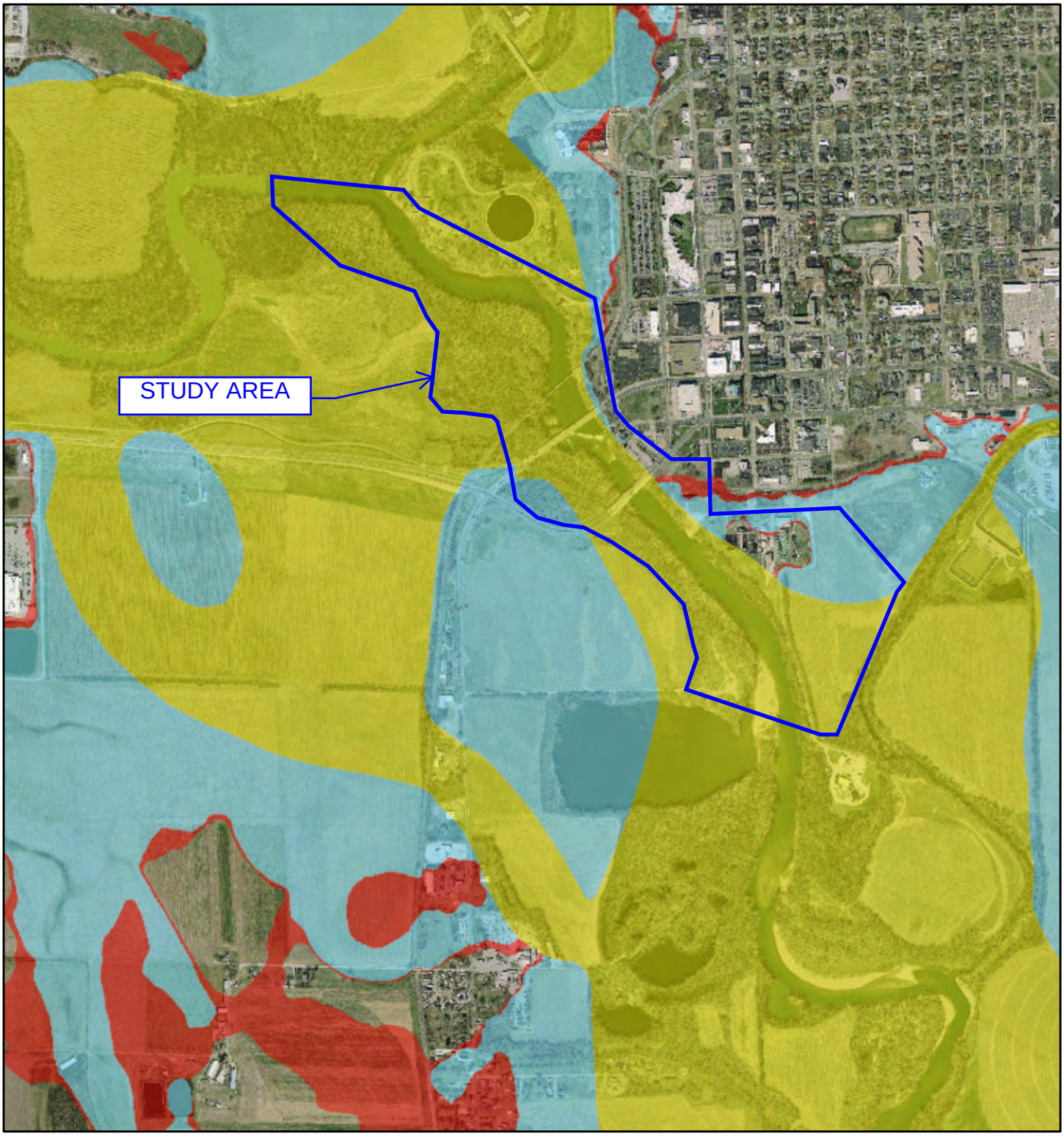
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

Figure 4

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Columbus River Front Study



August 10, 2016

1:16,000

0 0.125 0.25 0.5 mi

0 0.2 0.4 0.8 km

Floodplains - FIRM (June 2016)

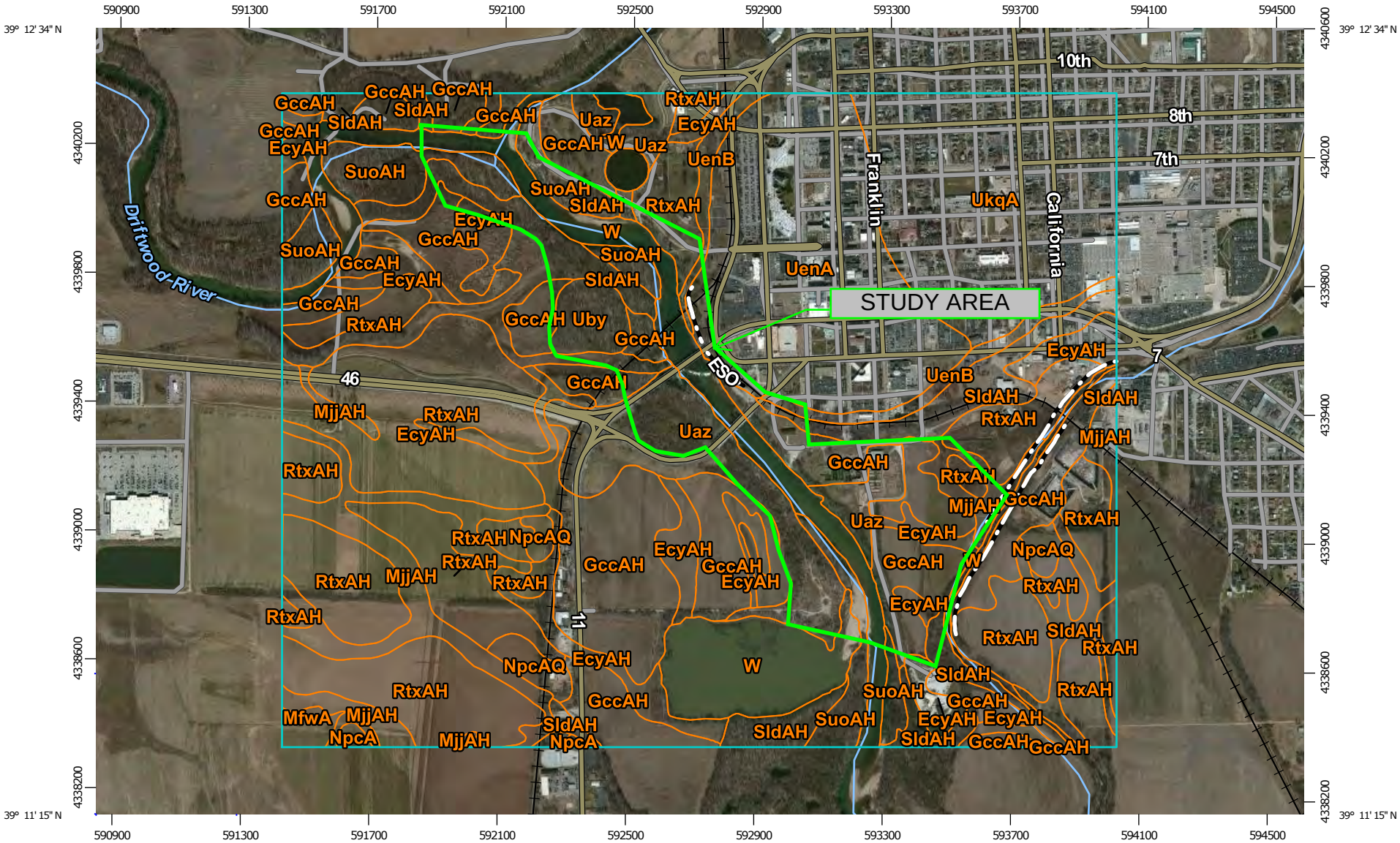
- Floodway
- 1% Annual Chance Flood Hazard
- 0.2% Annual Chance, Protected by Levee
- 0.2% Annual Chance Flood Hazard

Indiana Spatial Data Portal, UITS, ESRI
Federal Emergency Management Agency (FEMA), Indiana Department of Natural Resources (IDNR)

Figure 5

BF&S

Soil Map—Bartholomew County, Indiana
(Resource Inventory - Columbus, IN)



Map Scale: 1:17,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 250 500 1000 1500

Feet: 0 500 1000 2000 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bartholomew County, Indiana
Survey Area Data: Version 18, Sep 8, 2015

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

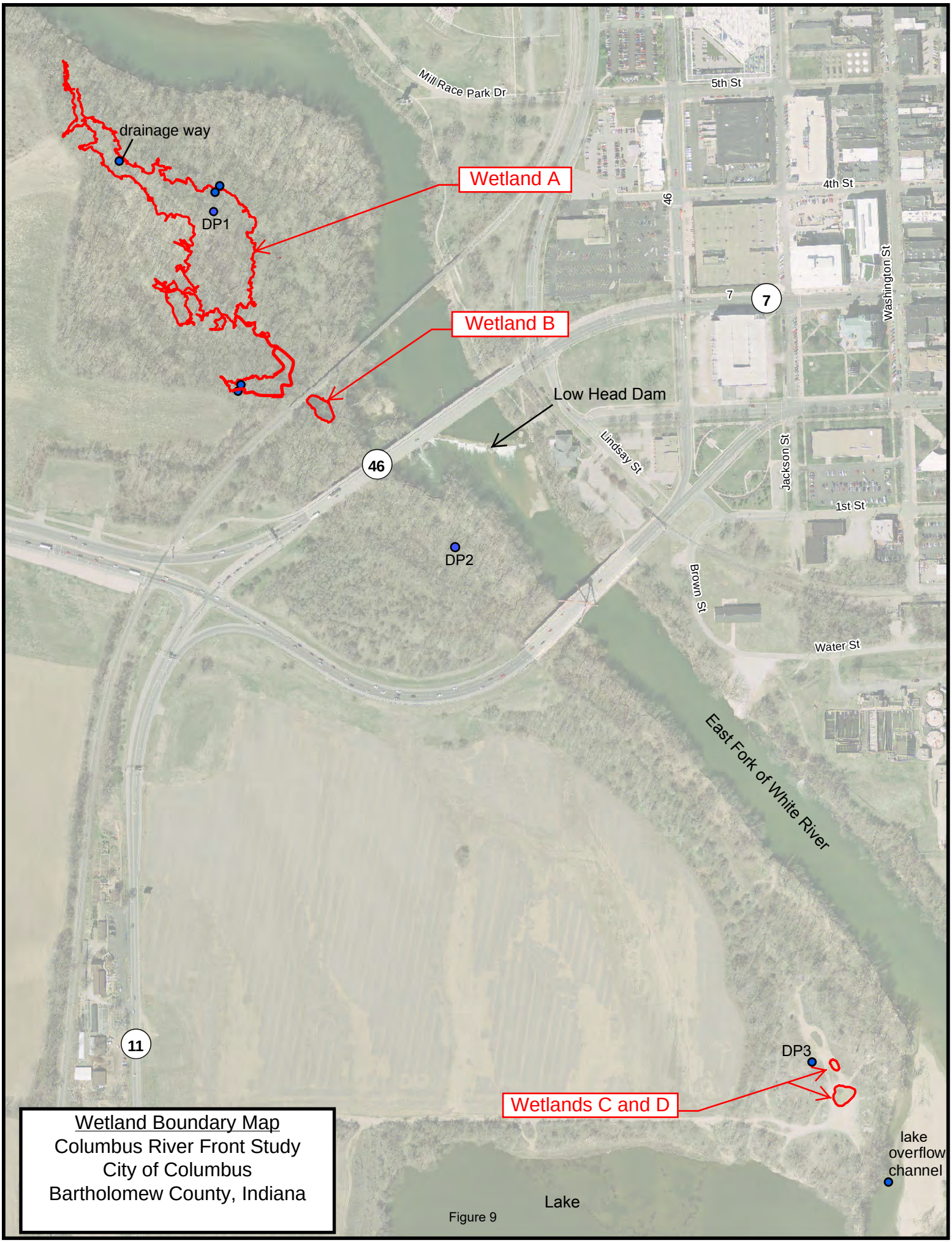
Date(s) aerial images were photographed: Sep 17, 2011—Mar 10, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

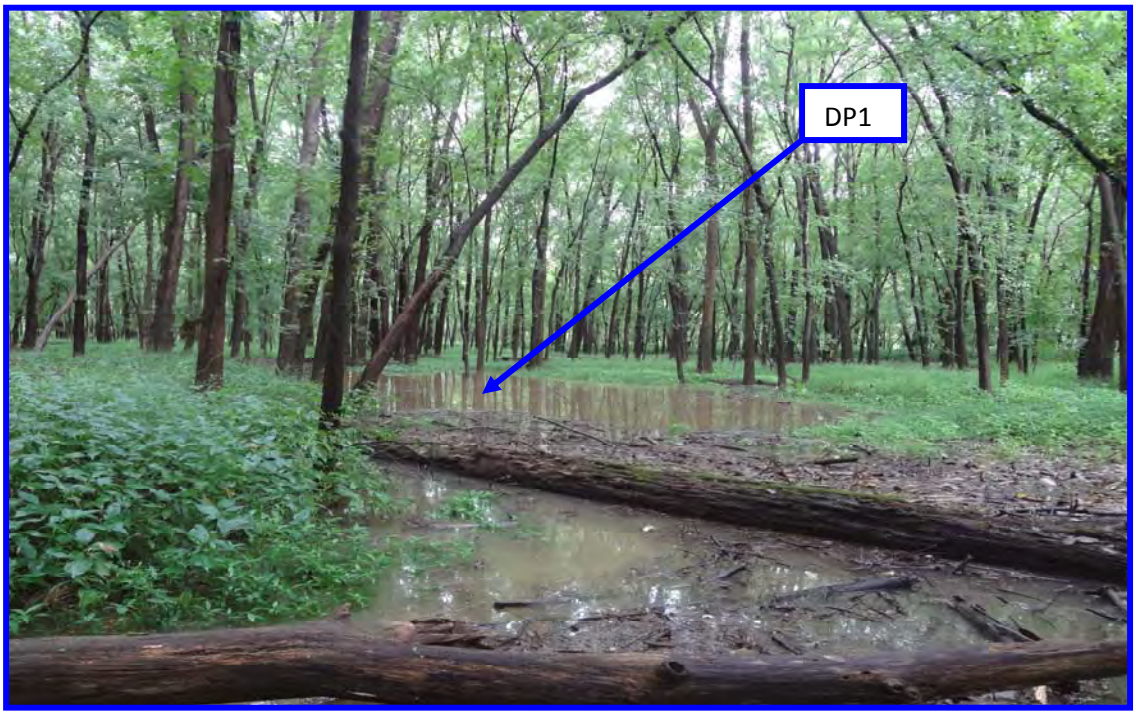
Bartholomew County, Indiana (IN005)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
EcyAH	Eel loam, 0 to 2 percent slopes, frequently flooded, brief duration	77.5	5.9%
GccAH	Genesee loam, 0 to 2 percent slopes, frequently flooded, brief duration	225.2	17.2%
MfwA	Martinsville loam, sandy substratum, 0 to 2 percent slopes	4.6	0.4%
MjjAH	Medway silty clay loam, 0 to 2 percent slopes, frequently flooded, brief duration	62.1	4.7%
NpcA	Nineveh gravelly sandy loam, 0 to 2 percent slopes	1.8	0.1%
NpcAQ	Nineveh gravelly sandy loam, 0 to 2 percent slopes, rarely flooded	12.8	1.0%
NpeB2	Nineveh sandy loam, 2 to 6 percent slopes, eroded	1.6	0.1%
RtxAH	Rossburg silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	282.5	21.6%
SldAH	Shoals silt loam, 0 to 2 percent slopes, frequently flooded, brief duration	105.9	8.1%
SuoAH	Stonelick fine sandy loam, 0 to 2 percent slopes, frequently flooded, brief duration	55.7	4.3%
Uaz	Udorthents, sandy	74.3	5.7%
Uby	Udorthents, loamy	11.9	0.9%
UenA	Urban land-Fox complex, 0 to 2 percent slopes	140.9	10.8%
UenB	Urban land-Fox complex, 2 to 6 percent slopes	17.7	1.4%
UkqA	Urban land-Nineveh complex, 0 to 2 percent slopes	124.8	9.5%
W	Water	110.5	8.4%
Totals for Area of Interest		**1,309.9**	**100.0%**

Figure 8



Wetland Boundary Map
Columbus River Front Study
City of Columbus
Bartholomew County, Indiana

Figure 9



1) Looking northwest at Data Point #1 (DP1) within Wetland A

2) Looking east at natural berm near DP1

3) Looking at upstream overflow channel carrying floodwater from Driftwood River through the study area and into the depressions surrounding DP1

4) Looking north at open water pond near railroad bridge (Wetland B)

5) Looking at east at Data Point 2 (DP2) in a non-wetland

6) Looking north at the low head dam spanning East Fork of White River

7) Looking south at Wetland C

8) Looking south at Wetland D

Wetland A in

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Columbus River Front Study City/County: Columbus/Bartholomew Sampling Date: 6/15/16

Applicant/Owner: City of Columbus State: IN Sampling Point: DP1 in

Investigator(s): Neal Bennett and Ryan Scott Section, Township, Range: Sec. 24, T9N, R5E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): slight depression

Slope (%): <2% Lat: 39.202002 Long: -85.929592 Datum: NAD 83

Soil Map Unit Name: (Uby) Udorthents loamy NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation —, Soil —, or Hydrology — significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____
Hydric Soil Present?	Yes X	No ____
Wetland Hydrology Present?	Yes X	No ____
Is the Sampled Area within a Wetland?	Yes X	No ____

Remarks:
Data point taken in the forested area north of the railroad bridge in a slight depression, with lack of vegetation, encircled by trees.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: *)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer saccharinum	30%	+	FACW
2. Fraxinus pennsylvanica	30%	+	FACW
3. Populus deltoides	30%	+	FAC
4. Platanus occidentalis	10%	—	FACW
5.			
	100% = Total Cover		

Sapling/Shrub Stratum (Plot size: *)			
1. none observed			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: *)			
1. Acer saccharinum (seedlings)	50%	+	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	50% = Total Cover		

Woody Vine Stratum (Plot size: *)			
1. Vitis riparia	10%	+	FACW
2. Toxicodendron radicans	10%	+	FACW
	20% = 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	0	x 1 =	0
FACW species	140	x 2 =	280
FAC species	30	x 3 =	90
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	170 (A)		370 (B)

Prevalence Index = B/A = 2.17

Hydrophytic Vegetation Indicators:

— 1 - Rapid Test for Hydrophytic Vegetation

+ 2 - Dominance Test is >50%

+ 3 - Prevalence Index is ≤3.0[1]

— 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

— Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
* Whole community was sampled.

SOIL

Sampling Point: DP1 in

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
A	0-2"	10YR 4/2	100%	—	—	—	—	CL	1¼" ribbon test
B1	2"-4"	10YR 5/2	95%	10YR 3/6	5%	C	M	S	No ribbon
B2	4"-16"+	10YR 4/2	98%	10YR 3/6	2%	C	M	C	2" ribbon test

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]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 X No ___

Remarks:
Soil sample had a clay loam upper horizon, stripped of organics, but below that, a 2 inch sand layer contained masked sand grains along with redox concentrations. Soil is hydric at this location.

HYDROLOGY

Wetland Hydrology Indicators:

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

- + Surface Water (A1) *
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- + Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- + Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ 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) (6:0) PASS

Field Observations:

Surface Water Present? * Yes X No ___ Depth (inches): ↑8"

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes X No ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
*Inundation present during field visit on 8/17/16.

Remarks:
Several indicators of hydrology were observed. Data taken on 6/15/16 & 8/17/16.

Wetland A out

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Columbus River Front Study City/County: Columbus/Bartholomew Sampling Date: 6/15/16

Applicant/Owner: City of Columbus State: IN Sampling Point: DP1 out

Investigator(s): Neal Bennett & Ryan Scott Section, Township, Range: Sec. 24, T9N, R5E

Landform (hillslope, terrace, etc.): natural levee Local relief (concave, convex, none): sloped

Slope (%): ~2% Lat: 39.202473 Long: -85.929748 Datum: NAD 83

Soil Map Unit Name: (SldAH) Shoals silt loam NWI classification: PFO1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation —, Soil —, or Hydrology — significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Data point taken on a mound near natural levee toe-of-slope. Indicative of the site outside of depressional areas.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: *)	Absolute % Cover	Dominant Species?	Indicator Status
1. Celtis occidentalis	50%	+	FAC
2. Populus deltoides	30%	+	FAC
3. Platanus occidentalis	10%	–	FACW
4. Acer saccharinum	10%	–	FACW
5.			
	100% = Total Cover		

Sapling/Shrub Stratum (Plot size: *)	Absolute % Cover	Dominant Species?	Indicator Status
1. Aesculus glabra	10%	+	FAC
2.			
3.			
4.			
5.			
	10% = Total Cover		

Herb Stratum (Plot size: *)	Absolute % Cover	Dominant Species?	Indicator Status
1. Sanicula odorata	50%	+	FAC
2. ~~Urtica~~ dioica	50%	+	FAC
3. Pilea pumila	1%	–	FACW
4. Bidens discoidea	1%	–	FACW
5. Polygonum virginianum	1%	–	FAC
6. Fraxinus pennsylvanica (seedlings)	1%	–	FACW
7. Solidago gigantea	1%	–	FACW
8.			
9.			
10.			
	105% = Total Cover		

Woody Vine Stratum (Plot size: *)	Absolute % Cover	Dominant Species?	Indicator Status
1. Toxicodendron radicans	20%	+	FACW
2.			
	20% = 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	0	x 1 =	0
FACW species	44	x 2 =	88
FAC species	191	x 3 =	573
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	235 (A)		661 (B)

Prevalence Index = B/A = 2.8

Hydrophytic Vegetation Indicators:

- — 1 - Rapid Test for Hydrophytic Vegetation
- ± 2 - Dominance Test is >50%
- ± 3 - Prevalence Index is ≤3.0[1]
- — 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- — Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
*whole community was sampled.

SOIL

Sampling Point: DP1 out

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
A	0-4"	10YR3/2	100%	—	—	—	—	SiL	<1" ribbon
B	4"-16+	10YR4/2	100%	—	—	—	—	SiL	<1" ribbon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]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 X

Remarks:
No field indicators present.

HYDROLOGY

Wetland Hydrology Indicators:

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

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Water-Stained Leaves (B9)
- ___ Aquatic Fauna (B13)
- ___ True Aquatic Plants (B14)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres on Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Gauge or Well Data (D9)
- ___ 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) (7:0) PASS

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): _____

Water Table Present? Yes ___ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): _____

Wetland Hydrology Present? Yes ___ No X

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

Remarks:
Adjacent to standing water that is approx. 6" deep. Mound near toe-of-slope. Debris piles surround the mound w/in the inundated areas. Wetland hydrology is downslope.

non-wetland

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Columbus River Front Study City/County: Columbus/Bartholomew Sampling Date: 6/15/16

Applicant/Owner: City of Columbus State: IN Sampling Point: DP2 out

Investigator(s): Neal Bennett & Ryan Scott Section, Township, Range: Sec. 25, T9N, R5E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none

Slope (%): ~2% Lat: 39.198848 Long: -85.926518 Datum: NAD 83

Soil Map Unit Name: (Vaz) Udarthents, sandy NWI classification: PSS1A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)

Are Vegetation —, Soil —, or Hydrology — significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Data point taken between road bridges backwater area, in a lower contour.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: *)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	70%	+	FAC
2. Acer saccharinum	30%	+	FACW
3.			
4.			
5.			
	100% = Total Cover		

Sapling/Shrub Stratum (Plot size: *)			
1. None observed			
2.			
3.			
4.			
5.			
	= Total Cover		

Herb Stratum (Plot size: *)			
1. Symphyotrichum racemosum	75%	+	FACW
2. Polygonum virginianum	5%	–	FAC
3. Ambrosia trifida	5%	–	FAC
4. Acer negundo (seedlings)	2%	–	FAC
5. Rudbeckia laciniata	2%	–	FACW
6. Elymus virginicus	2%	–	FACW
7. Viola septentrionalis	2%	–	FACU
8.			
9.			
10.			
	93% = Total Cover		

Woody Vine Stratum (Plot size: *)			
1. None observed			
2.			
	= 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	0	x 1 =	0
FACW species	109	x 2 =	218
FAC species	82	x 3 =	246
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	193 (A)		472 (B)

Prevalence Index = B/A = 2.4

Hydrophytic Vegetation Indicators:

- — 1 - Rapid Test for Hydrophytic Vegetation
- + 2 - Dominance Test is >50%
- + 3 - Prevalence Index is ≤3.0[1]
- — 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- — Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
*whole community was sampled

SOIL

Sampling Point: DP 2 out

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
A 0-4"	10YR4/2	50%	—	—	—	—	SiCL	
B 4"-16+	10YR4/3	50%	—	—	—	—	SaL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if observed):

Type: n/a

Depth (inches): ___

Hydric Soil Present? Yes ___ No X

Remarks:
No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? Yes ___ No X

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

Remarks:
No water filled the pit, and no saturation was present within the sample, even though the site had received significant rainfall in prior days.

Wetland C & D out

WETLAND DETERMINATION DATA FORM – Midwest Region

Project/Site: Columbus River Front Study City/County: Columbus / Bartholomew Sampling Date: 8/17/16
Applicant/Owner: City of Columbus State: IN Sampling Point: DP3 out
Investigator(s): Neal Bennett & Ryan Scott Section, Township, Range: Sec. 25, T9N, R5E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none
Slope (%): ~2% Lat: 39.193695 Long: -85.922025 Datum: NAD 83
Soil Map Unit Name: (UaZ) Udorthents, sandy NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation —, Soil +, or Hydrology — significantly disturbed? Are "Normal Circumstances" present? Yes X 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 X	No ____	Is the Sampled Area within a Wetland? Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks: Data point taken just west, and downslope of perched, emergent wetlands, isolated by dirt driving paths.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30' radius)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus deltoides	30%	+	FAC
2. Platanus occidentalis	15%	+	FACW
3.			
4.			
5.			
	45% = Total Cover		
Sapling/Shrub Stratum (Plot size: 15' radius)			
1. Ulmus sibericum (juvila)	50%	+	UPL
2.			
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: 5' radius)			
1. Poa pratensis	80%	+	FAC
2. Conyza canadensis	20%	+	UPL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. None observed			
2.			
	____ = 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: 5 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 60% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	110	x 3 =	330
FACU species	0	x 4 =	0
UPL species	70	x 5 =	350
Column Totals:	195 (A)		710 (B)

Prevalence Index = B/A = 3.6

Hydrophytic Vegetation Indicators:
— 1 - Rapid Test for Hydrophytic Vegetation
+ 2 - Dominance Test is >50%
— 3 - Prevalence Index is ≤3.0[1] FAILS
— 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
— Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks: (Include photo numbers here or on a separate sheet.)
Passes the dominance test, but fails the prevalence index. Radius sampling plots were used.

SOIL

Sampling Point: DP3 out

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6"	10YR 5/3	100%	—	—	—	—	S	no ribbon

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

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

Indicators for Problematic Hydric Soils[3]:

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

[3]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 X

Remarks:
Fill cap brought in to remediate the site. Large gravel below 6" prevented deeper soil sampling.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Water Table Present? Yes ____ No X Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ____ No X Depth (inches): _____

Wetland Hydrology Present? Yes ____ No X

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

Remarks:
Hydrology moves quickly through the sand layer, downhill, toward slopes that ultimately lead to the river.