Legal Department

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Columbus, OH 43215-2373
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March 2, 2018

Ms. Barcy F. McNeal
Docketing Division
Public Utilities Commission of Ohio
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Columbus, Ohio 43215-3793

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RE: In the matter of the Construction Notice Application of AEP Ohio Transmission Company, Inc. for a Certificate of Environmental Compatibility and Public Need for the East Lima-Marysville 345kV Transmission Line Extension Project
Case No. 18-0256-EL-BNR

Dear Ms. McNeal:

Attached please find a copy of AEP Ohio Transmission Company, Inc.'s ("AEP Ohio Transco") Construction Notice application for the above-referenced project, which is being submitted pursuant to O.A.C. 4906-6-05.

Copies of this filing will also be submitted to the executive director or the executive director's designee and provided to the OPSB Staff via electronic message.

If you have any questions, please do not hesitate to contact me.

Respectfully submitted,

/s/ Christen M. Blend
Christen M. Blend (0086881), Counsel of Record
Hector Garcia (0084517)
Counsel for AEP Ohio Transmission Company, Inc.

cc: John Jones, Counsel OPSB Staff
Jon Pawley, OPSB Staff

Construction Notice For East Lima-Marysville 345 kV Transmission Line Extension Project

Case No. 18-0256-EL-BNR

Submitted to:
The Ohio Power Siting Board
Pursuant to Ohio Administrative Code
Section 4906-6-05

Submitted by:
AEP Ohio Transmission Company, Inc.

March 2, 2018

CONSTRUCTION NOTICE

AEP Ohio Transmission Company, Inc.'s East Lima-Marysville 345 kV Transmission Line Extension Project

4906-6-05

AEP Ohio Transmission Company, Inc. ("AEP Ohio Transco") provides the following information to the Ohio Power Siting Board ("OPSB") pursuant to Ohio Administrative Code Section 4906-6-05.

4906-6-05(B) General Information

B(1) Project Description

The name of the project and applicant's reference number, names and reference number(s) of resulting circuits, a brief description of the project, and why the project meets the requirements for a Letter of Notification.

AEP Ohio Transco is proposing the East Lima-Marysville Transmission Line Extension Project ("Project"), located in the Belle Center, McDonald Township, Hardin County, Ohio. The Project includes the construction of five steel pole structures tapping into a switch station to serve a customer. The entirety of this construction will be in Ohio Power Company's right-of-way ("ROW"), and on the property of Hardin Wind Energy LLC ("Hardin Wind") for the Hardin Wind Project. Figure 1 shows the proposed alignment of the transmission line extension.

The Project meets the requirements for a Construction Notice ("CN") because it is within the types of projects defined by (1)(a) of Appendix A to O.A.C. 4906-1-01, *Application Requirement Matrix for Electric Power Transmission Lines*:

1. *New construction, extension, or relocation of single or multiple circuit electric power transmission line(s), or upgrading existing transmission or distribution line(s) for operation at a higher transmission voltage, as follows:*

    (a) Line(s) not greater than 0.2 miles in length.

The PUCO Case Number for this project is 18-0256-EL-BNR.

B(2) Statement of Need

If the proposed Construction Notice project is an electric power transmission line or gas or natural gas transmission line, a statement explaining the need for the proposed facility.

This Project is necessary to provide an electrical interconnection from AEP Ohio Transco's existing 345 kV transmission line to a switch station being constructed by Hardin Wind and to meet AEP Ohio Transco's customer, Hardin Wind's, requirements.

The East Lima-Marysville 345 kV circuit will be cut to loop in and out of a new 345 kV station (Hardin Switch) to implement the terms of the PJM Interconnection Services Agreement (ISA) and Interconnection Construction Services Agreement (ICSA) associated with PJM queue positions U2-041 and V3-028. The ISA and ICSA provide for the interconnection of the Hardin Energy Center to the transmission grid.

The Hardin Energy Center generation project itself has been submitted to the OPSB separately by Hardin Wind in OPSB Case Nos. 09-0479-EL-BGN, 11-3446-EL-BGA, 16-0469-EL-BGA, and 16-2404-EL-BGA.

B(3) Project Location

The applicant shall provide the location of the project in relation to existing or proposed lines and substations shown on an area system map of sufficient scale and size to show existing and proposed transmission facilities in the Project area.

Figure 1 shows the location of the Project in relation to existing transmission lines and the new switching station.

B(4) Alternatives Considered

The applicant shall describe the alternatives considered and reasons why the proposed location or route is best suited for the proposed facility. The discussion shall include, but not be limited to, impacts associated with socioeconomic, ecological, construction, or engineering aspects of the project.

No formal siting or routing study was completed for the Hardin Wind Project to AEP Ohio Transco's East Lima-Marysville 345 kV transmission line interconnections, and no significant alternatives were studied. Hardin Wind provided AEP Ohio Transco with the proposed routes that best met the layout of Hardin Wind's project.

The location of the utility switchyard adjacent to the existing 345 kV electric transmission line corridor will facilitate AEP Ohio Transco's tap into the existing transmission lines and allow for consolidation of property ultimately to be controlled by AEP Ohio Transco. The utility switchyard was positioned as close to the 345 kV lines as possible.

All poles have been specifically positioned to minimize the need for structures to be located in a wetland or floodplain. The resulting ROWs represent the most suitable and least-impact routing alternatives.

B(5) Public Information Program

The applicant shall describe its public information program to inform affected property owners and tenants of the nature of the project and the proposed timeframe for project construction and restoration activities.

Because the Project will be located fully on Ohio Power Company-owned Property, no other property owners or tenants will be affected. AEP Ohio Transco maintains a website (http://aeptransmission.com/ohio/) on which an electronic copy of this CN is available. A paper copy of the CN will be served to the public library in each political subdivision affected by this Project.

B(6) Construction Schedule

The applicant shall provide an anticipated construction schedule and proposed in-service date of the project.

Construction of the Project is planned to begin in the first or early second quarter of 2018, and the anticipated in-service date will be approximately October 2018.

B(7) Area Map

The applicant shall provide a map of at least 1:24,000 scale clearly depicting the facility with clearly marked streets, roads, and highways, and an aerial image.

Figure 1 provides a zoomed map of the proposed Project area. Figure 2 provides a map of the Project area in 1:24,000-scale, on recent aerial photography. Figure 3 shows the project area on the United States Geologic Service (USGS) 7.5-minute topographic map of the Fostoria (1973) quadrangle. To visit the Project location from Columbus, take I-70 W/I-71 S, and follow signs for Dayton/Rich St/Town St. Take exit 93 to merge onto I-270 N towards Cleveland, and follow for 9 miles. Take exit 17B to merge onto OH-161 W/US-33W for 1.2 miles. Continue onto US-33 W for 45.3 miles. Exit onto OH-117 W towards OH-366/Huntsville/Lima. Merge onto OH-117 W for and follow 8.8 miles. Turn right onto OH-235N and stay on OH-235 N for approximately 2 miles. Turn right onto OH-67 E and follow for 2.4 miles. Turn left onto Johnson Road, follow for 1.8 miles. Turn right onto Co Rd 150, follow for .5 mile. Turn left at the first cross street onto Dodds Road, follow for 1.1 miles. The Project area will be in the farm field to the left between Dodds Road and OH-195. The approximate address is 14155 Township Road 65, Belle Center, OH, 43310.

B(8) Property Agreements

The applicant shall provide a list of properties for which the applicant has obtained easements, options, and/or land use agreements necessary to construct and operate the facility and a list of the additional properties for which such agreements have not been obtained.

All construction will occur on Ohio Power Company property and ROW and Hardin Wind property. No other property easements, options, or land use agreements are necessary to construct the Project or operate the transmission lines.

B(9) Technical Features

The applicant shall describe the following information regarding the technical features of the project:

B(9)(a) Operating characteristics, estimated number and types of structures required, and right-of-way and/or land requirements.

The Project will involve a total of five steel monopoles. Descriptions of their operating characteristics are found below. Typical structures are provided in Figure 4.

Structure 238A: The galvanized steel pole structure will stand approximately 150 feet tall with davit arms and I-String insulator assemblies. It will operate at 345 kV and carry three (3) 2,303,000 CM ACAR conductors and one (1) 159,000 CM ACSR shield wire. This structure will be constructed along existing ROW.

Structures 238B1, B2, C1, C2: The galvanized steel pole structures will stand approximately 150 feet tall with vertically configured strain insulator assemblies. They will operate at 345 kV and carry three (3)

2,303,000 CM ACAR conductors and one (1) 48-fiber OPGW. Two of these steel monopole, dead-end structures will be constructed within the 0.3-mile eastern line tap ROW, and another two will be constructed within the 0.3-mile western line tap ROW.

B(9)(b) Electric and Magnetic Fields

For electric power transmission lines that are within one hundred feet of an occupied residence or institution, the production of electric and magnetic fields during the operation of the proposed electric power transmission line.

No occupied residences or institutions are located within 100 feet of the Project.

B(9)(b)(ii) Design Alternatives

A discussion of the applicant's consideration of design alternatives with respect to electric and magnetic fields and their strength levels, including alternate conductor configuration and phasing, tower height, corridor location, and right-of-way width.

No occupied residences or institutions are located within 100 feet of the Project.

B(9)(c) Project Cost

The estimated capital cost of the project.

The capital cost estimate for the proposed Project, which is comprised of applicable tangible and capital costs, is approximately $1,800,000.

B(10) Social and Economic Impacts

The applicant shall describe the social and ecological impacts of the project:

B(10)(a) Operating Characteristics

Provide a brief, general description of land use within the vicinity of the proposed project, including a list of municipalities, townships, and counties affected.

The Project is within McDonald Township in Hardin County, Ohio. The land use within the vicinity of the Project is agricultural and residential. The 0.04-mile long transmission line to the switching station is completely within Ohio Power Company's current ROW and Hardin Wind Energy LLC Property. No tree clearing is anticipated to be required for the Project. There are no residences within 1,000 feet of the centerline of the Project. There are no parks, schools, churches, cemeteries, wildlife management areas, or nature preserve lands within 1,000 feet of the centerline of the Project.

B(10)(b) Agricultural Land Information

Provide the acreage and a general description of all agricultural land, and separately all agricultural district land, existing at least sixty days prior to submission of the application within the potential disturbance area of the project.

The Hardin County auditor has been contacted regarding agricultural district lands in Hardin Township. It does not appear that any agricultural district land is within 1,000 feet of the Project. The proposed transmission line extension is adjacent to existing 345 kV transmission lines. New infrastructure will be limited to five new steel pole structures. Impacts to agricultural land are expected to be minimal.

B(10)(c) Archaeological and Cultural Resources

Provide a description of the applicant's investigation concerning the presence or absence of significant archaeological or cultural resources that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

A Phase I Archaeological Investigation was completed by AEP Ohio Transco's consultant. No archaeological or history architecture resources were found within the Project area. This report can be found under Appendix C.

B(10)(d) Local, State, and Federal Agency Correspondence

Provide a list of the local, state, and federal governmental agencies known to have requirements that must be met in connection with the construction of the project, and a list of documents that have been or are being filed with those agencies in connection with siting and constructing the project.

AEP Ohio Transco's customer, Hardin Wind filed a Notice of Intent with the Ohio Environmental Protection Agency for authorization of construction storm water discharges under General Permit OHC000004. AEP Ohio Transco has prepared a Cultural Report to be coordinated with the State Historic Preservation Office, and this report can be found under Appendix C. There are no other known local, state, or federal requirements that must be met prior to commencement of the proposed Project.

B(10)(e) Threatened, Endangered, and Rare Species

Provide a description of the applicant's investigation concerning the presence or absence of federal and state designated species (including endangered species, threatened species, rare species, species proposed for listing, species under review for listing, and species of special interest) that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

AEP Ohio Transco's customer, Hardin Wind's consultant coordinated with the USFWS and ODNR regarding special status species in the vicinity of the Project. No impacts to threatened or endangered species are expected. A copy of the coordination for the Project is included as Appendix B.

B(10)(f) Areas of Ecological Concern

Provide a description of the applicant's investigation concerning the presence or absence of areas of ecological concern (including national and state forests and parks, floodplains,

wetlands, designated or proposed wilderness areas, national and state wild and scenic rivers, wildlife areas, wildlife refuges, wildlife management areas, and wildlife sanctuaries) that may be located within the potential disturbance area of the project, a statement of the findings of the investigation, and a copy of any document produced as a result of the investigation.

AEP Ohio Transco's customer, Hardin Wind's consultant prepared a Wetland Delineation and Stream Assessment Report. No impacts to wetlands or streams are anticipated. A copy of the Wetland Delineation and Stream Assessment Report for the Project is included as Appendix A.

B(10)(g) Unusual Conditions

Provide any known additional information that will describe any unusual conditions resulting in significant environmental, social, health, or safety impacts.

To the best of AEP Ohio Transco's knowledge, no unusual conditions exist that would result in significant environmental, social, health, or safety impacts.

Figure 1

Figure 2

Figure 3

Figure 4

1 inch equals 200 feet

Coordinate System: NAD 1983 UTM Zone 16N

Structures

Work Area

Existing Transmission Line

New Switch Station

East Lima-Marysville 345kV Transmission Line Extension Project

Transmission Line Engineering Group

Source: American Electric Power, ESRI
Comments:

Drawn By: adannemi
Date: 2/16/2018

AEP OHIO
An AEP Company
700 Morrison Rd.
Gahanna, OH 43230-6642
PH: (614) 716-1000
Fax: (614) 552-1818

Path: C:\Projects\Lima-Marys\Lima\GoDocs\ArcMXD\Lima.aprx

1 inch equals 2,000 feet

Coordinate System: NAD 1983 UTM Zone 16N

○ Structures

Work Area

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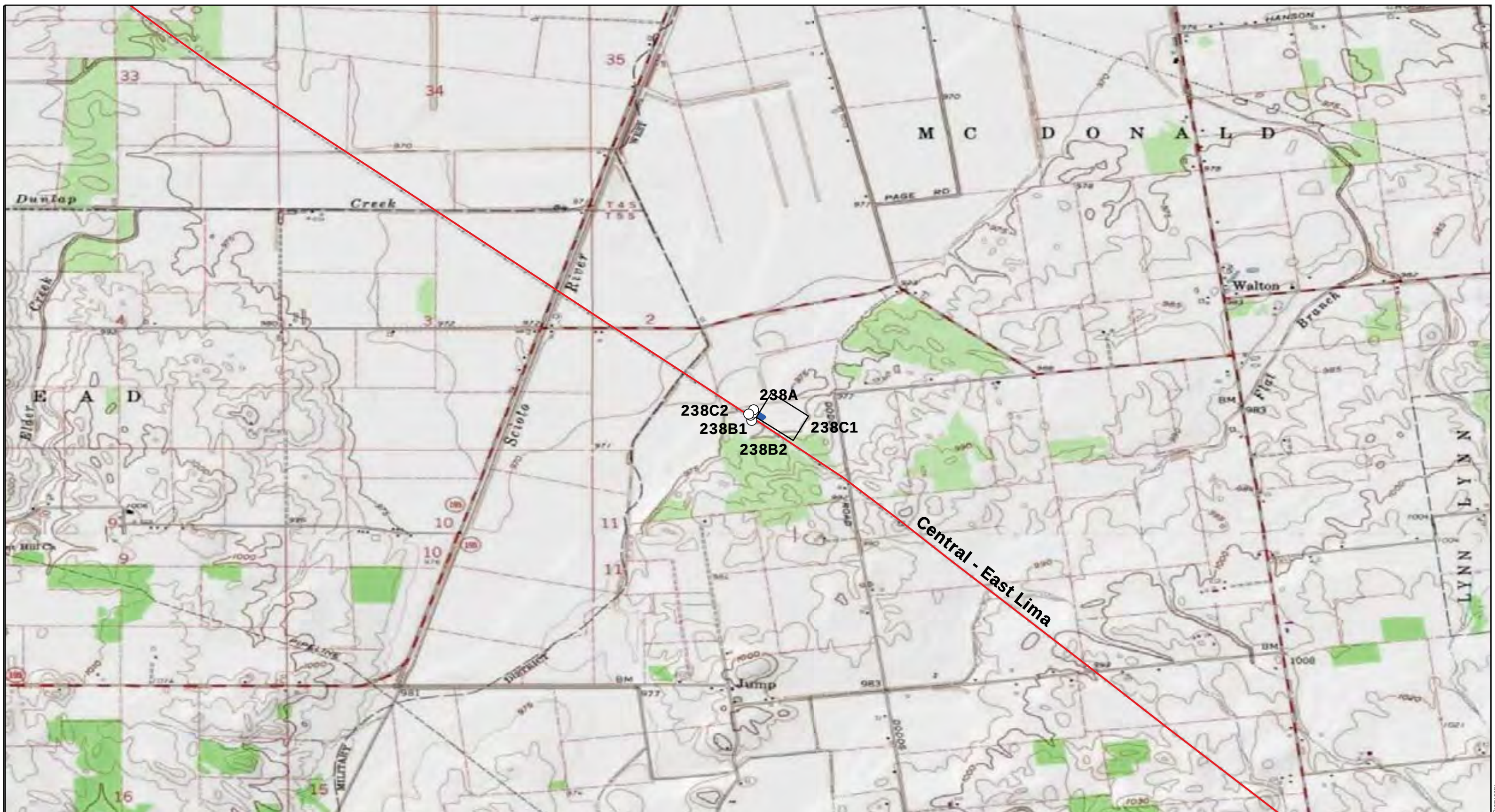

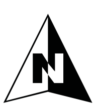

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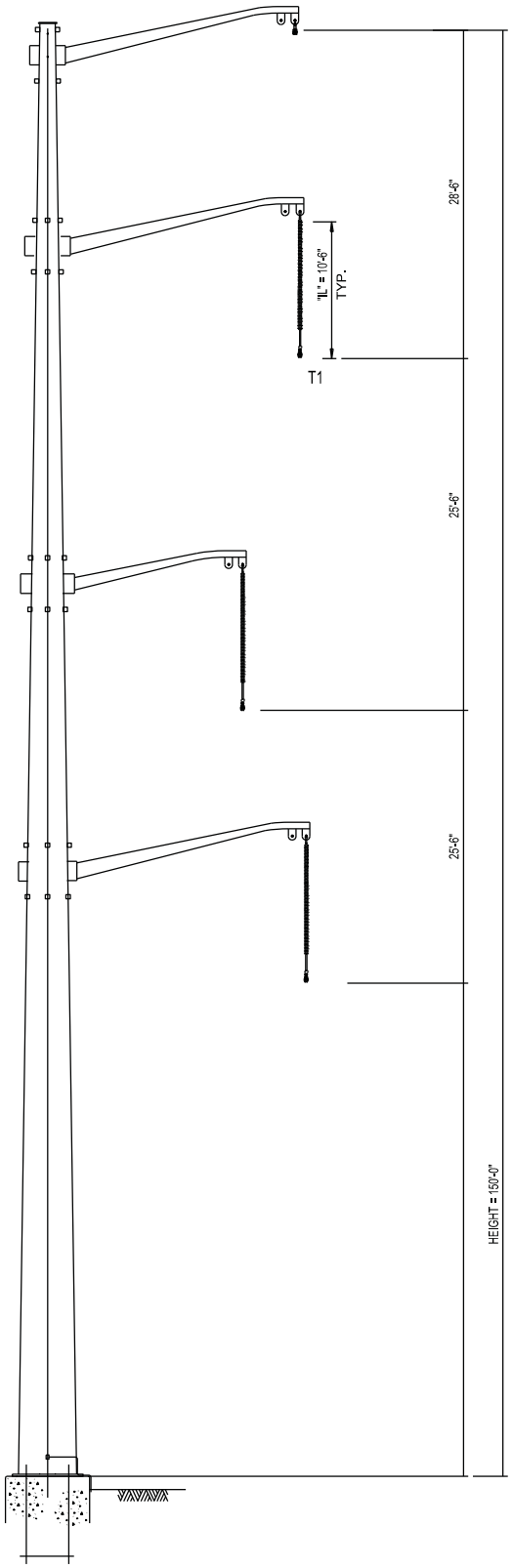

Figure A: 345kV Suspension
Central - East Lima
Structure 238A1

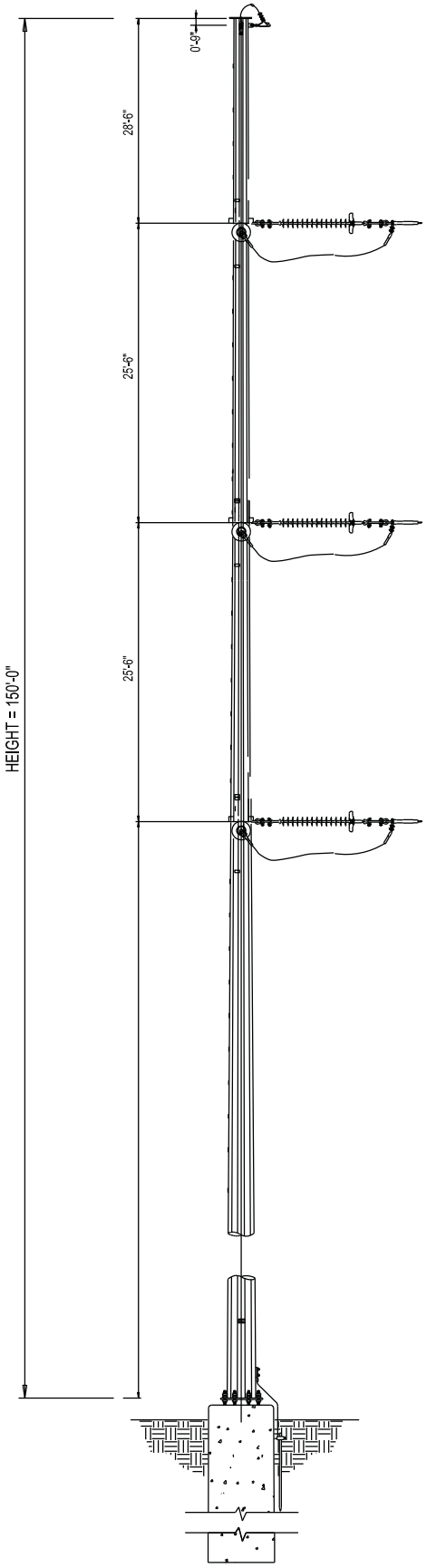

Figure B: 345kV Dead End
Central - East Lima
Structures 238B1,B2,C1,C2

Appendix A Wetland Delineation and Stream Assessment Report

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September 12, 2017

Mr. Gabriel Klooster
Hardin Solar Energy, LLC
One South Wacker Drive, Suite 1800
Chicago, Illinois 60606

Subject: Addendum (*Hardin Wind Energy Project Wetlands and Other Waters of the U.S. Delineation Survey Report, October 2016*) for Point of Interconnection Facility
TRC Project No. 274096.0002.0000

1.0 Introduction

On behalf of Hardin Solar Energy, LLC (HSE), TRC Environmental Corporation (TRC) has prepared this Addendum to the Hardin Wind Energy Project Wetlands and Other Waters of the U.S. Delineation Report, October 2016, as part of the environmental studies conducted for the Hardin Wind Energy Project located in Hardin County, Ohio. HSE requested a study of a potential substation location that may be the point of interconnection (POI) for the Hardin Wind Energy Center (Project). The Study Area consists of one substation area of approximately 52.0 acres (21.0 hectares) in Marion Township, Hardin County, Ohio (Appendix A, Figure 1). The Study Area is bounded by Township Road 65 to the east and neighboring landowners to the north, south and west.

This Addendum contains the methodology and results of the wetland identification and delineation investigations performed by TRC. Mr. Justin Pitts, a TRC environmental scientist who has been performing wetland delineations for over 10 years, was the lead field scientist and primary author of this Addendum.

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

The Study Area lies within the Eastern Corn Belt Plains, which typically have loamy and well-drained soils, and most commonly characterized by rolling plains and local end moraines (Wilken, Jiménez Nava and Griffith 2011). The vegetation of the ecoregion was originally dominated by American beech (*Fagus grandifolia*), sugar maple (*Acer saccharum*), and American basswood (*Tilia americana*) forests. Overall the landscape has been significantly altered to accommodate agricultural activities which have negatively altered stream chemistry and turbidity (United States Environmental Protection Agency [EPA] 2010; US EPA 2013) (Wilken, Jiménez Nava and Griffith 2011). 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 Upper Scioto (HUC 05060001) river basin (USDA-NRCS, 2013). The Study Area is actively farmed and comprised primarily of corn and soybean monocultures.

2.0 Methodology

Pursuant to the USACE wetlands and other waters of the U.S. (WOUS) 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 desktop review included the following: the United States Geological Survey (USGS) Alger, Ohio (1994) 7.5 minute series topographical quadrangle map (Appendix A, Figure 1); soil datasets acquired from the NRCS Web Soil Survey (USDA 2016) for Hardin County, Ohio (Appendix A, Figure 2); the U. S. Fish and Wildlife Service (USFWS) National Wetland Inventory Map (NWI) near Alger, Ohio (USFWS 2016; Appendix A, Figure 3); National Hydrography Dataset (USGS 2017) and the Federal Emergency Management Agency (FEMA) flood hazard risk map (FEMA 2016; Appendix A, Figure 4). The desktop review sources were reviewed to identify potential wetlands and other WOUS that may be present in the Study Area. These potential wetlands and WOUS are defined in Section 2.2. The results of the desktop review were used to aid in the field investigation.

2.2 Field Methodology – Wetlands

While no wetlands were identified, the following procedures were or would have been employed as applicable to delineate wetlands had they been discovered. For any wetland that would be found in the Study Area they would have been identified and their boundaries determined in accordance with the U.S. Army Corps of Engineers (USACE) *Wetlands Delineation Manual (1987 Manual)* (USACE 1987), utilizing the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0) (Regional Supplement)* (USACE 2010). Consistent with the *1987 Manual*, wetland determinations were based on soil characteristics, hydrologic characteristics, and dominant plant species. In addition, wetlands and other WOUS (see Section 2.4 below) were evaluated in accordance with the Ohio EPA as part of the State of Ohio's Water Quality Standards (OAC Chapter 3745-1). Field surveys were conducted on July 31, 2017. Areas that exhibited hydric soils, wetland hydrology, and a dominance of hydrophytic vegetation would be considered potentially jurisdictional wetlands. When wetlands or other WOUS (see Section 2.4 below) would be identified, they would be considered potentially jurisdictional until verified by the USACE.

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). If found, mottled soils with a matrix chroma of two or less, or unmottled soils with a matrix chroma of one or less would be considered to exhibit hydric soil characteristics (USDA 2010; USACE 2010).

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 surface water or saturated soils, water marks on trees, drift deposits, water-stained leaves, and oxidized root zones surrounding living roots within 12 inches (30 cm) of the soil surface. Examples of secondary wetland hydrology indicators include drainage patterns, presence of crayfish burrows, and

geomorphic position. 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 (Braun 1967; Braun 1969; Gleason and Cronquist 1991; Holmgren 1998; Mohlenbrock 2001; Mohlenbrock 2001a; 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). If wetlands were suspected, dominant vegetation for each community would be determined by estimating dominant species in the tree, sapling, shrub, herb, and woody vine strata. Dominant species would be determined by using the 50/20 dominance rule for each stratum (tree, sapling, shrub, herb, and woody vine), which would be accomplished by estimating the percent areal cover for each species. The relative percent areal cover would be calculated for each species by dividing each species percent cover by the total percent cover for all species and multiplying by 100. The species would be arranged in descending order of relative percent cover. A running total would be calculated by adding the relative cover of each species starting with the species with the highest relative cover until the total cover equaled 50. All species included in this calculation would be regarded as dominant. Species of equal cover value that contributed to meeting the sum of 50 would also be considered dominant. Additionally, other species that solely accounted for 20 percent or more of the relative percent cover would also be considered dominant species.

When identified, the indicator status of each dominant species would be determined. An indicator status of obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and/or upland (UPL) was assigned to each plant species in the *U.S. Army Corps of Engineers National Wetlands Plant List* (Lichvar et al. 2016). In accordance with the aforementioned guidance, an area would be classified as satisfying hydrophytic vegetation criteria when, under normal circumstances, all dominant species across all strata are rated OBL or FACW (Rapid Test, Indicator 1), more than 50 percent of the composition of the dominant species from all strata has OBL, FACW, and/or FAC species (Dominance Test, Indicator 2), or calculating a prevalence index of less than or equal to 3 (Prevalence Index, Indicator 3).

A FAC-neutral test would be calculated for each data set as a means of determining the presence of wetland hydrology. This test would consider all FAC species as neutral for wetland determination and would compare 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 would result when dominant species wetter than FAC were more prevalent than dominant species that were drier than FAC. A positive FAC-neutral test would be utilized as a secondary indicator of wetland hydrology.

Plots, and consequently communities, that met the three criteria of hydric soils, wetland hydrology, and hydrophytic vegetation would be considered wetlands. Wetland boundaries would be mapped where one or more of these criteria were indicative of upland characteristics. Sample points would be taken in nearby adjacent upland areas to confirm that one or more of the criteria were not met in these locations.

If wetlands were found within the Study Area, they would be classified according to the USFWS *Classification of Wetlands and Deepwater Habitats for the United States* (Cowardin, et al. 1979). Wetland classifications would be 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 would be 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 would be labeled consecutively (e.g., *W-01, W-02*, etc.), and correspond to the wetlands would be illustrated on the Delineated Resource Boundaries map provided in Appendix A as Figure 5. The wetland boundaries would be mapped as polygons; the wetland areal extents would be calculated using the shapefile properties utility in ArcMap.

Sample points would be recorded to provide a characterization of the wetland and other WOUS located within the Study Area and recorded on USACE Wetland Determination Data Forms. Appendix B provides photo documentation of field observations.

2.3 Ohio Rapid Assessment Method

In accordance with Ohio requirements, if wetlands were identified they would be delineated using the Ohio Rapid Assessment Method (ORAM Version 5.0) (Mack 2001). 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 are 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 Modified 2: 35 – 44.9
Category 2: 45 – 59.9 (Moderate Quality)
Category 2 or 3: 60 – 64.9
Category 3: 65 – 100 (High Quality)

ORAM data forms (ORAM v. 5.0 Field Form Quantitative Rating) would be completed for each wetland in the field and supplemented by aerial photographic interpretation to aid in boundary determination estimates located beyond the Study Area. These forms would be the basis for the provisional wetland categorizations and scores which would be considered preliminary until verified by the Ohio EPA.

2.4 Other Waters of the U.S.

The Study Area was screened for the presence of other WOUS that met the criteria specified in the *1987 Manual*. Other WOUS would consist of ephemeral, intermittent, and perennial streams, as well as open water features, such as ponds or lakes. Drainage channels that exhibited a defined "bed and bank" and an ordinary high water mark in the channel would be identified and delineated as potentially jurisdictional streams. All final jurisdictional determinations would be made by the USACE; therefore, determinations are considered preliminary until verified by the USACE (USACE/USEPA 2008).

Streams identified, if any, during delineations would be evaluated using approved assessment methods outlined in the *Biological Criteria for the Protection of Aquatic Life* (OEPA 1986, 2015), which provides an empirical, quantified evaluation method for 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 WOUS. Depending on the size of the stream's drainage area, data collection for 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 is available, the drainage area is calculated using automated basin characteristics from the USGS StreamStats v 4.0: Ohio (USGS 2016).

Following Ohio EPA guidance, any stream with a drainage area of greater than or equal to 1.0 square mile (1.6 square kilometers), or which has pools with maximum depths over 15.8 inches (40.0 centimeters),

determined by measuring pool depth within the stream, would be evaluated using the QHEI. Data on these streams were collected in the QHEI form provided by the Ohio EPA, and utilized six principal metrics: substrate, instream cover, channel morphology, riparian zone and bank erosion, pool/glide and riffle-run quality, and map gradient. Each metric would be scored separately and summed to obtain the total QHEI score. Ranges may vary slightly in smaller streams (< 20 square miles; <52 square kilometers), compared to larger streams. In general 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 would be utilized to score streams with a drainage area of less than 1.0 square mile (1.6 square kilometers). Data on these streams were collected on primary 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, would be recorded. Measurements would include bankfull width, maximum pool depth, and substrate composition.

Using the scoring method associated with these forms, a designation of Class I, II, or III would be 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 would be scored at multiple representative locations. QHEI and HHEI scores would be considered preliminary until verified by the Ohio EPA.

3.0 Results

Review of vegetation, soil pits and hydrology revealed no wetlands or other WOUS were identified within the Study Area.

3.1 Background Resources

3.1.1 USGS Topographic Map

Based on the desktop review, the Study Area contained no mapped wetland features according to the Alger, Ohio USGS topographic quadrangle (Appendix A, Figure 1) (USGS 1994). The majority of the terrain is almost completely level. The elevation ranges from approximately 970 feet to 980 feet (296 meters to 299 meters) above mean sea level.

3.1.2 Soils

According to the soil dataset acquired from the NRCS Web Soil Survey for Hardin County, Ohio, the Study Area is underlain by five (5) different soil types: Linwood muck (Ln), Olentangy Silt Loam (Ot), Pewamo Silty Clay Loam, 0 – 1 Percent Slopes (PkA), Blount Silt Loam, Ground Moraine, 0 – 2 Percent Slopes (Blg1A1), and Blount Silt Loam, Ground Moraine, 2 - 4 Percent Slopes (Blg1B1). Blg1B1 is mapped as non-hydric soils with hydric inclusions, while Ln, Ot, PkA and Blg1A1 are mapped as hydric soil within Hardin County, Ohio (USDA 2015) (Table 1 and Appendix A, Figure 2). Throughout the Study Area, soils and hydrology have been greatly influenced by the historic ditching and tiling (for agricultural purposes) (USDA 2016).

Table 1. Soils Mapped within the Study Area

Soil Code	Soil Name	Percent (%) in Study Area	Hydric Status
Blg1A1	Blount Silt Loam, Ground Moraine, 0 – 2 Percent Slopes	10.2	Hydric
Blg1B1	Blount Silt Loam, Ground Moraine, 2 – 4 Percent Slopes	0.4	Non-Hydric with Hydric Inclusions
Ln	Linwood muck	13.6	Hydric
Ot	Olentangy Silt Loam	34.7	Hydric
PkA	Pewamo Silty Clay Loam, 0 – 1 Percent Slopes	41.1	Hydric

3.1.3 National Wetland Inventory

According to the USFWS NWI (USFWS 2016), no wetland or riverine systems are mapped within the Study Area (Appendix A, Figure 3).

3.1.4 FEMA Flood Hazard

According to the FEMA mapping, the Study Area is not located within a FEMA Flood Zone (FEMA 2016) (Appendix A, Figure 4).

3.2 Detailed Delineations

TRC performed this wetland and other WOUS identification and delineation during the normal growing season in Ohio, on July 31, 2017 and August 30, 2017. Weather conditions were warm, between 68 and 76 degrees Fahrenheit (20 and 24 degrees Celsius, respectively), with no rain. The date of last precipitation was on July 28, 2017 and August 29, 2017 when approximately 0.05 inch (0.13 cm) and 0.33 inch (0.84 cm) had fallen, respectively. Non-native cultivated crops (soy bean) were observed within the Study Area. No wetlands or other WOUS were identified and/or delineated. Findings within this Report are preliminary and are subject to final determination by the USACE and the Ohio EPA.

3.2.1 Wetlands

Nearly all of the Study Area is maintained in active, rotational agricultural (soy bean). No wetlands were identified within the Study Area.

3.2.2 Other Waters of the U.S.

No WOUS were identified within the Study Area.

4.0 References

Braun, Lucy E. 1967. *The Vascular Flora of Ohio, Volume 1-The Monocotyledoneae: Cattails to Orchids.* Columbus, OH: The Ohio State University Press.

—. 1969. *The Woody Plants of Ohio: Trees, Shrubs, and Woody Climbers Native, Naturalized, and Escaped.* Columbus, OH: Ohio State University Press.

Cowardin, Lewis M, Virginia Carter, Francis C Golet, and Edward T LaRoe. 1979. "Classification of Wetlands and Deepwater Habitats of the United States." Office of Biological Services, U.S. Fish and Wildlife Service, Washington, D.C., 103.

FEMA. 2016. *FEMA Flood Map Serice Center.* https://msc.fema.gov/portal.

Gleason, Henry A, and Arthur Cronquist. 1991. *Manual of the Vascular Plants of Northeastern United States and Adjacent Canada.* 2nd. Bronx, NY: The New York Botanical Press.

Holmgren, Noel H. 1998. *Illustrated Companion to Gleason and Cronquist's Manual: Illustrations of the Vascular Plants of Northeastern United States and Adjacent Canada.* Bronx, NY: The New York Botanical Garden.

Lichvar, R W, D L Banks, W N Kirchner, and N C Melvin. 2016. *The National Wetland Plant List: 2016 Ratings.* Phytoneuron 2016-30.

Mack, John J. 2001. "Ohio Rapid Assessment Method for Wetlands, Manual for Using Version 5.0." Ohio EPA Technical Bulletin Wetland/2001-1-1, Division of Surface Water, 401 Wetland Ecology Unit, Ohio Environmental Protection Agency, Columbus, OH, 72.

Mohlenbrock, Robert H. 2006. *Illustrated Flora of Illinois, Flowering Plants: Flowering Rush to Rushes.* 2nd. Carbondale, IL: Southern Illinois University Press.

—. 2002. *Illustrated Flora of Illinois, Grasses: Bromus to Paspalum.* 2nd. Carbondale, IL: Southern Illinois University Press.

—. 2011. *Illustrated Flora of Illinois, Sedges: Carex.* 2nd. Carbondale, IL: Southern Illinois University Press.

—. 2001. *Illustrated Flora of Illinois, Sedges: Cyperus to Scleria.* 2nd. Carbondale, IL: Southern Illinois University Press.

—. 2001a. *Ilustrated Flora of Illinois, Grasses: Panicum to Danthonia.* 2nd. Carbondale, IL: Southern Illinois University Press.

Munsell Color. 2009. *Munsell Soil Color Book.* 2013. Grand Rapids, MI.

Newcomb, Lawrence. 1977. *Newcomb's Wildflower Guide.* Little, Brown and Company.

OEPA. 1986, 2015. "The Biological Criteria for the Protection of Aquatic Life, Volumes I-III." Division of Surface Water, Ohio Environmental Protection Agency, Columbus.

Rhoads, Ann Fowler, and Timothy A Block. 2007. *The Plants of Pennsylvania.* 2nd. Philadelphia, PA: University of Pennsylvania Press.

Rothrock, Paul E. 2009. *Sedges of Indiana and the Adjacent States: The Non-Carex Species.* Indianapolis, IN: Indiana Academy of Science.

Stein, John, Denise Binion, and Robert Acciavatti. 2003. *Field Guide to Native Oak Species of Eastern North America.* Morgantown, WV: U.S. Department of Agriculture, Forest Service.

US EPA. 2013. "Level III Ecoregions of the Conterminous United States." U.S. EPA Office of Research and Development (ORD) - National Health and Environmental Effects Research Laboratory (NHEEL), U.S. Environmental Protection Agency, Corvallis, OR.

—. 2010. *U.S. Environmental Protection Agency*. Accessed May 4, 2015. ftp://ftp.epa.gov/wed/ecoregions/pubs/CEC_LEVEL_III_Descriptions_US_May2010.doc.

USACE. 1987. *Corps of Engineers Wetlands Delineation Manual.* Vicksburg, MS: Environmental Laboratory U.S. Army Corps of Engineers, Waterways Experiment Station, Wetlands Research Program Technical Report Y-87-1.

—. No date. *Definition of Terms.* Accessed April 7, 2017. http://www.nap.usace.army.mil/Missions/Regulatory/FAQs/definitions.aspx.

USACE. 2007. *Jurisdictional Determination Form Instructional Guidebook.* http://www.usace.army.mil/Portals/2/docs/civilworks/.../jd_guidebook_051207final.pdf

USACE/USEPA. 2008. "Memorandum Clean Water Act Jurisdiction Following the U.S. Supreme Court's Decision in Rapanos v. United States & Carabell V. United States."

USACE. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0).* U.S. Army Corps of Engineers, Vicksburg: U.S. Army Corps Research and Development Center, 154.

USDA. 2010. *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils, Version 7.0.* Natural Resources Conservation Service, U.S. Department of Agriculture, In Cooperation with the National Technical Committee for Hydric Soils, 43 pp.

USDA. 2015. "National Hydric Soils List." Excel spreadsheet, Natural Resources Conservation Service, U.S. Department of Agricuture. http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/.

—. 2016. *Web Soil Survey 3.0.* http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

USDA/NRCS. 2013. *Watershed Boundary Dataset.* Accessed April 7, 2017. https://datagateway.nrcs.usda.gov/GDGOrder.aspx.

USFWS. 2016. *National Wetlands Inventory Online Mapper v 2.0.* https://www.fws.gov/wetlands/data/mapper.HTML.

USGS. 1994. "Topographical Quadrangle Maps (7.5-minute series)." U.S. Geological Survey.

USGS. 2016. *StreamStats, v 3.0.* U.S. Geological Survey. Accessed December 21, 2016. https://streamstatsags.cr.usgs.gov/v3_beta/viewer.htm.

USGS. 2017. National Hydrography Datatset. http://datagateway.nrcs.usda.gov. Accessed August 21, 2017.

Voss, Edward G, and Anton A Reznicek. 2012. *Field Manual of Michigan Flora.* Ann Arbor, MI: University of Michigan Press.

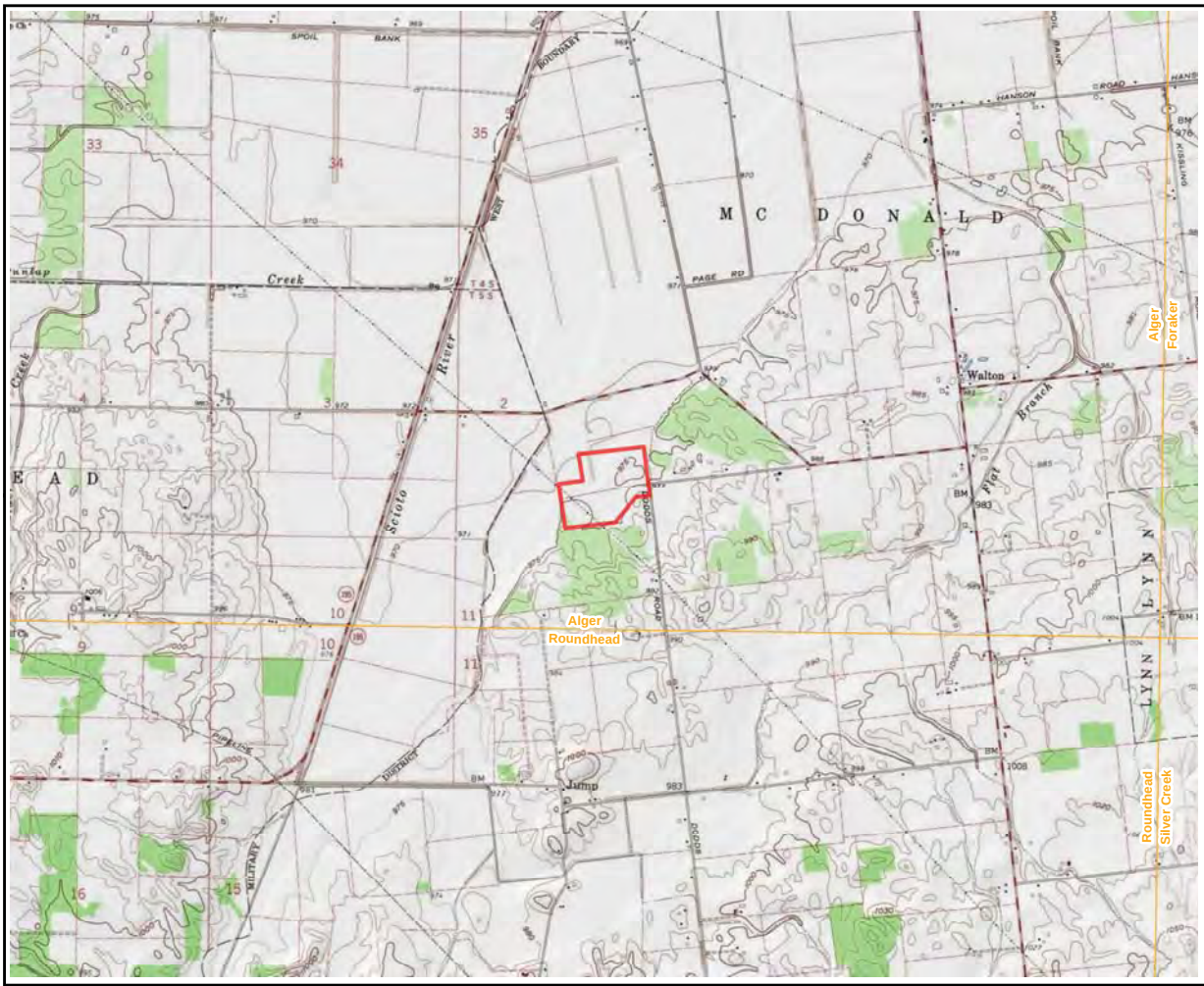
Weakley, Alan S, J. Christopher Ludwig, and John F Townsend. 2013. *Flora of Virginia.* 2nd. Edited by Bland Crowder. Foundation of the Flora of Virginia Project, Inc. and Botanical Research Institute of Texas.

Wilken, Ed, Francisco Jiménez Nava, and Glenn Griffith. 2011. *North American Terrestrial Ecoregions Level III.* Commission for Environmental Cooperation, Canada. http://www.cec.org/Atlas/Files/Terrestrial_Ecoregions_L1TerrestrialEcoregions_L1_GeoPDF.zip

Appendix A

Figures

TRC - GIS



LEGEND

- Wetland Study Area Point of Intersection
- U.S. Geological Survey 24K Quad

0 1,000 2,000 Feet

1 " = 2,000 '

1:24,000

N

PROJECT:

HARDIN SOLAR ENERGY, LLC
HARDIN SOLAR ENERGY CENTER PROJECT

TITLE:

USGS TOPOGRAPHIC MAP
PROJECT LOCATION MAP

DRAWN BY:	RWINTERRINGER	PROJ NO.:	282080.0000.0000
CHECKED BY:	JPITTS		
APPROVED BY:	MSPONSLER		**FIGURE 1. USGS TOPO**
DATE:	SEPTEMBER 2017		

TRC
921 Eastwind Drive, Suite 122
Westerville, OH 43081
Phone: 614.423.6334
www.trcsolutions.com

FILE NO.: Figure 1 Addendum 2.mxd

LEGEND

- Wetland Study Area Point of Interconnection
- National Hydrography Dataset (NHD) Streams
- Non-Hydric Soils With Hydric Inclusions
- Hydric Soils

Project Area Soils

- Blg1A1 - Blount silt loam, end moraine, 0 to 2 percent slopes
- Blg1B1 - Blount silt loam, ground moraine, 2 to 4 percent slopes
- Ln - Linwood muck
- Ot - Olentangy silt loam
- PkA - Pewamo silty clay loam, 0 to 1 percent slopes
- Ro - Roundhead muck

0 200 400 Feet

1 " = 250 '

1:3,000

N

PROJECT:
HARDIN SOLAR ENERGY, LLC
HARDIN SOLAR ENERGY CENTER PROJECT

TITLE:
ADDENDUM
USDA SOIL SURVEY MAP

DRAWN BY:	RWINTERRINGER	PROJ NO.:	282080.0000.0000
CHECKED BY:	JPITTS		
APPROVED BY:	MSPONSLER		
DATE:	SEPTEMBER 2017		

FIGURE 2. SOILS MAP

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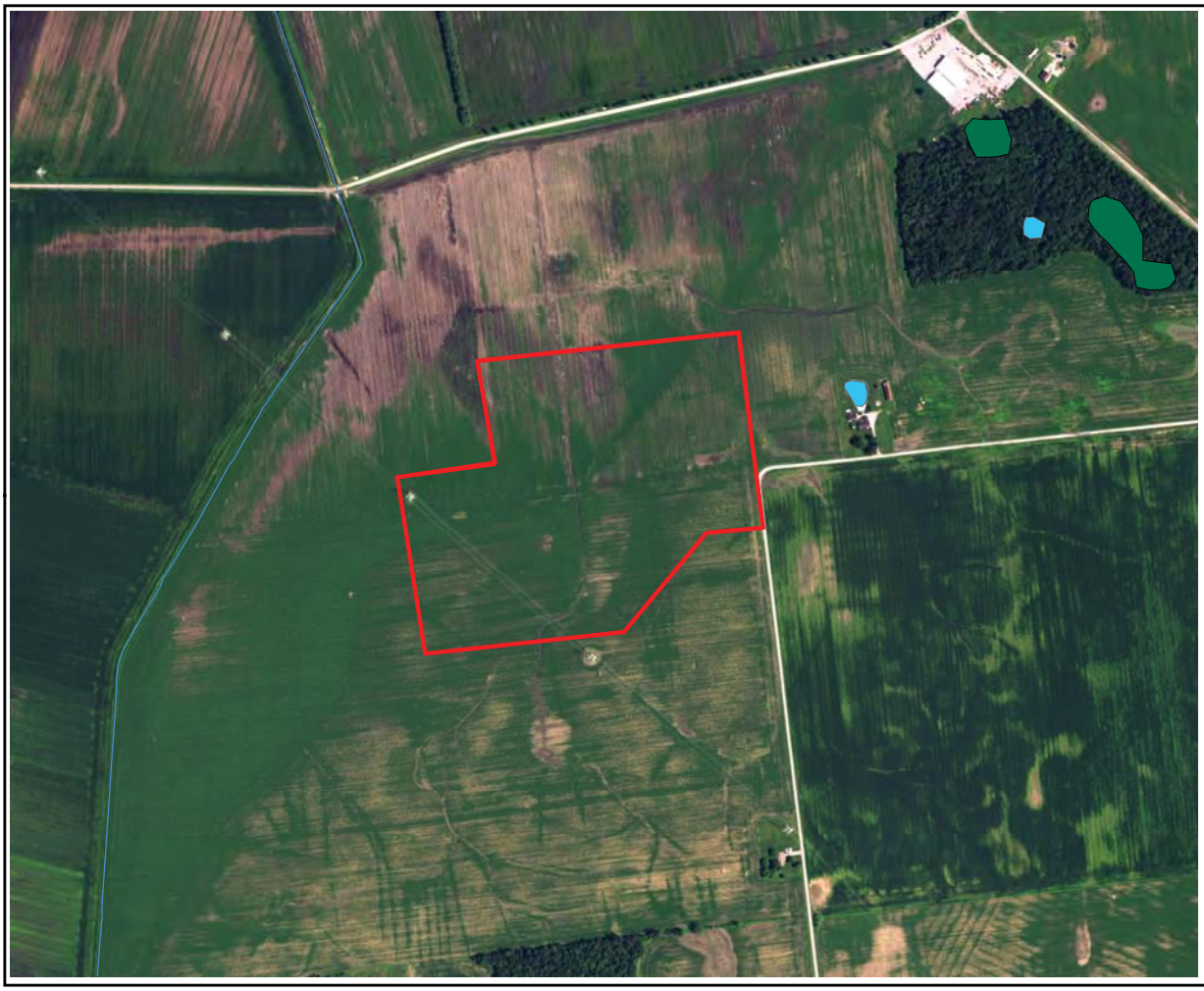
FILE NO.: Figure 2 Addendum 2.mxd

TRC - GIS



LEGEND

- Wetland Study Area Point of Interconnection

National Wetlands Inventory (NWI) Types

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Riverine

N

0 200 400 Feet

1 " = 500 '

1:6,000

PROJECT:

HARDIN SOLAR ENERGY, LLC
HARDIN SOLAR ENERGY CENTER PROJECT

TITLE:

ADDENDUM
NATIONAL WETLAND INVENTORY MAP

DRAWN BY:	RWINTERRINGER	PROJ NO.:	282080.0000.0000
CHECKED BY:	JPITTS		
APPROVED BY:	MSPONSLER		**FIGURE 3. NWI MAPPING**
DATE:	SEPTEMBER 2017		

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FILE NO.: Figure 3 Addendum 2.mxd

TRC - GIS

LEGEND

Wetland Study Area Point of Interconnection

National Hydrography Dataset (NHD) Streams

NOTES

1. **FEMA Amendment:** According to the FEMA website, there are no mapped flood layers for parcel 39025A. No current or historic data appears on a search with the FEMA Flood Map Service Center. https://msc.fema.gov

N

0 200 400 Feet

1 " = 250 '

1:3,000

PROJECT:

HARDIN SOLAR ENERGY, LLC
HARDIN SOLAR ENERGY CENTER PROJECT

TITLE:

ADDENDUM
FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD HAZARD MAP

DRAWN BY:	RWINTERRINGER	PROJ NO.:	282080.0000.0000
CHECKED BY:	JPITTS		
APPROVED BY:	MSPONSLER		**FIGURE 4. FEMA MAP**
DATE:	SEPTEMBER 2017		

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FILE NO.: Figure 4 Addendum 2.mxd

TRC - GIS

LEGEND

Wetland Study Area Point of Interconnection

Photo Points

N

0 200 400 Feet

1 " = 250 '

1:3,000

PROJECT:

HARDIN SOLAR ENERGY, LLC
HARDIN SOLAR ENERGY CENTER PROJECT

TITLE:

ADDENDUM PHOTO LOCATION MAP

DRAWN BY:	RWINTERRINGER	PROJ NO.:	282080.0000.0000
CHECKED BY:	JPITTS		
APPROVED BY:	MSPONSLER		**PHOTO MAP**
DATE:	SEPTEMBER 2017		

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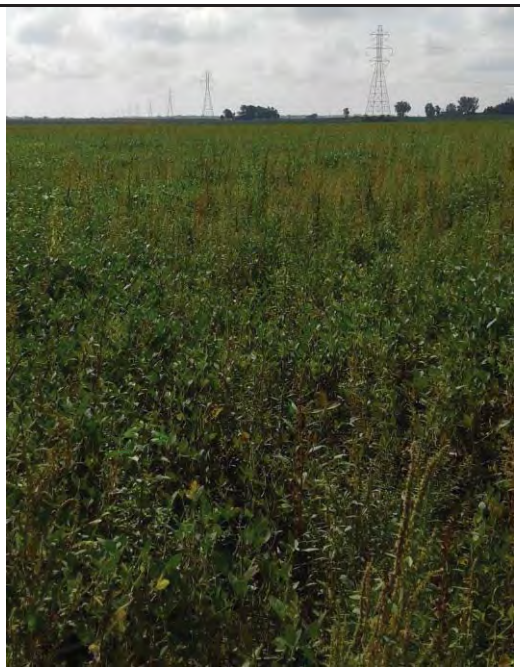
FILE NO.: Figure Photo Map Addendum 2.mxd

Appendix B

Photographic Log

Invenergy LLC	**State**: Ohio	**County:** Hardin
Project Name: Hardin Wind Energy Project		

Photo ID: Photo 1 **Date:** July 31, 2017 **Feature:** Upland/Agriculture Field **Comments:** Facing southwest; representative view of project study area.	
Photo ID: Photo 2 **Date:** July 31, 2017 **Feature:** Upland/Agricultural Field **Comments:** Facing south; representative view of project study area.	

Invenergy LLC	**State**: Ohio	**County:** Hardin
Project Name: Hardin Wind Energy Project		
Photo ID: Photo 3 **Date:** August 30, 2017 **Feature:** Upland/Agriculture Field **Comments:** Facing southwest; representative view of project study area.		
Photo ID: Photo 4 **Date:** August 30, 2017 **Feature:** Upland/Agricultural Field **Comments:** Facing east; representative view of project study area.		

Invenergy LLC	**State**: Ohio	**County:** Hardin
Project Name: Hardin Wind Energy Project		

Photo ID: Photo 5 **Date:** August 30, 2017 **Feature:** Upland/Agriculture Field **Comments:** Facing south; representative view of project study area.	
Photo ID: Photo 6 **Date:** August 30, 2017 **Feature:** Upland/Agricultural Field **Comments:** Facing east; representative view of project study area.	

Invenergy LLC	**State**: Ohio	**County:** Hardin
Project Name: Hardin Wind Energy Project		
Photo ID: Photo 7 **Date:** August 30, 2017 **Feature:** Upland/Agriculture Field **Comments:** Facing south-southeast; representative view of project study area.		

Appendix B USFWS & ODNR Coordination Letter

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
614-416-8993 / FAX 614-416-8994

February 3, 2009

Ms. Michelle Carder
WEST, Inc.
2003 Central Ave.
Cheyenne, WY 82001

TAILS# 31420-2009-TA-0333

Dear Ms. Carder:

This is in response to your October 20, 2008 letter, received by this office on November 17, 2008, requesting our review of a proposed wind energy project in Hardin County, Ohio. Representatives from WEST, Inc., the project developer, the U.S. Fish and Wildlife Service, and Ohio Department of Natural Resources participated in a meeting on September 3, 2008 to discuss the project proposal and wildlife survey recommendations. Additionally, a wildlife survey protocol for the project area was submitted by Rhett Good, WEST, Inc. via e-mail on November 24, 2008. The project area is predominantly rural and agricultural, however several woodlots greater than 10 hectares exist within the project boundaries. We agree that the wildlife surveys proposed in your November 24, 2008 protocol are appropriate for the project site, and are the same as what we discussed during our meeting.

The following comments are being provided pursuant to the Endangered Species Act (ESA), Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Fish and Wildlife Act of 1956. This information is being provided to assist you in making an informed decision regarding wildlife issues, site selection, project design, and compliance with applicable laws. The Service has been working closely with the Ohio Department of Natural Resources (ODNR) Division of Wildlife to develop recommended survey protocols and site evaluations that will satisfy both state and federal wildlife statutes, and this letter describes these measures, in part. We appreciate your early coordination with both ourselves and ODNR, and recommend continued collaboration on this project to ensure wildlife issues are fully and appropriately addressed.

The Fish and Wildlife Service (Service) supports the development of wind power as an alternative energy source, however, wind farms can have negative impacts on wildlife and their habitats if not sited and designed with potential wildlife and habitat impacts in mind. Selection of the best sites for turbine placement is enhanced by ruling out sites with known, high concentrations of birds and/or bats passing within the rotoswept area of the turbines or where the effects of habitat fragmentation will be detrimental. In support of wind power generation as a wildlife-friendly, renewable source of power, development sites with comparatively low bird, bat and other wildlife values, would be preferable and would have relatively lower impacts on wildlife.

WATER RESOURCE COMMENTS:

The Service recommends that impacts to streams and wetlands be avoided, and buffers surrounding these systems be preserved. Streams and wetlands provide valuable habitat for fish and wildlife resources, and the filtering capacity of wetlands helps to improve water quality. Naturally vegetated buffers surrounding these systems are also important in preserving their wildlife-habitat and water quality-enhancement properties. Furthermore, forested riparian systems (wooded areas adjacent to streams) provide important stopover habitat for birds migrating through the region. The proposed activities do not constitute a water-dependent activity, as described in the Section 404(b)(1) guidelines, 40 CFR 230.10. Therefore, practicable alternatives that do not impact aquatic sites are presumed to be available, unless clearly demonstrated otherwise. Therefore, before applying for a Section 404 permit, the client should closely evaluate all project alternatives that do not affect streams or wetlands, and if possible, select an alternative that avoids impacts to the aquatic resource. If water resources will be impacted, the Buffalo District of the Corps of Engineers should be contacted for possible need of a Section 404 permit.

ENDANGERED SPECIES COMMENTS:

Because of the potential for wind power projects to impact endangered bird, bat, or other listed species, they are subject to the Endangered Species Act (16 U.S.C. 1531-1544) section 9 provisions governing "take", similar to any other development project. Take incidental to a lawful activity may be authorized through the initiation of formal consultation, if a Federal agency, is involved; or if a Federal agency, Federal funding, or a Federal permit are not involved in the project, an incidental take permit pursuant to section 10(a)(1)(B) of the ESA may be obtained upon completion of a satisfactory habitat conservation plan for the listed species. However, there is no mechanism for authorizing incidental take "after-the-fact."

The proposed project lies within the range of the **Indiana bat** (*Myotis sodalis*), a Federally-listed endangered species. Since first listed as endangered in 1967, their population has declined by nearly 60%. Several factors have contributed to the decline of the Indiana bat, including the loss and degradation of suitable hibernacula, human disturbance during hibernation, pesticides, and the loss and degradation of forested habitat, particularly stands of large, mature trees. Fragmentation of forest habitat may also contribute to declines. During the winter Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

1. Dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas.

2. Live trees (such as shagbark hickory and oaks) which have exfoliating bark.

3. Stream corridors, riparian areas, and upland woodlots which provide forage sites.

The Service currently has no records for Indiana bats within Hardin County, however this is due to an absence of survey data for this area. Suitable summer habitat exists within the project area. Additionally, wind power developments within Pennsylvania, West Virginia, and other states are known to cause take of relatively large numbers of bats (no Indiana bats to date). Therefore further assessment of the bat community within the project area is warranted to determine if take of Indiana bats (or other bat species) is likely to occur.

Mist Net Surveys: Based on ODNR's On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio, five mist net sites are recommended for the project area. Your wildlife survey protocol describes proposed Indiana bat mist net survey protocols that

meet ODNR's recommendations, and exceed Service recommendations, therefore we agree that this protocol is acceptable to confirm the presence or likely absence of Indiana bats within the project area. We recommend that the highest quality Indiana bat habitat areas within the project area be selected for mist netting. Mature woodlots greater than 100 acres in size with permanent water sources should be the primary focus of mist net surveys. Service biologists would be happy to aid in identification and selection of suitable mist net sites, if necessary. Please note that Indiana bat surveys may only be conducted by individuals with a Federal permit (please see attached list). If an Indiana bat is captured, this office shall be notified within 24 hours, or by the next business day.

Radio Transmitters: Up to four Indiana bats should be fitted with radio transmitters and tracked to roost site(s) and foraging areas until daily activity patterns are fairly well established, or as long as the transmitter remains attached and activated. Preference shall be given to tracking female bats, though one male Indiana bat may be tracked if captured prior to capturing four female Indiana bats. Please see ODNR's recommended survey protocol for additional information on radiotracking non-Indiana bats.

Acoustic Surveys: Your survey protocol includes installation of AnaBat II detectors on the meterological tower within the project area, and recording of bat echolocation calls from March 15-November 15, 2009. We agree that this is appropriate and inline with ODNR's recommendations.

Coordination of Survey Results: Please submit survey results to this office for review. Survey results will be interpreted to determine areas with relatively low bat activity/diversity as opposed to areas with relatively high bat activity/diversity. Based on the survey results, we may make recommendations as to turbine placement and operation, additional consultation under Section 7 or 10 of the Endangered Species Act of 1973, as amended, or pre- or post-construction monitoring.

The project lies within the range of the **clubshell mussel** (*Pleurobema clava*) and **rayed bean mussel** (*Villosa fabalis*), federally-listed endangered and candidate species. Clubshell is known from the Scioto River watershed in areas with sand or gravel substrate and riffles and runs. The rayed bean is generally known from smaller, headwater creeks, but records exist in larger rivers such as Blanchard River, and suitable habitat is generally present in the Scioto River. Rayed bean are usually found in or near shoal or riffle areas, and in the shallow, wave-washed areas of lakes. Substrates typically include gravel and sand, and they are often associated with, and buried under the roots of, vegetation, including water willow (*Justicia americana*) and water milfoil (*Myriophyllum* sp.). Should the proposed project directly or indirectly impact the Scioto or Blanchard Rivers, further coordination with this office is warranted, and surveys to determine the presence or probable absence of mussels may be necessary.

The proposed project lies within the range of the copperbelly watersnake and eastern massasauga, Federally listed endangered and candidate species. Due to the project type, location, and onsite habitat, none of these species would be expected within the project area, and no impacts to these species are expected. Relative to these species, this precludes the need for further action on this project as required by the 1973 Endangered Species Act, as amended.

MIGRATORY BIRD COMMENTS:

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Bald and golden eagles are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Unlike the

Endangered Species Act, neither the MBTA nor its implementing regulations at 50 CFR Part 21, provide for permitting of "incidental take" of migratory birds. While bald eagles are known to occur in Hardin County, none are within 5 miles of the project area. Therefore, we do not anticipate any impact on this species.

The Service's Office of Law Enforcement serves its mission to protect Federal trust wildlife species, in part, by actively monitoring industries known to negatively impact wildlife, and assessing their compliance with Federal law. These industries include oil/gas productions sites, cyanide heap/leach mining operations, industrial waste water sites, and wind power sites. There is no threshold as to the number of birds incidentally killed by wind power sites, or other industry, past which the Service will seek to initiate enforcement action. However, the Service is less likely to prioritize enforcement action against a site operator that is cooperative in seeking and implementing measures to mitigate takes of protected wildlife.

The Service and ODNR Division of Wildlife have worked together to develop a recommended bird survey protocol for wind turbine projects. As noted above, your proposed wildlife survey protocols generally conform to ODNR's On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio. Bird survey results will be interpreted to determine if potential risk to birds is relatively high or low in various portions of the project area. Based on survey results we may make recommendations as to turbine placement and operation, or pre- or post-construction monitoring.

Research into the actual causes of bat and bird collisions with wind turbines is limited. To assist Service field staffs in review of wind farm proposals, as well as aid wind energy companies in developing best practices for siting and monitoring of wind farms, the Service published *Interim Guidelines to Avoid and Minimize Wildlife Impacts from Wind Turbines* (2003). We encourage any company/licensee proposing a new wind farm to consider the following excerpted suggestions from the guidelines in an effort to minimize impacts to migratory birds and bats.

1) Pre-development evaluations of potential wind farm sites to be conducted by a team of Federal and/or State agency wildlife professions with no vested interest in potential sites;

2) Rank potential sites by risk to wildlife;

3) Avoid placing turbines in documented locations of federally-listed species;

4) Avoid locating turbines in known bird flyways or migration pathways, or near areas of high bird concentrations (i.e., rookeries, leks, refuges, riparian corridors, etc.);

5) Avoid locating turbines near known bat hibernation, breeding, or maternity colonies, in migration corridors, or in flight paths between colonies and feeding areas;

6) Configure turbine arrays to avoid potential avian mortality where feasible. Implement storm water management practices that do not create attractions for birds, and maintain contiguous habitat for area-sensitive species;

7) Avoid fragmenting large, contiguous tracts of wildlife habitat;

8) Use tubular supports with pointed tops rather than lattice supports to minimize bird perching and nesting opportunities;

9) If taller turbines (top of rotorswept area is greater than 199 feet above ground level) require lights for aviation safety, the minimum amount of lighting specified by the Federal Aviation Administration (FAA) should be used. Unless otherwise requested by the FAA, only white strobe lights should be used at night, and should be of the minimum intensity and frequency of flashes allowable. Red lights should not be used, as they appear to attract night-migrating birds at a higher rate than white lights;

10) Adjust tower height to reduce risk of strikes in areas of high risk for wildlife.

The full text of the guidelines is available at http://www.fws.gov/habitatconservation/wind.pdf. The Service believes that implementing these guidelines may help reduce mortality caused by wind turbines. We encourage you to consider these guidelines in the planning and design of the project. We particularly encourage placement of turbines away from any large wetland, stream corridor, or wooded areas, including the areas mentioned previously, and avoid placing turbines between nearby habitat blocks.

Thank you for the opportunity to provide comments on this proposed project. Please contact biologist Megan Seymour at extension 16 in this office if we can be of further assistance.

Sincerely,

Mary Knapp

Mary Knapp, Ph.D.
Supervisor

Cc: Mr. Keith Lott, ODNR, Old Woman Creek, 2514 Cleveland Road East, Huron, OH 44839
Mr. Brian Mitch, ODNR, REALM, Columbus, OH

Attachments: Indiana bat surveyor list

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994
January 7, 2009

USFWS permittees for Indiana bat surveys in Ohio*

Alliance Consulting Inc. T. Sydney Burke 124 Philpott Lane Beaver, WV 25813 (304) 255-0491 ext. 343 / FAX (304) 255-4232 sburke@aci-wv.com	**Appalachian Technical Services** P.O. Box 3537 6741 Indian Creek Road Wise, VA 24293 (276) 328-4200 / FAX (276) 328-4900 wise@atsone.com
BHE Environmental Russ Romme 11733 Chesterdale Road Cincinnati, OH 45246 (513) 326-1500 / FAX (513) 326-1550 RRomme@BHEEnvironmental.com	**Eric Britzke** 815 Dillard Street Forrest City, AR 72335 (870) 261-3666 ebritzke@hotmail.com
Timothy Carter Ball State University Department of Biology, CL 121 Muncie, IN 47306-0440 (765) 285-8842 / FAX (765) 285-8804 tccarter@bsu.edu	**Civil & Environmental Consultants** 3600 Park 42 Drive, Suite 130B Cincinnati, OH 45241-2072 (513) 985-0226 / (800) 759-5614 Neil Bossart – Pittsburgh Office 333 Baldwin Road Pittsburgh, PA 15205-9702 (412) 429-2324 / (800) 365-2324 FAX (412) 429-2114 nbossart@cecinc.com
Copperhead Environmental Consulting, Inc. P.O. Box 73 11641 Richmond Road Paint Lick, KY 40461 (859) 925-9012 mwgumbert@copperheadconsulting.com	
Davey Resource Group Michelle Malcosky 1500 N. Mantua St., P.O. Box 5193 Kent, OH 44240-5193 (800) 828-8312 / FAX (330) 673-0860 Jessica Hickey, ext.27 Ken Christensen, ext. 34 mmalcosky@davey.com	**Kathleen Dunlap** Professional Service Industries, Inc. 4960 Vulcan Ave. Columbus, OH 43228 (614) 876-8000 (office) / (614) 638-5941 (mobile) FAX (614) 876-0548 kathleen.dunlap@psiusa.com
Eco-Tech, Inc. Peter Lee Droppelman Eco-Tech, Inc. 1003 E. Main St. Frankfort, KY 40601 (502) 695-8060 / FAX (510) 695-8061 ldroppelman@ecotechinc.com	**Ecological Specialties LLC** William D. Hendricks 1785 Symsonia Highway Symsonia, KY 42082 (270) 832-1883 / FAX (270) 851-4363 myotis@hughes.net

Brianne Lorraine Walters Dept. of Ecology and Organisimal Biology Indiana State University Terre Haute, IN 47809 (812) 237-8294 / FAX (812) 237-2526 bwalters2@isugw.indstate.edu	**Western Ecosystems Technology, Inc.** 2003 Central Avenue Cheyenne, WY 82001 (307) 634-1756 / FAX (307) 637-6981 admin@west-inc.com
John O. Whitaker, Jr. Department of Life Sciences Indiana State University Terre Haute, IN 47809 (812) 237-2383 / FAX (812) 237-2526 jwhitaker3@isugw.indstate.edu	

*This list reflects permit data available as of January 7, 2009, and is subject to periodic revision to reflect permit changes

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ecological Services
4625 Morse Road, Suite 104
Columbus, Ohio 43230
(614) 416-8993 / FAX (614) 416-8994

March 4, 2010

TAILS # 31420-2010-TA-0344

Mr. Rhett Good
Western Ecosystems Technology, Inc.
2003 Central Ave.
Cheyenne, WY, 82001

Re: Hardin Wind Farm, 09-479-EL-BGN

Dear Mr. Good:

This is in reference to the proposed Hardin County Wind project, to be located in multiple townships in southeastern Hardin County, Ohio. The Service previously reviewed the Ohio Power Siting Board Application for informational completeness and provided response letters dated August 14 and September 30, 2009. This application was submitted by Hardin Wind Energy LLC, and seeks issuance of a Certificate of Environmental Compatibility and Public Need. The proposed Hardin Wind Farm (HWF) involves the construction of approximately 120-200 turbines with either 1.5 MW or 2.5 MW electrical output per unit with associated access roads, electrical infrastructure, construction staging areas, and an operations and maintenance facility. The proposed project area includes approximately 35,864 acres in Hardin County with the dominant cover type consisting of agricultural land. Streams and wetlands do exist within the project area and we understand efforts are being made to avoid and minimize impacts to aquatic resources wherever possible.

The U. S. Fish and Wildlife Service received your December 16, 2009 report on the biological studies conducted for the pre-construction wildlife monitoring surveys. This letter serves as a response to that report.

The Service, Invenergy, their representatives, and the Ohio Department of Natural Resources (ODNR) have been involved in site planning and review of the proposal over the past year or so. We attended a meeting in September 2008, and submitted a letter to WEST Inc. on February 3, 2009 regarding proposed wildlife survey protocols for this project. We have participated in meetings on August 4, September 10, and October 22, 2009, in addition to conference calls regarding the proposed project. We agree that the bird and bat surveys implemented by Hardin Wind Energy LLC were sufficient to document wildlife use of the project area, and all agreed-upon surveys have been completed as requested by ODNR and the Service. We appreciate that Invenergy has worked collaboratively with the Service to address potential wildlife, habitat, and natural resource issues in advance of applying to the Ohio Power Siting Board for this proposed project.

ENDANGERED SPECIES COMMENTS:
No federally listed species were observed during any of the wildlife surveys at the HWF however, a male Indiana bat was recently captured within 5 miles of the southeast edge of the HWF project boundary.

The project lies within the range of the Indiana bat, a federally listed endangered species. During winter,

Indiana bats hibernate in caves and abandoned mines. Summer habitat requirements for the species are not well defined but the following are considered important:

(1) dead or live trees and snags with peeling or exfoliating bark, split tree trunk and/or branches, or cavities, which may be used as maternity roost areas;
(2) live trees (such as shagbark hickory and oaks) which have exfoliating bark;
(3) stream corridors, riparian areas, and upland woodlots which provide forage sites.

The project area consists of approximately 88.2% agricultural land, 3.0% deciduous forest, 2.9% pasture/hay, with the remaining area comprised of small amounts of grasslands, emergent wetlands and open water. The project area may potentially provide some limited suitable roosting and foraging habitat for the Indiana bat.

Acoustic bat surveys were conducted March 18-November 15, 2009 and total of 2,939 bat passes were recorded with an average of 3.00 bat passes per detector night. We understand that 84.3% of the passes consisted of low frequency bats, suggesting a high relative abundance of big brown, silver-haired, and hoary bats. According to your information, only hoary and eastern red bats were identified to species for the survey, with hoary bats making up 26.0% of the total passes and eastern red bats making up 5.3% of the total passes. Mist net surveys were conducted June 15-June 25, 2009 for a total of 72 net-nights. We understand a total of only 27 bats were captured consisting of 5 species. No Indiana bats were captured. The sites that captured the highest number of bats are located in the north/north-eastern section of the project area where habitat consists of forested parcels with associated streams.

It was agreed upon in our last meeting that the proposed project would be split into two phases –Phase I would include the northwest portion of the project area and Phase II would include the southeast portion of the project area. We request that Hardin Wind Energy LLC provide a copy of a map delineating the exact boundary of the various phases to the Service. The phased approached has been suggested because constraints relative to the federally endangered Indiana bat (*Myotis sodalis*) recently captured within 5 miles of the southeast edge of the HWF, and the consultation process to address Indiana bat may delay permitting of the project as a whole.

Phase I of the project area contains some limited suitable Indiana bat habitat and it is outside the 5 mile buffer of any documented captures of Indiana bats. Based on the limited amount of suitable Indiana bat summer maternity habitat within the proposed Phase 1 project area, the Service does not believe that mortality of Indiana bats during summer is likely to occur for Phase 1 of the project. However, an Indiana bat mortality was recently detected at a wind power facility in Indiana. The mortality occurred during the fall migration period, and the project area where the mortality occurred was composed of agricultural fields and did not support suitable Indiana bat summer habitat (forests). This indicates that take of Indiana bats from wind turbines during the fall and possibly during the spring migration seasons could occur at any wind power facility within the range of the Indiana bat. At this time the Service is developing Indiana bat range-wide recommendations to address potential take of Indiana bats for wind power facilities without suitable summer habitat, but for which take may occur during the migration periods. The Service will provide all wind power developers in Ohio these recommendations when they become available. In the meantime, developers may want to consider the following two options to ensure violations of the Endangered Species Act (ESA) Section 9 take prohibition do not occur:

1) Feather turbines during low wind speed conditions at night during the fall and spring migratory seasons as a way to proactively and definitively avoid take of Indiana bats (and other species of bats as well). Based on the Indiana bat Draft Recovery Plan First Revision

(Service, 2007), fall migration generally occurs between August 1 and October 15, and spring migration generally occurs between April 1 and May 15.

2) Alternatively, work with the Service to develop a valid research program for your facility during the migration seasons. Then apply for an ESA Section 10(a) (1)(A) Enhancement of Survival permit that would allow for legal possession of Indiana bat fatalities during the research program. The details of such a research program may vary according to sites, but in general would include operating the turbines under various regimes and conducting intense fatality searches for each participating turbine to gain better knowledge of when Indiana bats were most susceptible to fatalities during the migration periods. Data from this research will be used by the Service to determine the level of take that occurs during migration periods, potentially to suggest more appropriate avoidance and minimization measures, and timing of such measures relative to migration periods. Either of these two options would allow wind facilities to operate without risk of violating the Endangered Species Act.

A third alternative is for a wind facility to work with the Service to apply for an Incidental Take Permit by submitting a Habitat Conservation Plan (HCP), as required under Section 10 of the Endangered Species Act. An HCP can be used to address Indiana bat presence during both summer foraging and migration periods. An HCP does typically require some time and survey effort to complete.

We understand that phase II of the project will include the southeast portion of the project, including the portion of the project within the 5 mile buffer of an Indiana bat capture. Phase II of the project does contain some suitable roosting and foraging habitat for the Indiana bat and given the positive record of an Indiana bat within 5 miles of the project area, the Service believes there is a potential risk for take to occur. For phase II of the project, the Service recommends formal consultation through Section 7 of the ESA or development of an HCP to apply for an incidental take permit under section 10 of the ESA.

MIGRATORY BIRD COMMENTS:
No federally listed species were observed during any of the wildlife surveys at the HWF. According to the biological studies report, a total of 20 state listed or sensitive bird species were observed during all the surveys, with the northern harrier and bobolink being the most common observed state listed species at the proposed HWF. To minimize impacts to the northern harrier and bobolink, the Service recommends avoiding placing turbines in suitable habitat for these species which includes grasslands, meadows, wetlands, pasture, hayfields, and prairie habitat.

We understand that passerine migration surveys were conducted September 15-November 15, 2008 and August 15-September 14, 2009 with 3 point counts per week that detected 49 species. Breeding bird surveys were conducted May 8-June 26, 2009 at 22 points that detected 77 species. Diurnal bird/raptor migration surveys were conducted September 3-October 31, 2008 and March 16-May 1, 2009 with 4 point counts and 3 surveys and week that detected 64 species. Sandhill crane migration surveys were conducted 3 days per week from November 8-December 13, 2008 with a group of 3 cranes observed during migration. Raptor nest surveys were conducted in March 2009 and 1 active red-tailed hawk nest and 2 unknown inactive nests were located. Overall, the pre-construction bird surveys conducted for the proposed project did not detect a high diversity of species which could be expected in the surrounding largely agricultural habitat.

The Migratory Bird Treaty Act (16 U.S.C. 703-712; MBTA) implements four treaties that provide for international protection of migratory birds. The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Bald and golden eagles are afforded additional legal protection under the Bald and Golden Eagle Protection Act (16 U.S.C. 668-668d). Unlike the

Endangered Species Act, neither the MBTA nor its implementing regulations at 50 CFR Part 21, provide for permitting of "incidental take" of migratory birds. While bald eagles are known to occur in Hardin County, none are within 5 miles of the project area and only 1 bald eagle was observed during the raptor migration surveys. Given that no bald eagles are located within close proximity to the project area and there is a general lack of suitable nesting and foraging habitat for this species, the Service believes that it is unlikely this species would be impacted by the proposed project. In addition, based on the proposed location of this project, the general lack of suitable habitat for migratory birds, the disturbed nature of the project area, and the results of the bird surveys conducted by the applicant, the Service does not believe this site poses a substantial threat to migratory birds or their habitat, though a limited amount of mortality to migratory birds should be expected to occur.

AVOIDANCE AND MINIMIZATION MEASURES:

1. The Indiana bat risk assessment for the HWF states that as a mitigation measure for the Indiana bat "No trees will be cleared between October 15-April 1 during the construction or operation of the proposed project." The Service strongly recommends any clearing of forested habitat within Phase I of the proposed project area be conducted during the winter timeframe of September 30-April 1 to protect bats and migratory birds that may be using that habitat. This clearing for Phase I should also not occur until all required permits (ex, Section 404 permit from Corps of Engineers, Certificate of Environmental Compatibility and Need from OPSB) are obtained. This avoidance and minimization measure (A&MM) only applies to Phase I at this time, although it is likely that Phase II would have similar recommendations. However, A&MM for Phase II will be determined during the formal consultation process. No tree clearing should occur on Phase II of the project until that time.
2. The Service notes that in the Indiana bat risk assessment, Invenergy proposes to "place wind turbines a minimum distance of 100 meters from forest edges, wetlands, or perennial streams where the 5 mile buffer of the Indiana bat intersects with the project area". At this time, the Service wishes to address recommendations and A&MM for Phase II of the project during the Section 7 consultation process or Section 10 permit process.
3. Turbines and meteorological towers should have the fewest number of lights permitted by the Federal Aviation Administration (FAA). Preferably these will be lights with the minimum intensity, and number of flashes per minute (longest strobe) allowable by the FAA. Lights around substations or auxiliary structures should be down-shielded, equipped with motion sensors, or turned off when not in use. This will help to minimize potential impacts to migratory birds, which can become disoriented by steady burning lights, especially during fog or low cloud ceilings.
4. The Service recommends that transmission lines and collection lines be buried wherever possible to avoid or minimize electrocution hazards to birds. The recommendations of the Avian Power Line Interaction Committee should be used for any above-ground lines, transformers, or conductors.
5. We understand that a post construction monitoring plan has not yet been developed according to page 23 of this report. The Service recommends the project be monitored post-construction to determine impacts to migratory birds and bats and an adaptive management plan should be implemented to address responses and outcomes. A specific post-construction monitoring plan should be based upon ODNR's On-Shore Bird and Bat Pre- and Post-Construction Monitoring Protocol for Commercial Wind Energy Facilities in Ohio and should be reviewed by the Service and ODNR. We also recommend that the post-construction mortality studies be conducted by an independent third party contractor with expertise in bird/bat mortality monitoring. A collection permit from the Service's Division of Migratory Birds will be necessary to complete post-construction monitoring. Application materials are by contacting: permitsR3MB@fws.gov. Results of mortality surveys and other forms of monitoring should be used to adjust operations to reduce mortality if necessary and feasible, as well as improve design and sitting of future wind

generation facilities. The Developer or its contractor should provide to this office each year, no later than December 31, copies of annual bird/bat mortality monitoring reports. Implementation of the post-construction monitoring protocol should be made a condition of any issued certificate.

The Service requests clarification on whether an Individual permit or a Nationwide Permit will be required from the U.S. Army Corps of Engineers to address culverts for road crossings of streams, and if it has been determined that a isolated wetland permit is required from the Ohio EPA. If 404/401 permits are determined necessary for the proposed project, the Service would like to be included in any discussions on how the Section 7 consultation process will be addressed for the proposed project.

We appreciate your conscientious efforts to protect the Indiana bat and other natural resources within the Hardin County Wind Farm project area. If you have questions, or if we may be of further assistance in this matter, please contact Megan Seymour at extension 16 or Melanie Cota at extension 15 in this office.

Sincerely,

Angela J Boyer

Mary Knapp, Ph.D.
Field Supervisor

cc: Keith Lott, ODNR, 2514 Cleveland Road East, Huron, OH 44839
Stuart Siegfried, PUCO, 180 E. Broad St., Columbus, OH 43215
Susan Fields, USACE, Energy Resource Section, Huntington, WV 25701
Steve Metivier, Buffalo District, Corps of Engineers, Buffalo, NY

Appendix C Cultural Report

Phase I Cultural Resource Management Investigations for American Electric Power's East Lima-Marysville 345kV T-Line Extension Project in McDonald Township, Hardin County, Ohio

Ryan J. Weller

February 28, 2018

1395 West Fifth Ave.
Columbus, OH 43212
Phone: 614.485.9435
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Website: www.wellercrm.com

Phase I Cultural Resource Management Investigations for American Electric Power's East Lima-Marysville 345kV T-Line Extension Project in McDonald Township, Hardin County, Ohio

By

Ryan Weller

Submitted By:

Ryan Weller, P.I
Weller & Associates, Inc.
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Columbus, OH 43212
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Prepared For:

American Electric Power
700 Morrison Road
Gahanna, OH 43230

Ryan Weller, P.I.

February 28, 2018

W-2392

Abstract

In February 2018, Weller & Associates, Inc. conducted Phase I Cultural Resource Management Investigations for American Electric Power's East Lima-Marysville 345kV T-Line Extension Project in McDonald Township, Hardin County, Ohio. The work was conducted under contract with American Electric Power (AEP) for submittal to the Ohio Power Siting Board. These investigations were conducted for discontinuous access corridors and planned structures locations within an existing electric line corridor easement. The majority of this project corridor is located in a rural, lowly populated, upland landscape. The field investigations involved visual inspection, surface collection, and subsurface testing. The fieldwork did not result in the identification of any cultural materials; there are no significant cultural resources identified in the study area.

The work was conducted in flat upland area that is considered as the Scioto Marsh. This is an expansive former glacial lake area that is at the headwaters of the Scioto River. This is an area that is contained poorly drained conditions, had it not been for tiling, and includes dark, organic soils. The project area is small and pertains to T-lines of an existing 345kV electric line to extend into a proposed switch station. This area is to the west of Dodds Road and east of the channeled Scioto River and SR 195.

A literature review conducted prior to the field investigations determined that there were two archaeological sites identified in the study area, 33HR0205 and 225. Site 33HR0225 is an isolated find spot. Site 33HR0205 is a multi-component site in which the prehistoric period component was considered for additional work. This site is to the southeast of the project area. The project area has not been the subject of any actual previous investigations but does appear to have been within an area that was investigated as part of a wind turbine farm.

There were no archaeological sites identified during these investigations and there are no buildings/structures older than 50 years within the study area. The project is not considered to involve any significant cultural resources or landmarks. No further work is deemed necessary for this project.

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Introduction

In February 2018, Weller & Associates, Inc. conducted Phase I Cultural Resource Management Investigations for American Electric Power's East Lima-Marysville 345kV T-Line Extension Project in McDonald Township, Hardin County, Ohio (Figures 1-3). The work was conducted under contract with American Electric Power (AEP) pursuant to documentary requirements for the Ohio Power Siting Board (OPSB). These investigations were conducted in a manner subject to the survey and report format established in *Archaeology Guidelines* (Ohio Historic Preservation Office 1994). The work efforts were designed to evaluate pertinent cultural resources for the National Register of Historic Places (NRHP) pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 [36 CFR 800]). This report summarizes the results of the fieldwork and literature review. The work includes a literature review/background documentation, archaeological field investigations, and visual inspection of the Area of Potential Effects (APE).

Chad Porter completed the literature review on February 22, 2018. The field investigations for this project were conducted on February 23, 2018. The field crew included Josh Engle, Chris Goodrich, and Justin Fryer. Ryan Weller served as the Principal Investigator and Senior Project Manager. Jackie Lehmann conducted the investigations for the history/architecture component of this project.

Project Description

The project is for an extension of an existing 345kV T-line to the proposed Hardin Switch. The project area is located in an upland, till plain area that is near the Scioto Marsh. The project involves a small area that appears to be mostly contained in agricultural land that is not near any buildings. These investigations will require a cultural resource survey (archaeology & architecture) for submission to the lead involved state agency, the Ohio Power Siting Board. Since this is a small project, a single document will be prepared to include both archaeology and architecture.

Environmental Setting

Climate

Hardin County, like all of Ohio, has a continental climate with hot and humid summers and cold winters. Most of precipitation falls in June, and the smallest amount falls in February. The average annual temperature in Allen County is 11°C. Precipitation is favorably distributed for the production of crops (United States Department of Agriculture, Soil Conservation Service [USDA, SCS] 2018).

Physiography, Relief, and Drainage

All of Hardin County is located in the Till Plain region (Brockman 1998). There are end moraine deposits that extend in a general east-west manner through Allen and Hardin Counties. Hardin County also has large areas that are considered as lacustrine

deposits from former lakes (Pavey et al. 1999); which is the case for this project. The project area is located within what has been coined the 'Scioto Marsh', which is essentially at the headwaters of the Scioto River. The project area contains flat and poorly drained conditions as it is located within a basin. The area is drained by the Scioto River, which is ditched/channelized through this area.

Geology

The underlying bedrock near the Allen-Hardin County line is comprised of Silurian age materials (Brockman 1998). The Silurian System consists of sedimentary rocks, mainly of dolomite, anhydrite, gypsum, salt, and shale.

Soils

The project area is located in in the west-central part of Hardin County. This is located within the Blount-Pewamo soil association. There are three soil series types included in this part, Pewamo, Olentangy, and Blount. The former two are indicative of low, depressed conditions. Blount soils are reflective of slight rises (USDA, SCS 2018).

Table 1. Soils in the Project.

Soil Symbol	Soil Name	% Slope	Location
BlG1A1	Blount silt loam	0-2	Slight rises on till plains
Ot	Olentangy silt loam	0	Depressions
PkA	Pewamo silty clay loam	0-2	Depressions in till plains

Flora

There was, and continues to be, great floral diversity in Ohio. This diversity is relative to the soils and the terrain that generally includes the till plain, lake plain, terminal glacial margins, and unglaciated plateau (Forsyth 1970). Three major glacial advances, including the Kansan, Illinoisan, and Wisconsinan, have affected the landscape of Ohio. The effects of the Wisconsin glaciation are most pronounced and have affected more than half of the state (Pavey et al. 1999). The following is to provide comparison of the different floral regions of Ohio relative to this project.

The least diverse part of Ohio extends in a belt from the northeast below the lake-affected areas through most of western Ohio (Gordon 1966). These areas are part of the late Wisconsin ground moraine and lateral end moraines. It is positioned between the lake plains region and the terminal glacial moraines. This area included broad forested areas of beech maple forests interspersed with mixed oak forests in elevated terrain or where relief is greater (Forsyth 1970; Gordon 1966). Prairie environments such as those in Wyandot and Marion County areas would contain islands of forests, but were mostly expansive open terrain dominated by grasses.

The northwestern Ohio terrain is nearly flat because of ancient glacial lakes and glaciation, which affected the flora. However, the vegetation was more diverse than the till plain to the south and east because of the variety of factors that contributed to its

terrain. Forests within the Black Swamp were generally comprised of elm/ash stands; however, dissected areas along drainages and drier, elevated areas from beach deposits would contain mixed forests of oak and hickory (Gordon 1966, 1969). There was little upland floral diversity in the lake plains (Black Swamp region) except for the occasional patches of oak and hickory. Floral variety was most evident in narrow sleeves along larger stream valleys where there is relief.

The most biological diversity in Ohio is contained within the Allegheny Plateau, which encompasses the southeastern two-thirds of the state (Sheaffer and Rose 1998). Because this area is higher and has drier conditions, it is dominated by mixed oak forests. Some locations within the central part of this area contain beech and mixed mesophytic forests. There are large patches of oak and sugar maple forests to the south of the terminal moraine from Richland to Mahoning County (Gordon 1966).

Southwestern Ohio from about Cincinnati to Bellefontaine east to the Scioto River historically contained a very diverse floral landscape. This is an area where moraines from three glacial episodes are prevalent (Pavey et al. 1999). Forests in this area include elm-ash swamp, beech, oak-sugar maple, mixed mesophytic, prairie grasslands, mixed oak, and bottomland hardwoods (Core 1966; Gordon 1966, 1969). These forests types are intermingled with prairies being limited to the northern limits of this area mostly in Clark and Madison Counties.

Generally, beech forests are the most common variety through Ohio and could be found in all regions. Oak and hickory forests dominated the southeastern Ohio terrain and were found with patchy frequency across most of northern Ohio. Areas that were formerly open prairies and grasslands are in glacial areas, but are still patchy. These are in the west central part of the state. Oak and sugar maple forests occur predominantly along the glacial terminal moraine. Elm-ash swamp forests are prevalent in glaciated areas including the northern and western parts of Ohio (Gordon 1966; Pavey et al. 1999).

Western Hardin County, including the project area, is generally within what is considered to be a beech and elm-ash swamp forest area (Gordon 1966).

Fauna

The upland forest zone offered a diversity of mammals to the prehistoric diet. This food source consisted of white-tailed deer, black bear, Eastern cottontail rabbit, opossum, a variety of squirrels, as well as other less economically important mammals. Several avian species were a part of the upland prehistoric diet as well (i.e. wild turkey, quail, ruffed grouse, passenger pigeon, etc.). The lowland zone offered significant species as well. Raccoon, beaver, and muskrat were a few of the mammals, while wood duck and wild goose were the economically important birds. Fishes and shellfish were also an integral part of the prehistoric diet. Ohio muskellunge, yellow perch, white crappie, long nose gar, channel catfish, pike, and sturgeon were several of the fish, whereas, the Ohio naiad mollusc, butterfly's shell, long solid, common bullhead, knob rockshell, and cod shell were the major varieties of shellfish. Reptiles and amphibians,

such as several varieties of snakes, frogs, and turtles, were also part of the prehistoric diet (Trautman 1981; Lafferty 1979; Mahr 1949).

Cultural Setting

The first inhabitants of Ohio were probably unable to enter this land until the ice sheets of the Wisconsin glacier melted around 14,000 B.C. Paleoindian sites are considered rare due to the age of the sites and the effects of land altering activities such as erosion. Such sites were mostly used temporarily and thus lack the accumulation of human occupational deposits that would have been created by frequent visitation. Paleoindian artifact assemblages are characteristic of transient hunter-gatherer foraging activity and subsistence patterns. In Ohio, major Paleoindian sites have been documented along large river systems and near flint outcrops in the Unglaciated Plateau (Cunningham 1973). Otherwise, Paleoindian sites in the glaciated portions of Ohio are encountered infrequently and are usually represented by isolated finds or open air scatters.

The Paleoindian period is characterized by tool kits and gear utilized in hunting Late Pleistocene megafauna and other herding animals including but not limited to short-faced bear, barren ground caribou, flat-headed peccary, bison, mastodon, giant beaver (Bamforth 1988; Brose 1994; McDonald 1994). Groups have been depicted as being mobile and nomadic (Tankersley 1989); artifacts include projectile points, multi-purpose unifacial tools, burins, gravers, and spokeshaves (Tankersley 1994). The most diagnostic artifacts associated with this period are fluted points that exhibit a groove or channel positioned at the base to facilitate hafting. The projectiles dating from the late Paleoindian period generally lack this trait; however, the lance form of the blade is retained and is often distinctive from the following Early Archaic period (Justice 1987).

The Archaic period has been broken down into three sub-categories, including the Early, Middle, and Late Archaic. During the Early Archaic period (ca. 10,000-8000 B.P.), the environment was becoming increasingly arid as indicated by the canopy (Shane 1987). This period of dryness allowed for the exploitation of areas that were previously inaccessible or undesirable. The Early Archaic period does not diverge greatly from the Paleoindian regarding the type of settlement. Societies still appear to be largely mobile with reliance on herding animals (Fitting 1963). For these reasons, Early Archaic artifacts can be encountered in nearly all settings throughout Ohio. Tool diversity increased at this time including hafted knives that are often re-sharpened by the process of beveling the utilized blade edge and intense basal grinding (Justice 1987). There is a basic transition from lance-shaped points to those with blades that are triangular. Notching becomes a common hafting trait. Another characteristic trait occurring almost exclusively in the Early and Middle Archaic periods is basal bifurcation and large blade serrations. Tool forms begin to vary more and may be a reflection of differential resource exploitation. Finished tools from this period can include bifacial knives, points, drills/perforators, utilized flakes, and scrapers.

The Middle Archaic period (8000-6000 B.P.) is poorly known or understood in archaeological contexts within Ohio. Some (e.g., Justice 1987) regard small bifurcate points as being indicative of this period. Ground stone artifacts become more prevalent

at this time. Other hafted bifaces exhibit large side notches with squared bases, but this same trait can extend back to the Paleoindian period. The climate at this time is much like that of the modern era. Middle Archaic period subsistence tended to be associated with small patch foraging that involved a consistent need for mobility with a shift towards stream valleys (Stafford 1994). Sites encountered from this time period throughout most of Ohio tend to be lithic scatters or isolated finds. The initial appearance of regional traits may be apparent at this time.

The Late Archaic period in Ohio (ca 6000-3000 B.P.) diverges from the previous periods in many ways. Preferred locations within a regional setting appear to have been repeatedly occupied. The more intensive and repeated occupations often resulted in the creation of greater social and material culture complexity. The environment at this time is warmer and drier. Most elevated landforms in northeastern Ohio have yielded Archaic artifacts (Prufer and Long 1986: 7), and the same can be stated for the remainder of Ohio.

Various artifacts are diagnostic of the Late Archaic period. Often, burial goods provide evidence that there was some long-distance movement of materials, while lithic materials used in utilitarian assemblages are often from a local chert outcrop. There is increased variation in projectile point styles that may reflect regionalism. Slate was often used in the production of ornamental artifacts. Ground and polished stone artifacts reached a high level of development. This is evident in such artifacts as grooved axes, celts, bannerstones, and other slate artifacts.

It is during the Terminal Archaic period (ca 3500-2500 B.P.) that extensive and deep burials are encountered. Cultural regionalism within Ohio is evident in the presence of Crab Orchard (southwest), Glacial Kame (northern), and Meadowood (central to Northeastern). Along the Ohio River, intensive occupations have been placed within the Riverton phase. Pottery makes its first appearance during the Terminal Late Archaic.

The Early Woodland period (ca 3000-2100 B.P.) in Ohio is often associated with the Adena culture and the early mound builders (Dragoo 1976). Early and comparably simple geometric earthworks first appear with mounds more spread across the landscape. Pottery at this time is thick and tempered with grit, grog, or limestone; however, it becomes noticeably thinner towards the end of the period. There is increased emphasis on gathered plant resources, including maygrass, chenopodium, sunflower, and squash. Habitation sites have been documented that include structural evidence. Houses that were constructed during this period were circular, having a diameter of up to 18.3 m (Webb and Baby 1963) and often with paired posts (Cramer 1989). Artifacts dating from this period include leaf-shaped blades with parallel to lobate hafting elements, drilled slate pieces, ground stone, thick pottery, and increased use of copper. Early Woodland artifacts can be recovered from every region of Ohio.

In northwest and north-central Ohio, there are not very many mounds or village sites that indicate an Early Woodland occupation. Artifacts from these areas often are reflective of seasonal hunting excursions. Adena-like bifaces and tools are commonly found in river and stream valleys that drain into Lake Erie as well as in the uplands. It is

assumed that Early Woodland inhabitants used these areas for little more than a transient hunting-collecting subsistence. One of the best-known Early Woodland sites is the Leimbach site. This site is located where the Huron River empties into Lake Erie (Shane 1975). Early Woodland ceramics and lugged vessels have been recovered from this site. Evidence of Early Woodland activity, such as ceramics, has been encountered infrequently at locations across north-central and northwestern Ohio.

The Middle Woodland period (ca 2200-1600 B.P.) is often considered to be equivalent with the Hopewell culture. The largest earthworks in Ohio date from this period. There is dramatic increase in the appearance of exotic materials that appear most often in association with earthworks and burials. Artifacts representative of this period include thinner, grit-tempered pottery, dart-sized projectile points (Lowe Flared, Steuben, Snyders, and Chesser) [Justice 1987], exotic materials (mica, obsidian, and marine shell, etc.). The points are often thin, bifacially beveled, and have flat cross sections. There seems to have been a marked increase in the population as well as increased levels of social organization. Middle Woodland sites seem to reflect a seasonal exploitation of the environment. There is a notable increase in the amount of Eastern Agricultural Complex plant cultigens, including chenopodium, knotweed, sumpweed, and little barley. This seasonal exploitation may have followed a scheduled resource extraction year in which the populations moved camp several times per year, stopping at known resource extraction loci. Middle Woodland land use appears to center on the regions surrounding earthworks (Dancey 1992; Pacheco 1996); however, there is evidence of repeated occupation away from earthworks (Weller 2005). Household structures at this time vary with many of them being squares with rounded corners (Weller 2005). Exotic goods are often attributed to funerary activities associated with mounds and earthworks. Utilitarian items are more frequently encountered outside of funerary/ritual contexts. The artifact most diagnostic of this period is the bladelet, a prismatic and thin razor-like tool, and bladelet cores. Middle Woodland remains are more commonly recovered from central Ohio south and lacking from most areas in the northern and southeastern part of the state.

Little information is known about the Middle Woodland period of western and northwestern Ohio. This may be due to a poor representation of artifacts from this period or because the area is not directly associated with the Hopewell culture. The loosely associated patterns of earthworks to habitation sites that have been identified in central and southern Ohio areas are not present in this region. Sites associated with this period have been identified along the south and western shores of Lake Erie, but they are not common (Stothers et al. 1979; Stothers 1986).

The Late Woodland period (ca A.D. 400-900) is distinct from the previous period in several ways. There appears to be a population increase and a more noticeable aggregation of groups into formative villages. The villages are often positioned along large streams, on terraces, and were likely seasonally occupied (Cowan 1987). This increased sedentism was due in part to a greater reliance on horticultural garden plots, much more so than in the preceding Middle Woodland period. The early Late Woodland groups were growing a wide variety of crop plants that are collectively referred to as the Eastern Agricultural Complex. These crops included maygrass, sunflower, and

domesticated forms of goosefoot and sumpweed. This starch and protein diet was supplemented with wild plants and animals. Circa A.D. 800 to 1000, populations adopted maize agriculture, and around this same time, shell-tempered ceramics appear. Other technological innovations and changes during this time period included the bow and arrow and changes in ceramic vessel forms.

Evidence suggests that the Late Woodland occupations in northern Ohio developed from the Western Basin Middle Woodland tradition. The Late Woodland period in northern Ohio is best defined by ceramic traditions. Western Basin Late Woodland sites have been identified in most of the river valleys in northwestern Ohio such as the Maumee, Auglaize, and the Sandusky Rivers. Radiocarbon dating establishes this Late Woodland occupation at the first century B.C. to A.D. 500 (Pratt and Bush 1981: 88). The Western Basin tradition consists of three primary phases, which include the Riviere au Vase, the Younge (Fitting 1965), and the Springwells phase. Influence from the Cole complex may extend into the area from the south, but this remains theoretical and not well researched.

The Late Prehistoric period in northwest and northern Ohio is often associated with an intensification of the use of plant resources, the presence of large villages, and a steady population increase. Permanent villages were associated with a heavy dependence on farming. These villages were often located on the meander belt zones of river valleys (Stothers et al. 1984: 6). Subsistence of these farming communities relied upon maize, beans, and squash as the major cultigens. Villages were often strategically located on bluff tops. There is a change in social structure to a chiefdom-based society. The Late Prehistoric period in northwest Ohio has been segregated into the Sandusky tradition and smaller phases based largely on age and ceramic assemblage traits.

The Sandusky tradition has been broken up into four phases. These phases are identified (in chronological order) as Eiden, Wolf, Fort Meigs, and Indian Hills. These are often associated with a style of ceramic referred to as Mixter Tool Impressed, Mixter Dentate, Mixter Cordmarked, and Parker Festooned. The Eiden and Wolf phases show a dependence upon fishing, and villages are usually associated with large cemeteries (Schneider 2000; Shane 1967).

The Fort Meigs and Indian Hills phases occur late in the Late Prehistoric period. The Fort Meigs phase may be related to the Wolf phase in that the pottery is similar. Fort Meigs phase occupations are identified by specific rim and neck motifs that are applied to their pottery. The Indian Hills phase is associated with shell-tempered pottery. Some villages show evidence of defensive features such as stockade lines, ditches, or earthen walls (Pratt and Bush 1981: 155). There is little evidence to support inter-village relationships, such as trade; this lack may have been due to competition for localized resources.

Protohistoric to Settlement

By the mid-1600s, French explorers traveled through the Ohio country as

trappers, traders, and missionaries. They kept journals about their encounters and details of their travels. These journals are often the only resource historians have regarding the early occupants of seventeenth century Ohio. The earliest village encountered by the explorers in 1652 was a Tionontati village located along the banks of Lake Erie and the Maumee River. Around 1670, it is known that three Shawnee villages were located along the confluence of the Ohio River and. the Little Miami River. Because of the Iroquois Wars, which continued from 1641-1701, explorers did not spend much time in the Ohio region, and little else is known about the natives of Ohio during the 1600s. Although the Native American tribes of Ohio may have been affected by the outcome of the Iroquois Wars, no battles occurred in Ohio (Tanner 1987).

French explorers traveled extensively through the Ohio region from 1720-1761. During these expeditions, the locations of many Native American villages were documented. In 1751, a Delaware village known as Maguck existed near present-day Chillicothe. In 1758, a Shawnee town known as 'Lower Shawnee 2' existed at the same location. The French also documented the locations of trading posts and forts, which were typically established along the banks of Lake Erie or the Ohio River (Tanner 1987).

While the French were establishing a claim to the Ohio country, many Native Americans were also entering new claims to the region. The Shawnee were being forced out of Pennsylvania because of English settlement along the eastern coast. The Shawnee created a new headquarters at Shawnee Town, which was located at the mouth of the Scioto River. This headquarters served as a way to pull together many of the tribes which had been dispersed because of the Iroquois Wars (Tanner 1987).

Warfare was bound to break out as the British also began to stake claims in the Ohio region by the mid-1700s. The French and Indian War (1754-1760) affected many Ohio Native Americans; however, no battles were recorded in Ohio (Tanner 1987). Although the French and Indian War ended in 1760, the Native Americans continued to fight against the British explorers. In 1764, Colonel Henry Bouquet led a British troop from Fort Pitt, Pennsylvania to near Zanesville, Ohio.

In 1763, the Seven Years' War fought between France and Britain, also known as the French and Indian War ended with The Treaty of Paris. In this Peace of Paris, the French ceded their claims in the entire Ohio region to the British. When the American Revolution ended with the Second Treaty of Paris in 1783, the Americans gained the entire Ohio region from the British; however, they designated Ohio as Indian Territory. Native Americans were not to move south of the Ohio River but Americans were encouraged to head west into the newly acquired land to occupy and govern it (Tanner 1987).

By 1783, Native Americans had established fairly distinct boundaries throughout Ohio. The Shawnee tribes generally occupied southwest Ohio, while the Delaware tribes stayed in the eastern half of the state. Wyandot tribes were located in north-central Ohio, and Ottawa tribes were restricted to northeast Ohio. There was also a small band of Mingo tribes in eastern Ohio along the Ohio River, and there was a band of Mississauga

tribes in northeastern Ohio along Lake Erie. The Shawnee people had several villages within Ross County along the Scioto River (Tanner 1987). Although warfare between tribes continued, it was not as intense as it had been in previous years. Conflicts were contained because boundaries and provisions had been created by earlier treaties.

In 1795, the Treaty of Greenville was signed as a result of the American forces defeat of the Native American forces at the Battle of Fallen Timbers. This allocated the northern portion of Ohio to the Native Americans, while the southern portion was opened for Euro-American settlement. Although most of the battles which led up to this treaty did not occur in Ohio, the outcome resulted in dramatic fluctuations in the Ohio region. The Greenville Treaty line was established, confining all Ohio Native Americans to northern Ohio, west of the Tuscarawas River (Tanner 1987).

Ohio Native Americans were again involved with the Americans and the British in the War of 1812. Unlike the previous wars, many battles were fought in the Ohio country during the War of 1812. By 1815, peace treaties began to be established between the Americans, British, and Native Americans. The Native Americans lost more and more of their territory in Ohio. By 1830, the Shawnee, Ottawa, Wyandot, and Seneca were the only tribes remaining in Ohio. These tribes were contained on reservations in northwest Ohio. By the middle 1800s, the last of the Ohio Native Americans signed treaties and were removed from the Ohio region.

Hardin County History

Hardin County takes its name from the Virginian Col. John H. Hardin who served in the War for Independence and in the frontier battles with the natives succeeding that war. However, it is not certain that the man ever visited the lands that would one day bear his name. The possibility that military men, fur traders, and roving squatters passed through this land without ever knowing or being known is generally accepted as true. Like most other counties in Ohio Hardin was not a county at the time of statehood, but unlike many other counties, Hardin did not have settlers at that same time. The reason for this is the location of the land within the Frontier Indian Wars. The land was not officially open to civilizing settlement until 1817 (Warner, Beers & Co. 1883). It was only after the treaty of that year appeared by which the Indians moved yet further west that the land was available for governing and occupancy. Three years later, the state government divided all the land acquired from that treaty into new counties, Hardin was one of these though it was attached to Logan County for jurisdictional support until the state deemed it self-sufficient in 1833 and declared it a separate entity (Blue 1933, Kohler 1910, Warner, Beers & Co. 1883).

This does not mean that there were no whites in this territory before 1817. In fact, there was a fine military presence thanks to Col. Duncan McArthur, later Governor of Ohio, who laid a road into the region and built a fort in the wilderness at the corner of what would be Buck Township in the center of Hardin County. That fort named for McArthur was eventually the place of initial settlement and was the foundation for the town of Kenton. Most historians agree that this fort was not in continual operation from

1816; but they all agree that a man named Alfred Hale and his family was squatting at the fort in 1817. This makes Hale the first settler of Hardin County. Hale owns two more Hardin County 'firsts' the happiest and saddest ones; in 1819 his son, Jonas, was the first white child born in the region, the other was the death of his wife leading to the first white burial sometime in the early 1820's. Soon after, Hale left the land (Blue 1933, Kohler 1910, Warner, Beers & Co. 1883).

Legal settlement begins with Peter C. McArthur and Daniel Campbell. These men came to claim, clear, and plant land in 1818; which they did. However, Indian troubles drove them back to their families in Ross County until 1822 when they came back to settle permanently. McArthur did so and was an influential man in Hardin's early history serving as early schoolmaster and as the first County Assessor. Campbell's family was stricken with illness and death and he again retreated south but returned in 1829. He also served the emerging county in several public offices. The place these men located was to the east of the Scioto. The same year they returned to their claims, Samuel Tidd arrived and settled near them on Elder Creek. Before long the area was populated enough that another early settler, Jonathan Carter, decided to lay out a town. Roundhead encompassed his cabin which he built in 1829 on the site of an Indian encampment; plat 1832. This was the first town in Hardin (Blue 1933, Kohler 1910, Warner, Beers & Co. 1883).

The second town in Hardin was selected and built specifically to be the County Seat of Justice. Ira Page, Abner Snoddy, and Edward Morgan were the committee to find a suitable place for a county seat. They did so along the north side of the Scioto in 1833 and prevailed upon George and Jacob Houser and neighbor Lemuel Wilmoth to donate a total of 40 acres for the laying out of said town. The courthouse was up and running within two years, incorporation came in 1845 (Blue 1933).

About that same time, immigration and development began to boom. Col. John Ross built a gristmill near Kenton the same year of its plat. Charles W. Stevenson built another, also in 1833 on Silver Creek to the south. Before long the county had mills of all kinds, general stores for basic needs, taverns and stills, garment and furniture manufacturers, tanners and cabinetmakers, shoemakers, blacksmiths, wagon makers, brick manufacturing, a marble works, followed later by an agricultural society (1851), an iron foundry (1875), railroad car factory (1890), a sign company, candy makers, and a machine tool company. The Mad River and Lake Erie Railroad came from Sandusky south to Kenton and the first train passed the county seat with grand fanfare on July 4, 1846 (Blue 1933, Kohler 1910, Warner, Beers & Co. 1883).

Along with industry grew education and religion. Early schools were typical of the period, usually subscription with a trusted neighbor as headmaster when he could spend time away from his fields. In the 1830's, Hardin and the other counties began to collect state funds from the sale of school lands and public schools began to grow at leaps and bounds. Brick schools with multiple rooms began in 1857 with the Central School in Kenton. Religious societies appeared as soon as there were enough settlers to meet on Sundays. The Methodists under the supervision of itinerate preacher Thomas Thompson,

organized in 1832 and built a church in Kenton in 1839 (Blue 1933, Kohler 1910, Warner, Beers & Co. 1883).

The village of Ada, which today is home to Ohio Northern University and the football manufacturers Wilson, came about through the work of S. M. Johnson in 1853. Agler (originally Jeggers then Preston) was a stop on the Chicago and Atlantic Railroad. The plat for Agler dates 1882 and it gained incorporation in 1896. Hugh D. Miller named Dunkirk at the time of its platting in 1852. Its incorporation came on September 4, 1867. Up in the northeast corner of Hardin is the town of Forest. The coming of the Pennsylvania Railroad inspired John Gormley to plat the town in 1853; incorporated three years later. Mt. Victory in the southeast owes its birth to R. D. Miller. In 1851, he laid it out and the state incorporated it 28 years later. He also laid out Ridgeway in 1851 but it gained incorporation much sooner in 1858 (AdaNet 2005).

McDonald Township History

McDonald Township is located in the southwestern part of Hardin County. It is located fully within the portion of the county that is at the northern aspect of the Virginia Military District. This township is oddly shaped as it partially reflects a segment of the upper Scioto River channel; this pertains to the western and northern sides. The township was named for a former resident of the township, William McDonald, when it was organized in 1836. It was originally part of Roundhead Township and was politically tied to Logan County until the early 1830s. McDonald and family were the first settlers of the township from Ross County, circa 1822. Several other families arrived during the 1820s and into the early 1830s. However, the populace throughout the township was scattered and there were few aggregate communities (Howland 1879; Howe 1888) and this isolation through disbursement caused settlers to tend to their needs without having to travel distances; this was true of medicinal needs.

Histories refer to the Shawnee Tribe hunting in this area into the 1830s before their removal to reservations in Oklahoma; they came from Logan and Allen County reservations (Howland 1879). This township is the location of the Zimmerman Kame, a series of Terminal Late Archaic burials that were identified during gravel mining operations. The burials are indicative of the Glacial Kame Culture and this is one of the type sites.

Agricultural activity, like most of Ohio, was the primary means of subsistence for the early settlers. Still, grist mills that were established were in adjacent townships and required travel for use. Mills were located in Lynn Township, but the majority was a place called Moots Mill that was about 28 miles away. Much of what had stymied early occupants and growth was the swampy conditions experienced in association with the Scioto Marsh/Swamp. Adequate drainage of the large swamp that is at the upper reaches of the Scioto River was still an active pursuit into the late 1800s. Annual bouts with malaria are mentioned, which certainly would have made lengthy settlements difficult. Hunting in the early 1800s goes hand-in-hand with agriculture for subsistence. This

township was known to be plentiful with game that included: turkeys, wild hogs, and black bear (Howland 1879).

Population growth was slow and according to census data the township had 285 people in 1840 and 1,449 by 1880 (Howe 1888). This is of note as the population as of 2000 was at 914 people, a noticeable decline. The primary activity in the township remains affiliated with agriculture.

Research Design

The purpose of this Phase I survey is to locate and identify cultural resources that will be affected by the planned construction activities. This includes archaeological deposits as well as architectural properties that are older than 50 years regarded as being in the APE. Once these resources are identified, they are evaluated for their eligibility to the NRHP. The literature review aspect of these investigations is to answer or address the following questions:

1) Did the literature review reveal anything that suggests the project area had been previously surveyed, and what is the relationship of previously recorded properties to the project area?
2) Are cultural resources likely to be identified in the project area?

Archaeological Field Methods

The survey conducted for this project used two methods of sampling/testing to identify and evaluate cultural resources. These included surface collection and visual inspection. Aspects of the project were photographically documented to demonstrate conditions. The following describes the survey methods:

Surface Collection. Portions of the access corridors are suitable for surface collection strategies. The bare ground visibility in these areas is greater than 50 percent. Pedestrian transects are spaced at 5 m intervals through these applicable areas. If artifacts are identified during this survey, they are flagged and plotted using a Trimble GeoXT global positioning system for the purposes of demonstrating distribution and for GIS layering.

Visual inspection. This method is conducted to document the nature of the project area and its conditions, disturbed setting, general nature of the area, and presence of any unmarked buildings. This method is used to verify the absence or likelihood of any cultural resources within and around the project area to assist in defining the APE.

The application of the resulting field survey methods was documented in field notes, field maps, and project plan maps.

Architectural Field Methods

This survey was conducted following the guidelines established in *Archeology and Preservation: Secretary of the Interior's Standards and Guidelines* (National Park Service 1983) and *Guidelines for Local Surveys: A Basis for Preservation Planning. National Register Bulletin No. 24* (National Park Service 1997). When properties are identified, they are subjected to the guidelines outlined in *National Register Bulletin 15, How to Apply the National Register Criteria for Evaluation* (National Park Service 1996).

There are four criteria for eligibility to be listed in the National Register of Historic Places (NRHP). Only one of these criteria must be met to be considered eligible for listing; however, oftentimes more than one of the criteria is met. The criteria for significance include:

A. Association with historic events or patterns of events;
B. Association with persons important to our past;
C. Exceptional or important architectural characteristics; and/or
D. Data potential.

Architectural properties typically qualify under Criteria A, B, or C. Criterion D is typically reserved for archaeological sites.

In addition to meeting at least one of the established criteria, the appropriate integrity must also be retained by the resource. There must be integrity of location, design, workmanship, setting, materials, feeling, and association.

Prior to commencing fieldwork, a literature review was conducted to determine if any previously recorded architectural properties, NRHP properties, or Ohio Genealogical Society cemeteries were present within the APE. Historic maps were also reviewed to aid in guiding the fieldwork and detecting the possible presence of properties 50 years of age or older within the APE. Background research was also conducted in order to establish a historic context of the region.

The field survey included a systematic approach to identifying all properties 50 years of age or older within the APE that is within the viewshed of the proposed project. Each property identified within the viewshed was photographed and annotated on appropriate mapping and included in the report. The approach was to identify those properties with NRHP potential, followed by a more intensive documentation and evaluation of those potentially eligible aboveground resources. The comprehensive survey involved recording of each property 50 years of age or older to a baseline level of documentation.

A summary and analysis of the field data detailing the overall architectural character of the APE is included as a narrative in the report. Weller historians analyzed the data and identified properties that are clearly not eligible for the NRHP due to a lack

of significance or loss of integrity, as well as identified potential NRHP properties and advanced them to a more advanced level of documentation and evaluation.

Definitions

Within this report, an *architectural resource* is defined as aboveground buildings or structures that are 50 years of age or older. A *historic property* is defined as a building, structure, object, or site that is listed in, or considered eligible for listing in, the NRHP. An *effect* is defined as an activity associated with the project that alters a characteristic of a historic property that qualified it for inclusion in the NRHP.

Curation

There were no artifacts identified from this project. Notes and maps affiliated with this project will be maintained at Weller & Associates, Inc. files.

Literature Review

The literature review study area is defined as a 305 m (1,000 ft) area extending from the centerline of the project area (Figure 2). In conducting the literature review, the following resources were consulted at the Ohio State Historic Preservation Office (SHPO) and the State Library of Ohio:

1) *Archeological Atlas of Ohio* (Mills 1914);
2) SHPO United States Geological Survey (USGS) 7.5' series topographic maps;
3) Ohio Archaeological Inventory (OAI) files;
4) Ohio Historic Inventory (OHI) files;
5) National Register of Historic Places (NRHP) files;
6) SHPO consensus Determinations of Eligibility (DOE) files;
7) SHPO CRM/contract archaeology files;
8) Hardin County atlases, histories, historic USGS 15'series topographic map(s), and current USGS 7.5' series topographic map(s); and
9) Online and genealogical cemetery resource data.

A review of the *Atlas* (Mills 1914) was conducted and there are no sites indicated near the project area according to this resource.

There are few recorded archaeological sites in Hardin County. However, there are two sites located in the study area that were identified during a professional survey for a wind turbine farm. These sites 33HR0205 and 225 both date from the prehistoric period . There are no sites recorded in the study area for this project. Site 33HR0225 is an isolated find spot and was not regarded as being significant. Site 33HR0205 is a multi-component prehistoric period artifact scatter that contains Early Archaic, Late Archaic, and Middle Woodland components. There is a historic period component known from this site. Additional Phase II investigations were recommended for the

prehistoric period component of this site if it could not be avoided. This site is located to the southeast of the current area of investigation (Figure 2).

The OHI files indicated no previously recorded OHI properties located in the project or its study area.

A review of the NRHP files and SHPO consensus DOE files was conducted. There are no NRHP or DOE properties within the project area or study area.

A review of the CRM/contract files indicates that there are no reviewed previous surveys within the project or its study area. However, this area was the subject of a large, selective survey for a wind turbine farm (according to the OAI form); however, the report had not been filed at the time the current investigations were completed.

Historical atlases were reviewed for this project. The *Atlas of Hardin County, Ohio* (Howland 1879) indicates that this area was owned by H. Wood or S. Hedgeman; neither of these owners had any buildings indicated on their parcels. The USGS *1943 Alger, Ohio 15 Minute Series (Topographic)* map does not indicate any buildings within the project area or in its vicinity (Figure 4). Inspection of the *USGS 1962 Alger, Ohio 7.5 Minute Series (Topographic) map* indicates not buildings in the vicinity. The 345kV electric line route is indicated. There are no cemeteries located in the study area.

Evaluation of Research Questions 1 and 2

There were two questions presented in the research design that will be addressed at this point. These are:

1) Did the literature review reveal anything that suggests the project area had been previously surveyed?
2) Are cultural resources likely to be identified in the project area?

The literature review for this project identified only two archaeological sites within the study area. Importantly, site 33HR0205 is a site that was recommended for additional work if it could not be avoided by planned wind farm construction. This multi-component prehistoric/historic period site is located to the east of Dodds Road and is southeast of the project area. The boundaries of the site were established during the Phase I survey and it is apparent that the current project does not intercept it. Additionally, the project area is located in a lower-lying setting and the site is on a slight elevation that is above the defined Scioto Marsh limits. Archaeological sites are not anticipated from the current project area as it is within a low, poorly drained area.

Fieldwork Results

The Phase I field investigations for this project were conducted on February 23, 2018 (Figures 5-9). The weather at the time of survey was not a hindrance; it was warm with temperatures nearing 60 degrees Fahrenheit. The field investigations involved

surface collection, visual inspection, and photographic documentation. Surface collection methods of investigation were well-suited for the project. The conditions at the time of survey included well-weathered agricultural fields. These investigations were conducted prior to any ground disturbance activity. There were no cultural materials identified during these investigations and there are no buildings older than 50 years within the study area.

Surface collection methods were conducted throughout the investigated area for this project (Figures 5-8). The surface collection conditions identified a well weathered stubble field that had bare ground surface visibility that ranged from 60-90 percent. Standing water and poorly drained conditions assisted in increasing the surface visibility as it washed some of the surface fodder from the area. Pedestrian transects were spaced at 5 m intervals through this area. There were no cultural materials identified in this area despite excellent survey conditions.

There were no cultural materials identified during these investigations. The survey conditions were considered to be excellent for the identification of sites as it involved surface collection of a well-weathered field. However, the project area is located in a comparably low and imperfectly drained area. There have been archaeological sites identified in the study area (n=2) and they are both on elevated areas that border the Scioto Marsh; a situation where cultural material might be expected. Site 33HR0205's location was noted in the field as it is opposite one of the lattice structures and distanced from the project. This site is located on an elevated landform, conditions which are not present in the current project area. The findings are consistent with what was expected from this area.

Architectural Survey Results

The project APE was dominated by a rural agricultural landscape. The survey focused on those above ground resources that were located within 1,000 feet of the proposed T-line project. There are no buildings older than 50 years within the project area or its vicinity.

APE Definition and NRHP Determination

The APE is a term that must be applied on an individual project basis. The nature of the project or undertaking is considered in determining the APE. This may include areas that are off the property or outside of the actual project's boundaries to account for possible visual impacts. For example, when the construction is limited to underground activity, the APE may be contained within the footprint of the project. The APE for this project includes the footprint of the proposed access/construction easements and temporary construction easements. The APE determination is considerate of both that archaeological and architectural aspects of the cultural resources survey. However, it is limited by the 305 m (1,000 ft) study area imposed as part of the OPSB regulations.

The project is small and accounts for T-lines from an existing 345kV electric line to a proposed electric switch station. The project corridor width was 30.5 m (100 ft). The surveyed area is located in a low area that is contained in farmland.

There are no buildings or properties older than 50 years identified within what is regarded as the APE. Site 33HR0205 is an archaeological site that was recommended for NRHP evaluation/assessment. This site is not located within the project area, it is to the southeast of it. It is unclear where access roads are proposed, but it is recommended that this site area be avoided (which it is as the project is currently understood). The project does not involve any significant cultural resources or landmarks.

Recommendations

In February 2018, Weller & Associates, Inc. conducted Phase I Cultural Resource Management Investigations for American Electric Power's East Lima-Marysville 345kV T-Line Extension Project in McDonald Township, Hardin County, Ohio. The archaeological fieldwork involved intensive surface collection, visual inspection, and photographic documentation. The work was conducted in a low, depressed landform setting that is within the Scioto Marsh. There were no archaeological sites identified during these investigations and there are no buildings within the study area. This project is not considered to involve any significant cultural resources or landmarks. No further cultural resource management work is deemed necessary for this project.

References Cited

AdaNet
2005 "Hardin County Histories." Electronic Document, http://www2.wcoil.com/~adanet/hchist.html, accessed May 22, 2006. AdaNet Webring.

Bamforth, D.
1988 *Ecology and Human Organization on the Great Plains.* Plenum, New York.

Blue, H. T. O.
1933 *Centennial Hisory of Hardin County, Ohio*. Rogers-Miller Co., Canton, Ohio.

Brose, D. S.
1994 "Archaeological Investigations at the Paleo Crossing Site, a Paleoindian Occupation in Medina County, Ohio." In: *The First Discovery of America: Archaeological Evidence of the Early Ohio Area*, edited by W. S. Dancey, pp. 61-76. The Ohio Archaeological Council, Columbus.

Cowan, W. C.
1987 *First Farmers of the Middle Ohio Valley: Fort Ancient Societies, A.D. 1000-1670*. The Cincinnati Museum of Natural History, Cincinnati.

Cramer, A.
1989 *The Dominion Land Company Site: An Early Adena Mortuary Manifestation in Franklin County, Ohio.* M.A. Thesis, Kent State University, Kent, Ohio.

Cunningham, R. M.
1973 "Paleo Hunters along the Ohio River." In: *Archaeology of Eastern North America* 1(1): 116-118. Eastern States Archeological Federation, Bethlehem, Connecticut.

Dancey, W. S.
1992 "Village Origins in Central Ohio: The Results and Implications of Recent Middle and Late Woodland Research." In: *Cultural Variability in Context: Woodland Settlements of the Mid-Ohio Valley*, edited by M. F. Seeman, pp. 24-29. Special Papers 7, *Midcontinental Journal of Archaeology*, Kent State University Press, Kent, Ohio.

Dragoo, D.
1976 "Some Aspects of Eastern North American Prehistory: A Review 1975." In: *American Antiquity* 41(1):3-27. The Society for American Archaeology, Washington, DC.

Fitting, J. E.
1965 "Late Woodland Culture in Southeastern Michigan." In: *Anthropological Papers, the Museum of Anthropology*, No. 24, University of Michigan, Ann Arbor.

1963 "The Hi-Lo Site: A Paleo-Indian Site in Western Michigan." In: *Wisconsin Archaeologist* 44:87-96. Wisconsin Historical Society, Madison, Wisconsin.

Fuller, J.
1981 "Developmental Change in Prehistoric Community Patterns: The Development of Nucleated Village Communities in Northern West Virginia." Unpublished Ph.D. Dissertation, Department of Anthropology, University of Washington, Seattle.

Howe, H.
1888 *Historical Collections of Ohio, Vol. I.* H. Howe & Son, Columbus.

1854 *Historical Collections of Ohio.* E. Morgan & Co's. Cincinnati.

Jakle, J.A., R.W. Bastian, and D.K. Meyer
1988 *Common Houses in America's Small Town: The Atlantic Seaboard to the Mississippi Valley*. University of Georgia, Athens, Georgia.

Justice, N.
1987 *Stone Age Spears and Arrow Points of the Midcontinental and Eastern United States*. Indiana University Press, Bloomington and Indianapolis.

Knapp, H. S.
1872 *History of the Maumee Valley: Commencing with its Occupation by the French in 1680*. Slade Mammoth Printing and Publishing House, Toledo, Ohio.

Kohler, M. I.
1910 *A Twentieth Century History of Hardin County Ohio: A Narrative Account of Its Historical Progress Its People and Its Principal Interests. Vol. I.* The Lewis Publishing Company, Chicago.

McAlester, V. and L.
2013 *A Field Guide to American Houses.* Alfred A. Knopf, New York.

McDonald, H.
1994 "The Late Pleistocene Vertebrate Fauna in Ohio: Coinhabitants with Ohio's Paleoindians." In: *The First Discovery of America: Archaeological Evidence of the Early Ohio Area,* edited by W. S. Dancey, pp. 23-41. The Ohio Archaeological Council, Columbus.

National Park Service
1983 *Archeology and Historic Preservation: Secretary of the Interior's Standards and Guidelines.* National Park Service, Department of the Interior, Washington, D.C.

1996 *How to Apply the NRHP Criteria for Evaluation.* NRHP Bulletin 15. National Park Service, Department of the Interior, Washington, D.C.

1997 *Guidelines for Local Surveys: A Basis for Preservation Planning.* NRHP Bulletin 24. National Park Service, Department of the Interior, Washington, D.C.

Pacheco, P.
1996 "Ohio Hopewell Regional Settlement Patterns." In: *A View From The Core: A Synthesis of Ohio Hopewell Archaeology,* edited by P. Pacheco, pp. 16-35. The Ohio Archaeological Council, Columbus.

Pollack, D. and A. Henderson
2000 "Insights into Fort Ancient Culture Change: A View from South of the Ohio River." In: *Cultures Before Contact: The Late Prehistory of Ohio and Surrounding Regions,* edited by R. Genheimer, pp. 194-227. The Ohio Archaeological Council, Columbus.

Pratt, G. M., and D. R. Bush
1981 *Archaeological Resource Management in Ohio: A State Plan for Archaeology (Draft).* Copy available for review at the Ohio Historic Preservation Office, Columbus.

Prufer, O. H., and D. A. Long
1986 "The Archaic of Northeastern Ohio." In: *Kent Research Papers in Archaeology, No. 6,* Kent State University Press, Kent, Ohio.

Schneider, A. M.
2000 "Archaeological Reflections of the Western Basin Tradition in the Maumee River Valley of Western Lake Erie, with Special Emphasis on Ceramic Analysis." Unpublished master's thesis, The University of Toledo, Toledo, Ohio.

Shane, L.
1987 "Late-glacial Vegetational and Climatic History of the Allegheny Plateau and the Till Plains of Ohio and Indiana, U.S.A." In: *Boreas* 16:1-20. The Boreas Collegium, Blackwell Publishing Ltd., Edinburgh.

Shane, O. C., III
1975 "The Mixter Site: A Multicomponent Locality in Erie County, Ohio." In: *Studies in Ohio Archaeology* (rev. ed.), edited by O. H. Prufer. Kent State University Press, Kent, Ohio.

1967 "The Leimbach Site." In: *Studies in Ohio Archaeology*, edited by O. H. Prufer, pp. 98-120. The Press of Western Reserve University, Cleveland.

Stafford, R.
1994 "Structural Changes in Archaic Landscape Use in the Dissected Uplands of Southwestern Indiana." In: *American Antiquity,* 59:219-237. The Society for American Archaeology, Washington, DC.

Stothers, D.
1986 "The Western Basin Middle Woodland: Fact or Fiction?" Paper presented at the Midwest Archaeological Conference, Columbus.

Stothers, D., G. Pratt and O. C. Shane III
1979 "The Western Basin Middle Woodland." In: *Hopewell Archaeology,* edited by D. Brose and N. Greber. The Kent State University Press, Kent, Ohio.

Stothers, D. M., J. R. Graves, and B. G. Redmond
1984 "The Sandusky and Western Basin Traditions: A Comparative Analysis of Settlement-Subsistence Systems." In: *Toledo Area Aboriginal Research Society Bulletin 7* (1&2): 1-73. Toledo Area Aboriginal Research Society, Toledo, Ohio.

Tankersley, K.
1994 "Was Clovis a Colonizing Population in Eastern North America?" In: *The First Discovery of America: Archaeological Evidence of the Early Ohio Area,* edited by W. S. Dancey, pp. 95-116. The Ohio Archaeological Council, Columbus.

1989 "Late Pleistocene Lithic Exploitation and Human Settlement Patterns in the Midwestern United States." Unpublished Ph.D. dissertation, Department of Anthropology, Indiana University, Bloomington.

Tanner, H.
1987 *Atlas of Great Lakes Indian History*. University of Oklahoma Press, Norman.

Warner, Beers, & Co.
1883 *The History of Hardin County, Ohio*. Warner, Beers & Co., Chicago.

Webb, W. S., and R. S. Baby
1963 *The Adena People No. 2*. The Ohio Historical Society, The Ohio State University Press, Columbus.

Weller, R. J.
2005 *Data Recovery at the Haven Site (33DL1448) Located in Liberty Township, Delaware County, Ohio*. Weller & Associates. Submitted to the Delaware County Sanitary Engineer's Office. Copy available for review at the Ohio Historic Preservation Office, Columbus.

Winter, N. O.
1917 *A History of Northwest Ohio*. The Lewis Publishing Company, Chicago and New York.

Figures

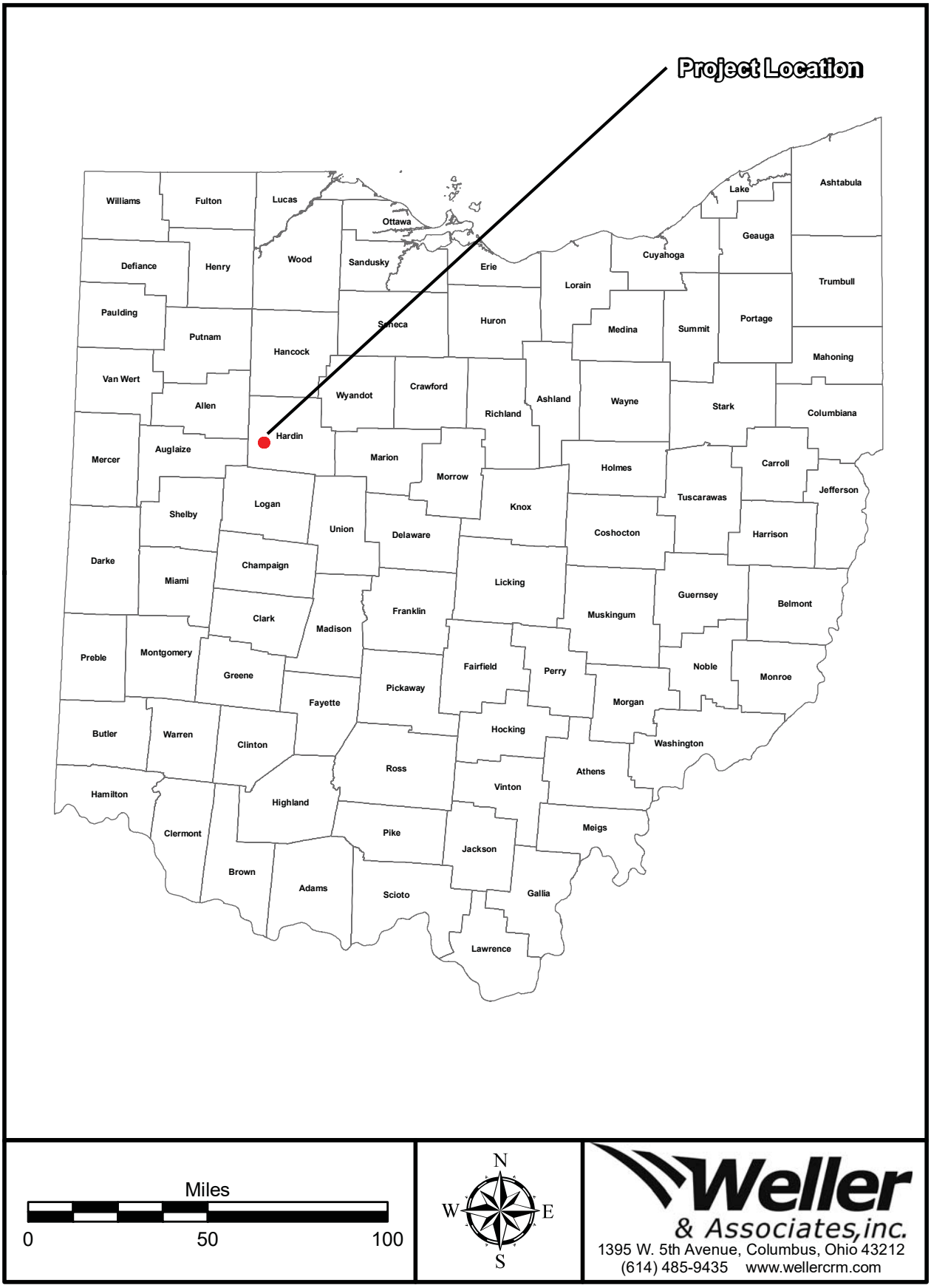

Figure 1. Political map of Ohio showing the approximate location of the project.

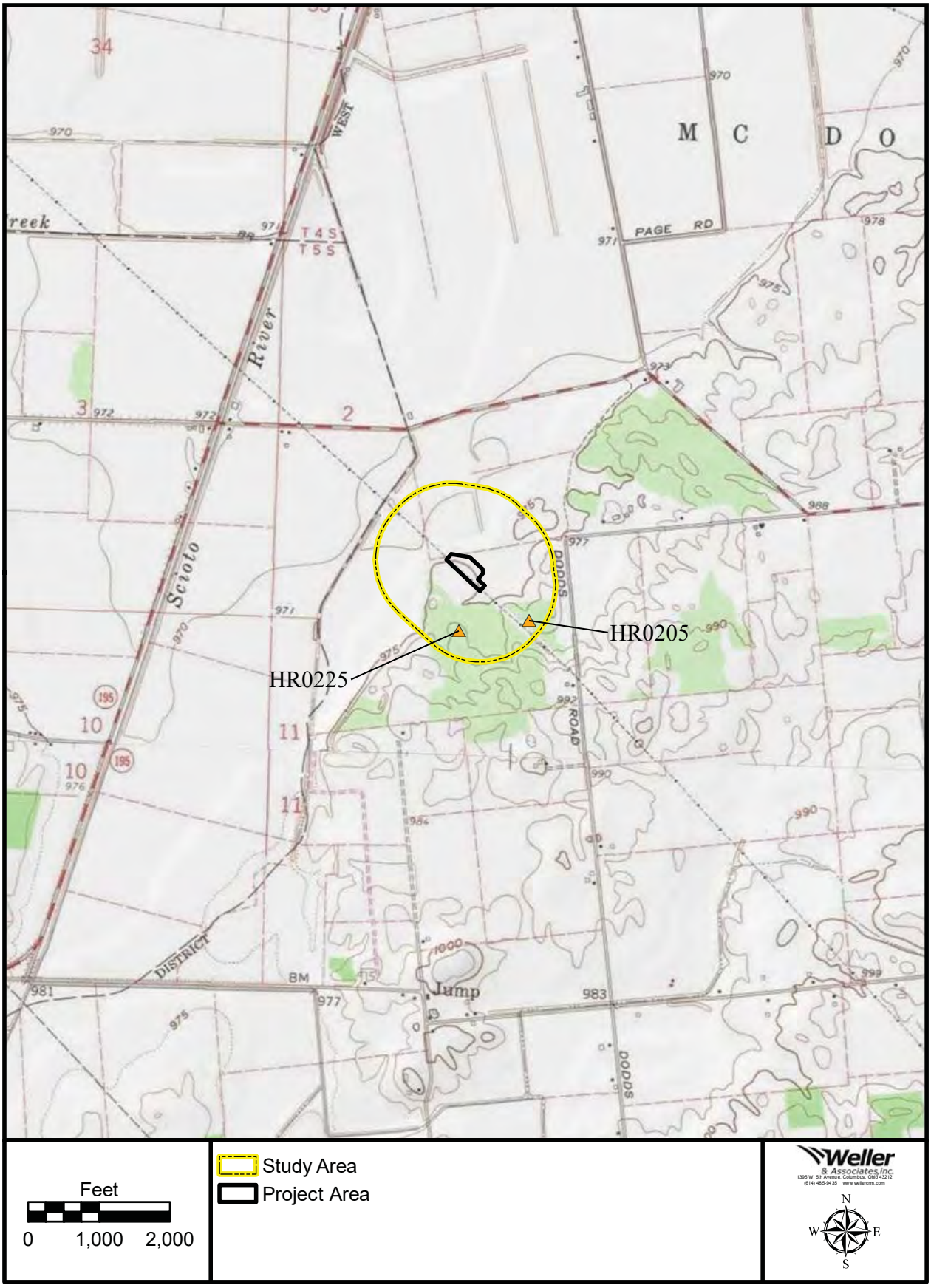

Figure 2. Portion of the USGS *1962 Alger, Ohio 7.5 Minute Series (Topographic)* map indicating the location of the project and recorded resources within the study area.

Figure 3. Aerial map indicating the location of the project and recorded resources within the study area.

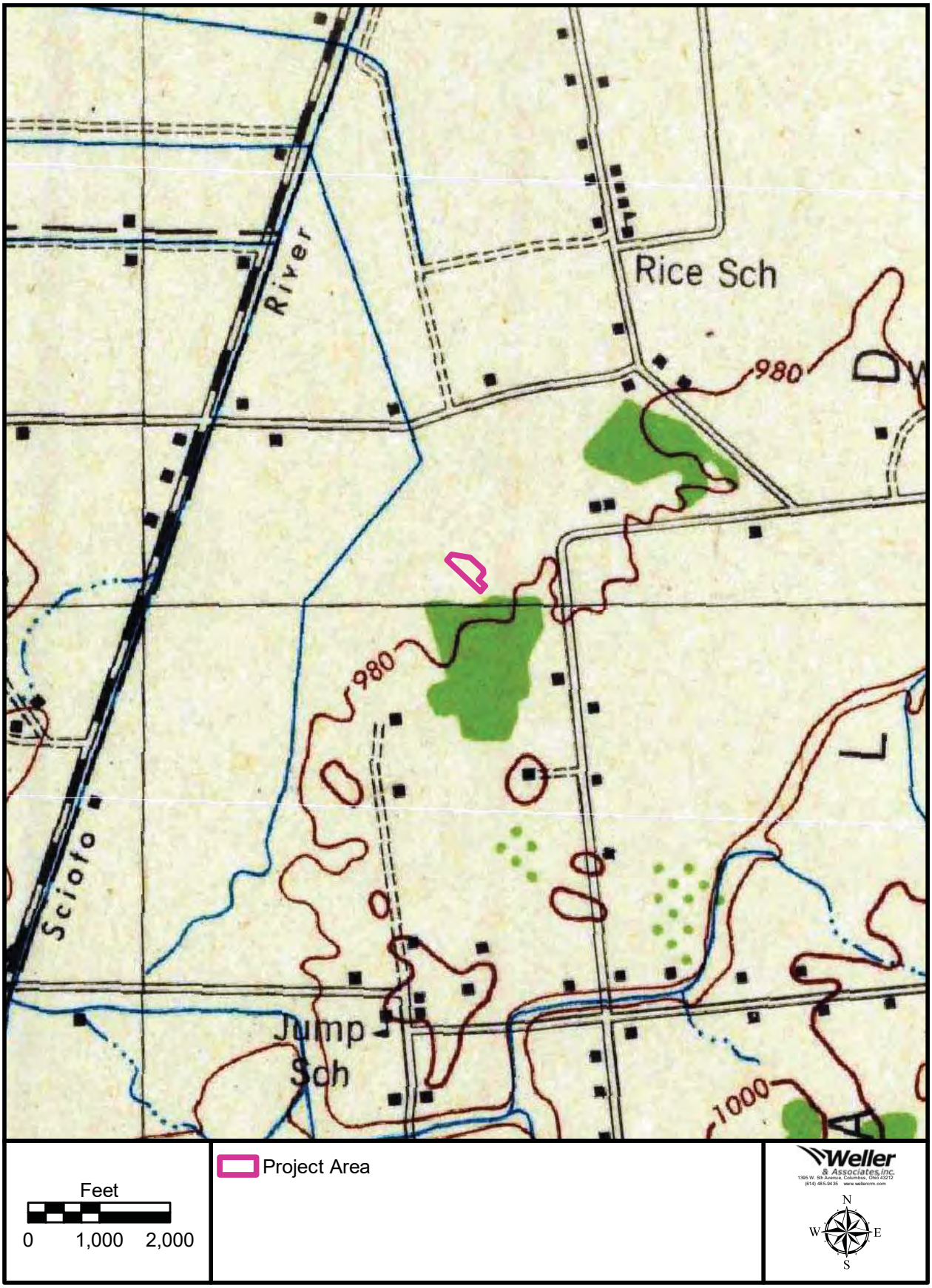

Figure 4. Portion of the USGS *1943 Alger, Ohio 15 Minute Series (Topographic)* map indicating the approximate location of the project.

Figure 5. Aerial fieldwork map of the project indicating the results of testing and photo orientations.

Figure 6. View of the project.

Figure 7. Conditions within the project.

Figure 8. Typical visibility within the surface collected soybean stubble field.

Figure 9. Conditions south of the project.

Summary: Application (Construction Notice Application) electronically filed by Ms. Christen M. Blend on behalf of AEP Ohio Transmission Power Company, Inc.