

**Vinton Solar Energy LLC
Case No. 17-774-EL-BGN**

Application Part 4 of 5

Part 4 includes:

- **Exhibit F TRC Wetlands and other Waters of the U.S. Delineation Report June 2017**

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Exhibit F

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**WETLANDS AND OTHER WATERS OF THE U.S.
DELINEATION REPORT**

Vinton Solar Energy Center

Vinton County, Ohio

June 2017

TRC Project No. 274099.0000.0003



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Acronyms

FAC	Facultative
FACU	Facultative upland
FACW	Facultative wetland
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
HHEI	Headwater Habitat Evaluation Index
HUC	hydrologic unit code
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OBL	Obligate wetland
Ohio EPA	Ohio Environmental Protection Agency
ORAM	Ohio Rapid Assessment Method
PEM	Palustrine emergent
PFO	Palustrine forested
PHWH	Modified Class I Primary Headwater Habitat
POW	Palustrine open-water
Project	Hardin Solar Energy Center Project
PSS	Palustrine Scrub-shrub
QHEI	Ohio EPA Qualitative Habitat Evaluation Index
Report	Wetlands and Other Waters of the U.S. Delineation Report
RPW	Relatively Permanent Water
TNW	Traditional Navigable Water
TRC	TRC Environmental Corporation
UPL	Upland
U.S.	United States
USACE	United States Army Corps of Engineers
USDA-NRCS	United States Department of Agriculture – Natural Resources Conservation Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VSE	Vinton Solar Energy, LLC

1.0 Introduction

On behalf of Vinton Solar Energy, LLC. (VSE), TRC Environmental Corporation (TRC) has prepared this Wetlands and Other Waters of the U.S. Delineation Report (Report) as part of the environmental studies conducted for the Vinton Solar Energy Center Project (Project), located in Vinton County, Ohio. This Report contains the methodology and results of the wetland identification and delineation investigations performed by TRC. Mr. Nathan Renaudin (TRC), an environmental scientist who has been performing wetland delineations for over six years, was the lead field scientist and primary author of this Report.

The primary objective of the survey was to identify and evaluate wetlands and other waters of the U.S. within the Study Area, such that the resources could be considered in the planning, design, permitting, and installation of the proposed Project in accordance with Ohio Administrative Code (OAC) Chapter 4906-4-08 (B)(1)(a)(iv-v)-(b).

The Study Area consists of the potential construction impact area and an approximately 100-foot (30-meter) buffer totaling approximately 1,250 acres (506 hectares) of pastureland, cultivated cropland, emergent herbaceous wetlands, developed land of varying intensities, and mixed and deciduous forest around the edges. Nearly, all of the Study Area had been surface mined for coal and reclaimed to modern standards, i.e. grading to approximate original contour, replacement of topsoil and revegetation with a stable ground cover (USDA 2016) (USGS 1994). Currently, the Study Area is privately-owned land being used primarily to raise cattle (Appendix A, Figure 1).

The Study Area lies within the Unglaciaded Plateau section of the Allegheny Plateau physiographic province of Ohio (Wilkin, Nava and Griffith 2011). The Unglaciaded Plateau covers southeastern Ohio and contains deep valleys, high hills, and winding streams (ODNR 2017). Sandstone is common in the region and supports a variety of cliffs, gorges, natural bridges and waterfalls. A long belt of high hills stretching from Monroe to Columbiana Counties divides eastward and westward flowing streams (ODNR 2017). Topography in the region consists of steep slopes and high ridges, with elevations ranging from 781 feet (238 meters) above mean sea level, to approximately 961 feet (293 meters) above mean sea level along the ridgetops. The proposed Project is located within the Ohio River drainage basin. The United States Department of Agriculture-Natural Resources Conservation Service (USDA-NRCS) maintains a classification system for identifying watersheds by hydrologic unit code (HUC). The Project is located within the Raccoon-Symmes (8-Digit HUC: 05090101) river basin (USDA-NRCS 2013). The streams and

tributaries found within the Study Area include unnamed tributaries to Raccoon Creek and Elk Fork. The Study Area is located within Elk Township in Vinton County, Ohio (Appendix A, Figure 1).

2.0 METHODOLOGY

Pursuant to the USACE wetlands and other waters of the U.S. delineation methodology, potential wetland and other waters of the U.S. located within the Study Area were identified, delineated, and mapped through the combined use of existing available public source information and field investigations.

2.1 DESKTOP REVIEW METHODOLOGY

The sources utilized for the desktop review included: the United States Geological Survey (USGS) Zaleski, Ohio (1985) and McArthur (1961) 7.5 minute series topographical quadrangles (Appendix A, Figure 1), soil datasets acquired from the Natural Resources Conservation Service (NRCS) Web Soil Survey (USDA 2016) for Vinton County, Ohio (Appendix A, Figure 2), the United States Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) for Ohio (Appendix A, Figure 3), and the Federal Emergency Management Agency (FEMA) flood hazard risk map (FEMA 2016; Appendix A, Figure 4). Sources were reviewed to identify conditions that may be present at the Study Area. The results of the desktop review were used to aid in the field investigation.

2.2 FIELD METHODOLOGY-WETLANDS

Wetland resources within the Study Area were identified and their boundaries determined in accordance with the United States Army Corps of Engineers *Wetlands Delineation Manual (1987 Manual)* (USACE 1987), utilizing the *Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual: Eastern Mountains and Piedmont Region (Version 2.0) (Regional Supplement)* (USACE 2012). Consistent with the *1987 Manual*, wetland determinations were based on dominant plant species, soil characteristics, and hydrologic characteristics. In addition, wetlands and other waters of the U.S. were evaluated in accordance with the Ohio Environmental Protection Agency (Ohio EPA) as part of the State of Ohio's Water Quality Standards (OAC Chapter 3745-1). Areas that exhibit hydric soils, wetland hydrology, and a dominance of hydrophytic vegetation were considered potentially jurisdictional wetlands. Wetlands or other waters of the U.S. are considered potentially jurisdictional until verified by the USACE (USACE 2008).

Since the majority of Study Area was located in reclaimed coal mined land, most of the wetlands have signs of hydrologic regime change, multiple vegetative influences and soil overturn. These wetlands are identified as "problematic" and specific influences were documented within the Wetland Determination Data Forms-Eastern Mountains and Piedmont Region. A photographic log of field observations is

presented in Appendix B. Completed USACE Wetland Determination Data Forms- Eastern Mountains and Piedmont Region are presented in Appendix C.

Soils were examined by excavating a soil pit with a shovel approximately 12 to 20 inches (30 to 51 centimeters) below the ground surface. The exposed soil profile was examined for characteristics using hydric soil criteria described in the National Technical Committee for Hydric Soils *Field Indicators of Hydric Soils in the United States* (USDA 2010). Hue, value, and chroma of the matrix (e.g., 10YR 6/1) and mottles (e.g., 10YR 5/6) of moist soils are examined, as determined by using the *Munsell Soil Color Chart* (Munsell Color 2009). Mottled soils with a matrix chroma of 2 or less, or unmottled soils with a matrix chroma of 1 or less are considered to exhibit hydric soil characteristics (USDA 2010). Mottled soils with a matrix chroma greater than 2 and unmottled soils with a matrix chroma greater than 1 are considered to exhibit non-hydric characteristics.

The hydrology criterion in the *Regional Supplement* requires that an area exhibit at least one primary or at least two secondary indicators of wetland hydrology. Examples of primary wetland hydrology indicators include standing water or saturated soils, water marks on trees, drift lines, water-stained leaves, and oxidized root zones surrounding living roots. Examples of secondary wetland hydrology indicators include drainage patterns, microtopographic relief, presence of crayfish burrows, and sparsely vegetated concave surfaces. Additional secondary signs of hydrology include visible saturation on aerial photography and a positive facultative (FAC)-neutral test as described below (USACE 2010).

Plants were identified to the lowest taxonomic level possible, using professional texts to differentiate cryptic taxa (E. L. Braun 1967) (E. L. Braun 1969) (Gleason and Cronquist 1991) (Holmgren 1998) (Mohlenbrock 2001) (Mohlenbrock 2001) (Mohlenbrock 2002) (Mohlenbrock 2006) (Mohlenbrock 2011) (Newcomb 1977) (Rhoads and Block 2007, Rothrock 2009) (Stein, Binion and Acciavatti 2003) (Voss and Reznicek 2012) (Weakley, Ludwig and Townsend 2013). Dominant vegetation for each community was determined by estimating dominant species in the tree, sapling, shrub, herbaceous, and woody vine strata. Dominant species was determined by using the 50/20 dominance rule for each stratum, which was accomplished by estimating the percent areal cover for each species. The relative percent areal cover was calculated for each species by dividing each species percent cover by the total percent cover for all species and multiplying by 100. The species were then arranged in descending order of relative percent cover. A running total was kept by adding the relative cover of each species starting with the species with the highest relative cover until the total cover equals 50. All species included in this calculation are regarded as dominant. Species

of equal cover value that contributed to meeting the sum of 50 are also considered dominant. Additionally, other species that solely accounted for 20 percent or more of the relative percent cover were also considered dominant species.

The indicator status of each dominant species was determined. An indicator status of obligate wetland (OBL), facultative wetland (FACW), FAC, facultative upland (FACU) and/or upland (UPL) has been assigned to each plant species in the *U.S. Army Corps of Engineers National Wetlands Plant List* (Lichvar, Banks, et al. 2016). In accordance with the aforementioned guidance, an area was classified with hydrophytic vegetation when, under normal circumstances, more than 50 percent of the composition of the dominant species from all strata has OBL, FACW, and/or FAC species.

A FAC-neutral test was calculated for each data set as a means of determining the presence of wetland hydrology. This test considers all FAC species as neutral for wetland determination and compares the number of dominant species wetter than FAC (e.g. OBL, FACW) against the number of dominant species drier than FAC (e.g. FACU, UPL). A positive FAC-neutral test results when dominant species wetter than FAC are more prevalent than dominant species drier than FAC. A positive FAC-neutral test is a secondary indicator of wetland hydrology.

Plots, and consequently communities, that meet the three criteria of hydric soils, wetland hydrology, and hydrophytic vegetation are considered wetlands. Wetland boundaries were mapped where one or more of these criteria gave way to upland characteristics. Samples were also taken in nearby apparent upland areas to confirm that one or more of the criteria were not met in these locations.

Wetlands within the Study Area were classified according to the USFWS *Classification of Wetlands and Deepwater Habitats for the United States* (Cowardin, et al. 1979). Wetland classifications were based upon hydrophytic vegetation type and dominance found within the delineated wetland, and included the following classification types: palustrine emergent (PEM), palustrine scrub-shrub (PSS), palustrine forested (PFO), palustrine open-water (POW), or a combination of these classifications (Cowardin, et al. 1979).

The wetland boundaries were flagged, and surveyed through the use of a Global Positioning System (GPS) receiver capable of sub-meter accuracy (model R1 handheld, Trimble, Sunnyvale, California). The delineated wetlands were labeled (e.g., *Wetland 1*, *Wetland 2*, etc.), and correspond to the wetlands

illustrated on the Delineated Resources map provided in Appendix A, as Figure 5A). The wetland boundaries were mapped as polygons and the wetland areal extents were calculated using the shapefile properties utility in ArcMap.

Wetland boundaries that extended beyond the Study Area were collected to the edge of the Study Area and categorized as “Open Ended” within the GPS data to indicate that the wetland continued. Wetlands that were just outside the Study Area had points collected on them and were indicated as “Outside Study Area” within the GPS data.

2.3 OHIO RAPID ASSESSMENT METHOD

In accordance with Ohio requirements, delineated wetlands within the Study Area were categorized using the Ohio Rapid Assessment Method (ORAM Version 5.0) (Mack 2001). The scoring sheets (data forms) for individual wetlands were completed and were the basis for the provisional wetland categorizations. The ORAM is designed to aid in the determination of wetland categories as defined in Ohio’s Wetland Antidegradation Rule (OAC Rule 3745-1-54). Wetlands were categorized as low quality (Category 1) to high quality (Category 3). The score from the Quantitative Rating ranges from 0 to 100 and the scoring breakdown for wetland regulatory categories is as follows:

Category 1: 0 – 29.9 (Low Quality)

Category 1 or Gray Zone: 30 – 34.9

Category 2: 35 – 59.9 (Moderate Quality)

Category 2 or 3: 60 – 64.9

Category 3: 65 - 100 (High Quality)

The ORAMs were performed using detailed field evaluations and supplemented by aerial photographic interpretation to aid in boundary determination estimates located beyond the Study Area. While the score and conclusions of the ORAM are designed such that they correlate well with more detailed measures of the biology of wetland, they are not considered absolutely definite. ORAM scores are considered preliminary until verified by the Ohio EPA. Refer to Appendix D for completed data forms.

The scoring sheets (ORAM Version 5.0 Field Form Quantitative Rating) for individual wetlands were completed and were the basis for the provisional wetland categorizations. The delineated wetlands and preliminary ORAM scores are illustrated in Appendix A, Figure 5B.

2.4 OTHER WATERS OF THE U.S.

The Study Area was screened for the presence of areas that meet the criteria for “other waters of the U.S.” specified in the *1987 Manual*. Other waters of the U.S. consist of ephemeral, intermittent, and perennial streams, as well as open water features, such as ponds. Drainage channels that exhibited defined “bed and bank” and an ordinary high water mark in the channel were identified and delineated as jurisdictional streams. Drainage channels that do not exhibit an ordinary high water mark and/or defined bed and bank were regarded as non-jurisdictional drainages. Jurisdictional determinations are made by the USACE; therefore, all determinations are preliminary until verified by the USACE.

Streams identified during delineations were evaluated using the methods outlined in *Biological Criteria for the Protection of Aquatic Life* (OEPA 1986; 2015). These approved assessment methods provide an empirical, quantified evaluation of streams as required by the State of Ohio for permitting and mitigation purposes. These classifications are regularly utilized to determine the level of compensatory mitigation that may be needed for impacts to waters of the U.S. Depending on the size of the stream’s drainage area, data collection for all potential streams includes completion of either the Ohio EPA Qualitative Habitat Evaluation Index (QHEI) or the Headwater Habitat Evaluation Index (HHEI) Data Form. Where coverage was available, the, drainage area was calculated using automated basin characteristics from USGS StreamStats v 4.0: Ohio (USGS 2016b).

Following Ohio EPA guidance, any stream with a drainage area of greater than 1.0 square mile (2.6 square kilometers), or which has pools with maximum depths over 15.8 inches (40.0 centimeters), as determined by measuring pool depth within the stream, was evaluated using the QHEI. Data on these streams were collected in the QHEI form provided by the Ohio EPA. The QHEI is composed of six principal metrics: substrate, instream cover, channel morphology, riparian zone and bank erosion, pool/glide and riffle-run quality, and map gradient. Each metric is scored separately and summed to obtain the total QHEI score. Narrative ranges vary slightly in smaller streams (<20 square miles; 52 square kilometers) compared to larger streams. For smaller streams: Excellent >70, Good 55-69, Fair 43-54, Poor 30-42, and Very Poor <30; for larger streams: Excellent >75, Good 60-74, Fair 45-59, Poor 30-44, and Very Poor <30.

The HHEI was utilized to score streams with a drainage area of less than 1.0 square mile (2.6 square kilometers). Data on these streams were collected on the HHEI forms, provided by the Ohio EPA. Observational data regarding the physical nature of the stream corridor including stream flow, riparian zone land use and buffer width, and channel modification were recorded. Measurements included bankfull

width, maximum pool depth and substrate composition. A biological survey was conducted if deemed necessary using best professional judgment.

Using the scoring method associated with these forms, a Class I, II, or III was assigned to each stream (with Class I being the least protected and Class III being the most protected). Streams that exhibited a major change in morphology were scored at multiple representative locations. QHEI and HHEI scores are considered preliminary until verified by the Ohio EPA. Appendix E provides completed Ohio EPA QHEI Field Sheets and HHEI Data Forms. The delineated wetlands and QHEI and HHEI scores are illustrated in Appendix A, Figure 5B.

The Study Area was investigated for other waters of the U.S. that are considered “open water” by the USACE. For this project, open water was considered to be “an area that, during a year with normal patterns of precipitation, has standing or flowing water for sufficient duration to establish an ordinary high water mark, where aquatic vegetation is either non-emergent, sparse, or absent” (USACE no date (n.d.)). The derived open water (pond) boundaries were surveyed through the use of a GPS receiver capable of sub-meter accuracy (model R1 handheld, Trimble, Sunnyvale, California). The delineated open waters were labeled (e.g., *Delineated Pond 1*, *Delineated Pond 2*, etc.), and correspond to the resource features illustrated on the Delineated Resource map (Appendix A, Figure 5A). The open water boundaries are mapped as polygons and the areas are calculated using the shapefile properties utility in ArcMap.

3.0 RESULTS

During the investigations identified within this Report, 17 wetlands, 17 streams, and 17 open water resources were identified and delineated within the Study Area (Tables 3.1, 3.2.1, and 3.2.2).

Table 3.1 Potential Wetlands and Other Waters of the U.S. Investigated and Jurisdictional Determinations within the Study Area

Resource ID	Field Survey Date	Location (Latitude, Longitude)	Provisional Determination	Acreage (Hectares) of Jurisdictional Waters in Study Area and Cowardin Classification ¹	Acreage of Jurisdictional Waters Impacted
Wetland 1	4/4/17	39.272410, -82.45133	Water of the U.S., Wetland	1.04 (0.42)/PEM	0.00
Wetland 2	4/4/17	39.276106, -82.449888	Water of the U.S., Wetland	0.20(0.08)/PEM	0.00
Wetland 3	4/4/17	39.276106, -82.449888	Water of the U.S., Wetland	0.21(0.08)/PEM/PSS	0.00
Wetland 4	4/4/17	39.276315, -82.448510	Water of the U.S., Wetland	0.21(0.08)/PEM	0.18
Wetland 5	4/4/17	39.273748, -82.439297	Water of the U.S., Wetland	2.27(0.92)/PEM	0.00
Wetland 6	4/4/17	39.274811, -82.441962	Water of the U.S., Wetland	0.87(0.35)/PEM	0.02
Wetland 7	4/4/17	39.276210, -82.437901	Water of the U.S., Wetland	4.89(1.98)/PEM	1.31
Wetland 8	4/5/17	39.254545, -82.450319	Water of the U.S., Wetland	0.04(0.02)/PEM	0.00
Wetland 9	4/5/17	39.259318, -82.450941	Water of the U.S., Wetland	0.26(0.11)/PEM	0.11
Wetland 10	4/6/17	39.266278, -82.436575	Water of the U.S., Wetland	0.31(0.13)/PEM/PSS	0.00
Wetland 11	4/6/17	39.269150, -82.440516	Water of the U.S., Wetland	2.28(0.92)/PEM	0.32
Wetland 12	4/6/17	39.265649, -82.437574	Water of the U.S., Wetland	0.07(0.03)/PEM	0.07
Wetland 13	4/6/17	39.270208, -82.449238	Water of the U.S., Wetland	0.17(0.07)/PEM	0.17

Resource ID	Field Survey Date	Location (Latitude, Longitude)	Provisional Determination	Acreage (Hectares) of Jurisdictional Waters in Study Area and Cowardin Classification ¹	Acreage of Jurisdictional Waters Impacted
Wetland 14	4/6/17	39.26563, -82.448479	Water of the U.S., wetland	0.60(0.24)/PEM	0.00
Wetland 15	4/6/17	39.265109, -82.449004	Water of the U.S., Wetland	0.13(0.05)/PEM	0.00
Wetland 16	4/7/17	39.273639, -82.434730	Water of the U.S., wetland	0.04(0.02)/PEM	0.00
Wetland 17	4/7/17	39.2735823, -82.434111	Water of the U.S., Wetland	0.20(0.08)/PEM	0.00
Stream 1	4/4/17	39.282403, -82.446157	Water of the U.S., Stream	0.04(0.16)/R5	0.00
Stream 2	4/4/17	39.279931, -82.436295	Water of the U.S., Stream	0.03(0.01)/R4	0.00
Stream 3	4/5/17	39.249595, -82.450919	Water of the U.S., Stream	0.01(0.004)/R6	0.00
Stream 4	4/5/17	39.259100, -82.451057	Water of the U.S., Stream	0.03(0.01)/R4	0.02
Stream 5	4/6/17	39.264303, -82.439159	Water of the U.S., Stream	0.01(0.004)/R4	0.00
Stream 6	4/6/17	39.263891, -82.440346	Water of the U.S., Stream	0.06(0.02) /R5	0.00
Stream 7	4/6/17	39.261682, -82.441246	Water of the U.S., Stream	0.01(0.004)/R4	0.00
Stream 8	4/6/17	39.261768, -82.441377	Water of the U.S., Stream	0.01(0.004)/R4	0.00
Stream 9	4/6/17	39.263743, -82.444095	Water of the U.S., Stream	0.01(0.004)/R4	0.00
Stream 10	4/6/17	39.264828, -82.444182	Water of the U.S., Stream	0.01(0.004)/R4	0.00
Stream 11	4/6/17	39.266508, -82.436062	Water of the U.S., Stream	0.11(0.04)/R5	0.00
Stream 12	4/6/17	39.268753, -82.441925	Water of the U.S., Stream	0.06(0.02)/R4	0.00

Resource ID	Field Survey Date	Location (Latitude, Longitude)	Provisional Determination	Acreage (Hectares) of Jurisdictional Waters in Study Area and Cowardin Classification ¹	Acreage of Jurisdictional Waters Impacted
<i>Stream 13</i>	4/6/17	39.268093, -82.448709	Water of the U.S., Stream	0.21(0.08)/R4	0.11
<i>Stream 14</i>	4/6/17	39.265280, -82.448221	Water of the U.S., Stream	0.04(0.02)/R4	0.00
<i>Stream 15</i>	4/6/17	39.271042, -82.442770	Water of the U.S., Stream	0.01(0.004)/R4	0.00
<i>Stream 16</i>	4/7/17	39.271307, -82.438245	Water of the U.S., Stream	0.05(0.02)/R4	0.00
<i>Stream 17</i>	4/7/17	39.272974, -82.434954	Water of the U.S., Stream	0.02(0.01)/R4	0.00
<i>Pond 1</i>	4/4/17	39.276580, -82.447578	Water of the U.S., Open water	0.52(0.10)/PUBG	0.00
<i>Pond 2</i>	4/4/17	39.280488, -82.438724	Water of the U.S., Open water	0.20(0.08)/PUBG	0.03
<i>Pond 3</i>	4/4/17	39.279853, -82.437565	Water of the U.S., Open water	0.28(0.11)/PUBG	0.00
<i>Pond 4</i>	4/4/17	39.281334, -82.444956	Water of the U.S., Open water	0.21(0.08)/PUBG	0.21
<i>Pond 5</i>	4/4/17	39.282633, -82.446987	Water of the U.S., Open water	0.69(0.28)/PUBG	0.00
<i>Pond 6</i>	4/4/17	39.276621, -82.443349	Water of the U.S., Open water	2.87(1.16)/PUBG	0.00
<i>Pond 7</i>	4/4/17	39.276580, -82.447578	Water of the U.S., Open water	0.17(0.07)/PUBG	0.00
<i>Pond 8</i>	4/4/17	39.273311, -82.434416	Water of the U.S., Open water	0.35(0.14)/PUBG	0.00

Resource ID	Field Survey Date	Location (Latitude, Longitude)	Provisional Determination	Acreage (Hectares) of Jurisdictional Waters in Study Area and Cowardin Classification ¹	Acreage of Jurisdictional Waters Impacted
<i>Pond 9</i>	4/5/17	39.251677, -82.455963	Water of the U.S., Open water	0.64(0.26)/PUBG	0.00
<i>Pond 10</i>	4/5/17	39.249763, -82.456215	Water of the U.S., Open water	0.36(0.15)/PUBG	0.17
<i>Pond 11</i>	4/5/17	39.250770, -82.452287	Water of the U.S., Open water	0.89(0.36)/PUBG	0.01
<i>Pond 12</i>	4/5/17	39.254225, -82.454394	Water of the U.S., Open water	4.19(1.70)/PUBG	0.00
<i>Pond 13</i>	4/5/17	39.255923, -82.458291	Water of the U.S., Open water	0.42(0.17)/PUBG	0.00
<i>Pond 14</i>	4/5/17	39.252792, -82.456987	Water of the U.S., Open water	0.74(0.30)/PUBG	0.00
<i>Pond 15</i>	4/5/17	39.269953, -82.454552	Water of the U.S., Open water	0.52(0.21)/PUBG	0.00
<i>Pond 16</i>	4/6/17	39.267323, -82.437478	Water of the U.S., Open water	2.24(0.91)/PUBG	0.00
<i>Pond 17</i>	4/6/17	39.271199, -82.436861	Water of the U.S., Open water	0.70(0.28)/PUBG	0.00

PEM = palustrine emergent

PSS = palustrine scrub/shrub

R4 = intermittent stream

R5 = perennial stream

R6 = ephemeral stream

PUBG = palustrine unconsolidated bottom, intermittently exposed

3.1 Background Resources

3.1.1 USGS Topographic Map

Based on desktop review, the Study Area contains 27 wetland features according to the Zaleski, Ohio (1985) and McArthur (1961) 7.5 minute series topographical quadrangles (Appendix A, Figure 1). The terrain is relatively flat to gently sloping with the higher ground being located nearest to Township Road 14. The elevation ranges from approximately 781 to 961 feet (238 to 293 meters) above mean sea level.

3.1.2 Soils

According to the soil dataset acquired from the NRCS Web Soil Survey for Vinton County, Ohio, the Study Area was underlain by eight different soil types; the eight are mapped as non-hydric (USDA 2017). The Bethesda and Wharton-Latham are soil series formed from surface mining reclamation (Table 3.1.1 and Appendix A, Figure 2).

Table 3.1.1 Soils Mapped within the Study Area

Soil Code	Soil Name	Percent (%) in Study Area	Hydric Status
BhB	Bethesda Silty Clay Loam	32.20	Non-Hydric
BhC	Bethesda Silty Clay Loam	32.93	Non-Hydric
BhE	Bethesda Silty Clay Loam	2.17	Non-Hydric
GaE	Germano-Gilpin Complex	0.02	Non-Hydric
StF	Steinsburg-Gilpin Association	0.17	Non-Hydric
WhL1C1	Wharton-Latham Silt Loams	8.83	Non-Hydric
WhL1D1	Wharton-Latham Silt Loams	3.36	Non-Hydric
WhL1E1	Wharton-Latham Silt Loams	20.32	Non-Hydric

3.1.3 National Wetland Inventory

According to the USFWS NWI (USFWS 2016), 18 freshwater open waters (PUBG), one freshwater forested (PFO)/scrub-shrub (PSS) wetland and two freshwater emergent (PEM) wetlands are mapped within the Study Area (Appendix A, Figure 3).

3.1.4 FEMA Flood Hazard

According to the FEMA Flood Hazard mapping (Community-Panel Numbers 390553 0005 A & 390553 0002 A, January 9, 1981), the Study Area is not located within a FEMA Flood Zone (FEMA 2016) (Appendix A, Figure 4).

3.2 DETAILED DELINEATIONS

TRC performed wetland and other waters of the U.S. identification and delineation on April 4, 2017 through April 7, 2017, at the beginning of the normal growing season in Ohio. Weather conditions were seasonably warm, in the high 40 degrees Fahrenheit (4 to 10 degrees Celsius) with light rain and partially sunny days. Native herbaceous vegetation had begun to sprout and was, at times, difficult to positively identify. The presence of apparent hydrology and hydric soil indicators, as well as identifiable plant species within the wetland area, allowed for positive wetland determinations. The USACE maintains the final authority that determines jurisdiction; therefore, statements about jurisdiction within this Report are preliminary and subject to final determination by the USACE and Ohio EPA.

3.2.1 Wetlands

The Study Area has been historically impacted by strip mining and is now actively grazed by cattle. Soils and hydrology throughout the Study Area have been influenced by these activities (USDA 2016). While some soil samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples.

During the course of this investigation, 17 wetlands were identified and delineated, and are listed in Table 3.2.1 described below and shown in Appendix A on Figures 5A and 5B). The completed USACE Wetland Determination Data Forms-Eastern Mountains and Piedmont Region are presented in Appendix C.

Table 3.2.1 Wetlands Delineated within the Study Area

Wetland ID	Vegetation Class ¹	Extends Offsite?	Acres (Hectares) ²	ORAM Score ³	ORAM Category ³	Jurisdictional Status ⁴
1	PEM	Yes	1.04 (0.42)	23	1	Jurisdictional
2	PEM	No	0.20(0.08)	20	1	Jurisdictional
3	PSS/PEM	Yes	0.21(0.08)	27	1	Jurisdictional
4	PEM	No	0.21(0.08)	20	1	Jurisdictional
5	PEM	Yes	2.27(0.92)	30	2	Jurisdictional
6	PEM	Yes	0.87(0.35)	34	2	Jurisdictional
7	PEM	Yes	4.89(1.98)	33	2	Jurisdictional
8	PEM	No	0.04(0.02)	22	1	Jurisdictional
9	PEM	No	0.26(0.11)	25	1	Jurisdictional
10	PSS/PEM	Yes	0.31(0.13)	32	2	Jurisdictional
11	PEM	Yes	2.28(0.92)	31	2	Jurisdictional
12	PEM	No	0.07(0.03)	16	1	Jurisdictional
13	PEM	No	0.17(0.07)	18	1	Jurisdictional
14	PEM	Yes	0.60(0.24)	29	1	Jurisdictional

Wetland ID	Vegetation Class ¹	Extends Offsite?	Acres (Hectares) ²	ORAM Score ³	ORAM Category ³	Jurisdictional Status ⁴
15	PEM	Yes	0.13(0.05)	25	1	Jurisdictional
16	PEM	No	0.04(0.02)	14	1	Jurisdictional
17	PEM	No	0.20(0.08)	15	1	Jurisdictional

1 PEM = palustrine emergent
PSS = palustrine scrub/shrub

2 Represents delineated acreage within Study Area

3 Preliminarily assigned. Not considered final until verified by Ohio EPA

4 Preliminarily assigned. Not considered final until verified by the USACE

All wetlands and streams within the Study Area display a physical connectivity or adjacency to unnamed tributaries of Raccoon Creek and Elk Fork. The Ohio River is considered a Traditional Navigable Waterway (TNW) by the USACE (2007), this gives the USACE jurisdiction over the Ohio River and all connected tributaries. Raccoon Creek, is a relatively permanent water (RPW) with continuous flow and directly connects to the Ohio River as defined by USACE (2007); therefore, Raccoon Creek and all associated tributaries are deemed jurisdictional by the USACE. Consequently, the direct connection to Raccoon Creek makes Elk Fork a jurisdictional water. Any delineated features with a direct connection or significant adjacency to any identified unnamed tributaries to Raccoon Creek or Elk Fork have been determined to be jurisdictional by the USACE for the reasons outlined above.

Wetland 1

Wetland 1 is a 1.04 acre (0.42 hectares) PEM wetland dominated by common rush (*Juncus effuses*) and broadleaf cattail (*Typha latifolia*). Vegetation has been grazed in portions of the wetland. The sample point is located approximately 500 feet (152 meters) north of the intersection of Township Roads 14 and 15. The wetland is preliminarily assigned an ORAM score of 23, corresponding to a Category 1 wetland (low quality). The determination of a Category 1 wetland was based on size, intensity of surrounding land use, disturbance regime, and lack of natural buffers.

Wetland 1 abuts an open water that is located outside the Study Area. Based on review of the Zaleski, Ohio USGS topographic quadrangle, the open water outside the Study Area drains to an unnamed tributary to Elk Fork. The unnamed tributary to Elk Fork flows west and confluences with Elk Fork approximately 4,607 feet (1,404 meters) from the Study Area (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Elk Fork, Wetland 1 is considered preliminarily jurisdictional.

Wetland 2

Wetland 2 is a 0.20 acre (0.08 hectares) PEM wetland dominated by common rush, fox sedge (*Carex vulpinoidea*) and red clover (*Trifolium pretense*). Vegetation has been grazed in portions of the wetland. The sample point is located approximately 2,400 feet (732 meters) north of the intersection of Township Roads 14 and 15. The wetland is preliminarily assigned an ORAM score of 20 (low quality), corresponding to a Category 1 wetland primarily due to size, intensity of surrounding land use and lack of natural buffers.

Wetland 2 can be found at the southern edge of delineated Pond 1. Based on review of the Zaleski, Ohio USGS topographic quadrangle, Wetland 2 and Pond 1 are adjacent to other wetlands located outside the Study Area (Appendix A, Figure 1) (USGS 1994). These wetland features, including Wetland 2, are located adjacent to an unnamed tributary to Elk Fork and an unnamed tributary to Raccoon Creek. Based on the location, proximity and connectivity to both unnamed tributaries, Wetland 2 is considered preliminarily jurisdictional.

Wetland 3

Wetland 3 is a 0.21 acre (0.08 hectares) PSS/PEM wetland extending outside the Study Area dominated by American sycamore (*Plantanus occidentalis*), autumn olive (*Elaeagnus umbellata*) and multiflora rose (*Rosa multiflora*) in the shrub stratum, and common rush and fox sedge in the herbaceous stratum. Habitat development is fair, with small amounts of hummock/tussock habitat. This wetland can be found alongside Township Road 15. The sample point is located approximately 2,200 feet (671 meters) north of the intersection of Township Roads 14 and 15. This wetland was preliminarily assigned an ORAM score of 27, corresponding to a Category 1 wetland (low quality). The determination of a Category 1 wetland was based on the lack of natural buffers, intensity of surrounding land use, and low microtopography.

Wetland 3 extends beyond the study area and has a downstream hydrologic connection to an off-site drainage. Based on review of the Zaleski, Ohio USGS topographic quadrangle, the off-site drainage flows southwest to an unnamed tributary to Elk Fork before entering Elk Fork (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Elk Fork, Wetland 3 is considered preliminarily jurisdictional.

Wetland 4

Wetland 4 is a 0.21 acre (0.08 hectares) PEM wetland dominated by common rush, fox sedge and orchard grass (*Dactylis glomerata*) with hydrology coming from precipitation. The sample point is located approximately 5,400 feet (1,646 meters) northeast of the intersection of Township Roads 14 and 15. Lack of natural buffers, small size, and intensity of surrounding land use contributed to Wetland 4 being preliminarily assigned an ORAM score of 20, corresponding to a Category 1 wetland (low quality).

Wetland 4 drains into delineated Stream 1, an unnamed tributary to Raccoon Creek. Based on review of the Zaleski, Ohio USGS topographic quadrangle, Stream 1 flows southeast away from the Study Area and confluences with another unnamed tributary to Raccoon Creek (Appendix A, Figure 1) (USGS 1994). This second unnamed tributary to Raccoon Creek flows east and confluences with Raccoon Creek approximately 600 feet (184 meters) north of Powder Plant Road. Based on the location, proximity and connectivity to Raccoon Creek, Wetland 4 is considered preliminarily jurisdictional.

Wetland 5

Wetland 5 is a 2.27 acre (0.92 hectares) PEM wetland extending outside the Study Area. Dominate plant species include broadleaf cattail and fox sedge. Vegetation has been grazed on the edges of the wetland, making species identification difficult. This wetland can be found on the western edge of a tree line that crosses Township Road 14. The sample point is located approximately 4,100 feet (1,250 meters) east of the intersection of Township Roads 14 and 15. Wetland 5 is preliminarily assigned an ORAM score of 30, corresponding to the ORAM “Grey Zone” and, therefore, assigned as a Category 2 wetland (moderate quality) primarily due to size, intensity of surrounding land use, lack of habitat development, and low microtopography.

Wetland 5 is located adjacent to an unnamed tributary to Raccoon Creek. Based on review of the Zaleski, Ohio USGS topographic quadrangle, the unnamed tributary to Raccoon Creek flows southeast away from the Study Area and drains to a roadway drainage ditch before entering Raccoon Creek (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 5 is considered preliminarily jurisdictional.

Wetland 6

Wetland 6 is a 0.87 acre (0.35 hectares) PEM wetland dominated by multiflora rose and autumn olive in the shrub stratum and common rush and fox sedge in the herbaceous stratum. Vegetation has been grazed on the edges of the wetland, making species identification difficult. This wetland can be found on the western edge of a tree line that crosses Township Road 14. The sample point is located approximately 3,600 feet (1,097 meters) northeast of the intersection of Township Roads 14 and 15. Wetland 6 is preliminarily assigned an ORAM score of 34, corresponding to a Category 2 wetland (moderate quality) primarily due to size, disturbance regime, and lack of natural buffers. In addition, acid mine drainage can be found throughout the wetland.

Wetland 6 abuts an adjacent open water, where both are located adjacent to an unnamed tributary to Raccoon Creek. Based on review of the Zaleski, Ohio USGS topographic quadrangle, the unnamed

tributary to Raccoon Creek flows southeast away from the Study Area and drains to a roadway drainage ditch before entering Raccoon Creek (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 6 is considered preliminarily jurisdictional.

Wetland 7

Wetland 7 is a 4.89 acre (1.98 hectares) PEM wetland dominated by broadleaf cattail, common rush and fox sedge. Vegetation has been grazed on the edges of the wetland, making species identification difficult. This particular wetland can be found on the eastern edge of a tree line that crosses Township Road 14. The NWI map shows this area as being a large freshwater PEM wetland (Appendix A, Figure 1). The sample point is located approximately 4,800 feet (1,463 meters) northeast of the intersection of Township Roads 14 and 15. Wetland 7 is preliminarily assigned an ORAM score of 33, corresponding to a Category 2 wetland (moderate quality) primarily due to size, intensity of surrounding land use, disturbance regime, and lack of natural buffers.

Wetland 7 is located adjacent to an unnamed tributary of Raccoon Creek. Based on review of the Zaleski, Ohio USGS topographic quadrangle, the unnamed tributary to Raccoon Creek flows southeast away from the Study Area and drains to a roadway drainage ditch before entering Raccoon Creek (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 7 is considered preliminarily jurisdictional.

Wetland 8

Wetland 8 is a 0.04 acre (0.02 hectares) PEM wetland dominated by fox sedge, narrowleaf cattail (*Typha angustifolia*) and American sycamore. Bare ground and rocks can be found throughout the wetland. This slope wetland can be found on the western edge of a tree line on a hillslope. The sample point is located approximately 6,000 feet (1,829 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 8 is preliminarily assigned an ORAM score of 22, corresponding to a Category 1 (low quality) wetland primarily due to size, intensity of surrounding land use, disturbance regime, and lack of natural buffers.

A hydrological connection can be observed outside the Study Area that connects Wetland 8 to another NWI wetland approximately 998 feet (304 meters) northeast of the Study Area (Appendix A, Figure 3). Based on review of the Zaleski, Ohio USGS topographic quadrangle, the NWI wetland is adjacent to an unnamed tributary to Elk Fork that flows southeast away from the Study Area (Appendix A, Figure 1) (USGS 1994). Within the Study Area this unnamed tributary to Elk Fork was delineated as Stream 13. The unnamed tributary to Elk Fork (Stream 13) confluences with Elk Fork near the intersection of U.S. Route 50 and

Stone Quarry Road. Based on the location, proximity and connectivity to Elk Fork, Wetland 8 is considered preliminarily jurisdictional.

Wetland 9

Wetland 9 is a 0.26 acre (0.11 hectares) PEM wetland dominated by common rush and narrowleaf cattail. Bare ground can be found throughout the wetland. Hydrology appears to be mostly as a result of both precipitation and stream overflow. This slope wetland is situated on the western edge of a tree line. The sample point is located approximately 4,300 feet (1,311 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 9 is preliminarily assigned an ORAM score of 25, corresponding to a Category 1 (low quality) wetland primarily due to size, intensity of surrounding land use disturbance regime, and lack of natural buffers.

Within the Study Area, Wetland 9 drains to delineated Stream 4. Based on review of the Zaleski, Ohio USGS topographic quadrangle, the Stream 4 flows southeast and then east away from the Study Area and confluences with an unnamed tributary to Elk Fork (Stream 13) (Appendix A, Figure 1) (USGS 1994). The unnamed tributary to Elk Fork (Stream 13) confluences with Elk Fork near the intersection of U.S. Route 50 and Stone Quarry Road. Based on the location, proximity and connectivity to Elk Fork, Wetland 9 is considered preliminarily jurisdictional.

Wetland 10

Wetland 10 is a 0.31 acre (0.13 hectares) PEM/PSS wetland dominated by narrowleaf cattail. The sample point is located in the PEM portion of this wetland approximately 4,900 feet (1,494 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 10 is preliminarily assigned an ORAM score of 32, corresponding to the ORAM “Grey Zone” and, therefore, assigned as a Category 2 wetland (moderate quality) primarily due to size, intensity of surrounding land use, lack of natural buffers, and coverage of some invasive species.

Upstream, within the Study Area, hydrology for this wetland is traced to additional wetlands (Wetland 11), delineated streams (Stream 11), and an open water (Pond 16). Based on review of the Zaleski, Ohio USGS topographic quadrangle, Wetland 10 is located adjacent to an unnamed tributary Raccoon Creek and delineated Stream 11. The unnamed tributary to Raccoon Creek flows southeast away from the Study Area before entering Raccoon Creek (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 10 is considered preliminarily jurisdictional.

Wetland 11

Wetland 11 is a 2.28 acre (0.92 hectares) PEM wetland dominated by common rush, narrowleaf cattail, and fox sedge. Wetland vegetation has some areas where mowing, grazing and other impacts have made identification difficult. This wetland can be found on the northwestern edge of delineated Pond 16. The sample point is located approximately 4,000 feet (1,219 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 11 is preliminarily assigned an ORAM score of 31, corresponding to a Category 2 wetland (moderate quality) primarily due to size, intensity of surrounding land use, lack of natural buffers, and coverage of invasive species.

Upstream, within the Study Area, hydrology is traced to a delineated intermittent stream (Stream 15). Based on review of the Zaleski, Ohio USGS topographic quadrangle, Wetland 11 is located adjacent to an unnamed tributary Raccoon Creek that flows southeast away from the Study Area before entering Raccoon Creek (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 11 is considered preliminarily jurisdictional.

Wetland 12

Wetland 12 is a 0.07 acre (0.03 hectares) PEM wetland dominated by common rush and reed canary grass (*Phalaris arundinacea*); a common invasive species in wetlands. Vegetation has been grazed in portions of the wetland, making species identification difficult. This wetland is extremely small and dominated by common rush. The sample point is located approximately 4,000 feet (1,219 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 12 is preliminarily assigned an ORAM score of 16, corresponding to a Category 1 wetland (low quality) primarily due to size, intensity of surrounding land use, lack of natural buffers, and coverage of invasive species.

Within the Study Area, Wetland 12 is located adjacent, approximately 200 feet (61 meters), to delineated Wetland 10 and Stream 11. Based on review of the Zaleski, Ohio USGS topographic quadrangle, delineated Wetland 10 and Stream 11 drain to an unnamed tributary to Raccoon Creek that flows southeast away from the Study Area before entering Raccoon Creek. (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 12 is considered preliminarily jurisdictional.

Wetland 13

Wetland 13 is a 0.17 acre (0.07 hectares) PEM wetland dominated by common rush, red clover and fox sedge. Vegetation has been grazed in portions of the wetland, making species identification difficult. The sample point is located approximately 1,300 feet (396 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 13 is preliminarily assigned an ORAM score of 18, corresponding to a Category

1 wetland (low quality) primarily due to size, intensity of surrounding land use, lack of natural buffers, and low quality of wetland plants.

Downstream and within the Study Area, Wetland 13 exhibits connectivity to delineated Stream 13. Based on review of the Zaleski, Ohio USGS topographic quadrangle, delineated Stream 13 is an unnamed tributary to Elk Fork. The unnamed tributary flows southeast away from the Study Area and confluences with Elk Fork near the intersection of U.S. Route 50 and Stone Quarry Road (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Elk Fork, Wetland 13 is considered preliminarily jurisdictional.

Wetland 14

Wetland 14 is a 0.60 acre (0.24 hectares) PEM wetland dominated by common rush, fox sedge and broadleaf cattail. Vegetation has been grazed in many portions of the wetland, making species identification difficult. This can be found on a hillslope on the western edge of a tree line. The sample point is located approximately 2,400 feet (732 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 14 is preliminarily assigned an ORAM score of 29, corresponding to a Category 1 (low quality) wetland primarily due to size and lack of natural buffers.

Wetland 14 is located adjacent to an unnamed tributary to Elk Fork. Based on review of the Zaleski, Ohio USGS topographic quadrangle, the unnamed tributary to Elk Fork flows southeast away from the Study Area and confluences with Elk Fork near the intersection of U.S. Route 50 and Stone Quarry Road (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Elk Fork, Wetland 14 is considered preliminarily jurisdictional.

Wetland 15

Wetland 15 is a 0.13 acre (0.05 hectares) PEM wetland dominated by autumn olive in the shrub stratum and common rush, broadleaf cattail and fox sedge in the herbaceous stratum. Vegetation has been grazed in portions of the wetland, making species identification difficult. This slope wetland can be found on the western edge of a tree line. The sample point is located approximately 2,400 feet (732 meters) southeast of the intersection of Township Roads 14 and 15. Wetland 15 is preliminarily assigned an ORAM score of 25, corresponding to a Category 1 (low quality) wetland primarily due to size, intensity of surrounding land use, lack of buffers, and coverage of invasive species.

Wetland 15 is located adjacent to a non-jurisdictional drainage and intermittent stream that connects to an unnamed tributary to Elk Fork outside the Study Area. Based on review of the Zaleski, Ohio USGS

topographic quadrangle, the unnamed tributary to Elk Fork flows southeast away from the Study Area and confluences with Elk Fork near the intersection of U.S. Route 50 and Stone Quarry Road (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Elk Fork, Wetland 15 is considered preliminarily jurisdictional.

Wetland 16

Wetland 16 is a 0.04 acre (0.02 hectares) PEM wetland dominated by common rush. Vegetation has been grazed in portions of the wetland, making species identification difficult. The sample point is located approximately 5,400 feet (1,646 meters) east of the intersection of Township Roads 14 and 15, north of Infirmary Road. Wetland 16 is preliminarily assigned an ORAM score of 14, corresponding to a Category 1 wetland (low quality) primarily due to size, intensity of surrounding land use and lack of buffers.

Wetland 16 is located approximately 100 feet (30 meters) from delineated Pond 8, which drains to delineated Stream 17. Based on review of the Zaleski, Ohio USGS topographic quadrangle, delineated Stream 17 drains to an unnamed tributary to Raccoon Creek that flows southeast away from the Study Area before entering another unnamed tributary of Raccoon Creek. Raccoon Creek is located approximately 2,812 feet (857 meters) from the confluence (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 16 is considered preliminarily jurisdictional.

Wetland 17

Wetland 17 is a 0.20 acre (0.08 hectares) PEM wetland dominated by common rush. Vegetation has been grazed in many portions of the wetland, making species identification difficult. The sample point is located approximately 5,400 feet (1,646 meters) east of the intersection of Township Roads 14 and 15, north of Infirmary Road. Wetland 17 is preliminarily assigned an ORAM score of 15, corresponding to a Category 1 wetland (low quality) primarily due to size, intensity of surrounding land use and lack of buffers.

Wetland 17 is located approximately 100 feet (30 meters) from delineated Pond 8, which drains to delineated Stream 17. Based on review of the Zaleski, Ohio USGS topographic quadrangle, delineated Stream 17 drains to an unnamed tributary to Raccoon Creek that flows southeast away from the Study Area before entering another unnamed tributary of Raccoon Creek. Raccoon Creek is located approximately 2,812 feet (857 meters) from the confluence (Appendix A, Figure 1) (USGS 1994). Based on the location, proximity and connectivity to Raccoon Creek, Wetland 17 is considered preliminarily jurisdictional.

3.2.2 Other Waters of the U.S.

A. Streams

Seventeen (17) streams with defined bed and bank and ordinary high water mark were identified within the Study Area. The streams are listed in Table 3.2.2, described below and shown in Appendix A on Figures 5A and 5B. The delineated streams within the Study Area are within the Headwaters Elk Fork (HUC code 050901010302) and Town of Zaleski-Raccoon Creek (HUC code 050901010205) drainage basins. The streams within the Study Area have been influenced by historic mining (some streams exhibit visible acid mine drainage) and current cattle practices. Therefore, streams within the Study Area are designated as “Modified” Channels. Table 3.2.2 below, provides flow regime, length in the study area, drainage area, preliminary HHEI scores, and class and QHEI ratings for streams identified in the Study Area. Completed Ohio EPA stream assessment forms are provided in Appendix E. All jurisdiction determinations are preliminary because the USACE makes the final determination.

Table 3.2.2 Other Waters of the U.S Delineated within the Study Area

Stream ID	Flow Regime	Length ¹ (ft; m)	Drainage Area (sq mi; sq km) ²	HHEI Score ³	HHEI Class/ QHEI Rating
1	Perennial	632(193)	0.01(<0.001)	51	Modified Class II
2	Perennial	454(138)	0.01(<0.001)	50	Modified Class II
3	Ephemeral	57(17)	0.01(<0.001)	37	Modified Class II
4	Intermittent	261(80)	0.01(<0.001)	37	Modified Class II
5	Intermittent	200(61)	0.01(<0.001)	37	Modified Class II
6	Perennial	516(157)	0.01(<0.001)	52	Modified Class II
7	Intermittent	96(29)	0.01(<0.001)	40	Modified Class II
8	Intermittent	146(45)	0.01(<0.001)	34	Modified Class II
9	Intermittent	143(44)	0.01(<0.001)	38	Modified Class II
10	Intermittent	108(33)	0.01(<0.001)	28	Modified Class I
11	Perennial	461(141)	0.01(<0.001)	69	Modified Class II
12	Perennial	423(129)	0.01(<0.001)	41	Modified Class II
13	Intermittent	1,538(469)	0.01(<0.001)	36	Modified Class II
14	Intermittent	263(80)	0.01(<0.001)	43	Modified Class II
15	Intermittent	94(29)	0.01(<0.001)	28	Modified Class I
16	Intermittent	547(167)	0.01(<0.001)	37	Modified Class II
17	Intermittent	177(54)	0.01(<0.001)	27	Modified Class I

1 Represents delineated length, in feet, and meters within Study Area

2 Where within coverage, drainage area was calculated using automated basin characteristics from USGS StreamStats v 4.0: Ohio (USGS 2016b).

3 Primary Headwater Habitat Evaluation Index, for streams with drainage areas of less than 1.0 square miles and a max pool depth of less than 40 centimeters.

Stream 1

Stream 1 is a modified perennial stream originating within the Study Area with a drainage area of approximately 0.01 square miles (<0.001 square kilometers), flowing west through the Study Area for approximately 632 feet (193 meters). Based on the HHEI assessment methods, the dominate substrates are composed of cobble and silt, maximum pool depths is 2.4 inches (6.0 centimeters) and bank full width is 3.94 feet (1.20 meters). Consequently, this stream has been preliminarily assigned an HHEI score of 51 and is therefore categorized as a Modified Class II Primary Headwater Habitat (PHWH). Stream 1 connects to an unnamed tributary to Raccoon Creek, and, as such, is preliminarily determined to be a jurisdictional water of the U.S. No macroinvertebrates were observed during the time of delineation.

Stream 2

Stream 2 is a modified perennial stream originating within the Study Area with a drainage area of approximately 0.01 square miles (<0.001 square kilometers), flowing northwest for approximately 454 feet (138 meters) within the Study Area. Stream 2 connects to an unnamed tributary to Raccoon Creek and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are comprised of cobble and silt, maximum pool depths is 2.4 inches (6.0 centimeters) and bank full width is 3.9 feet (1.2 meters). Consequently, this stream has been preliminarily assigned an HHEI score of 50 and is therefore categorized as a Modified Class II PHWH.

Stream 3

Stream 3 is a modified ephemeral stream originating within the Study Area with a drainage area of less than 0.01 square miles (<0.001 square kilometers), flowing southwest for approximately 57 feet (17 meters) through the Study Area. Stream 3 is an ephemeral stream that connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, outside the Study Area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are comprised of gravel and silt, maximum pool depths is 1.6 inches (4.0 centimeters) and a bank full width is 3.6 feet (1.1 meters). This stream has been preliminarily assigned an HHEI score of 37 and is therefore categorized as a Modified Class II PHWH.

Stream 4

Stream 4 is a modified intermittent stream originating inside the Study Area with a drainage area of 0.01 square miles (<0.001 square kilometers), flowing southeast for approximately 261 feet (80 meters) through the Study Area. Stream 4 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek,

outside the study area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are gravel and silt, maximum pool depth is 1.6 inches (4.0 centimeters) and bank full width is 4.9 feet (1.5 meters). This stream has been preliminarily assigned an HHEI score of 37 and is therefore categorized as a Modified Class II PHWH.

Stream 5

Stream 5 originates inside the Study Area with intermittent flow regimes, and a drainage area of approximately 0.01 square miles (<0.001 square kilometers) flowing south for approximately 200 feet (61 meters) through the Study Area. Stream 5 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, outside the Study Area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are hardpan and silt, maximum pool depth is 2.8 inches (7.0 centimeters) and bank full width is 4.9 feet (1.5 meters). This streams have been preliminary assigned an HHEI score of 37 and is therefore categorized as a Modified Class II PHWH.

Stream 6

Stream 6 is a modified perennial stream originating within the Study Area. This stream has a drainage area of approximately 0.01 square miles (<0.001 square kilometers) and flows southeast approximately 516 feet (157 meters) though the Study Area. Stream 6 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, outside the study area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are cobble and hardpan, maximum pool depth is 2.8 inches (7.0 centimeters) and bank full width is 5.3 feet (1.6 meters). This stream has been preliminarily assigned an HHEI score of 52 and is therefore categorized as a Modified Class II PHWH.

Stream 7

Stream 7 is a modified intermittent stream originating within the Study Area. With a drainage area of approximately 0.01 square miles(<0.001 square kilometers), the stream flows southeast approximately 96 feet (29 meters) though the Study Area and confluences with Stream 8. Stream 7 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, outside the study area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are cobble and silt, maximum pool depth is 1.2 inches (3.0 centimeters) and bank full width is 4.3 feet (1.3 meters). This stream has been preliminarily assigned an HHEI score of 40 and is therefore categorized as a Modified Class II PHWH.

Stream 8

Stream 8 is a modified intermittent stream originating within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers). The Stream flows south approximately 146 feet (45 meters) through Study Area and then confluences with Stream 7. Stream 8 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, outside the study area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are gravel and hardpan, maximum pool depth is 1.2 inches (3.0 centimeters) and bank full width 4.3 feet (1.3 meters). This stream has been preliminarily assigned an HHEI score of 34 and is therefore categorized as a Modified Class II PHWH.

Stream 9

Stream 9 is a modified intermittent stream originating within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers), and flows southwest approximately 143 feet (44 meters) through Study Area. Stream 9 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, outside the study area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are gravel and silt, maximum pool depth is 1.2 inches (3.0 centimeters) and bank full width is 4.3 feet (1.3 meters). This stream has been preliminarily assigned an HHEI score of 38 and is therefore categorized as a Modified Class II PHWH.

Stream 10

Stream 10 is a modified intermittent stream originating within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers), and flows southwest approximately 108 feet (33 meters) through Study Area. Stream 10 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, outside the Study Area and is therefore determined to be preliminary jurisdictional. Based on the HHEI assessment methods, the dominate substrates are hardpan and silt, maximum pool depth is 1.2 inches (3.0 centimeters) and bank full width is 4.3 feet (1.3 meters). This stream has been preliminarily assigned an HHEI score of 28 and is therefore categorized as a Modified Class I PHWH.

Stream 11

Stream 11 is a modified perennial stream originating within the Study Area draining Delineated Pond 16. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers), and flows south approximately 461 feet (141 meters) through Study Area. Stream 11 connects downstream to an unnamed tributary to Raccoon Creek and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are boulder and silt, maximum pool depth is 3.5 inches

(9.0 centimeters) and bank full width is 4.3 feet (1.3 meters). This stream has been preliminarily assigned an HHEI score of 69 and is therefore categorized as a Modified Class II PHWH.

Stream 12

Stream 12 is a modified perennial stream, originating within the Study Area, which drains into Delineated Wetland 11. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers), and flows east approximately 423 feet (129 meters) to Delineated Wetland 11. Stream 12 connects to an unnamed tributary to Raccoon Creek downstream and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are gravel and silt, maximum pool depth is 1.2 inches (3.0 centimeters) and bank full width is 5.6 feet (1.7 meters). This stream has been preliminarily assigned an HHEI score of 41 and is therefore categorized as a Modified Class II PHWH.

Stream 13

Stream 13 is a modified intermittent stream originating from Delineated Wetland 13 within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers) and flows south approximately 1,538 feet (469 meters) through Study Area. Stream 13 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, downstream and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are gravel and silt, maximum pool depth is 1.2 inches (3.0 centimeters) and bank full width is 3.6 feet (1.1 meters). This stream has been preliminarily assigned an HHEI score of 36 and is therefore categorized as a Modified Class II PHWH.

Stream 14

Stream 14 is a modified intermittent stream originating within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers), and flows south approximately 263 feet (80 meters) through the Study Area to Delineated Wetland 14 outside of the Study Area. Stream 14 connects to an unnamed tributary to Elk Fork, which drains into Raccoon Creek, downstream and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are cobble and clay/hardpan, maximum pool depth is 1.6 inches (4.0 centimeters) and bank full width is 5.3 feet (1.6 meters). This stream has been preliminarily assigned an HHEI score of 43 and is therefore categorized as a Modified Class II PHWH.

Stream 15

Stream 15 is a modified intermittent stream originating within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers), and flows southeast approximately 94 feet (29 meters) through Study Area. Stream 15 connects to an unnamed tributary to Raccoon Creek downstream and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are hardpan and silt, maximum pool depth is 1.6 inches (4.0 centimeters) and bank full width is 4.9 feet (1.5 meters). This stream has been preliminarily assigned an HHEI score of 28 and is therefore categorized as a Modified Class I PHWH.

Stream 16

Stream 16 is a modified intermittent stream originating within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers), and flows southeast approximately 547 feet (167 meters) through Study Area and drains in to Pond 17. Stream 16 connects to an unnamed tributary to Raccoon Creek downstream and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are gravel and silt, maximum pool depth is 1.6 inches (4.0 centimeters) and bank full width is 4.6 feet (1.40 meters). This stream has been preliminarily assigned an HHEI score of 37 and is therefore categorized as a Modified Class II PHWH.

Stream 17

Stream 17 is a modified intermittent stream originating from delineated Pond 8 within the Study Area. This stream has a drainage area of 0.01 square miles (<0.001 square kilometers) and flows south approximately 177 feet (54 meters) through Study Area. Stream 17 connects to an unnamed tributary of Raccoon Creek downstream and, as such, it is preliminarily determined to be jurisdictional. Based on the HHEI assessment methods, the dominate substrates are gravel and silt, maximum pool depth is 0.8 inches (2.0 centimeters) and bank full width is 3.0 feet (0.9 meters). This stream has been preliminarily assigned an HHEI score of 27 and is therefore categorized as a Modified Class I PHWH.

B. Open Water (Pond)

The Study Area was investigated for areas that are considered “open water” by the USACE. The field investigation identified 17 potentially jurisdictional open water resources (ponds) within the Study Area (Table 3.2.3) (Appendix A, Figures 5A and 5B). These are all freshwater farm open waters that have been determined to be jurisdictional based on connectivity to streams and wetlands within the Project.

Table 3.2.3 Other Waters of the U.S Delineated within the Study Area (“Open Water”)

Pond ID	Vegetation Class ¹	Extends Offsite?	Acres(Hectares) ²	Jurisdictional Status ³
1	PUBG	No	0.52(0.21)	Jurisdictional
2	PUBG	Yes	0.20(0.08)	Jurisdictional
3	PUBG	No	0.28(0.11)	Jurisdictional
4	PUBG	No	0.21(0.08)	Jurisdictional
5	PUBG	Yes	0.69(.28)	Jurisdictional
6	PUBG	No	2.87(1.16)	Jurisdictional
7	PUBG	No	0.17(0.17)	Jurisdictional
8	PUBG	No	0.35(0.14)	Jurisdictional
9	PUBG	No	0.64(0.26)	Jurisdictional
10	PUBG	No	0.36(0.15)	Jurisdictional
11	PUBG	Yes	0.89(0.36)	Jurisdictional
12	PUBG	Yes	4.19(1.70)	Jurisdictional
13	PUBG	Yes	0.42(0.17)	Jurisdictional
14	PUBG	No	0.74(0.30)	Jurisdictional
15	PUBG	Yes	0.52(0.21)	Jurisdictional
16	PUBG	Yes	2.24(0.91)	Jurisdictional
17	PUBG	Yes	0.70(0.28)	Jurisdictional

1 PUBG = palustrine unconsolidated bottom, intermittently exposed

2 Represents delineated acreage within Study Area

3 Preliminarily assigned. Not considered final until verified by the USACE

4.0 LITERATURE CITED

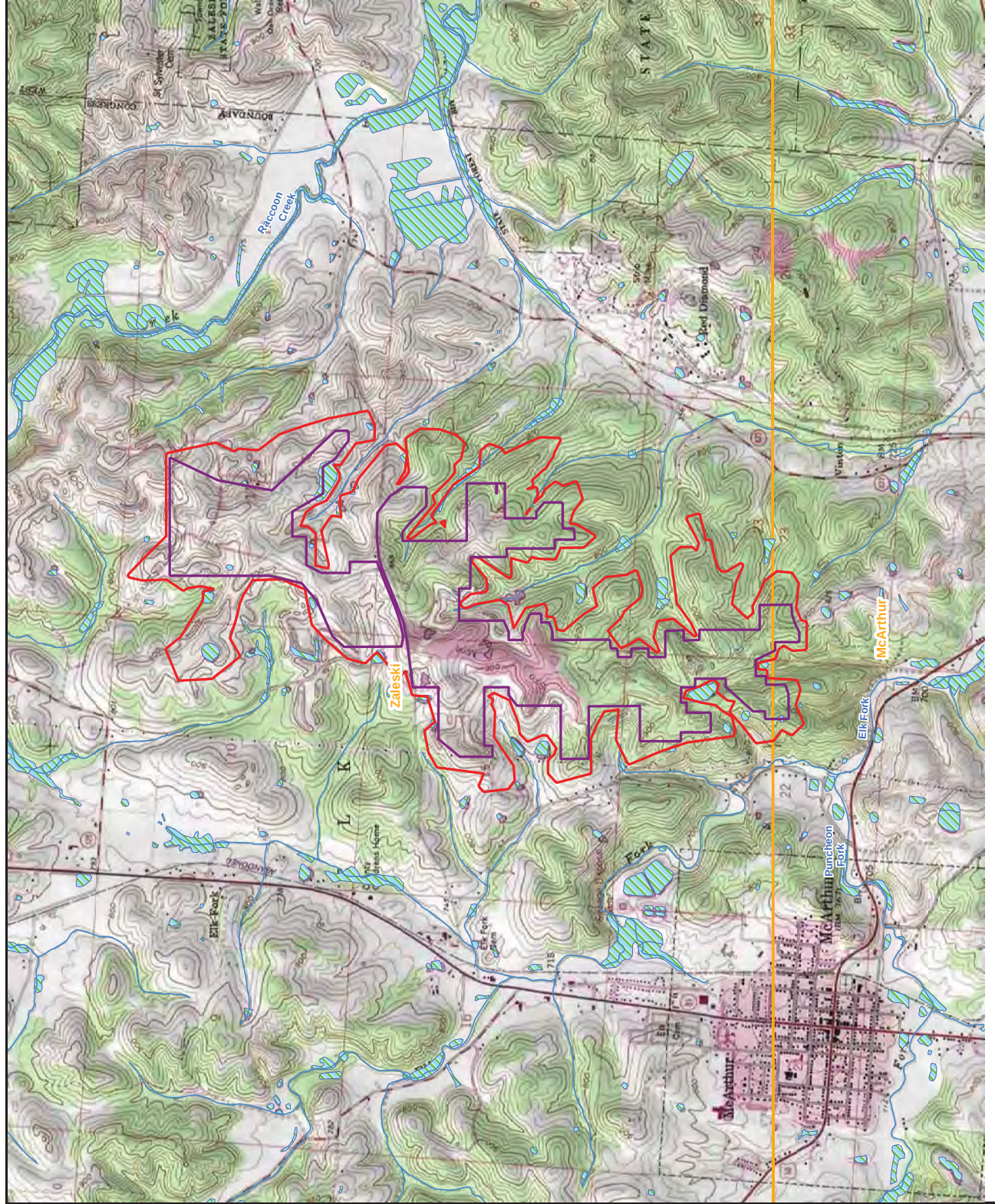
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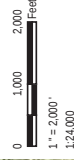
Appendix A

Figures

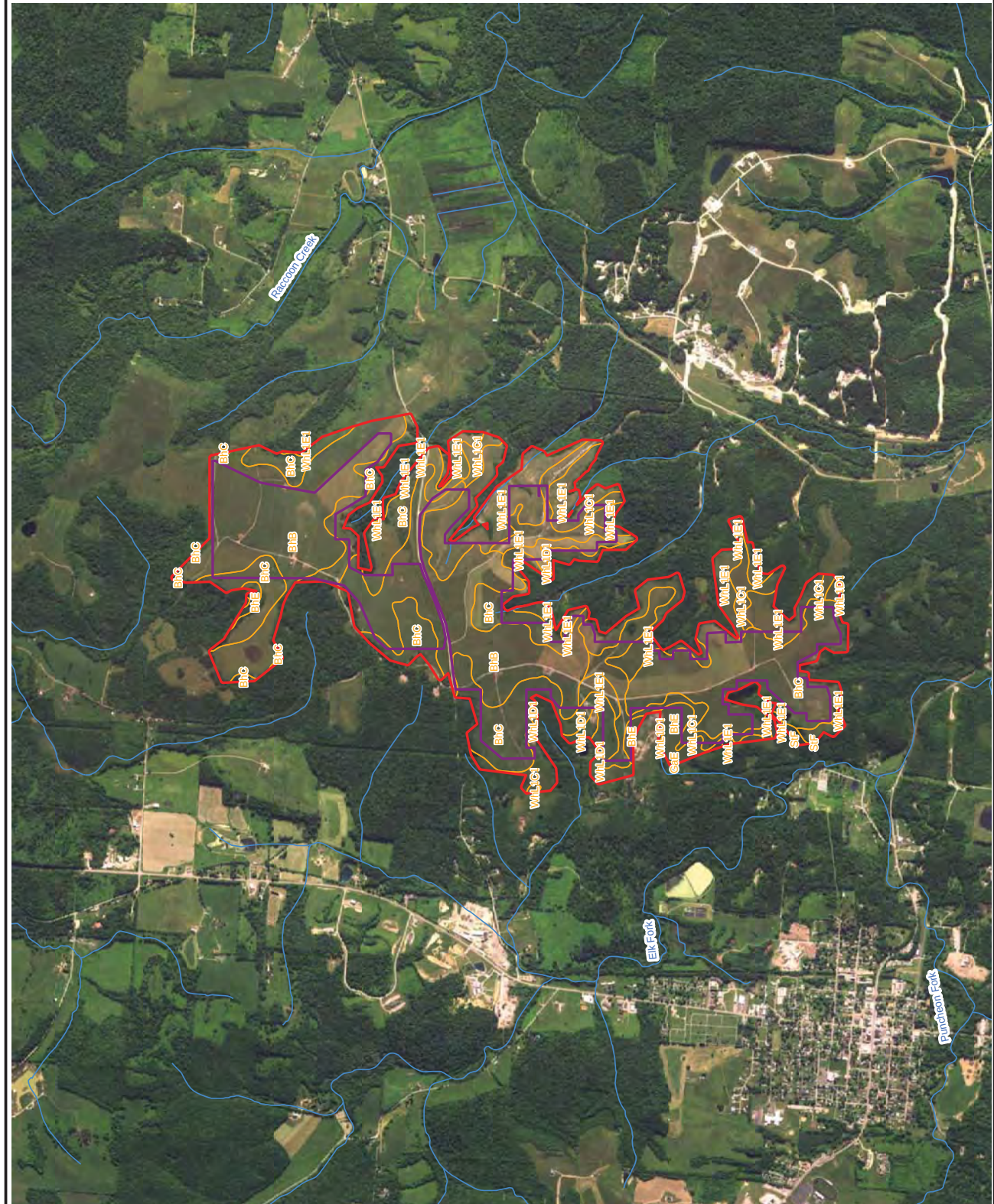


LEGEND

- Study Area
- Impact Area
- National Hydrography Dataset (NHD) Streams
- National Wetlands Inventory (NWI) Wetlands
- United States Geological Survey 24K Quad



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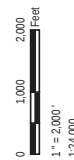
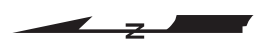


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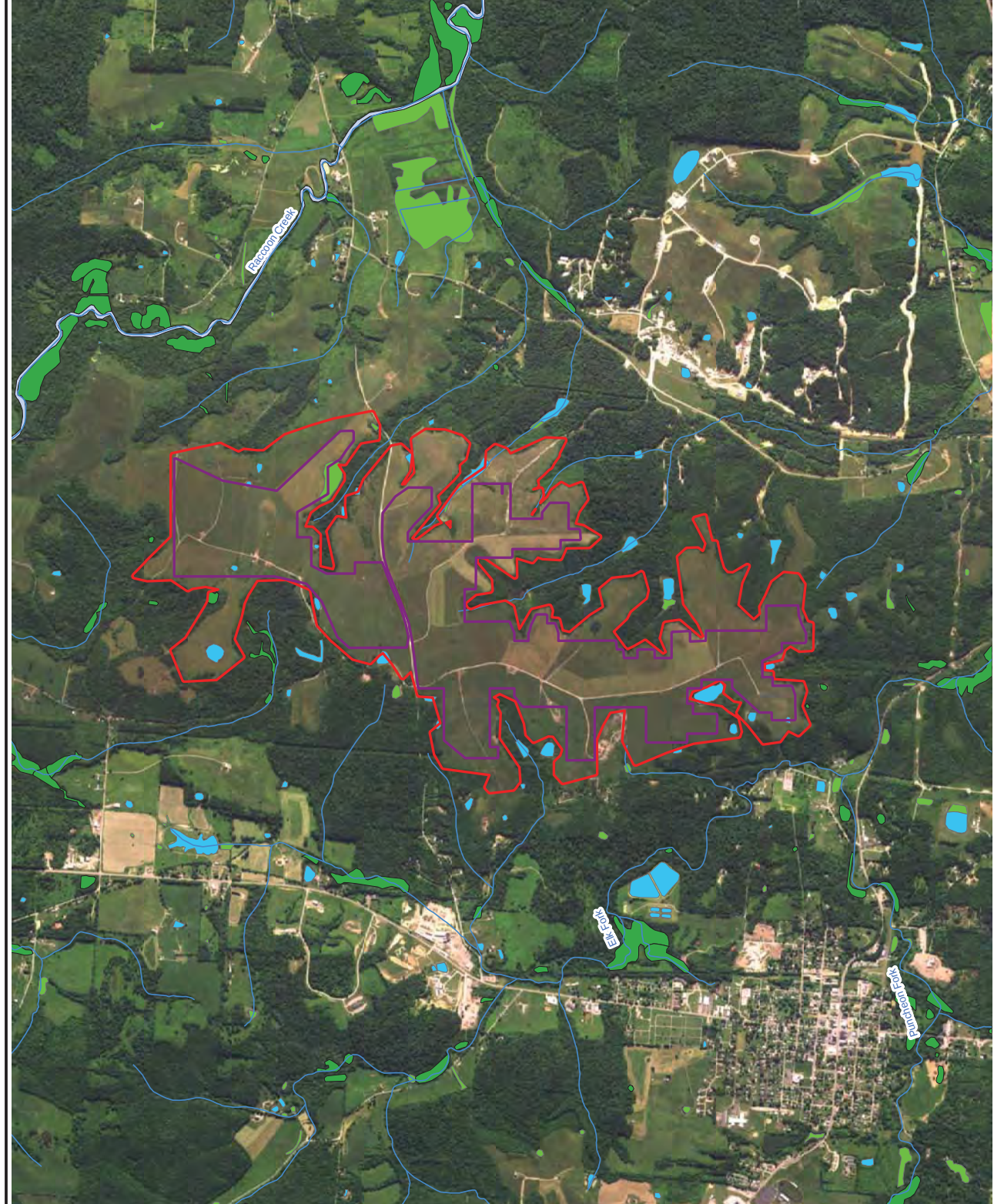
- Study Area
- Impact Area
- National Hydrography Dataset (NHD) Streams

Non-Hydric Soils

- B1B - Bethesda Silty Clay Loam
- B1C - Bethesda Silty Clay Loam
- B1E - Bethesda Silty Clay Loam
- GaE Germano-Gilpin Complex
- SF - Steinsburg-Gilpin Association
- W1L1C1 - Wharton-Latham Silt Loams
- W1L1D1 - Wharton-Latham Silt Loams
- W1L1E1 - Wharton-Latham Silt Loams



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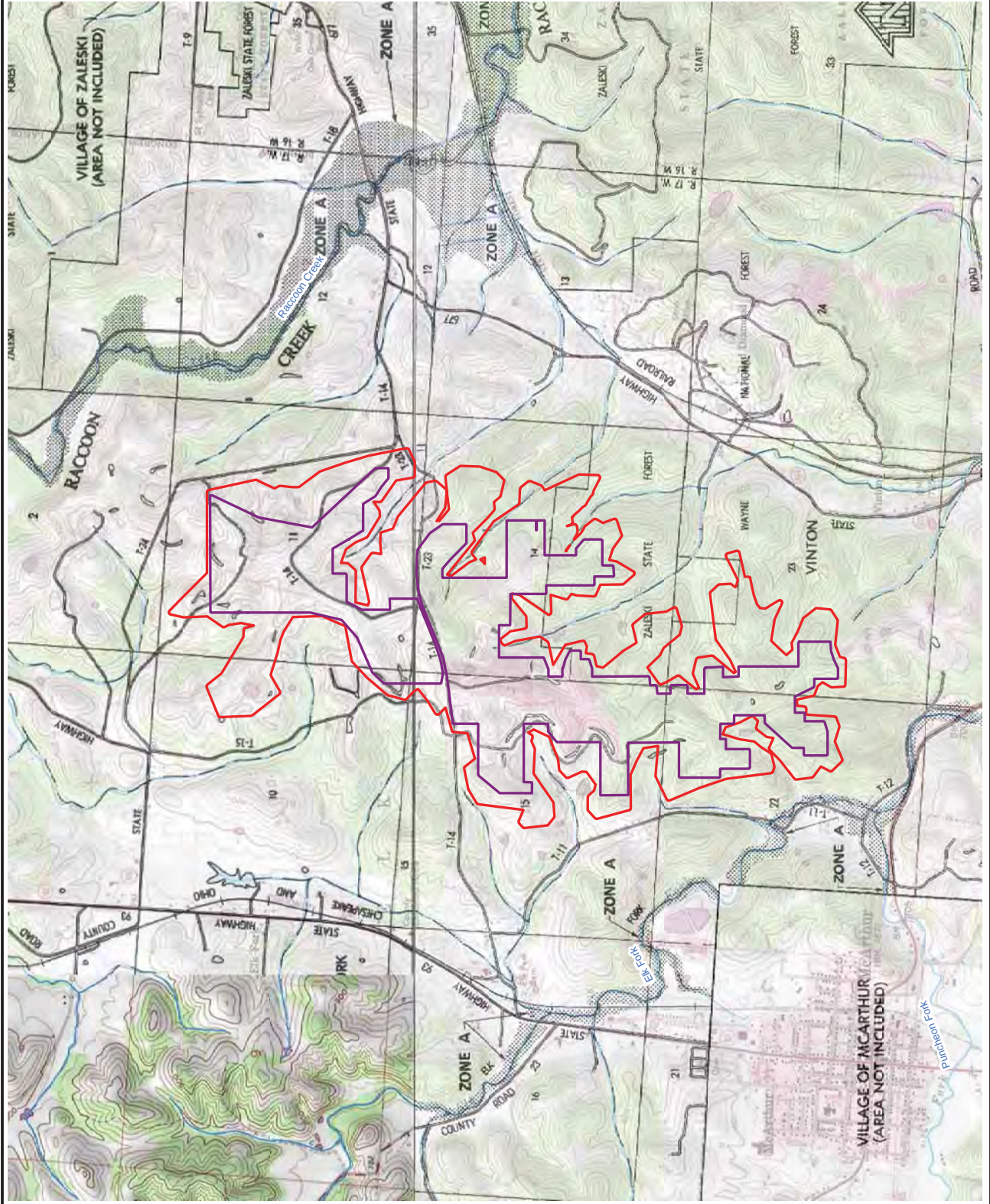
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- National Hydrography Dataset (NHD) Streams
- National Wetlands Inventory (NWI) Types**
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- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

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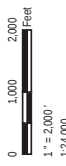
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- Study Area
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- National Hydrography Dataset (NHD) Streams



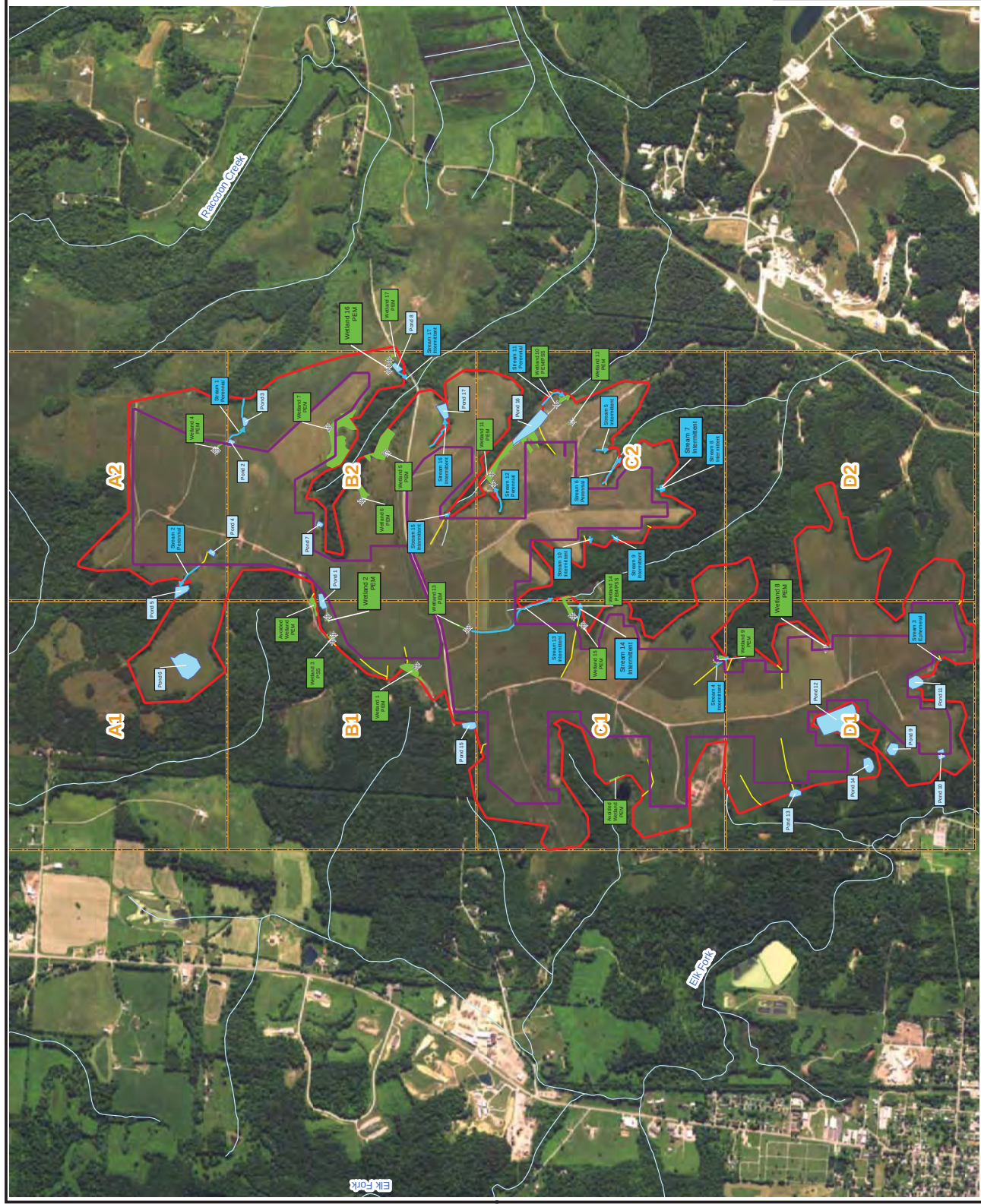
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- FEMA Amendment from October 13, 2009** The National Flood Insurance Program map affecting this property depicts a Special Flood Hazard Area that was determined using the best flood hazard data available to FEMA, but without performing a detailed engineering analysis. The flood elevation used to make this determination is based on approximate methods and has not been formalized through the standard process for establishing base flood elevations published in the Flood Insurance Study. This flood elevation is subject to change.

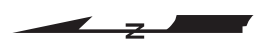


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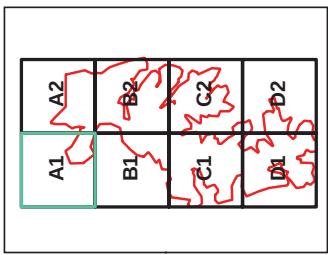
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 - Delineated Stream Centerline and Flow Direction
 - Non-Jurisdictional Drainage
 - Delineated Pond
 - National Hydrography Dataset (NHD) Streams



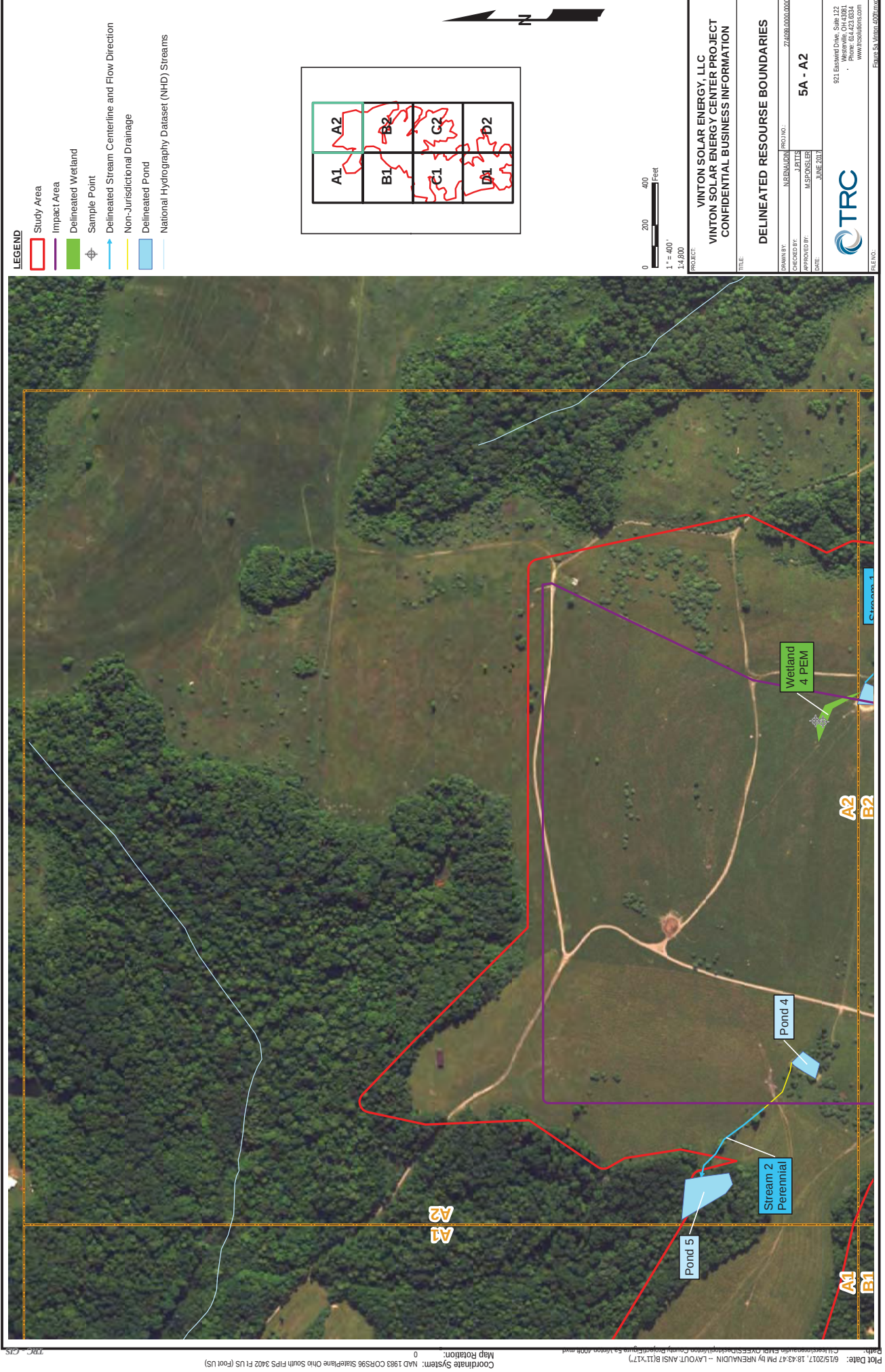
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- LEGEND**
- Study Area
 - Impact Area
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 - Sample Point
 - Delineated Stream Centerline and Flow Direction
 - Non-Jurisdictional Drainage
 - Delineated Pond
 - National Hydrography Dataset (NHD) Streams



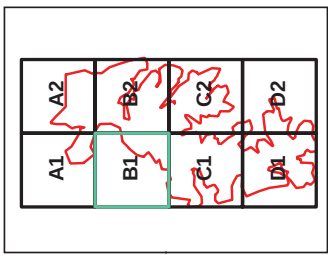
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LEGEND

- Study Area
- Impact Area
- Delineated Wetland
- Sample Point
- Delineated Stream Centerline and Flow Direction
- Non-Jurisdictional Drainage
- Delineated Pond
- National Hydrography Dataset (NHD) Streams



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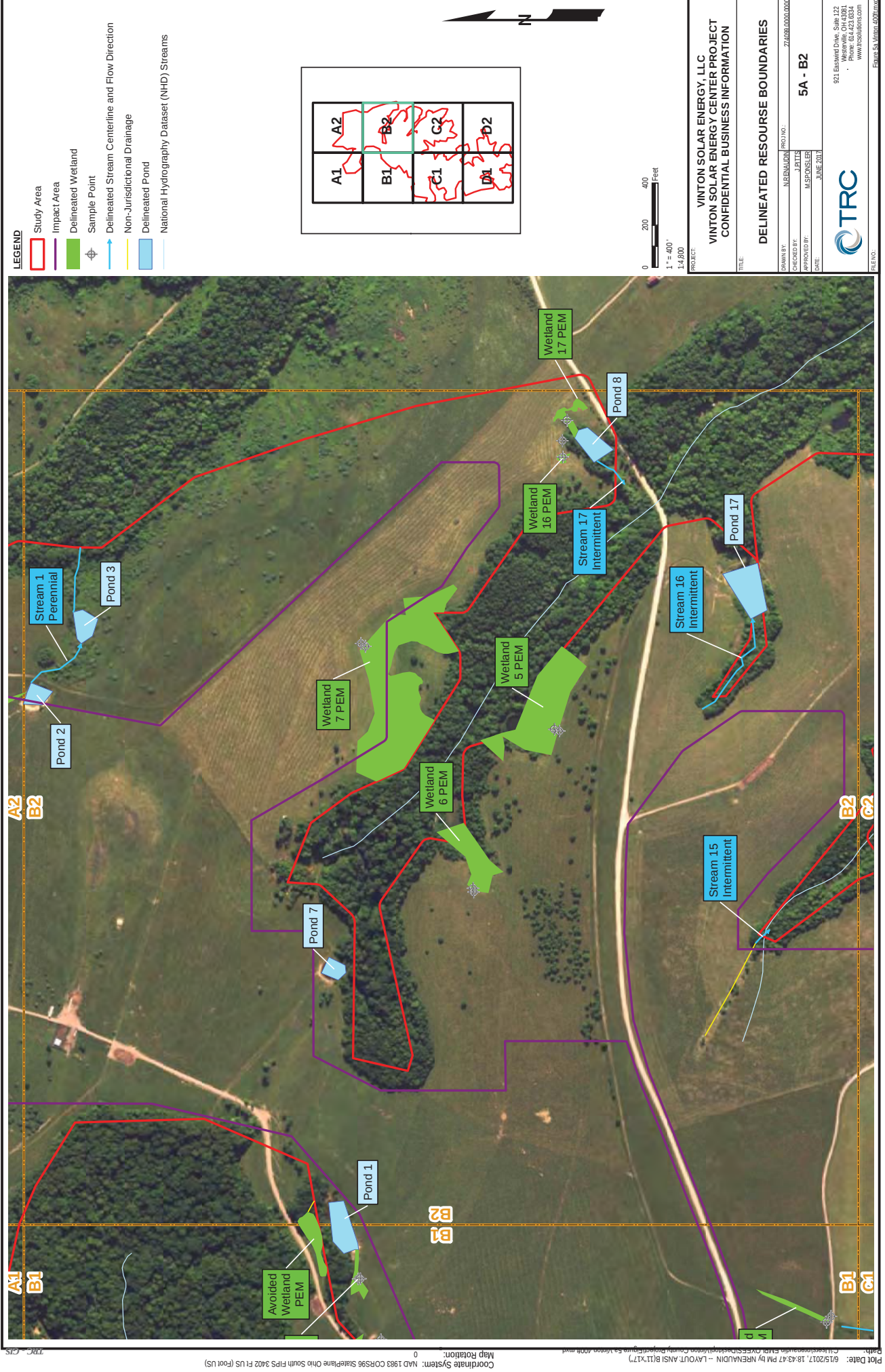
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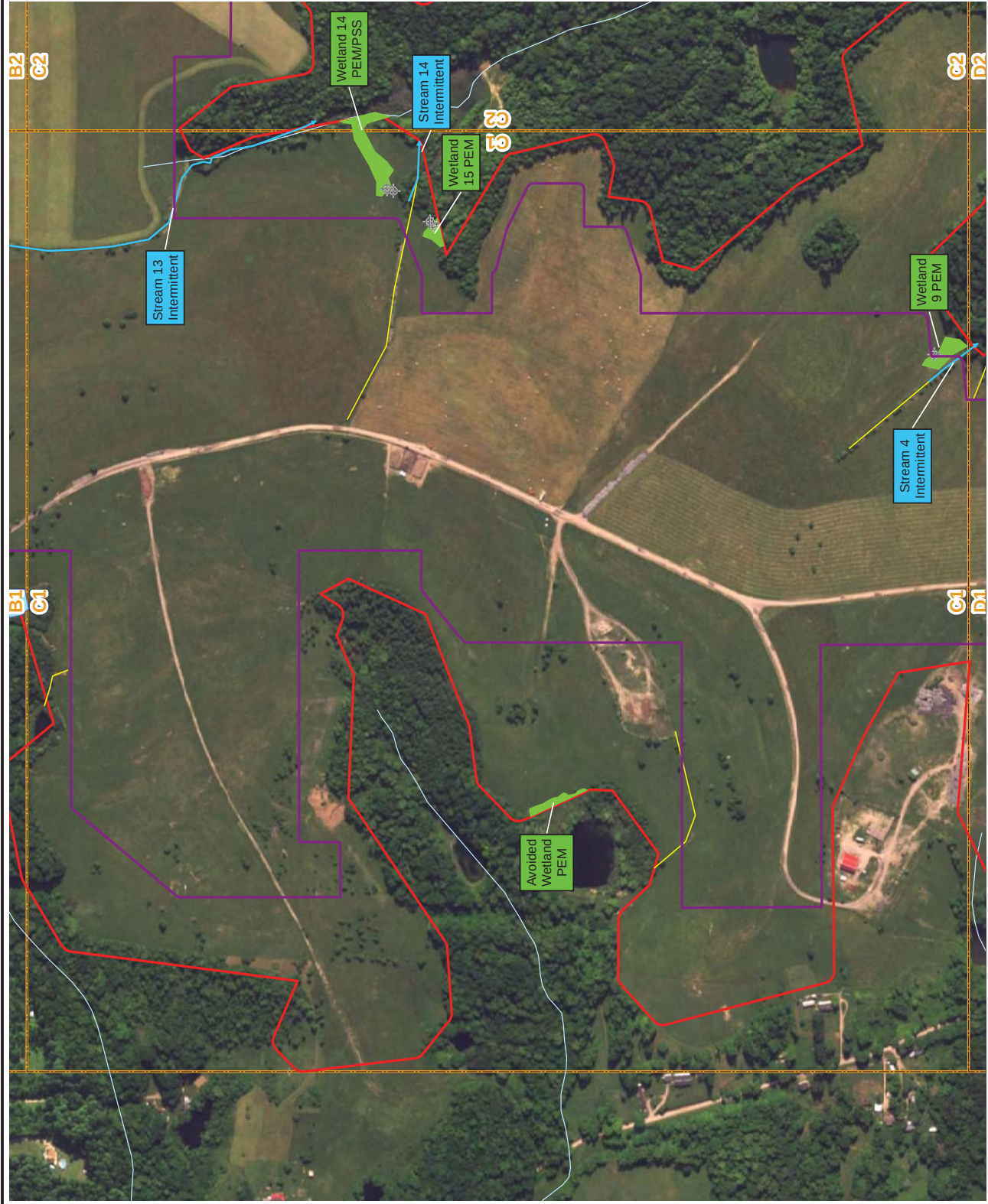
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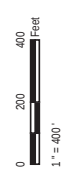
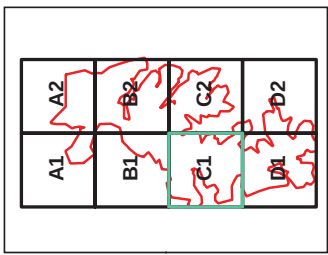
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LEGEND

- Study Area
- Impact Area
- Delineated Wetland
- Sample Point
- Delineated Stream Centerline and Flow Direction
- Non-Jurisdictional Drainage
- Delineated Pond
- National Hydrography Dataset (NHD) Streams



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DELINEATED RESOURCE BOUNDARIES

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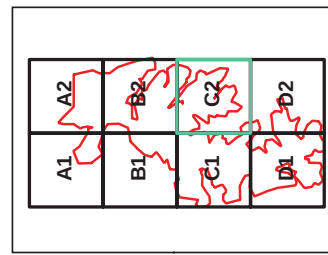
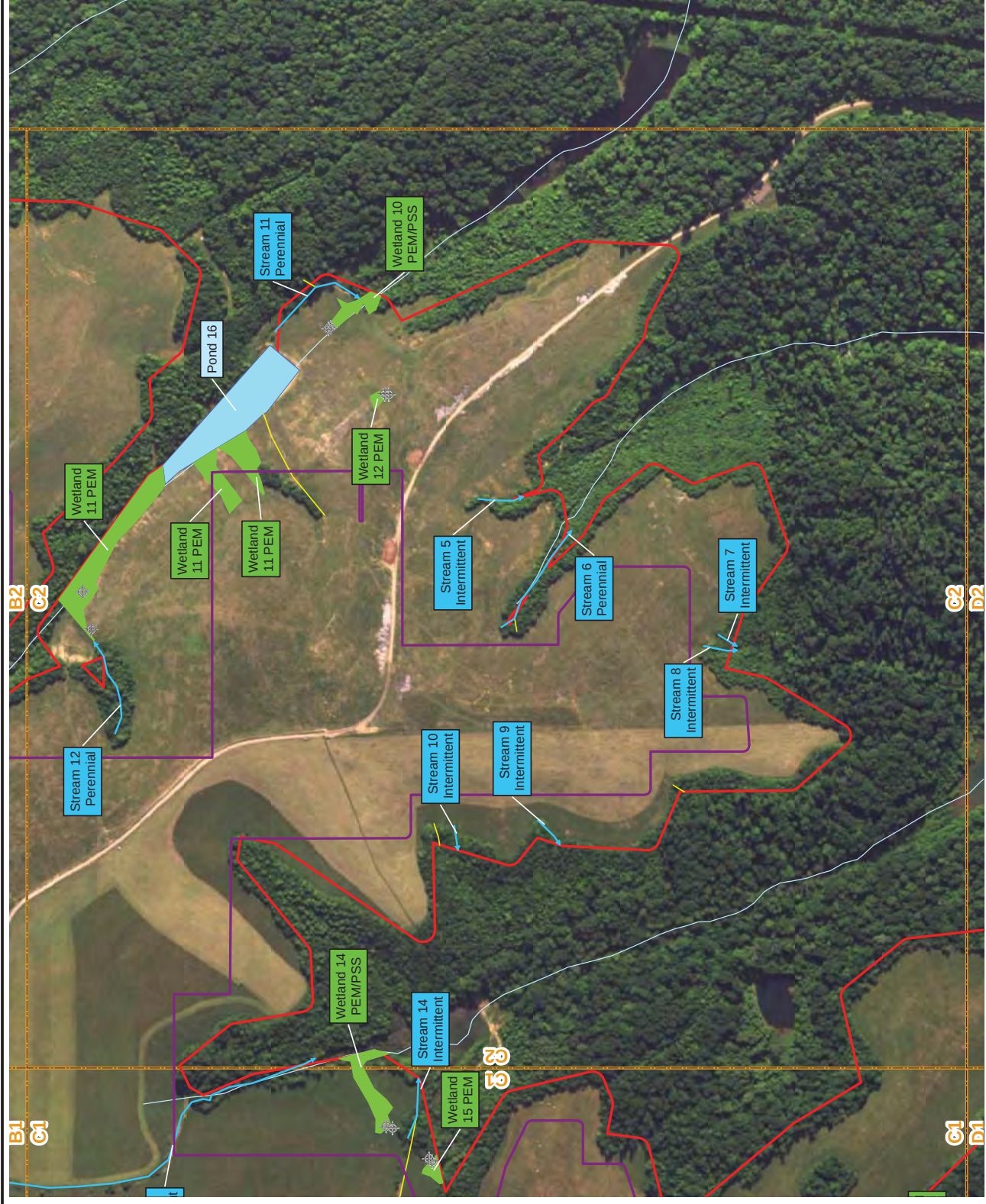
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APPROVED BY: M. SPONSLER
DATE: JUNE 2017

5A - C1

921 Eastwood Drive, Suite 101
Vinton, Ohio 45892
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TRC

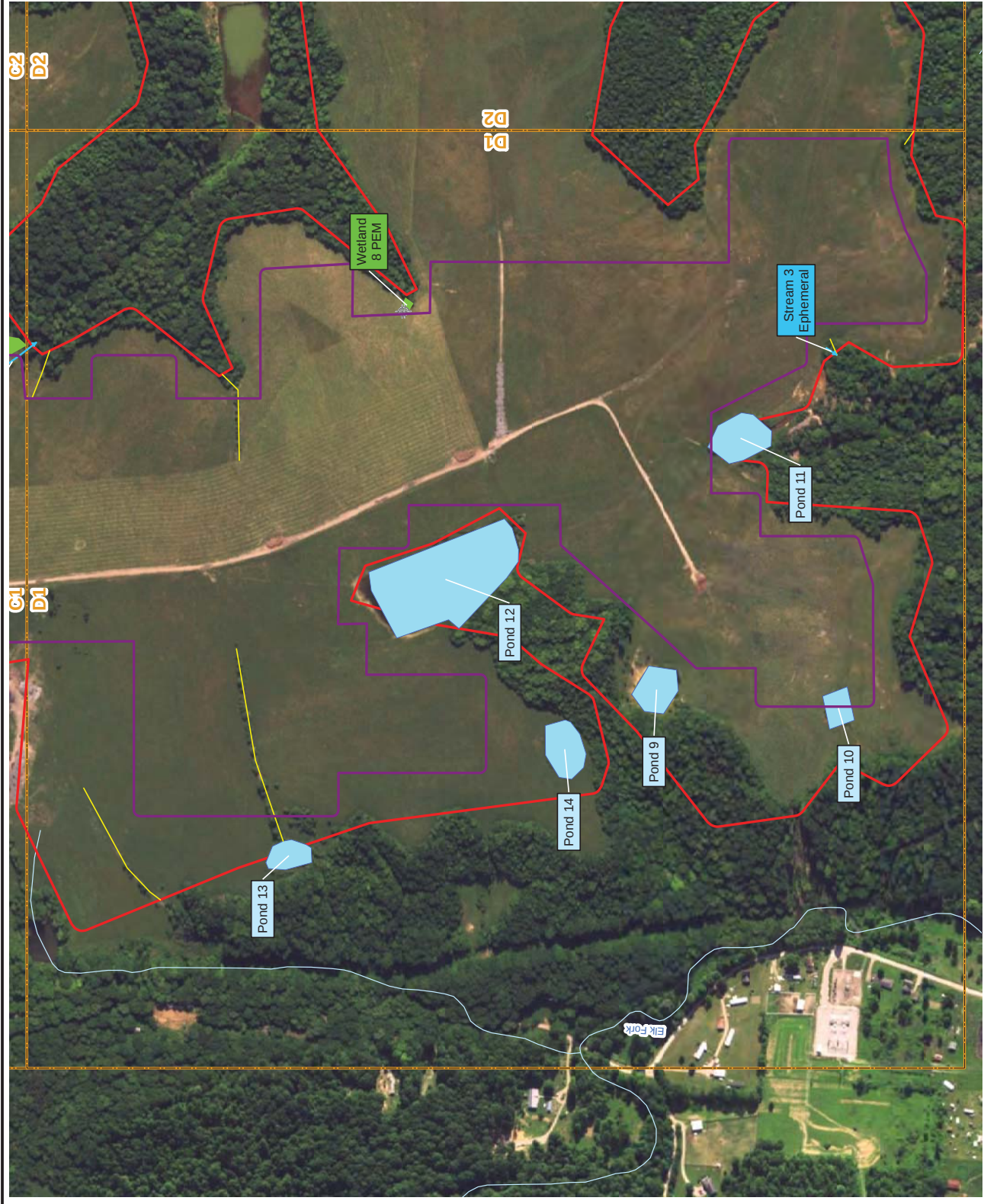
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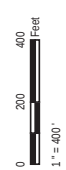
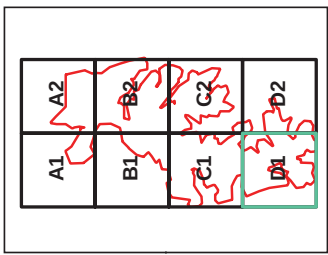
VINTON SOLAR ENERGY, LLC
VINTON SOLAR ENERGY CENTER PROJECT
CONFIDENTIAL BUSINESS INFORMATION

DELINEATED RESOURCE BOUNDARIES		PROJ NO.: 274030, 0000, 0000
DRAWN BY:	N. RENAUDIN	
CHECKED BY:	J. PITS	
APPROVED BY:	M. SPONSLER	
DATE:	JUNE 2017	


 921 Eastwind Drive, Suite 122
 Westerville, OH 43081
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- LEGEND**
- Study Area
 - Impact Area
 - Delineated Wetland
 - Sample Point
 - Delineated Stream Centerline and Flow Direction
 - Non-Jurisdictional Drainage
 - Delineated Pond
 - National Hydrography Dataset (NHD) Streams



VINTON SOLAR ENERGY, LLC
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CONFIDENTIAL BUSINESS INFORMATION

DELINEATED RESOURCE BOUNDARIES

PROJECT: VINTON SOLAR ENERGY CENTER PROJECT
DRAWN BY: NRENAUDIN
CHECKED BY: J. JONES
APPROVED BY: M. SPONSLER
DATE: JUNE 2017

PROJ. NO.: 27,659,000.000
5A - D1

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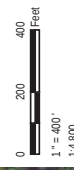
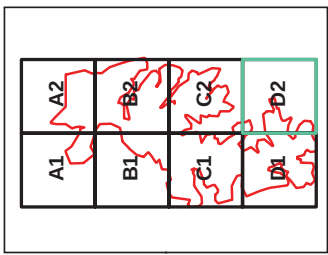
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File No.: 40070.mxd



LEGEND

- Study Area
- Impact Area
- Delineated Wetland
- Sample Point
- Delineated Stream Centerline and Flow Direction
- Non-Jurisdictional Drainage
- Delineated Pond
- National Hydrography Dataset (NHD) Streams



PROJECT:
VINTON SOLAR ENERGY, LLC
VINTON SOLAR ENERGY CENTER PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE:
DELINEATED RESOURCE BOUNDARIES

DATE:
JUNE 2017

APPROVED BY:
M. SPONSLER

CHECKED BY:
J. JONES

DRAWN BY:
NRENAUDIN

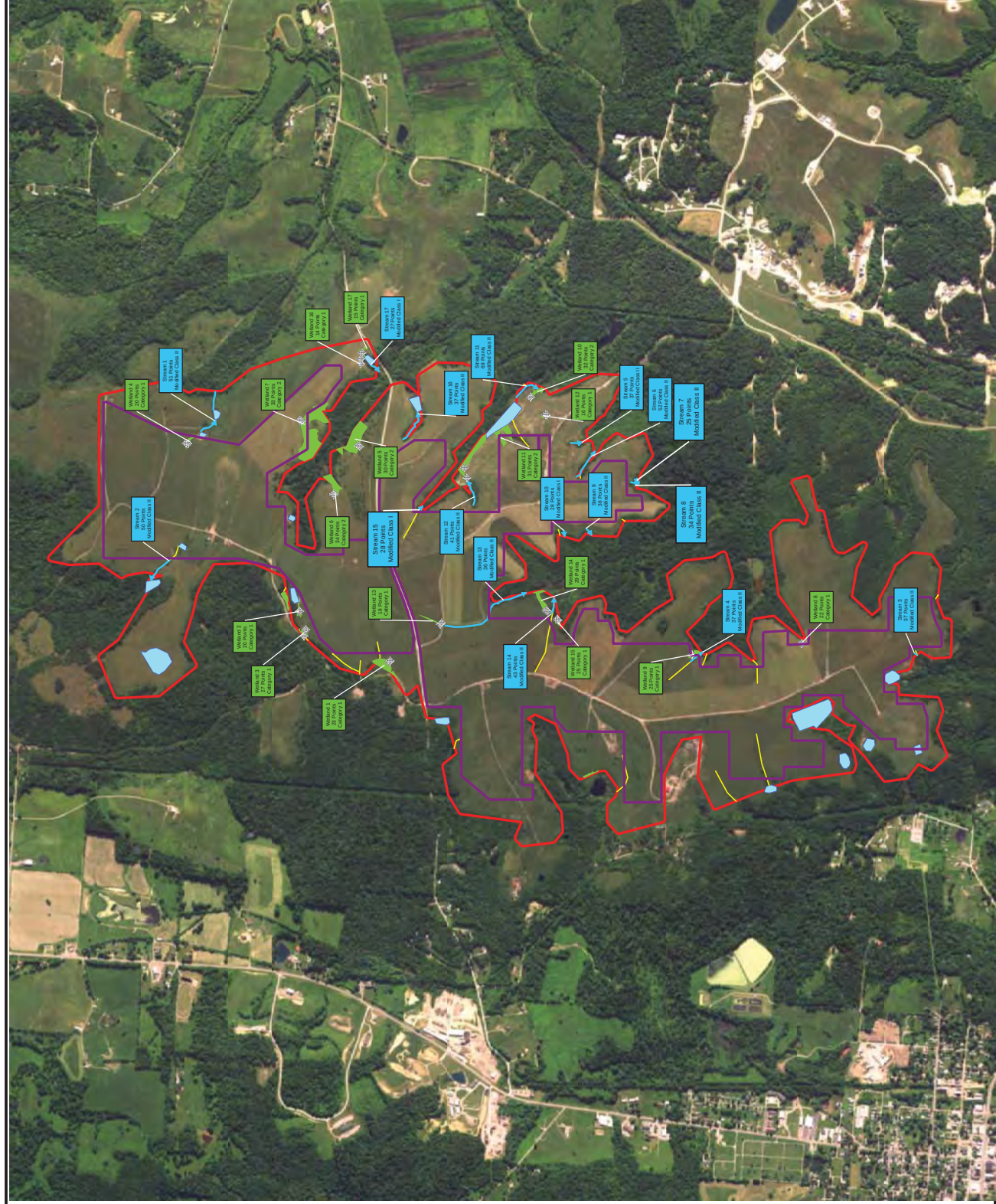
PROJ. NO.:
27,659,000,000

5A - D2

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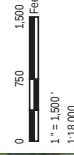
TRC

FILE NO.:
E:\0515 Vinton 4000.mxd



LEGEND

- Study Area
- Impact Area
- Delineated Wetland
- Sample Point
- Delineated Stream Centerline and Flow Direction
- Non-Jurisdictional Drainage
- Delineated Pond



PROJECT
VINTON SOLAR ENERGY, LLC
VINTON SOLAR ENERGY CENTER PROJECT
CONFIDENTIAL BUSINESS INFORMATION

TITLE
DELINEATED RESOURCE PRELIMINARY
ORAMS AND HHEIS

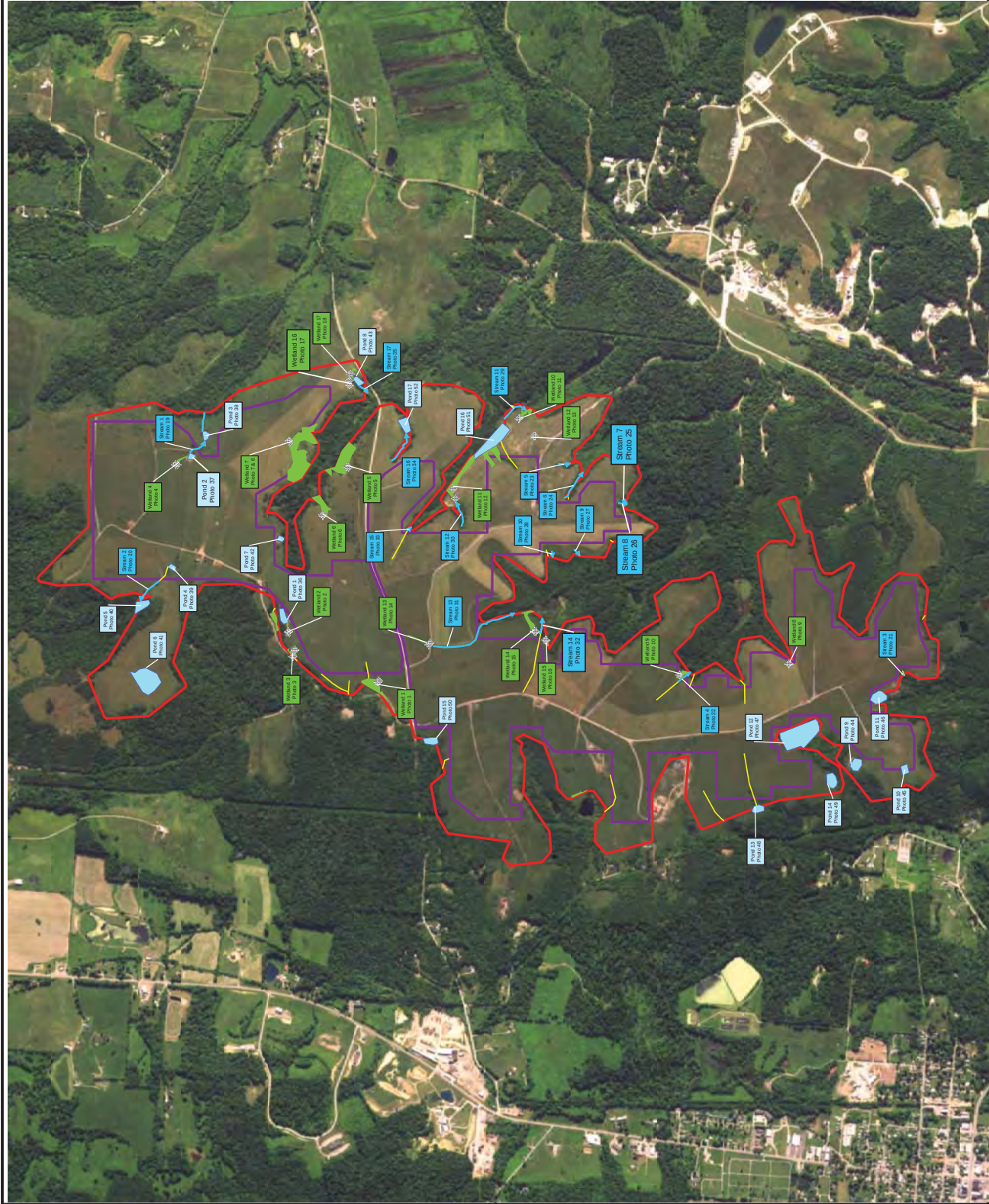
DRAWN BY:	NRENAUDIN	PROJ. NO.	274599.0000.0000
CHECKED BY:	J.PITTS		
APPROVED BY:	M.SPONSER		
DATE:	JUNE 2017		

5B

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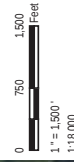
FILE NO.: Figure 5B_Vinton.mxd



LEGEND

- Study Area
- Impact Area
- Sample Point
- Delineated Wetland
- Delineated Stream Centerline and Flow Direction
- Non-Jurisdictional Drainage
- Delineated Pond

NOTE:
LABEL LEADERS INDICATE
THE LOCATION WHERE
THE PHOTO WAS TAKEN.



PROJECT
VINTON SOLAR ENERGY, LLC
VINTON SOLAR ENERGY CENTER PROJECT
CONFIDENTIAL BUSINESS INFORMATION

PHOTO LOCATIONS	
TITLE	
DRAWN BY: NRENAUDIN	PROJ NO: 274599.0000.0000
CHECKED BY: JWHITTLE	
APPROVED BY: M.SPONSER	
DATE: JUNE 2017	6



921 Eastwood Drive, Suite 101
Cincinnati, OH 45244-1001
Phone: 614.423.0334
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FILE NO:

Figure 6 Vinton.mxd

Appendix B

Photographic Log

Wetland Resource Photographs

Invenergy LLC		State: Ohio	County: Vinton
Project Name: Vinton Solar Energy Center Project			
Photo ID: Photo #1			
Date: 04-04-2017			
Feature: Wetland 1			
Comments: Photo of Wetland 1 facing Southwest.			
Photo ID: Photo #2			
Date: 04-04-2017			
Feature: Wetland 2			
Comments: Photo of Wetland 2 facing West.			

Photo ID: Photo #3	
Date: 04-04-2017	
Feature: Wetland 3	
Comments: Photo of Wetland 3 facing North.	
Photo ID: Photo #4	
Date: 04-04-2017	
Feature: Wetland 4	
Comments: Photo of Wetland 4 West.	

Photo ID: Photo #5	
Date: 04-04-2017	
Feature: Wetland 5	
Comments: Photo of Wetland 5 facing East.	
Photo ID: Photo #6	
Date: 04-04-2017	
Feature: Wetland 6	
Comments: Photo of Wetland 6 facing East.	

Photo ID: Photo #7	
Date: 04-04-2017	
Feature: Wetland 7	
Comments: Photo of Wetland 7 facing South.	
Photo ID: Photo #8	
Date: 04-04-2017	
Feature: Wetland 7	
Comments: Photo of soil for Wetland 7. Coal fragments can be easily found in the sample.	

Photo ID: Photo #9	
Date: 04-05-2017	
Feature: Wetland 8	
Comments: Photo of Wetland 8 facing East.	
Photo ID: Photo #10	
Date: 04-05-2017	
Feature: Wetland 9	
Comments: Photo of Wetland 9 facing South.	

Photo ID: Photo #11	
Date: 04-06-2017	
Feature: Wetland 10	
Comments: Photo of Wetland 10 facing Southeast.	
Photo ID: Photo #12	
Date: 04-06-2017	
Feature: Wetland 11	
Comments: Photo of Wetland 11 facing West.	

Photo ID: Photo #13	
Date: 04-06-2017	
Feature: Wetland 12	
Comments: Photo of Wetland 12 facing East.	
Photo ID: Photo #14	
Date: 04-06-2017	
Feature: Wetland 13	
Comments: Photo of Wetland 13 facing West.	

Photo ID: Photo #15	
Date: 04-06-2017	
Feature: Wetland 14	
Comments: Photo of Wetland 14 facing East.	
Photo ID7 Photo #16	
Date: 04-06-2017	
Feature: Wetland 15	
Comments: Photo of Wetland 15 facing East.	

Photo ID: Photo #17	
Date: 04-07-2017	
Feature: Wetland 16	
Comments: Photo of Wetland 16 facing East.	
Photo ID: Photo #18	
Date: 04-07-2017	
Feature: Wetland 17	
Comments: Photo of Wetland 17 facing East.	

Other Waters of the U.S. Resource Photographs

Invenergy LLC		State: Ohio	County: Vinton
Project Name: Vinton Solar Energy Center Project			
Photo ID: Photo #19			
Date: 04-04-2017			
Feature: Stream 1			
Comments: Photo of Stream 1 facing upstream West.			
Photo ID: Photo #20			
Date: 04-04-2017			
Feature: Stream 2			
Comments: Photo of Stream 2 facing downstream West.			

Photo ID: Photo #21	
Date: 04-05-2017	
Feature: Stream 3	
Comments: Photo of Stream 3 facing upstream North.	
Photo ID: Photo #22	
Date: 04-05-2017	
Feature: Stream 4	
Comments: Photo of Stream 4 facing downstream East.	

Photo ID: Photo #23	
Date: 04-06-2017	
Feature: Stream 5	
Comments: Photo of Stream 5 facing downstream South.	
Photo ID: Photo #24	
Date: 04-06-2017	
Feature: Stream 6	
Comments: Photo of Stream 6 facing downstream South.	

Photo ID: Photo #25	
Date: 04-06-2017	
Feature: Stream 7	
Comments: Photo of Stream 7 facing downstream South.	
Photo ID: Photo #26	
Date: 04-06-2017	
Feature: Stream 8	
Comments: Photo of Stream 8 downstream South.	

Photo ID: Photo #27	
Date: 04-06-2017	
Feature: Stream 9	
Comments: Photo of Stream 9 facing downstream West.	
Photo ID: Photo #28	
Date: 04-06-2017	
Feature: Stream 10	
Comments: Photo of Stream 10 facing downstream West.	

Photo ID: Photo #29	
Date: 04-06-2017	
Feature: Stream 11	
Comments: Photo of Stream 11 facing downstream South.	
Photo ID: Photo #30	
Date: 04-06-2017	
Feature: Stream 12	
Comments: Photo of Stream 12 facing upstream West.	

Photo ID: Photo #31	
Date: 04-06-2017	
Feature: Stream 13	
Comments: Photo of Stream 13 facing upstream North.	
Photo ID: Photo #32	
Date: 04-06-2017	
Feature: Stream 14	
Comments: Photo of Stream 14 facing downstream South.	

Photo ID: Photo #33	
Date: 04-06-2017	
Feature: Stream 15	
Comments: Photo of Stream 15 facing downstream South.	
Photo ID: Photo #34	
Date: 04-06-2017	
Feature: Stream 16	
Comments: Photo of Stream 15 facing upstream West.	

Photo ID: Photo #35	
Date: 04-07-2017	
Feature: Stream 17	
Comments: Photo of Stream 17 facing downstream West.	
Photo ID: Photo #36	
Date: 04-04-2017	
Feature: Pond 1	
Comments: Photo of Pond 1 facing Northeast.	

Photo ID: Photo #37	
Date: 04-04-2017	
Feature: Pond 2	
Comments: Photo of Pond 2 facing South.	
Photo ID: Photo #38	
Date: 04-04-2017	
Feature: Pond 3	
Comments: Photo of Pond 3 facing East.	

Photo ID: Photo #39	
Date: 04-04-2017	
Feature: Pond 4	
Comments: Photo of Pond 4 facing East.	
Photo ID: Photo #40	
Date: 04-04-2017	
Feature: Pond 5	
Comments: Photo of Pond 5 facing North.	

Photo ID: Photo #41	
Date: 04-04-2017	
Feature: Pond 6	
Comments: Photo of Pond 6 facing upstream West.	
Photo ID: Photo #42	
Date: 04-04-2017	
Feature: Pond 7	
Comments: Photo of Pond 7 facing North.	

Photo ID: Photo #43	
Date: 04-04-2017	
Feature: Pond 8	
Comments: Photo of Pond 8 facing West.	
Photo ID: Photo #44	
Date: 04-05-2017	
Feature: Pond 9	
Comments: Photo of Pond 9 facing Northwest.	

Photo ID: Photo #45	
Date: 04-05-2017	
Feature: Pond 10	
Comments: Photo of Pond 10 facing Northwest.	
Photo ID: Photo #46	
Date: 04-05-2017	
Feature: Pond 11	
Comments: Photo of Pond 11 facing West.	

Photo ID: Photo #47	
Date: 04-05-2017	
Feature: Pond 12	
Comments: Photo of Pond 12 facing East.	
Photo ID: Photo #48	
Date: 04-05-2017	
Feature: Pond 13	
Comments: Photo of Pond 13 facing North.	

Photo ID: Photo #49	
Date: 04-05-2017	
Feature: Pond 14	
Comments: Photo of Pond 14 facing North.	
Photo ID: Photo #50	
Date: 04-05-2017	
Feature: Pond 15	
Comments: Photo of Pond 15 facing South.	

Photo ID: Photo #51	
Date: 04-06-2017	
Feature: Pond 16	
Comments: Photo of Pond 16 facing West.	
Photo ID: Photo #52	
Date: 04-06-2017	
Feature: Pond 17	
Comments: Photo of Pond 17 facing West.	

Appendix C

USACE Wetland Data Forms

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 1
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.272417 Long: -82.451333 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the edge of a pond outside the study area. The sample point is located approximately 500 feet north of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☒ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>1</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-9</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 1

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus (Common Rush)</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Typha latifolia (Broadleaf Cattail)</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Carex vulpinoidea (Fox Sedge)</u>	<u>15</u>	<u>N</u>	<u>OBL</u>	
4. <u>Trifolium pratense (Red Clover)</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
5. <u>Trifolium repens (White Clover)</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
6. <u>Dactylis glomerata (Orchard Grass)</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>95</u> = Total Cover
50% of total cover: <u>47.5</u>				20% of total cover: <u>19</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the wetland, making species identification difficult.

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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☒
No ☐

SOIL

Sampling Point: Wetland 1

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 ¹	Loc ²		
0-1	2.5Y 2/1	100					Loam	Muck layer
1-6	2.5Y 4/1	90	10 YR 5/6	10	D	M	Silt Loam	Some coal fragments
6-12	2.5Y 5/1	90	10 YR 5/6	10	D	M	Silt Loam	Some coal fragments

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: 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) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

- ☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
☐ Thin Dark Surface (S9) (**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
☐ Umbric Surface (F13) (**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
☐ Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (**MLRA 147**)
☐ Coast Prairie Redox (A16) (**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators 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:**

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 1
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.27237 Long: -82.45126 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This Upland point can be found on the edge of a pond that is outside the study area. The sample point is located approximately 500 feet north of the intersection of township roads 14 and 15. This upland sample point is located directly alongside the boundary of Wetland 1.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 1

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Dactylis glomerata (Orchard Grass)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Trifolium repens (White Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense (Red Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Taraxacum officinale (Common Dandelion)</u>	<u>15</u>	<u>N</u>	<u>UPL</u>	
5. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>95</u> = Total Cover				
50% of total cover: <u>47.5</u> 20% of total cover: <u>19</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 3 (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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

SOIL

Sampling Point: Upland 1

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenergy LLC State: OH Sampling Point: Wetland 2
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.276315 Long: -82.448510 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the southern edge of delineated Pond 1. The sample point is located approximately 2,400 feet north of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>2</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-8</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: Wetland 2

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus</u> (Common Rush)	40	Y	FACW	
2. <u>Carex vulpinoidea</u> (Fox Sedge)	15	Y	OBL	
3. <u>Trifolium pratense</u> (Red Clover)	15	Y	FACU	
4. <u>Trifolium repens</u> (White Clover)	10	N	FACU	
5. <u>Dactylis glomerata</u> (Orchard Grass)	10	N	FACU	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				90 = Total Cover
50% of total cover: <u>45</u>				20% of total cover: <u>18</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of 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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0¹

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Vegetation has been grazed in many portions of the wetland, making species identification difficult. 10% bare ground.

SOIL

Sampling Point: Wetland 2

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 ¹	Loc ²		
0-1	2.5Y 2/1	100					Loam	Muck layer
1-5	2.5Y 4/1	95	10 YR 5/6	5	D	M	Silt Loam	Some coal fragments
5-12	2.5Y 5/1	97	10 YR 5/6	3	D	M	Silt Loam	Some coal fragments

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.
²Location: 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) (LRR N) ☐ Depleted Below Dark Surface (A11) ☐ Thick Dark Surface (A12) ☐ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148) ☐ Sandy Gleyed Matrix (S4) ☐ Sandy Redox (S5) ☐ Stripped Matrix (S6)	☐ Dark Surface (S7) ☐ Polyvalue Below Surface (S8) (MLRA 147, 148) ☐ Thin Dark Surface (S9) (MLRA 147, 148) ☐ Loamy Gleyed Matrix (F2) ☒ Depleted Matrix (F3) ☐ Redox Dark Surface (F6) ☐ Depleted Dark Surface (F7) ☐ Redox Depressions (F8) ☐ Iron-Manganese Masses (F12) (LRR N, MLRA 136) ☐ Umbric Surface (F13) (MLRA 136, 122) ☐ Piedmont Floodplain Soils (F19) (MLRA 148) ☐ Red Parent Material (F21) (MLRA 127, 147)
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Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (MLRA 147) ☐ Coast Prairie Redox (A16) (MLRA 147, 148) ☐ Piedmont Floodplain Soils (F19) (MLRA 136, 147) ☐ Very Shallow Dark Surface (TF12) ☐ Other (Explain in Remarks)	³ Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
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Restrictive Layer (if observed):

Type: _____	Hydric Soil Present? Yes ☒ No ☐
Depth (inches): _____	

Remarks: Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 2
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): _____ Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.27628 Long: -82.44850 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the southern edge of delineated Pond 1. The sample point is located approximately 4300 feet north of the intersection of township roads 14 and 15. This upland sample point is located directly alongside the boundary of Wetland 2.					

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 2

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Dactylis glomerata (Orchard Grass)</u>	<u>25</u>	<u>Y</u>	_____	
2. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>	_____	
3. <u>Trifolium pratense (Red Clover)</u>	<u>25</u>	<u>Y</u>	_____	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>15</u>	<u>N</u>	_____	
5. <u>Taraxacum officinale (Common Dandelion)</u>	<u>10</u>	<u>N</u>	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
_____ = 100				
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 3 (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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

SOIL

Sampling Point: Upland 2

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenergy LLC State: OH Sampling Point: Wetland 3
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 0
 Subregion (LRR or MLRA): MLRA126 Lat: 39.276106 Long: -82.449888 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PSS

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining. Township road 15 runs right through this particular wetland. The sample point is located approximately 2,200 feet north of the intersection of township roads 14 and 15.			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>2</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-7</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 3

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. <u>Platanus occidentalis</u> (Sycamore)	<u>10</u>	<u>Y</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>10</u> = Total Cover				
50% of total cover: <u>5</u> 20% of total cover: <u>2</u>				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. <u>Platanus occidentalis</u> (Sycamore)	<u>10</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Elaeagnus umbellata</u> (Autumn Olive)	<u>8</u>	<u>Y</u>	<u>NA</u>	
3. <u>Rosa multiflora</u> (Multiflora Rose)	<u>5</u>	<u>Y</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>23</u> = Total Cover				
50% of total cover: <u>11.5</u> 20% of total cover: <u>4.6</u>				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus</u> (Common Rush)	<u>40</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Carex vulpinoidea</u> (Fox Sedge)	<u>20</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Trifolium pratense</u> (Red Clover)	<u>10</u>	<u>N</u>	<u>FACU</u>	
4. <u>Trifolium repens</u> (White Clover)	<u>5</u>	<u>N</u>	<u>FACU</u>	
5. <u>Dactylis glomerata</u> (Orchard Grass)	<u>5</u>	<u>N</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>80</u> = Total Cover				
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				

Remarks: (Include photo numbers here or on a separate sheet.)
 20% bare ground found in wetland. Autumn Olive does not have a wetland indicator and was assigned "NA".

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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL

Sampling Point: Wetland 3

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 ¹	Loc ²		
0-1	2.5Y 2/1	100					Loam	Muck layer
1-5	2.5Y 6/1	70	2.5Y 6/1	20	D	M	Silt Loam	Some coal fragments
			2.5Y 6/8	10	D	M	Silt Loam	
5-12	2.5Y 6/1	75	2.5Y 5/2	15	D	M	Silt Loam	Some coal fragments
			2.5Y 6/8	10	D	M	Silt Loam	

¹Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains.²Location: 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) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

- ☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
☐ Thin Dark Surface (S9) (**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
☐ Umbric Surface (F13) (**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
☐ Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) (**MLRA 147**)
☐ Coast Prairie Redox (A16) (**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators 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:**

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 3
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.27601 Long: -82.449528 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found alongside township road 15. The sample point is located approximately 2,200 feet north of the intersection of township roads 14 and 15. This upland sample point is located directly alongside the boundary of Wetland 3.					

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 3

	Absolute % Cover	Dominant Species?	Indicator Status	
Tree Stratum (Plot size: <u>30ft</u>)				
1. <u>Acer rubrum (Red Maple)</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>7</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>29</u> (A/B)
2. <u>Quercus rubra (Red Oak)</u>	<u>10</u>	<u>Y</u>	<u>FACU</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
			<u>20</u> = Total Cover	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: _____ (A) _____ (B) Prevalence Index = B/A = _____
50% of total cover: <u>10</u> 20% of total cover: <u>4</u>				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	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.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
			_____ = Total Cover	Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height.
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. <u>Carpinus caroliniana (American hornbeam)</u>	<u>10</u>	<u>Y</u>	<u>FAC</u>	Hydrophytic Vegetation Present? Yes ☐ No ☒
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
			<u>10</u> = Total Cover	
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	Remarks: (Include photo numbers here or on a separate sheet.) Vegetation has been grazed in many portions of the area, making species identification difficult.
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense (Red Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
5. <u>Taraxacum officinale (Common Dandelion)</u>	<u>15</u>	<u>N</u>	<u>UPL</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
			<u>95</u> = Total Cover	
50% of total cover: <u>47.5</u> 20% of total cover: <u>19</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
			_____ = Total Cover	
50% of total cover: _____ 20% of total cover: _____				

SOIL

Sampling Point: Upland 3

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 4
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.281122 Long: -82.439165 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the northern edge of delineated pond 2. The sample point is located approximately 5,400 feet northeast of the intersection of township roads 14 and 15.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>2</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-4</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 4

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Carex vulpinoidea</u> (Fox Sedge)	40	Y	OBL	
2. <u>Juncus effusus</u> (Common Rush)	30	Y	FACW	
3. <u>Dactylis glomerata</u> (Orchard Grass)	20	Y	FACU	
4. <u>Trifolium repens</u> (White Clover)	5	N	FACU	
5. <u>Trifolium pratense</u> (Red Clover)	5	N	FACU	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the wetland, making species identification difficult.

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: _____ (A)	_____ (B)

 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?
 Yes ☒ No ☐

SOIL

Sampling Point: Wetland 4

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 4
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.28121 Long: -82.43915 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the northern edge of delineated Pond 2. The sample point is located approximately 5,500 feet northeast of the intersection of township roads 14 and 15. This upland sample point is located directly alongside the boundary of Wetland 4.					

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 4

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>18</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense (Red Clover)</u>	<u>18</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>12</u>	<u>Y</u>	<u>FACU</u>	
5. <u>Taraxacum officinale (Common Dandelion)</u>	<u>12</u>	<u>Y</u>	<u>UPL</u>	
6. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
7. <u>Carex vulpinoidea (Fox Sedge)</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 5 (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 _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 4

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>18</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense (Red Clover)</u>	<u>18</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>12</u>	<u>Y</u>	<u>FACU</u>	
5. <u>Taraxacum officinale (Common Dandelion)</u>	<u>12</u>	<u>Y</u>	<u>UPL</u>	
6. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
7. <u>Carex vulpinoidea (Fox Sedge)</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)

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

 Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

SOIL

Sampling Point: Upland 4

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 ¹	Loc ²		
0-2	2.5Y 4/3	100					Silt Loam	
2-16	2.5Y 4/3	95	10 YR 5/8	5	D	M	Silt Loam	Some coal fragments

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

²Location: 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) (LRR N)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (LRR N,
MLRA 147, 148)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (MLRA 147, 148)
☐ Thin Dark Surface (S9) (MLRA 147, 148)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (LRR N,
MLRA 136)
☐ Umbric Surface (F13) (MLRA 136, 122)
☐ Piedmont Floodplain Soils (F19) (MLRA 148)
☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (MLRA 147)
☐ Coast Prairie Redox (A16)
(MLRA 147, 148)
☐ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators 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:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 5
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.273748 Long: -82.439297 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the western edge of a tree line that crosses township road 14. The sample point is located approximately 4,100 feet east of the intersection of township roads 14 and 15.			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>3</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-6</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 5

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Typha latifolia (Broadleaf Cattail)</u>	45	Y	OBL	
2. <u>Carex vulpinoidea (Fox Sedge)</u>	30	Y	OBL	
3. <u>Scirpus cyperinus (Woolgrass)</u>	10	N	FACW	
4. <u>Juncus effusus (Common Rush)</u>	5	N	FACW	
5. <u>Trifolium pratense (Red Clover)</u>	5	N	FACU	
6. <u>Cyperus esculentus (Yellow Nutsedge)</u>	5	N	FACW	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of 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: 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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in on the edges of the wetland, making species identification difficult.

SOIL

Sampling Point: Wetland 5

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 5
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.273689 Long: -82.439323 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☐ No ☒
Hydric Soil Present?	Yes ☐ No ☒		
Wetland Hydrology Present?	Yes ☐ No ☒		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the western edge of a tree line that crosses township road 14. The sample point is located approximately 4,100 feet east of the intersection of township roads 14 and 15. This upland sample point is located directly alongside the boundary of Wetland 5.			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 5

Tree Stratum (Plot size: <u>30ft</u>) <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="width: 15%; text-align: center;">Absolute % Cover</th> <th style="width: 15%; text-align: center;">Dominant Species?</th> <th style="width: 30%; text-align: center;">Indicator Status</th> </tr> </thead> <tbody> <tr><td>1. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>2. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>6. _____</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr> <td colspan="2"></td> <td colspan="2" style="text-align: right;">_____ = Total Cover</td> </tr> <tr> <td colspan="2">50% of total cover: _____</td> <td colspan="2">20% of total cover: _____</td> </tr> </tbody> </table> Sapling Stratum (Plot size: <u>15ft</u>) <table style="width: 100%; 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Definitions of Five Vegetation Strata: Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH). Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH. Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height. Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height. Woody vine – All woody vines, regardless of height. Hydrophytic Vegetation Present? Yes ☒ No ☐		Total % Cover of:	Multiply by:		OBL species	<u>15</u>	x 1 =	<u>15</u>	FACW species	<u>15</u>	x 2 =	<u>30</u>	FAC species	<u>0</u>	x 3 =	<u>0</u>	FACU species	<u>45</u>	x 4 =	<u>180</u>	UPL species	<u>5</u>	x 5 =	<u>25</u>	Column Totals:	<u>90</u> (A)		<u>250</u> (B)
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Remarks: (Include photo numbers here or on a separate sheet.)

Vegetation has been grazed in many portions of the area, making species identification difficult. This area passes the prevalence index for hydrophytic vegetation due to the mix of species.

SOIL

Sampling Point: Upland 5

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 ¹	Loc ²		
0-1	2.5Y 2/1	100					Loam	Muck layer
2-16	2.5Y 4/3	95	10 YR 5/8	5	D	M	Silt Loam	Some coal fragments

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

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils ³ :		
☐ Histosol (A1)	☐ Dark Surface (S7)	☐ 2 cm Muck (A10) (MLRA 147)			
☐ Histic Epipedon (A2)	☐ Polyvalue Below Surface (S8) (MLRA 147, 148)	☐ Coast Prairie Redox (A16)			
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (MLRA 147, 148)	☒ (MLRA 147, 148)			
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Piedmont Floodplain Soils (F19)			
☐ Stratified Layers (A5)	☐ Depleted Matrix (F3)	☒ (MLRA 136, 147)			
☐ 2 cm Muck (A10) (LRR N)	☐ Redox Dark Surface (F6)	☐ Very Shallow Dark Surface (TF12)			
☐ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)	☐ Other (Explain in Remarks)			
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)				
☐ Sandy Mucky Mineral (S1) (LRR N,	☐ Iron-Manganese Masses (F12) (LRR N,				
MLRA 147, 148)	MLRA 136)				
☐ Sandy Gleyed Matrix (S4)	☐ Umbric Surface (F13) (MLRA 136, 122)				
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 148)				
☐ Stripped Matrix (S6)	☐ Red Parent Material (F21) (MLRA 127, 147)				

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

Restrictive Layer (if observed):			
Type: _____			
Depth (inches): _____			

Remarks:
Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples.

Hydric Soil Present?

Yes☐

No☒

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenergy LLC State: OH Sampling Point: Wetland 6
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 5
 Subregion (LRR or MLRA): MLRA126 Lat: 39.274811 Long: -82.441962 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the western edge of a tree line that crosses township road 14. The sample point is located approximately 3,600 feet northeast of the intersection of township roads 14 and 15.			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>3</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-6</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 6

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. <u>Elaeagnus umbellata</u>	10	Y	NA	
2. <u>Rosa multiflora</u>	5	Y	FACU	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				15 = Total Cover
50% of total cover: <u>7.5</u>				20% of total cover: <u>3</u>
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus</u> (Common Rush)	35	Y	FACW	
2. <u>Carex vulpinoidea</u> (Fox Sedge)	30	Y	OBL	
3. <u>Scirpus cyperinus</u> (Woolgrass)	10	N	FACW	
4. <u>Typha latifolia</u> (Broadleaf Cattail)	10	N	OBL	
5. <u>Trifolium pratense</u> (Red Clover)	10	N	FACU	
6. <u>Dactylis glomerata</u> (Orchard Grass)	5	N	FACU	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				100 = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in on the edges of the wetland, making species identification difficult.

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: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>40</u>	x 1 = <u>40</u>
FACW species <u>50</u>	x 2 = <u>100</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>15</u>	x 4 = <u>60</u>
UPL species <u>0</u>	x 5 = <u>0</u>
Column Totals: <u>105</u> (A)	<u>200</u> (B)

 Prevalence Index = B/A = 1.90

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☒ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

SOIL

Sampling Point: Wetland 6

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 ¹	Loc ²		
0-1	2.5Y 2/1	100					Loam	Muck layer
1-12	2.5Y 6/1	85	2.5Y 5/6	10	D	M	Silt Loam	Some coal fragments
			2.5Y 7/8	5	PL	M		

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

²Location: 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) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
☐ Thin Dark Surface (S9) (**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
☐ Umbric Surface (F13) (**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
☐ Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**MLRA 147**)
☐ Coast Prairie Redox (A16) (**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators 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:
Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils. Acid mine drainage can be found throughout the wetland.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 6
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.274807 Long: -82.442025 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the western edge of a tree line that crosses township road 14. The sample point is located approximately 3,600 feet northeast of the intersection of township roads 14 and 15. This upland sample point is located directly alongside the boundary of Wetland 6.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 6

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Juncus effusus (Common Rush)</u>	<u>16</u>	<u>Y</u>	<u>FACW</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>14</u>	<u>Y</u>	<u>FACU</u>	
5. <u>Carex vulpinoidea (Fox Sedge)</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
6. <u>Taraxacum officinale (Common Dandelion)</u>	<u>10</u>	<u>N</u>	<u>UPL</u>	
7. <u>Andropogon virginicus (Broomsedge Bluestem)</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>95</u> = Total Cover
50% of total cover: <u>47.5</u>				20% of total cover: <u>19</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of 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 <u>10</u>	x 1 = <u>10</u>
FACW species <u>16</u>	x 2 = <u>32</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>59</u>	x 4 = <u>236</u>
UPL species <u>10</u>	x 5 = <u>50</u>
Column Totals: <u>95</u> (A)	<u>328</u> (B)

Prevalence Index = B/A = 3.45

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

SOIL

Sampling Point: Upland 6

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 7
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.276214 Long: -82.437901 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the eastern edge of a tree line that crosses township road 14. The National Wetlands Inventory (NWI) shows this area as being a large freshwater PEM wetland. The sample point is located approximately 4,800 feet northeast of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☒ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>3</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-6</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 7

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Typha latifolia (Broadleaf Cattail)</u>	26	Y	OBL	
2. <u>Carex vulpinoidea (Fox Sedge)</u>	24	Y	OBL	
3. <u>Juncus effusus (Common Rush)</u>	20	Y	FACW	
4. <u>Scirpus cyperinus (Woolgrass)</u>	15	N	FACW	
5. <u>Trifolium pratense (Red Clover)</u>	5	N	FACU	
6. <u>Dactylis glomerata (Orchard Grass)</u>	5	N	FACU	
7. <u>Cyperus esculentus (Yellow Nutsedge)</u>	5	N	FACW	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>50</u> 20% of total cover: <u>20</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☒
No ☐

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in on the edges of the wetland, making species identification difficult.

SOIL

Sampling Point: Wetland 7

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 ¹	Loc ²		
0-1	2.5Y 2/1	100					Loam	Muck layer
1-12	2.5Y 4/2	70	10YR 5/6	20	D	M	Silt Loam	10% Coal Fragments

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

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:								Indicators for Problematic Hydric Soils³:
☐ Histosol (A1)	☐ Dark Surface (S7)	☐ 2 cm Muck (A10) (MLRA 147)						
☐ Histic Epipedon (A2)	☐ Polyvalue Below Surface (S8) (MLRA 147, 148)	☐ Coast Prairie Redox (A16)						
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (MLRA 147, 148)	☒ (MLRA 147, 148)						
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Piedmont Floodplain Soils (F19)						
☐ Stratified Layers (A5)	☒ Depleted Matrix (F3)	☒ (MLRA 136, 147)						
☐ 2 cm Muck (A10) (LRR N)	☐ Redox Dark Surface (F6)	☐ Very Shallow Dark Surface (TF12)						
☐ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)	☐ Other (Explain in Remarks)						
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)							
☐ Sandy Mucky Mineral (S1) (LRR N,	☐ Iron-Manganese Masses (F12) (LRR N,							
MLRA 147, 148)	MLRA 136)							
☐ Sandy Gleyed Matrix (S4)	☐ Umbric Surface (F13) (MLRA 136, 122)	³Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.						
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 148)							
☐ Stripped Matrix (S6)	☐ Red Parent Material (F21) (MLRA 127, 147)							

Restrictive Layer (if observed):	
Type: _____	Hydric Soil Present? Yes ☒ No ☐
Depth (inches): _____	

Remarks:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/4/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 7
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.272672 Long: -82.437855 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the eastern edge of a tree line that crosses township road 14. The sample point is located approximately 4,800 feet northeast of the intersection of township roads 14 and 15.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 7

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Trifolium pratense (Red Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
5. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
6. <u>Taraxacum officinale (Common Dandelion)</u>	<u>5</u>	<u>N</u>	<u>UPL</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 3 (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 _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

SOIL

Sampling Point: Upland 7

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/5/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 8
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 6
 Subregion (LRR or MLRA): MLRA126 Lat: 39.254545 Long: -82.450319 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland is small and can be found on the western edge of a tree line on a rocky hillslope. The sample point is located approximately 6,000 feet south of the intersection of township roads 14 and 15.			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>2</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-8</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 8

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. <u>Platanus occidentalis</u> (Sycamore)	<u>15</u>	<u>Y</u>	<u>FACW</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
<u>15</u> = Total Cover				
50% of total cover: <u>7.5</u> 20% of total cover: <u>3</u>				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Carex vulpinoidea</u> (Fox Sedge)	<u>20</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Typha angustifolia</u> (Narrowleaf Cattail)	<u>10</u>	<u>Y</u>	<u>OBL</u>	
3. <u>Juncus effusus</u> (Common Rush)	<u>13</u>	<u>Y</u>	<u>FACW</u>	
4. <u>Dactylis glomerata</u> (Orchard Grass)	<u>12</u>	<u>Y</u>	<u>FACU</u>	
5. <u>Trifolium pratense</u> (Red Clover)	<u>5</u>	<u>N</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>60</u> = Total Cover				
50% of total cover: <u>30</u> 20% of total cover: <u>12</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				

Remarks: (Include photo numbers here or on a separate sheet.)
 40% Bare ground and rocks can be found throughout the wetland.

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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☒
No ☐

SOIL

Sampling Point: Wetland 8

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/5/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 8
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 6
 Subregion (LRR or MLRA): MLRA126 Lat: 39.254572 Long: -82.450322 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the western edge of a tree line on a hillslope. The sample point is located approximately 6,000 feet northeast of the intersection of township roads 14 and 15. Sample point collected in the upland area next to delineated Wetland 9.					

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 8

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Trifolium pratense (Red Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Dactylis glomerata (Orchard Grass)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Taraxacum officinale (Common Dandelion)</u>	<u>25</u>	<u>Y</u>	<u>UPL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

SOIL

Sampling Point: Upland 8

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/5/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 9
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 6
 Subregion (LRR or MLRA): MLRA126 Lat: 39.259318 Long: -82.450941 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam & Wharton-Latham silt loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found alongside delineated stream 4. The sample point is located approximately 4,300 feet south of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>2</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-8</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 9

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus</u> (Common Rush)	25	Y	FACW	
2. <u>Typha angustifolia</u> (Narrowleaf cattail)	15	Y	OBL	
3. <u>Carex vulpinoidea</u> (Fox Sedge)	10	N	OBL	
4. <u>Dactylis glomerata</u> (Orchard Grass)	5	N	FACU	
5. <u>Trifolium pratense</u> (Red Clover)	5	N	FACU	
6. <u>Poa pratensis</u> (Kentucky bluegrass)	5	N	FACU	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
65 = Total Cover				
50% of total cover: <u>32.5</u> 20% of total cover: <u>13</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)
 Bare ground can be found throughout the wetland.

SOIL

Sampling Point: Wetland 9

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/5/17
 Applicant/Owner: Invenergy LLC State: OH Sampling Point: Upland 9
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 6
 Subregion (LRR or MLRA): MLRA126 Lat: 39.259380 Long: -82.450850 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the western edge of a tree line on a hillslope. The sample point is located approximately 4,300 feet northeast of the intersection of township roads 14 and 15. Sample point collected in the upland area next to delineated Wetland 9.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: Upland 9

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Trifolium pratense (Red Clover)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
4. <u>Taraxacum officinale (Common Dandelion)</u>	<u>15</u>	<u>N</u>	<u>UPL</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
80				
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 3 (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 _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0¹

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

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

Vegetation has been grazed in many portions of the area, making species identification difficult.

SOIL

Sampling Point: Upland 9

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 10
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 6
 Subregion (LRR or MLRA): MLRA126 Lat: 39.266278 Long: -82.436575 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: PEM/PSS

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the western edge of a tree line and a National Wetlands Inventory (NWI) Wetland. The sample point is located in the PEM portion of this wetland approximately 4,900 feet southeast of the intersection of township roads 14 and 15.			

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>2</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-4</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 10

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Typha angustifolia</u> (Narrowleaf Cattail)	40	Y	OBL	
2. <u>Carex vulpinoidea</u> (Fox Sedge)	20	Y	OBL	
3. <u>Juncus effusus</u> (Common Rush)	15	N	FACW	
4. <u>Dactylis glomerata</u> (Orchard Grass)	10	N	FACU	
5. <u>Phalaris arundinacea</u> (Reed Canarygrass)	10	N	FACW	
6. <u>Poa pratensis</u> (Kentucky Bluegrass)	5	N	FACU	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of 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: 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: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☒
No ☐

Remarks: (Include photo numbers here or on a separate sheet.)
 Bare ground can be found throughout the wetland. This sample point has been collected in the PEM portion.

SOIL

Sampling Point: Wetland 10

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 10
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 6
 Subregion (LRR or MLRA): MLRA126 Lat: 39.266303 Long: -82.436602 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the western edge of a tree line and National Wetlands Inventory (NWI) Wetland. The sample point is located outside the PEM portion of this wetland approximately 4,900 feet southeast of the intersection of township roads 14 and 15.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 10

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	40	Y	FACU	
2. <u>Dactylis glomerata (Orchard Grass)</u>	40	Y	FACU	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 2 (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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the wetland, making species identification difficult.

SOIL

Sampling Point: Upland 10

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 11
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 2
 Subregion (LRR or MLRA): MLRA126 Lat: 39.269150 Long: -82.440516 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on the western edge of delineated pond 16. The sample point is located approximately 4,000 feet southeast of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☒ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>1</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-4</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 11

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Typha angustifolia</u> (Narrowleaf Cattail)	25	Y	OBL	
2. <u>Carex vulpinoidea</u> (Fox Sedge)	23	Y	OBL	
3. <u>Juncus effusus</u> (Common Rush)	22	Y	FACW	
4. <u>Phalaris arundinacea</u> (Reed Canarygrass)	15	Y	FACW	
5. <u>Dactylis glomerata</u> (Orchard Grass)	10	N	FACU	
6. <u>Poa pratensis</u> (Kentucky Bluegrass)	3	N	FACU	
7. <u>Trifolium pratense</u> (Red Clover)	2	N	FACU	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				100 = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of 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: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)
 Wetland vegetation has some areas where mowing, grazing and other impacts have made identification difficult.

SOIL

Sampling Point: Wetland 11

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 11
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): _____ Slope (%): 2
 Subregion (LRR or MLRA): MLRA126 Lat: 39.269051 Long: -82.441071 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☒	No ☐			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on the western edge of delineated pond 16. The sample point is located approximately 4,000 feet southeast of the intersection of township roads 14 and 15.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 11

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>30</u> 20% of total cover: <u>12</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 2 (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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area. The majority of the sample contains bare ground throughout.

SOIL

Sampling Point: Upland 11

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 12
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.265649 Long: -82.437574 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland is extremely small and dominated mostly by rush. The sample point is located approximately 4,800 feet southeast of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>1</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-5</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 12

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus (Common Rush)</u>	<u>30</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Phalaris arundinacea (Reed Canarygrass)</u>	<u>20</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Carex vulpinoidea (Fox Sedge)</u>	<u>15</u>	<u>N</u>	<u>OBL</u>	
4. <u>Trifolium pratense (Red Clover)</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
5. <u>Dactylis glomerata (Orchard Grass)</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
6. <u>Poa pratensis (Kentucky Bluegrass)</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>90</u> = Total Cover				
50% of total cover: <u>45</u> 20% of total cover: <u>18</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				

Remarks: (Include photo numbers here or on a separate sheet.)
10% Bare ground throughout the wetland. Vegetation has been influenced by cattle.

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: _____ (A)	_____ (B)

 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?
 Yes ☒ No ☐

SOIL

Sampling Point: Wetland 12

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenergy LLC State: OH Sampling Point: Upland 12
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.265605 Long: -82.437574 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: UPL

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 ☐ No ☒	Is the Sampled Area within a Wetland? Yes ☐ No ☒
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☐ No ☒	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. The upland point is located approximately 4,800 feet southeast of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____	Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 12

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>30</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>30</u> 20% of total cover: <u>12</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 2 (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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area. The majority of the sample contains bare ground throughout.

SOIL

Sampling Point: Upland 12

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: PA Sampling Point: Wetland 13
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.270208 Long: -82.449238 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland?	Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐		
Wetland Hydrology Present?	Yes ☒ No ☐		
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This linear wetland originates in an open field and eventually drains into delineated stream 13. The sample point is located approximately 1,300 feet southeast of the intersection of township roads 14 and 15.			

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>1</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-5</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)		Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

Sampling Point: Wetland 13

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus</u> (Common Rush)	30	Y		FACW
2. <u>Carex vulpinoidea</u> (Fox Sedge)	20	Y		OBL
3. <u>Trifolium pratense</u> (Red Clover)	15	Y		FACU
4. <u>Dactylis glomerata</u> (Orchard Grass)	10	N		FACU
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				75 = Total Cover
50% of total cover: <u>37.5</u>				20% of total cover: <u>15</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of 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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☒ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0¹

☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

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

Bare ground found throughout the wetland. Vegetation has been influenced by cattle.

SOIL

Sampling Point: Wetland 13

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 ¹	Loc ²		
0-2	2.5Y 2/1	100					Loam	Muck layer
2-6	2.5Y 4/2	90	10YR 5/8	10	D	M	Silt Loam	
6-12	2.5Y 5/1	95	10YR 5/8	5	D	M	Silt Loam	Some Coal Fragments

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

²Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:			Indicators for Problematic Hydric Soils³:		
☐ Histosol (A1)	☐ Dark Surface (S7)	☐ 2 cm Muck (A10) (MLRA 147)			
☐ Histic Epipedon (A2)	☐ Polyvalue Below Surface (S8) (MLRA 147, 148)	☐ Coast Prairie Redox (A16)			
☐ Black Histic (A3)	☐ Thin Dark Surface (S9) (MLRA 147, 148)	☒ Piedmont Floodplain Soils (F19) (MLRA 147, 148)			
☐ Hydrogen Sulfide (A4)	☐ Loamy Gleyed Matrix (F2)	☐ Very Shallow Dark Surface (TF12)			
☐ Stratified Layers (A5)	☒ Depleted Matrix (F3)	☐ Other (Explain in Remarks)			
☐ 2 cm Muck (A10) (LRR N)	☐ Redox Dark Surface (F6)				
☐ Depleted Below Dark Surface (A11)	☐ Depleted Dark Surface (F7)				
☐ Thick Dark Surface (A12)	☐ Redox Depressions (F8)				
☐ Sandy Mucky Mineral (S1) (LRR N, MLRA 147, 148)	☐ Iron-Manganese Masses (F12) (LRR N, MLRA 136)				
☐ Sandy Gleyed Matrix (S4)	☐ Umbric Surface (F13) (MLRA 136, 122)				
☐ Sandy Redox (S5)	☐ Piedmont Floodplain Soils (F19) (MLRA 148)				
☐ Stripped Matrix (S6)	☐ Red Parent Material (F21) (MLRA 127, 147)				

Restrictive Layer (if observed):
Type: _____
Depth (inches): _____

Hydric Soil Present? Yes ☒ No ☐

Remarks:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenergy LLC State: OH Sampling Point: Upland 13
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.270150 Long: -82.449143 Datum: WGS84
 Soil Map Unit Name: Bethesda silty clay loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. The upland sample point is located approximately 1,300 feet southeast of the intersection of township roads 14 and 15.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 13

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense (Red Clover)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
5. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>85</u> = Total Cover				
50% of total cover: <u>42.5</u> 20% of total cover: <u>17</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 2 (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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____	(A) _____ (B) _____

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

SOIL

Sampling Point: Upland 13

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

[illegible]

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

²Location: 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) (**LRR N**)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☒ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)

- ☐ Dark Surface (S7)
- ☐ Polyvalue Below Surface (S8) **(MLRA 147, 148)**
- ☐ Thin Dark Surface (S9) **(MLRA 147, 148)**
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)
- ☐ Iron-Manganese Masses (F12) **(LRR N, MLRA 136)**
- ☐ Umbria Surface (F13) **(MLRA 136, 122)**
- ☐ Piedmont Floodplain Soils (F19) **(MLRA 148)**
- ☐ Red Parent Material (F21) **(MLRA 127, 147)**

Indicators for Problematic Hydric Soils³:

- ☐ 2 cm Muck (A10) **(MLRA 147)**
- ☐ Coast Prairie Redox (A16)
(MLRA 147, 148)
- ☐ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

³Indicators 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:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 14
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.265638 Long: -82.448479 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on a hillslope on the western edge of a tree line. The sample point is located approximately 2,400 feet southeast of the intersection of township roads 14 and 15. Delineated Stream 13 runs into this wetland from the north.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☒ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>2</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-9</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 14

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Typha latifolia (Broadleaf cattail)</u>	<u>30</u>	<u>Y</u>	<u>OBL</u>	
2. <u>Juncus effusus (Common Rush)</u>	<u>25</u>	<u>Y</u>	<u>FACW</u>	
3. <u>Carex vulpinoidea (Fox Sedge)</u>	<u>20</u>	<u>Y</u>	<u>OBL</u>	
4. <u>Trifolium pratense (Red Clover)</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
5. <u>Trifolium repens (White Clover)</u>	<u>10</u>	<u>N</u>	<u>FACU</u>	
6. <u>Dactylis glomerata (Orchard Grass)</u>	<u>5</u>	<u>N</u>	<u>FACU</u>	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Bare ground found throughout the wetland. Vegetation has been influenced by cattle.

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: _____ (A)	_____ (B)

 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?
 Yes ☒ No ☐

SOIL

Sampling Point: Wetland 14

[illegible]

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 14
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.265556 Long: -82.448506 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found alongside delineated Wetland 14 on a hillslope on the western edge of a tree line. The sample point is located approximately 2,400 feet southeast of the intersection of township roads 14 and 15.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:			
Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 14

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense (Red Clover)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
5. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>85</u> = Total Cover
50% of total cover: <u>47.5</u>				20% of total cover: <u>17</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
 Total Number of Dominant Species Across All Strata: 2 (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 _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☐ No ☒

SOIL

Sampling Point: Upland 14

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 ¹	Loc ²		
0-16	2.5Y 4/3	95	10 YR 5/8	5	D	M	Silt Loam	Some coal fragments

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

²Location: 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) (**LRR N**)

☐ Depleted Below Dark Surface (A11)

☐ Thick Dark Surface (A12)

☐ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)

☐ Sandy Gleyed Matrix (S4)

☐ Sandy Redox (S5)

☐ Stripped Matrix (S6)

☐ Dark Surface (S7)

☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)

☐ Thin Dark Surface (S9) (**MLRA 147, 148**)

☐ Loamy Gleyed Matrix (F2)

☐ Depleted Matrix (F3)

☐ Redox Dark Surface (F6)

☐ Depleted Dark Surface (F7)

☐ Redox Depressions (F8)

☐ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)

☐ Umbric Surface (F13) (**MLRA 136, 122**)

☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)

☐ Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**MLRA 147**)

☐ Coast Prairie Redox (A16) (**MLRA 147, 148**)

☐ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)

☐ Very Shallow Dark Surface (TF12)

☐ Other (Explain in Remarks)

Restrictive Layer (if observed):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☒

Remarks:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenergy LLC State: OH Sampling Point: Wetland 15
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.265109 Long: -82.449004 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on a hillslope on the western edge of a tree line. The sample point is located approximately 2,400 feet southeast of the intersection of township roads 14 and 15.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☒ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☒ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>3</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-9</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 15

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. <u>Elaeagnus umbellata</u> (Autumn Olive)	10	Y	NA	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				10 = Total Cover
50% of total cover: <u>5</u>				20% of total cover: <u>2</u>
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus</u> (Common Rush)	20	Y	FACW	
2. <u>Typha latifolia</u> (Broadleaf cattail)	20	Y	OBL	
3. <u>Carex vulpinoidea</u> (Fox Sedge)	16	Y	OBL	
4. <u>Phalaris arundinacea</u> (Reed Canarygrass)	14	Y	FACW	
5. <u>Trifolium pratense</u> (Red Clover)	13	N	FACU	
6. <u>Dactylis glomerata</u> (Orchard Grass)	12	N	FACU	
7. <u>Trifolium repens</u> (White Clover)	5	N	FACU	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				100 = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Autumn Olive is given the indicator status of NA because it has not been assigned a wetland indicator status.

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: _____ (A)	_____ (B)

 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?
 Yes ☒ No ☐

SOIL

Sampling Point: Wetland 15

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 ¹	Loc ²		
0-2	2.5Y 2/1	100					Loam	Muck layer
2-8	2.5Y 4/1	90	10YR 5/6	10	D	M	Silt Loam	
8-16	2.5Y 5/2	90	10YR 6/8	10	D	M	Silt Loam	Some Coal Fragments

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

²Location: 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) (LRR N)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (LRR N,
MLRA 147, 148)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (MLRA 147, 148)
☐ Thin Dark Surface (S9) (MLRA 147, 148)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (LRR N,
MLRA 136)
☐ Umbric Surface (F13) (MLRA 136, 122)
☐ Piedmont Floodplain Soils (F19) (MLRA 148)
☐ Red Parent Material (F21) (MLRA 127, 147)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (MLRA 147)
☐ Coast Prairie Redox (A16)
(MLRA 147, 148)
☐ Piedmont Floodplain Soils (F19)
(MLRA 136, 147)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators 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:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/6/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 15
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): _____ Slope (%): 3
 Subregion (LRR or MLRA): MLRA126 Lat: 39.265145 Long: -82.448962 Datum: WGS84
 Soil Map Unit Name: Wharton-Latham silt loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on a hillslope alongside delineated Wetland 15 on the western edge of a tree line. The sample point is located approximately 2,400 feet southeast of the intersection of township roads 14 and 15.					

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply) ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		Secondary Indicators (minimum of two required) ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? (includes capillary fringe) Yes ☐ No ☒ Depth (inches): _____		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 15

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>	<u>FACU</u>	
2. <u>Dactylis glomerata (Orchard Grass)</u>	<u>20</u>	<u>Y</u>	<u>FACU</u>	
3. <u>Trifolium pratense (Red Clover)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
4. <u>Poa pratensis (Kentucky bluegrass)</u>	<u>15</u>	<u>N</u>	<u>FACU</u>	
5. <u>Juncus effusus (Common Rush)</u>	<u>10</u>	<u>N</u>	<u>FACW</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
<u>85</u> = Total Cover				
50% of total cover: <u>42.5</u> 20% of total cover: <u>17</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 2 (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 _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☐
No ☒

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the wetland, making species identification difficult.

SOIL

Sampling Point: Upland 15

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 ¹	Loc ²		
0-1	2.5Y 2/1	100					Loam	Muck layer
2-16	2.5Y 4/3	95	10 YR 5/8	5	D	M	Silt Loam	Some coal fragments

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

²Location: 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) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (**LRR N,**
 MLRA 147, 148)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
☐ Thin Dark Surface (S9) (**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☐ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (**LRR N,**
 MLRA 136)
☐ Umbric Surface (F13) (**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
☐ Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**MLRA 147**)
☐ Coast Prairie Redox (A16)
 (**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19)
 (**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators 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:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/7/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 16
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.273639 Long: -82.434730 Datum: WGS84
 Soil Map Unit Name: Bethesda Silty Clay Loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found on a hillslope in an open field alongside delineated pond 8. The sample point is located approximately 5,400 feet east of the intersection of township roads 14 and 15 just north of infirmary road.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☒ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>1</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-8</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 16

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus (Common Rush)</u>	60	Y		FACW
2. <u>Trifolium repens (White Clover)</u>	5	N		FACU
3. <u>Dactylis glomerata (Orchard Grass)</u>	5	N		FACU
4. <u>Trifolium pratense (Red Clover)</u>	5	N		FACU
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				75 = Total Cover
50% of total cover: <u>37.5</u>				20% of total cover: <u>15</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of 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: 1 (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: _____ (A)	_____ (B)
Prevalence Index = B/A = _____	

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present? Yes ☒ No ☐

Remarks: (Include photo numbers here or on a separate sheet.)
25 % Bare ground found throughout the wetland. Vegetation has been influenced by cattle.

SOIL

Sampling Point: Wetland 16

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 ¹	Loc ²		
0-2	2.5Y 2/1	100					Loam	Muck layer
2-12	2.5Y 4/1	90	10YR 5/8	10	D	M	Silt Loam	Some Coal Fragments

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

²Location: 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) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (**LRR N,**
MLRA 147, 148)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
☐ Thin Dark Surface (S9) (**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (**LRR N,**
MLRA 136)
☐ Umbric Surface (F13) (**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
☐ Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**MLRA 147**)
☐ Coast Prairie Redox (A16)
(**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19)
(**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

Restrictive Layer (if observed):

Type:
Depth (inches):

Hydric Soil Present? Yes☒ No☐

Remarks:
Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/7/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Wetland 17
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.273582 Long: -82.434111 Datum: WGS84
 Soil Map Unit Name: Bethesda Silty Clay Loam NWI classification: PEM

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 ☒ No ☐	Is the Sampled Area within a Wetland? Yes ☒ No ☐
Hydric Soil Present?	Yes ☒ No ☐	
Wetland Hydrology Present?	Yes ☒ No ☐	
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This particular wetland can be found in an open field alongside delineated pond 8. The sample point is located approximately 5,400 feet east of the intersection of township roads 14 and 15 just north of infirmary road.		

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☒ Surface Water (A1) ☐ True Aquatic Plants (B14) ☒ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☒ Saturation (A3) ☒ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☒ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☒ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☒ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☒ FAC-Neutral Test (D5)
Field Observations: Surface Water Present? Yes ☒ No ☐ Depth (inches): <u>1</u> Water Table Present? Yes ☒ No ☐ Depth (inches): <u>-8</u> Saturation Present? Yes ☒ No ☐ Depth (inches): <u>0</u> (includes capillary fringe)	Wetland Hydrology Present? Yes ☒ No ☐	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: Within this data form, negative numbers in the water table represent inches below surface and 0, within the saturation column, represents surface saturation. During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.		

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Wetland 17

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of total cover: _____				
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus (Common Rush)</u>	<u>60</u>	<u>Y</u>	<u>FACW</u>	
2. <u>Carex vulpinoidea (Fox Sedge)</u>	<u>10</u>	<u>N</u>	<u>OBL</u>	
3. <u>Phalaris arundinacea (Reed Canarygrass)</u>	<u>5</u>	<u>N</u>	<u>FACW</u>	
4. <u>Trifolium pratense (Red Clover)</u>	<u>3</u>	<u>N</u>	<u>FACU</u>	
5. <u>Andropogon virginicus (Broomsedge Bluestem)</u>	<u>2</u>	<u>N</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: <u>40</u> 20% of total cover: <u>16</u>				
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
_____ = Total Cover				
50% of total cover: _____ 20% of 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: 1 (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: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☒ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:

Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).

Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.

Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.

Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.

Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?

Yes ☒
No ☐

Remarks: (Include photo numbers here or on a separate sheet.)
20 % Bare ground found throughout the wetland. Vegetation has been influenced by cattle.

SOIL

Sampling Point: Wetland 17

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 ¹	Loc ²		
0-2	2.5Y 2/1	100					Loam	Muck layer
2-12	2.5Y 4/1	90	10YR 5/8	10	D	M	Silt Loam	Some Coal Fragments

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

Hydric Soil Indicators:

☐ Histosol (A1)
☐ Histic Epipedon (A2)
☐ Black Histic (A3)
☐ Hydrogen Sulfide (A4)
☐ Stratified Layers (A5)
☐ 2 cm Muck (A10) (**LRR N**)
☐ Depleted Below Dark Surface (A11)
☐ Thick Dark Surface (A12)
☐ Sandy Mucky Mineral (S1) (**LRR N, MLRA 147, 148**)
☐ Sandy Gleyed Matrix (S4)
☐ Sandy Redox (S5)
☐ Stripped Matrix (S6)

☐ Dark Surface (S7)
☐ Polyvalue Below Surface (S8) (**MLRA 147, 148**)
☐ Thin Dark Surface (S9) (**MLRA 147, 148**)
☐ Loamy Gleyed Matrix (F2)
☒ Depleted Matrix (F3)
☐ Redox Dark Surface (F6)
☐ Depleted Dark Surface (F7)
☐ Redox Depressions (F8)
☐ Iron-Manganese Masses (F12) (**LRR N, MLRA 136**)
☐ Umbric Surface (F13) (**MLRA 136, 122**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 148**)
☐ Red Parent Material (F21) (**MLRA 127, 147**)

Indicators for Problematic Hydric Soils³:

☐ 2 cm Muck (A10) (**MLRA 147**)
☐ Coast Prairie Redox (A16) (**MLRA 147, 148**)
☐ Piedmont Floodplain Soils (F19) (**MLRA 136, 147**)
☐ Very Shallow Dark Surface (TF12)
☐ Other (Explain in Remarks)

³Indicators 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:

Soils have been greatly influenced by the historic mining throughout the study area. While some samples appear to be unaffected, there are hints of soil overturn and coal fragments throughout many of the samples. Soils meet F3 indicator for hydric soils.

WETLAND DETERMINATION DATA FORM – Eastern Mountains and Piedmont Region

Project/Site: Vinton Solar Energy Center Project City/County: McArthur/Vinton Sampling Date: 4/7/17
 Applicant/Owner: Invenenergy LLC State: OH Sampling Point: Upland 16/17
 Investigator(s): Nathan Renaudin & Lindsey Moss Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): Concave Slope (%): 1
 Subregion (LRR or MLRA): MLRA126 Lat: 39.273646 Long: -82.434457 Datum: WGS84
 Soil Map Unit Name: Bethesda Silty Clay Loam NWI classification: UPL

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 ☐	No ☒	Is the Sampled Area within a Wetland?	Yes ☐	No ☒
Hydric Soil Present?	Yes ☐	No ☒			
Wetland Hydrology Present?	Yes ☐	No ☒			
Remarks: The majority of the study area is in a field that has been historically impacted by strip mining but is now actively grazed by cattle. This upland point can be found on a hillslope in an open field alongside delineated Pond 8 and represents the upland sample for both delineated Wetlands 16 and 17. The sample point is located approximately 5,400 feet east of the intersection of township roads 14 and 15 just north of infirmary road.					

HYDROLOGY

Wetland Hydrology Indicators: <u>Primary Indicators (minimum of one is required; check all that apply)</u> ☐ Surface Water (A1) ☐ True Aquatic Plants (B14) ☐ High Water Table (A2) ☐ Hydrogen Sulfide Odor (C1) ☐ Saturation (A3) ☐ Oxidized Rhizospheres on Living Roots (C3) ☐ Water Marks (B1) ☐ Presence of Reduced Iron (C4) ☐ Sediment Deposits (B2) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Drift Deposits (B3) ☐ Thin Muck Surface (C7) ☐ Algal Mat or Crust (B4) ☐ Other (Explain in Remarks) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)		<u>Secondary Indicators (minimum of two required)</u> ☐ Surface Soil Cracks (B6) ☐ Sparsely Vegetated Concave Surface (B8) ☐ Drainage Patterns (B10) ☐ Moss Trim Lines (B16) ☐ Dry-Season Water Table (C2) ☐ Crayfish Burrows (C8) ☐ Saturation Visible on Aerial Imagery (C9) ☐ Stunted or Stressed Plants (D1) ☐ Geomorphic Position (D2) ☐ Shallow Aquitard (D3) ☐ Microtopographic Relief (D4) ☐ FAC-Neutral Test (D5)	
Field Observations: Surface Water Present? Yes ☐ No ☒ Depth (inches): _____ Water Table Present? Yes ☐ No ☒ Depth (inches): _____ Saturation Present? Yes ☐ No ☒ Depth (inches): _____ (includes capillary fringe)		Wetland Hydrology Present? Yes ☐ No ☒	
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: Remarks: During the past few days, there has been several inches of rain that has made many areas much wetter than most of the year.			

VEGETATION (Five Strata) – Use scientific names of plants.

 Sampling Point: Upland 16/17

Tree Stratum (Plot size: <u>30ft</u>)	Absolute % Cover	Dominant Species?	Indicator Status	
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Sapling Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Shrub Stratum (Plot size: <u>15ft</u>)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____
Herb Stratum (Plot size: <u>5ft</u>)				
1. <u>Juncus effusus (Common Rush)</u>	<u>30</u>	<u>Y</u>		<u>FACW</u>
2. <u>Trifolium pratense (Red Clover)</u>	<u>25</u>	<u>Y</u>		<u>FACU</u>
3. <u>Trifolium repens (White Clover)</u>	<u>25</u>	<u>Y</u>		<u>FACU</u>
4. <u>Taraxacum officinale (Common Dandelion)</u>	<u>10</u>	<u>N</u>		<u>UPL</u>
5. <u>Dactylis glomerata (Orchard Grass)</u>	<u>10</u>	<u>N</u>		<u>FACU</u>
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
11. _____	_____	_____	_____	
				<u>100</u> = Total Cover
50% of total cover: <u>50</u>				20% of total cover: <u>20</u>
Woody Vine Stratum (Plot size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
				_____ = Total Cover
50% of total cover: _____				20% of total cover: _____

Remarks: (Include photo numbers here or on a separate sheet.)
 Vegetation has been grazed in many portions of the area, making species identification difficult.

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
 Total Number of Dominant Species Across All Strata: 3 (B)
 Percent of Dominant Species That Are OBL, FACW, or FAC: 33 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species <u>0</u>	x 1 = <u>0</u>
FACW species <u>30</u>	x 2 = <u>60</u>
FAC species <u>0</u>	x 3 = <u>0</u>
FACU species <u>60</u>	x 4 = <u>240</u>
UPL species <u>10</u>	x 5 = <u>50</u>
Column Totals: <u>100</u> (A)	<u>350</u> (B)

 Prevalence Index = B/A = 3.50

Hydrophytic Vegetation Indicators:
☐ 1 - Rapid Test for Hydrophytic Vegetation
☐ 2 - Dominance Test is >50%
☐ 3 - Prevalence Index is ≤3.0¹
☐ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
☐ Problematic Hydrophytic Vegetation¹ (Explain)

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

Definitions of Five Vegetation Strata:
Tree – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and 3 in. (7.6 cm) or larger in diameter at breast height (DBH).
Sapling – Woody plants, excluding woody vines, approximately 20 ft (6 m) or more in height and less than 3 in. (7.6 cm) DBH.
Shrub – Woody plants, excluding woody vines, approximately 3 to 20 ft (1 to 6 m) in height.
Herb – All herbaceous (non-woody) plants, including herbaceous vines, regardless of size, and woody plants, except woody vines, less than approximately 3 ft (1 m) in height.
Woody vine – All woody vines, regardless of height.

Hydrophytic Vegetation Present?
 Yes ☐ No ☒

SOIL

Sampling Point: Upland 16/17

Appendix D

Ohio EPA ORAM Data Forms

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name:	Nathan Renaudin		
Date:	4/4/17		
Affiliation:	TRC Solutions		
Address:	2200 Liberty Avenue, Suite 100, Pittsburgh PA, 15222		
Phone Number:	412.713.7127		
e-mail address:	nrenaudin@trcsolutions.com		
Name of Wetland:	Wetland 1		
Vegetation Communit(ies):	PEM		
HGM Class(es):	Depressional		
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc.	See attached map		
Lat/Long or UTM Coordinate			
		39.272417 -82.451333	
USGS Quad Name		Zaleski	
County		Vinton	
Township		Mcarthur	
Section and Subsection		NA	
Hydrologic Unit Code		050901010302	
Site Visit		4/4/17	
National Wetland Inventory Map		See Report	
Ohio Wetland Inventory Map		See Report	
Soil Survey		See Report	
Delineation report/map		See Report	

Name of Wetland: Wetland 1	
Wetland Size (acres, hectares): 1.04	Acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See wetland report.	
Comments, Narrative Discussion, Justification of Category Changes:	
Final score : 23	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

Narrative Rating

INSTRUCTIONS. Answer each of the following questions. Questions 1, 2, 3 and 4 should be answered based on information obtained from the site visit or the literature *and* by submitting a Data Services Request to the Ohio Department of Natural Resources, Division of Natural Areas and Preserves, Natural Heritage Data Services, 1889 Fountain Square Court, Building F-1, Columbus, Ohio 43224, 614-265-6453 (phone), 614-265-3096 (fax), <http://www.dnr.state.oh.us/dnap>. The remaining questions are designed to be answered primarily by the results of the site visit. Refer to the User's Manual for descriptions of these wetland types. Note: "Critical habitat" is legally defined in the Endangered Species Act and is the geographic area containing physical or biological features essential to the conservation of a listed species or as an area that may require special management considerations or protection. The Rater should contact the Region 3 Headquarters or the Columbus Ecological Services Office for updates as to whether critical habitat has been designated for other federally listed threatened or endangered species. "Documented" means the wetland is listed in the appropriate State of Ohio database.

#	Question	Circle one	
1	Critical Habitat. Is the wetland in a township, section, or subsection of a United States Geological Survey 7.5 minute Quadrangle that has been designated by the U.S. Fish and Wildlife Service as "critical habitat" for any threatened or endangered plant or animal species? Note: as of January 1, 2001, of the federally listed endangered or threatened species which can be found in Ohio, the Indiana Bat has had critical habitat designated (50 CFR 17.95(a)) and the piping plover has had critical habitat proposed (65 FR 41812 July 6, 2000).	YES Wetland should be evaluated for possible Category 3 status Go to Question 2	NO Go to Question 2
2	Threatened or Endangered Species. Is the wetland known to contain an individual of, or documented occurrences of federal or state-listed threatened or endangered plant or animal species?	YES Wetland is a Category 3 wetland. Go to Question 3	NO Go to Question 3
3	Documented High Quality Wetland. Is the wetland on record in Natural Heritage Database as a high quality wetland?	YES Wetland is a Category 3 wetland Go to Question 4	NO Go to Question 4
4	Significant Breeding or Concentration Area. Does the wetland contain documented regionally significant breeding or nonbreeding waterfowl, neotropical songbird, or shorebird concentration areas?	YES Wetland is a Category 3 wetland Go to Question 5	NO Go to Question 5
5	Category 1 Wetlands. Is the wetland less than 0.5 hectares (1 acre) in size and hydrologically isolated and either 1) comprised of vegetation that is dominated (greater than eighty per cent areal cover) by <i>Phalaris arundinacea</i> , <i>Lythrum salicaria</i> , or <i>Phragmites australis</i> , or 2) an acidic pond created or excavated on mined lands that has little or no vegetation?	YES Wetland is a Category 1 wetland Go to Question 6	NO Go to Question 6
6	Bogs. Is the wetland a peat-accumulating wetland that 1) has no significant inflows or outflows, 2) supports acidophilic mosses, particularly <i>Sphagnum</i> spp., 3) the acidophilic mosses have >30% cover, 4) at least one species from Table 1 is present, and 5) the cover of invasive species (see Table 1) is <25%?	YES Wetland is a Category 3 wetland Go to Question 7	NO Go to Question 7
7	Fens. Is the wetland a carbon accumulating (peat, muck) wetland that is saturated during most of the year, primarily by a discharge of free flowing, mineral rich, ground water with a circumneutral ph (5.5-9.0) and with one or more plant species listed in Table 1 and the cover of invasive species listed in Table 1 is <25%?	YES Wetland is a Category 3 wetland Go to Question 8a	NO Go to Question 8a
8a	"Old Growth Forest." Is the wetland a forested wetland and is the forest characterized by, but not limited to, the following characteristics: overstory canopy trees of great age (exceeding at least 50% of a projected maximum attainable age for a species); little or no evidence of human-caused understory disturbance during the past 80 to 100 years; an all-aged structure and multilayered canopies; aggregations of canopy trees interspersed with canopy gaps; and significant numbers of standing dead snags and downed logs?	YES Wetland is a Category 3 wetland. Go to Question 8b	NO Go to Question 8b

8b	Mature forested wetlands. Is the wetland a forested wetland with 50% or more of the cover of upper forest canopy consisting of deciduous trees with large diameters at breast height (dbh), generally diameters greater than 45cm (17.7in) dbh?	YES Wetland should be evaluated for possible Category 3 status. Go to Question 9a	NO Go to Question 9a
9a	Lake Erie coastal and tributary wetlands. Is the wetland located at an elevation less than 575 feet on the USGS map, adjacent to this elevation, or along a tributary to Lake Erie that is accessible to fish?	YES Go to Question 9b	NO Go to Question 10
9b	Does the wetland's hydrology result from measures designed to prevent erosion and the loss of aquatic plants, i.e. the wetland is partially hydrologically restricted from Lake Erie due to lakeward or landward dikes or other hydrological controls?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 9c
9c	Are Lake Erie water levels the wetland's primary hydrological influence, i.e. the wetland is hydrologically unrestricted (no lakeward or upland border alterations), or the wetland can be characterized as an "estuarine" wetland with lake and river influenced hydrology. These include sandbar deposition wetlands, estuarine wetlands, river mouth wetlands, or those dominated by submersed aquatic vegetation.	YES Go to Question 9d	NO Go to Question 10
9d	Does the wetland have a predominance of native species within its vegetation communities, although non-native or disturbance tolerant native species can also be present?	YES Wetland is a Category 3 wetland Go to Question 10	NO Go to Question 9e
9e	Does the wetland have a predominance of non-native or disturbance tolerant native plant species within its vegetation communities?	YES Wetland should be evaluated for possible Category 3 status Go to Question 10	NO Go to Question 10
10	Lake Plain Sand Prairies (Oak Openings) Is the wetland located in Lucas, Fulton, Henry, or Wood Counties and can the wetland be characterized by the following description: the wetland has a sandy substrate with interspersed organic matter, a water table often within several inches of the surface, and often with a dominance of the gramineous vegetation listed in Table 1 (woody species may also be present). The Ohio Department of Natural Resources Division of Natural Areas and Preserves can provide assistance in confirming this type of wetland and its quality.	YES Wetland is a Category 3 wetland. Go to Question 11	NO Go to Question 11
11	Relict Wet Prairies. Is the wetland a relict wet prairie community dominated by some or all of the species in Table 1. Extensive prairies were formerly located in the Darby Plains (Madison and Union Counties), Sandusky Plains (Wyandot, Crawford, and Marion Counties), northwest Ohio (e.g. Erie, Huron, Lucas, Wood Counties), and portions of western Ohio Counties (e.g. Darke, Mercer, Miami, Montgomery, Van Wert etc.).	YES Wetland should be evaluated for possible Category 3 status Complete Quantitative Rating	NO Complete Quantitative Rating

Table 1. Characteristic plant species.

invasive/exotic spp	fen species	bog species	Oak Opening species	wet prairie species
<i>Lythrum salicaria</i>	<i>Zygadenus elegans</i> var. <i>glaucus</i>	<i>Calla palustris</i>	<i>Carex cryptolepis</i>	<i>Calamagrostis canadensis</i>
<i>Myriophyllum spicatum</i>	<i>Cacalia plantaginea</i>	<i>Carex atlantica</i> var. <i>capillacea</i>	<i>Carex lasiocarpa</i>	<i>Calamagrostis stricta</i>
<i>Najas minor</i>	<i>Carex flava</i>	<i>Carex echinata</i>	<i>Carex stricta</i>	<i>Carex atherodes</i>
<i>Phalaris arundinacea</i>	<i>Carex sterilis</i>	<i>Carex oligosperma</i>	<i>Cladium mariscoides</i>	<i>Carex buxbaumii</i>
<i>Phragmites australis</i>	<i>Carex stricta</i>	<i>Carex trisperma</i>	<i>Calamagrostis stricta</i>	<i>Carex pellita</i>
<i>Potamogeton crispus</i>	<i>Deschampsia caespitosa</i>	<i>Chamaedaphne calyculata</i>	<i>Calamagrostis canadensis</i>	<i>Carex sartwellii</i>
<i>Ranunculus ficaria</i>	<i>Eleocharis rostellata</i>	<i>Decodon verticillatus</i>	<i>Quercus palustris</i>	<i>Gentiana andrewsii</i>
<i>Rhamnus frangula</i>	<i>Eriophorum viridicarinarum</i>	<i>Eriophorum virginicum</i>		<i>Helianthus grosseserratus</i>
<i>Typha angustifolia</i>	<i>Gentianopsis</i> spp.	<i>Larix laricina</i>		<i>Liatris spicata</i>
<i>Typha xglauca</i>	<i>Lobelia kalmii</i>	<i>Nemopanthus mucronatus</i>		<i>Lysimachia quadriflora</i>
	<i>Parnassia glauca</i>	<i>Scheuchzeria palustris</i>		<i>Lythrum alatum</i>
	<i>Potentilla fruticosa</i>	<i>Sphagnum</i> spp.		<i>Pycnanthemum virginianum</i>
	<i>Rhamnus alnifolia</i>	<i>Vaccinium macrocarpon</i>		<i>Silphium terebinthinaceum</i>
	<i>Rhynchospora capillacea</i>	<i>Vaccinium corymbosum</i>		<i>Sorghastrum nutans</i>
	<i>Salix candida</i>	<i>Vaccinium oxycoccos</i>		<i>Spartina pectinata</i>
	<i>Salix myricoides</i>	<i>Woodwardia virginica</i>		<i>Solidago riddellii</i>
	<i>Salix serissima</i>	<i>Xyris difformis</i>		
	<i>Solidago ohioensis</i>			
	<i>Tofieldia glutinosa</i>			
	<i>Triglochin maritimum</i>			
	<i>Triglochin palustre</i>			

End of Narrative Rating. Begin Quantitative Rating on next page.

Site: Wetland 1	Rater(s): Nathan Renaudin	Date: 4/4/17
------------------------	----------------------------------	---------------------

2	2
max 6 pts.	subtotal

Metric 1. Wetland Area (size).

Select one size class and assign score.

- ☐ >50 acres (>20.2ha) (6 pts)
- ☐ 25 to <50 acres (10.1 to <20.2ha) (5 pts)
- ☐ 10 to <25 acres (4 to <10.1ha) (4 pts)
- ☐ 3 to <10 acres (1.2 to <4ha) (3 pts)
- ☒ 0.3 to <3 acres (0.12 to <1.2ha) (2pts)
- ☐ 0.1 to <0.3 acres (0.04 to <0.12ha) (1 pt)
- ☐ <0.1 acres (0.04ha) (0 pts)

3	5
max 14 pts.	subtotal

Metric 2. Upland buffers and surrounding land use.

2a. Calculate average buffer width. Select only one and assign score. Do not double check.

- ☐ WIDE. Buffers average 50m (164ft) or more around wetland perimeter (7)
- ☐ MEDIUM. Buffers average 25m to <50m (82 to <164ft) around wetland perimeter (4)
- ☐ NARROW. Buffers average 10m to <25m (32ft to <82ft) around wetland perimeter (1)
- ☒ VERY NARROW. Buffers average <10m (<32ft) around wetland perimeter (0)

2b. Intensity of surrounding land use. Select one or double check and average.

- ☐ VERY LOW. 2nd growth or older forest, prairie, savannah, wildlife area, etc. (7)
- ☐ LOW. Old field (>10 years), shrub land, young second growth forest. (5)
- ☒ MODERATELY HIGH. Residential, fenced pasture, park, conservation tillage, new fallow field. (3)
- ☐ HIGH. Urban, industrial, open pasture, row cropping, mining, construction. (1)

8	13
max 30 pts.	subtotal

Metric 3. Hydrology.

3a. Sources of Water. Score all that apply.

- ☐ High pH groundwater (5)
- ☐ Other groundwater (3)
- ☒ Precipitation (1)
- ☐ Seasonal/Intermittent surface water (3)
- ☐ Perennial surface water (lake or stream) (5)

3c. Maximum water depth. Select only one and assign score.

- ☐ >0.7 (27.6in) (3)
- ☐ 0.4 to 0.7m (15.7 to 27.6in) (2)
- ☒ <0.4m (<15.7in) (1)

3e. Modifications to natural hydrologic regime. Score one or double check and average.

- ☐ None or none apparent (12)
- ☐ Recovered (7)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

3b. Connectivity. Score all that apply.

- ☐ 100 year floodplain (1)
- ☒ Between stream/lake and other human use (1)
- ☐ Part of wetland/upland (e.g. forest), complex (1)
- ☐ Part of riparian or upland corridor (1)

3d. Duration inundation/saturation. Score one or dbl check.

- ☐ Semi- to permanently inundated/saturated (4)
- ☐ Regularly inundated/saturated (3)
- ☒ Seasonally inundated (2)
- ☐ Seasonally saturated in upper 30cm (12in) (1)

Check all disturbances observed	
☐ ditch ☐ tile ☐ dike ☐ weir ☐ stormwater input	☐ point source (nonstormwater) ☐ filling/grading ☐ road bed/RR track ☐ dredging ☒ other <u>Historic Mining/Cow Field</u>

7	20
max 20 pts.	subtotal

Metric 4. Habitat Alteration and Development.

4a. Substrate disturbance. Score one or double check and average.

- ☐ None or none apparent (4)
- ☐ Recovered (3)
- ☒ Recovering (2)
- ☐ Recent or no recovery (1)

4b. Habitat development. Select only one and assign score.

- ☐ Excellent (7)
- ☐ Very good (6)
- ☐ Good (5)
- ☐ Moderately good (4)
- ☐ Fair (3)
- ☒ Poor to fair (2)
- ☐ Poor (1)

4c. Habitat alteration. Score one or double check and average.

- ☐ None or none apparent (9)
- ☐ Recovered (6)
- ☒ Recovering (3)
- ☐ Recent or no recovery (1)

Check all disturbances observed	
☐ mowing ☐ grazing ☐ clearcutting ☐ selective cutting ☐ woody debris removal ☐ toxic pollutants	☐ shrub/sapling removal ☐ herbaceous/aquatic bed removal ☐ sedimentation ☐ dredging ☐ farming ☐ nutrient enrichment

20
subtotal this page

Site: Wetland 1	Rater(s): Nathan Renaudin	Date: 4/4/17
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20

subtotal first page

0	20
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max 10 pts.

subtotal

Metric 5. Special Wetlands.

Check all that apply and score as indicated.

- ☐ Bog (10)
- ☐ Fen (10)
- ☐ Old growth forest (10)
- ☐ Mature forested wetland (5)
- ☐ Lake Erie coastal/tributary wetland-unrestricted hydrology (10)
- ☐ Lake Erie coastal/tributary wetland-restricted hydrology (5)
- ☐ Lake Plain Sand Prairies (Oak Openings) (10)
- ☐ Relict Wet Prairies (10)
- ☐ Known occurrence state/federal threatened or endangered species (10)
- ☐ Significant migratory songbird/water fowl habitat or usage (10)
- ☐ Category 1 Wetland. See Question 1 Qualitative Rating (-10)

3	23
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max 20 pts.

subtotal

Metric 6. Plant communities, interspersions, microtopography.

6a. Wetland Vegetation Communities.

Score all present using 0 to 3 scale.

- 0

Aquatic bed
- 1

Emergent
- 0

Shrub
- 0

Forest
- 0

Mudflats
- 0

Open water
- 0

Other _____

6b. horizontal (plan view) Interspersion.

Select only one.

- ☐ High (5)
- ☐ Moderately high(4)
- ☐ Moderate (3)
- ☐ Moderately low (2)
- x

Low (1)
- ☐ None (0)

6c. Coverage of invasive plants. Refer to Table 1 ORAM long form for list. Add or deduct points for coverage

- ☐ Extensive >75% cover (-5)
- ☐ Moderate 25-75% cover (-3)
- ☐ Sparse 5-25% cover (-1)
- ☐ Nearly absent <5% cover (0)
- x

Absent (1)

6d. Microtopography.

Score all present using 0 to 3 scale.

- 0

Vegetated hummocks/tussocks
- 0

Coarse woody debris >15cm (6in)
- 0

Standing dead >25cm (10in) dbh
- 0

Amphibian breeding pools

Vegetation Community Cover Scale

0	Absent or comprises <0.1ha (0.2471 acres) contiguous area
1	Present and either comprises small part of wetland's vegetation and is of moderate quality, or comprises a significant part but is of low quality
2	Present and either comprises significant part of wetland's vegetation and is of moderate quality or comprises a small part and is of high quality
3	Present and comprises significant part, or more, of wetland's vegetation and is of high quality

Narrative Description of Vegetation Quality

low	Low spp diversity and/or predominance of nonnative or disturbance tolerant native species
mod	Native spp are dominant component of the vegetation, although nonnative and/or disturbance tolerant native spp can also be present, and species diversity moderate to moderately high, but generally w/o presence of rare threatened or endangered spp
high	A predominance of native species, with nonnative spp and/or disturbance tolerant native spp absent or virtually absent, and high spp diversity and often, but not always, the presence of rare, threatened, or endangered spp

Mudflat and Open Water Class Quality

0	Absent <0.1ha (0.247 acres)
1	Low 0.1 to <1ha (0.247 to 2.47 acres)
2	Moderate 1 to <4ha (2.47 to 9.88 acres)
3	High 4ha (9.88 acres) or more

Microtopography Cover Scale

0	Absent
1	Present very small amounts or if more common of marginal quality
2	Present in moderate amounts, but not of highest quality or in small amounts of highest quality
3	Present in moderate or greater amounts and of highest quality

23

End of Quantitative Rating. Complete Categorization Worksheets.

ORAM Summary Worksheet

		circle answer or insert score	Result
Narrative Rating	Question 1. Critical Habitat	YES NO	If yes, Category 3.
	Question 2. Threatened or Endangered Species	YES NO	If yes, Category 3.
	Question 3. High Quality Natural Wetland	YES NO	If yes, Category 3.
	Question 4. Significant bird habitat	YES NO	If yes, Category 3.
	Question 5. Category 1 Wetlands	YES NO	If yes, Category 1.
	Question 6. Bogs	YES NO	If yes, Category 3.
	Question 7. Fens	YES NO	If yes, Category 3.
	Question 8a. Old Growth Forest	YES NO	If yes, Category 3.
	Question 8b. Mature Forested Wetland	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9b. Lake Erie Wetlands - Restricted	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 9d. Lake Erie Wetlands – Unrestricted with native plants	YES NO	If yes, Category 3
	Question 9e. Lake Erie Wetlands - Unrestricted with invasive plants	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.
	Question 10. Oak Openings	YES NO	If yes, Category 3
Question 11. Relict Wet Prairies	YES NO	If yes, evaluate for Category 3; may also be 1 or 2.	
Quantitative Rating	Metric 1. Size	2	
	Metric 2. Buffers and surrounding land use	3	
	Metric 3. Hydrology	8	
	Metric 4. Habitat	7	
	Metric 5. Special Wetland Communities	0	
	Metric 6. Plant communities, interspersion, microtopography	3	
	TOTAL SCORE	23	Category based on score breakpoints 1

Complete Wetland Categorization Worksheet.

Wetland Categorization Worksheet

Choices	Circle one		Evaluation of Categorization Result of ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 2, 3, 4, 6, 7, 8a, 9d, 10	YES Wetland is categorized as a Category 3 wetland	NO	Is quantitative rating score <i>less</i> than the Category 2 scoring threshold (<i>excluding</i> gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been over-categorized by the ORAM
Did you answer "Yes" to any of the following questions: Narrative Rating Nos. 1, 8b, 9b, 9e, 11	YES Wetland should be evaluated for possible Category 3 status	NO	Evaluate the wetland using the 1) narrative criteria in OAC Rule 3745-1-54(C) and 2) the quantitative rating score. If the wetland is determined to be a Category 3 wetland using either of these, it should be categorized as a Category 3 wetland. Detailed biological and/or functional assessments may also be used to determine the wetland's category.
Did you answer "Yes" to Narrative Rating No. 5	YES Wetland is categorized as a Category 1 wetland	NO	Is quantitative rating score <i>greater</i> than the Category 2 scoring threshold (<i>including</i> any gray zone)? If yes, reevaluate the category of the wetland using the narrative criteria in OAC Rule 3745-1-54(C) and biological and/or functional assessments to determine if the wetland has been under-categorized by the ORAM
Does the quantitative score fall within the scoring range of a Category 1, 2, or 3 wetland?	YES Wetland is assigned to the appropriate category based on the scoring range	NO	If the score of the wetland is located within the scoring range for a particular category, the wetland should be assigned to that category. In all instances however, the narrative criteria described in OAC Rule 3745-1-54(C) can be used to clarify or change a categorization based on a quantitative score.
Does the quantitative score fall with the "gray zone" for Category 1 or 2 or Category 2 or 3 wetlands?	YES Wetland is assigned to the higher of the two categories or assigned to a category based on detailed assessments and the narrative criteria	NO	Rater has the option of assigning the wetland to the higher of the two categories or to assign a category based on the results of a nonrapid wetland assessment method, e.g. functional assessment, biological assessment, etc, and a consideration of the narrative criteria in OAC rule 3745-1-54(C).
Does the wetland otherwise exhibit <i>moderate OR superior</i> hydrologic OR habitat, OR recreational functions AND the wetland was <i>not</i> categorized as a Category 2 wetland (in the case of moderate functions) or a Category 3 wetland (in the case of superior functions) by this method?	YES Wetland was undercategorized by this method. A written justification for recategorization should be provided on Background Information Form	NO Wetland is assigned to category as determined by the ORAM.	A wetland may be undercategorized using this method, but still exhibit one or more superior functions, e.g. a wetland's biotic communities may be degraded by human activities, but the wetland may still exhibit superior hydrologic functions because of its type, landscape position, size, local or regional significance, etc. In this circumstance, the narrative criteria in OAC Rule 3745-1-54(C)(2) and (3) are controlling, and the under-categorization should be corrected. A written justification with supporting reasons or information for this determination should be provided.

Final Category			
Choose one	Category 1	Category 2	Category 3

End of Ohio Rapid Assessment Method for Wetlands.

Version 5.0	Ohio Rapid Assessment Method for Wetlands 10 Page Form for Wetland Categorization	
	Background Information Scoring Boundary Worksheet Narrative Rating Field Form Quantitative Rating ORAM Summary Worksheet Wetland Categorization Worksheet	Ohio EPA, Division of Surface Water Final: February 1, 2001

Instructions

The investigator is *STRONGLY URGED* to read the Manual for Using the Ohio Rapid Assessment Method for Wetlands for further elaboration and discussion of the questions below prior to using the rating forms.

The Narrative Rating is designed to categorize a wetland or to provide alerts to the Rater based on the presence or possible presence of threatened or endangered species. The presence or proximity of such species is often an indicator of the quality and lack of disturbance of the wetland being evaluated. In addition, it is designed to categorize certain wetlands as very low quality (Category 1) or very high quality (Category 3) regardless of the wetland's score on the Quantitative Rating. In addition, the Narrative Rating also alerts the investigator that a particular wetland *may* be a Category 3 wetland, again, regardless of the wetland's score on the Quantitative Rating.

It is *VERY IMPORTANT* to properly and thoroughly answer each of the questions in the ORAM in order to properly categorize a wetland. To *properly* answer all the questions, the boundaries of the wetland being assessed must be correctly identified. Refer to Scoring Boundary worksheet and the User's Manual for a discussion of how to determine the "scoring boundaries." In some instances, the scoring boundaries may differ from the "jurisdictional boundaries."

Refer to the most recent ORAM Score Calibration Report for the scoring breakpoints between wetland categories. The most recent version of this document is posted on Ohio EPA's Division of Surface Water web page at: <http://www.epa.ohio.gov/dsw/wetlands/WetlandEcologySection.aspx>

Background Information

Name: Nathan Renaudin	
Date: 4/4/17	
Affiliation: TRC Solutions	
Address: 2200 Liberty Avenue, Suite 100, Pittsburgh PA, 15222	
Phone Number: 412.713.7127	
e-mail address: nrenaudin@trcsolutions.com	
Name of Wetland: Wetland 2	
Vegetation Communit(ies): PEM	
HGM Class(es): Depressional	
Location of Wetland: include map, address, north arrow, landmarks, distances, roads, etc. See attached map	
Lat/Long or UTM Coordinate	39.276315- 82.448510
USGS Quad Name	Zaleski
County	Vinton
Township	Mcarthur
Section and Subsection	NA
Hydrologic Unit Code	050901010205
Site Visit	4/4/17
National Wetland Inventory Map	See Report
Ohio Wetland Inventory Map	See Report
Soil Survey	See Report
Delineation report/map	See Report

Name of Wetland: Wetland 2	
Wetland Size (acres, hectares): 0.18	Acres
Sketch: Include north arrow, relationship with other surface waters, vegetation zones, etc. See wetland report.	
Comments, Narrative Discussion, Justification of Category Changes:	
Final score : 20	Category: 1

Scoring Boundary Worksheet

INSTRUCTIONS. The initial step in completing the ORAM is to identify the “scoring boundaries” of the wetland being rated. In many instances this determination will be relatively easy and the scoring boundaries will coincide with the “jurisdictional boundaries.” For example, the scoring boundary of an isolated cattail marsh located in the middle of a farm field will likely be the same as that wetland’s jurisdictional boundaries. In other instances, however, the scoring boundary will not be as easily determined. Wetlands that are small or isolated from other surface waters often form large contiguous areas or heterogeneous complexes of wetland and upland. In separating wetlands for scoring purposes, the hydrologic regime of the wetland is the main criterion that should be used. Boundaries between contiguous or connected wetlands should be established where the volume, flow, or velocity of water moving through the wetland changes significantly. *Areas with a high degree of hydrologic interaction should be scored as a single wetland.* In determining a wetland’s scoring boundaries, use the guidelines in the ORAM Manual Section 5.0. In certain instances, it may be difficult to establish the scoring boundary for the wetland being rated. These problem situations include wetlands that form a patchwork on the landscape, wetlands divided by artificial boundaries like property fences, roads, or railroad embankments, wetlands that are contiguous with streams, lakes, or rivers, and estuarine or coastal wetlands. These situations are discussed below, however, it is recommended that Rater contact Ohio EPA, Division of Surface Water, 401/Wetlands Section if there are additional questions or a need for further clarification of the appropriate scoring boundaries of a particular wetland.

#	Steps in properly establishing scoring boundaries	done?	not applicable
Step 1	Identify the wetland area of interest. This may be the site of a proposed impact, a reference site, conservation site, etc.	X	
Step 2	Identify the locations where there is physical evidence that hydrology changes rapidly. Such evidence includes both natural and human-induced changes including, constrictions caused by berms or dikes, points where the water velocity changes rapidly at rapids or falls, points where significant inflows occur at the confluence of rivers, or other factors that may restrict hydrologic interaction between the wetlands or parts of a single wetland.	X	
Step 3	Delineate the boundary of the wetland to be rated such that all areas of interest that are contiguous to and within the areas where the hydrology does not change significantly, i.e. areas that have a high degree of hydrologic interaction are included within the scoring boundary.	X	
Step 4	Determine if artificial boundaries, such as property lines, state lines, roads, railroad embankments, etc., are present. These should not be used to establish scoring boundaries unless they coincide with areas where the hydrologic regime changes.	X	
Step 5	In all instances, the Rater may enlarge the minimum scoring boundaries discussed here to score together wetlands that could be scored separately.		
Step 6	Consult ORAM Manual Section 5.0 for how to establish scoring boundaries for wetlands that form a patchwork on the landscape, divided by artificial boundaries, contiguous to streams, lakes or rivers, or for dual classifications.	X	

End of Scoring Boundary Determination. Begin Narrative Rating on next page.

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Case No(s). 17-0774-EL-BGN

Summary: Application Part 4 of 5 (part 1 of 2) Exhibit F electronically filed by Christine M.T. Pirik on behalf of Pirik, Chris M.T.