Construction Notice for South Canton-West Canton 138kV Transmission Line Extension

AEP Ohio Transmission Company

PUCO Case No. 16-2211-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.

December 5, 2016
CONSTRUCTION NOTICE

AEP Ohio Transmission Company, Inc.’s South Canton-West Canton 138kV 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”) in accordance with the accelerated application requirements of Ohio Administrative Code Section 4906-6-05.

4906-6-05(8) 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.

The proposed South Canton-West Canton 138 kV Transmission Line Extension Project (Project) is not identified in the 2016 Long-Term Forecast Report (“LTFR”) for AEP Ohio (Document 16-1501-EL-FOR). At the time of the 2016 LTFR submittal in early 2016, the subject project was not a definite project and had not been approved in the capital budget. Since that time, the need for the Project has been identified and will be included in the 2017 LTFR submittal, which will be filed in 2017.

The Project consists of constructing a 138 kV transmission line loop from the existing South Canton-West Canton 138 kV line into Miles Avenue Station, a distribution station, in Stark County, Ohio. AEP Ohio Transco will insert new structures within the existing right-of-way of the South Canton-West Canton 138 kV line and loop the South Canton-West Canton 138 kV Transmission Line Extension 300 feet (0.06 mile) into the Miles Avenue distribution station. Figure 1 shows the location of the project in relation to the surrounding vicinity.

The Project meets the requirements for a Construction Notice (“CN”) because it is within the types of projects defined by Item (1)(a) and 2(a) of 4906-1-01 Appendix A Application Requirement Matrix for Electric Power Transmission Lines. These items state:

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.

2. Adding new circuits on existing structures designed for multiple circuit use, replacing conductors on existing structures with larger or bundled conductors, adding structures
Construction Notice for South Canton-West Canton 138kV Transmission Line Extension

...to an existing transmission line, or replacing structures with a different type of structure, for a distance of:

(a) Two miles or less.

B(2) Statement of Need

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

The project is needed to address inoperable transmission switching equipment serving the Miles Avenue distribution station. Presently, a 138 kV line switch sits outside Miles Avenue station, but has been damaged and non-functional for some time. This means that any needed 138 kV transmission line switching on the South Canton-West Canton 138 kV circuit results in an outage to the Miles Avenue station and the many residential customers served from that station. In addition, since the time the initial 138 kV switch was installed, several 138 kV structures and swimming pools have been built in the local area, making switch maintenance and troubleshooting difficult to impossible, due to inaccessibility of the switch. For these reasons, and considering future reliability of this distribution station, AEP Ohio Transco proposes to replace the 138 kV radial tap with a 138 kV double-circuit loop into Miles Avenue station and install 138 kV switches inside the station fence. This will provide two distinct feeds to the large distribution station, allow equipment maintenance and improve line-sectionalizing capability.

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 general location of the Project in relation to existing and proposed lines and substation in the vicinity.

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.

Miles Avenue distribution station is adjacent to the existing South Canton-West Canton 138 kV transmission line. This Project proposes a 300-foot loop from this 138 kV line. Based on close proximity between the source 138 kV line and the station, no other alternatives were considered viable. This is to ensure long-term reliability for the customers served from the Miles Avenue distribution station. The alternative of simply replacing the inoperable 138kv line switch is not practical, due to the inaccessibility of the switch location and the adjacent residential encroachments. This prevents a bucket truck from performing transmission maintenance. In addition, replacing the switch would have left a radial 138kv line tap into the station, which is inherently less reliable than a 138kv loop (in-and-out configuration).

B(5) Public Information Program

AEP Ohio Transmission Company, Inc. S. Canton-W. Canton 138kV Transmission Line Extension Project
December 2016
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.

AEP Ohio Transco will inform affected property owners and tenants about this Project through several different mediums. Within seven days of filing this Construction Notice, AEP Ohio Transco will issue a public notice in a newspaper of general circulation in the Project area. The notice will comply with all requirements of O.A.C. Section 4906-6-08(A)(1-6). Further, AEP Ohio Transco has mailed (or will mail) a letter, via first class mail, to affected landowners, tenants, contiguous owners and any other landowners AEP Ohio Transco may approach for an easement necessary for the construction, operation, or maintenance of the Project. The letter will comply with all requirements of OAC Section 4906-6-08(B). AEP Ohio Transco maintains a website (http://aeptransmission.com/ohio/) which provides the public access to an electronic copy of this CN. A paper copy of the CN will be served to the public library in each political subdivision for this Project. AEP Ohio Transco retains ROW land agents that discuss Project timelines, construction and restoration activities and convey this information to affected owners and tenants.

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 February 2017 with an anticipated in-service date of August 2017.

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.

Figures 1 and 2 provide the proposed Project area on maps of 1:24,000-scale. Figure 1 provides the proposed Project centerline on the United States Geological Survey (USGS) 7.5-minute topographic map of the Canton West quadrangle. Figure 2 shows the Project area on recent aerial photography, as provided by Bing Maps. To access the Project location from Columbus, take I-71 North for 68 miles. At Exit 176, take the ramp right for U.S. 30 East toward Wooster. Turn right onto U.S. 30 and continue for 54 miles. Take the ramp right and follow signs for State Route 297. Turn left onto State Route 297/State Route 791/Raff Road SW. After 1.4 miles, turn left onto State Route 172/Tuscarawas Street. After 0.5 mile, turn right onto Whipple Avenue NW. Go 0.9 mile and turn left onto 11th Street NW. The site is on the right side at the northwest corner of 11th Street NW and Miles Avenue NW at latitude 40.809, longitude 81.433.

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.
The Project is predominantly within existing right-of-way and on property owned by an affiliate of AEP Ohio Transco. No additional easements, options, or land use agreements will be necessary. No additional easements, options, and/or land use agreements are necessary to construct and operate the facility.

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 Miles Avenue 138 kV Extension will operate at 138 kV. It will consist of three-phase, 795 kcmil ACSR “Drake” conductors. One 7#8 alumoweld and one fiber-optic overhead groundwire will be used as shield wires. The insulator assemblies will consist of one string of polymer insulators for each phase. Three new 138 kV transmission line poles will be installed at tap points along the South Canton-West Canton 138 kV line within existing right-of-way. Two additional poles will be installed between the tap structures and station bays, as shown on Figure 3.

A sketch of the proposed structure type is included as Figure 4.

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.

B(9)(b)(i) Calculated Electric and Magnetic Field Strength Levels

Three loading conditions were examined: (1) normal maximum loading, (2) emergency line loading, and (3) winter normal conductor rating. Normal maximum loading represents the peak flow expected with all system facilities in service; daily/hourly flows fluctuate below this level. Emergency loading is the maximum current flow during unusual (contingency) conditions, which exist only for short periods of time. Winter normal (WN) conductor rating represents the maximum current flow that a line, including its terminal equipment, can carry during winter conditions. It is not anticipated that this line would operate at its WN rating in the foreseeable future. Loading levels and the calculated electric and magnetic fields are summarized below.

| S. Canton-W. Canton 138kV Circuits |
Construction Notice for South Canton-West Canton 138kV Transmission Line Extension

<table>
<thead>
<tr>
<th>Condition</th>
<th>Into Miles Avenue on South Side/Out of Miles Avenue on the North Side Load (A)</th>
<th>Electric Field (kV/m)*</th>
<th>Magnetic Field (mG)*</th>
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<tbody>
<tr>
<td>(1) Normal Max. Loading</td>
<td>320/256</td>
<td>0.2/1.4/0.2</td>
<td>16/29.2/17</td>
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<tr>
<td>(2) Emergency Line Loading</td>
<td>615/550</td>
<td>0.2/1.4/0.2</td>
<td>58.9/34.0</td>
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<tr>
<td>(3) WN Conductor Rating</td>
<td>1359/1359</td>
<td>0.2/1.6/0.2</td>
<td>83.4/152.4/83.4</td>
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</table>

*EMF levels (left ROW edge/maximum/right ROW edge) computed one meter above ground at the point of minimum ground clearance, assuming balanced phase currents and nominal voltages. Electric fields reflect normal and emergency operations; lower electric fields are expected during emergency conditions when one mutually coupled line is out of service.

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 alternatives were considered as the proposed transmission line construction associated with the Project is within existing ROW.

B(9)(b)(ii)(c) Project Cost

The estimated capital cost of the project.

The 2016 capital costs estimate for the proposed Project, comprised of applicable tangible and capital costs, is approximately $350,000.

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 located in Perry Township, Stark County, Ohio. Surrounding land uses are commercial, institutional, and industrial. No impacts to surrounding land use are anticipated.

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.

No agricultural land or agricultural district land parcels are affected by the Project.
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.

An archaeological investigation was conducted by an AEP Ohio Transco consultant for this Project. A copy of the resulting report is found under Appendix A.

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.

A Notice of Intent will be filed with the Ohio Environmental Protection Agency for authorization of construction storm water discharges under General Permit OHC000004. A Stark County Soil and Water Earth Disturbance Permit Application and Stark County Soil and Water Storm Water Pollution Prevention Plan Checklist Form will also be submitted. 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.

On behalf of AEP Ohio Transco, AEP Ohio Transco’s consultant submitted a request form to the Ohio Department of Natural Resources for records in the Natural Heritage Database. No records of special status species or habitat were reported. AEP Ohio Transco’s consultant reviewed the United States Fish and Wildlife Service (USFWS) Ohio County Distribution of Federally-Listed Threatened, Endangered, Proposed, and Candidate Species, revised October 2016. Two species were listed in Stark County. These include the endangered Indiana bat (Myotis sodalis) and the threatened northern long-eared bat (Myotis septentrionalis). AEP Ohio Transco’s consultant also conducted a field reconnaissance of the Project area in October 2016. The Project area is a vacant portion of a commercial/industrial parcel occupied by an existing station. Very limited tree cover potential suitable for bat species were observed. AEP Ohio Transco proposes to adhere to seasonal tree clearing restrictions for potential Indiana bat habitat trees between October 1 and March 31.
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.

On behalf of AEP Ohio Transco, AEP Ohio Transco’s consultant conducted a field reconnaissance of the Project area in October 2016. No wetlands or streams were identified. AEP Ohio Transco’s consultant also searched publicly available records for other areas of ecological concerns. None were identified in the immediate Project vicinity. Areas of ecological concern are not expected to be impacted by the Project. The Wetland Delineation and Stream Assessment Letter Report is found under Appendix B.

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 4
<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY.</th>
<th>ASSEMBLY</th>
<th>DESCRIPTION</th>
</tr>
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<tr>
<td>1</td>
<td>2</td>
<td>6100-0988</td>
<td>DAYBIT BK TO BK 10 FT. 0 IN. FIXED VANG, 50KSI</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>6100-0994</td>
<td>DAYBIT BK TO BK 8 FT. 0 IN. FIXED VANG, 50KSI</td>
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<tr>
<td>3</td>
<td>6</td>
<td>1186-0000</td>
<td>INSULATORS, SUSPENSION, Polyure, 25K, 138KV</td>
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<tr>
<td>4</td>
<td>1</td>
<td>3070-1102</td>
<td>OGW, Susp. Concrete, Steel or Wood Pole</td>
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<tr>
<td>5</td>
<td>1</td>
<td>2151-0030</td>
<td>Grounding, Steel Pole, #4 copper, Copper Welded, 5/8x8&quot;, Bonded, Without Standoff Bracket</td>
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<tr>
<td>6</td>
<td>1</td>
<td>7186-1186</td>
<td>Tel, BK, 3/4&quot; Bolts</td>
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</table>

S. Canton-W. Canton 138KV Line
Typical Structure - 250' Span
1 - 7#10 Alumoweld Shieldwire
6 - 795 ACSR (45/7) "Tern"
Miles Avenue 138kV Extension
Dead End Structure - 200' Span
1 - 7#10 Alumoweld Shieldwire
3 - 795 ACSR (45/7) "Tern"
REF. DRAWINGS

<table>
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<th>ITEM</th>
<th>QTY.</th>
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<th>DESCRIPTION</th>
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<tr>
<td>1</td>
<td>3</td>
<td>12BS-1380</td>
<td>138KV INSULATOR, POLYMER, HORIZONTAL POST W/TRUNNION CLAMP</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>30TO-1102</td>
<td>OHGW, SUSPENSION, CONCRETE, STEEL OR WOOD POLE</td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>21SE-1456</td>
<td>GROUND ROD FOR DIRECT EMBEDDED STEEL POLE</td>
</tr>
<tr>
<td>4</td>
<td>3</td>
<td>71AO-1231</td>
<td>3/4 IN FLAT DEAD-END TEE</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>50AO-1106</td>
<td>SCREW ANCHOR 3 HELIX, 20K</td>
</tr>
<tr>
<td>6</td>
<td>2</td>
<td>42CO-1117</td>
<td>GUY WIRE ASSEMBLY (AW), MEDIUM (25K) CORROSION ZONE</td>
</tr>
</tbody>
</table>

**Miles Avenue 138KV Extension**

**Angle Structure - 200' Span**

1 - 7#10 Alumoweld Shieldwire

3 - 795 ACSR (45/7) "Tern"
Phase I Cultural Resource Management Investigations for the Approximately 1.37 ha (3.39 ac) Miles Station Expansion and Tap Project in the City of Canton Township, Stark County, Ohio

Ryan J. Weller

November 18, 2016
Phase I Cultural Resource Management Investigations for the Approximately 1.37 ha (3.39 ac) Miles Station Expansion and Tap Project in the City of Canton Township, Stark County, Ohio

By

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Lead Agency:

Ohio Power Siting Board

__________________________________________
Ryan J. Weller, P.I.

November 18, 2016

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Abstract

In November of 2016, American Electric Power (AEP) contracted Weller & Associates, Inc. to conduct Phase I Cultural Resource Management Investigations for the Approximately 1.37 ha (3.39 ac) Miles Station Expansion and Tap Project in the City of Canton Township, Stark County, Ohio. The lead agency for the project is the Ohio Power Siting Board (OPSB). A cultural resources management (CRM) survey was conducted in a manner that is reflective of the Section 106 of the National Historic Preservation Act to identify any sites or properties relative to this undertaking and to evaluate them for the National Register of Historic Places (NRHP). The work involved a literature review and field investigations. No buildings or structures older than 50 years are being taken or directly impacted. These investigations did not identify any previously unrecorded archaeological sites.

The project area is located in an urban setting of Canton. It is to the east of Woodlawn Avenue and is north of 11th Street NW. There are single-family residences located in the immediate and surrounding area. Much of the archaeological investigations were conducted in manicured lawn conditions. The project plans are to expand the existing Miles Station facility and includes a new tap line. This will have minimal impact to the current setting, which consists mostly of single-family residential back yards.

The literature review that was conducted for this project did not identify any recorded cultural resources within the project or its study area. Residences that are in the immediate vicinity are not older than 50 years.

These investigations involved subsurface testing and visual inspection. There were no cultural resources identified during these investigations, as the area was found largely be contained in disturbed land. The planned work will not impact or involve any significant archaeological/architectural resources. A finding reflective of ‘no historic properties affected’ is considered appropriate/no landmarks are involved. No further work is deemed necessary for this project.
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5. Portion of the USGS 1901 Canton, Ohio 15 Minute Series (Topographic) map indicating the approximate location of the project.
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9. View of the shovel tested area within the southern portion of the project.
10. Conditions within the northern portion of the project.
11. Some of the conditions within the western portion of the project.
12. Some of the conditions within the western portion of the project.
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Introduction

In November of 2016, American Electric Power (AEP) contracted Weller & Associates, Inc. to conduct Phase I Cultural Resource Management Investigations for the Approximately 1.37 ha (3.39 ac) Miles Station Expansion and Tap Project in the City of Canton Township, Stark County, Ohio (Figures 1-3). The lead agency for this project is the Ohio Power Siting Board (OPSB). A cultural resource management (CRM) survey was conducted similar to a Section 106 of the National Historic Preservation Act survey to identify any sites or properties relative to this undertaking and to evaluate them for the National Register of Historic Places (NRHP). The work involved a literature review and field investigations. This report summarizes the results of the fieldwork and literature review. The report format and design is similar to that established in Archaeology Guidelines (Ohio State Historic Preservation Office [SHPO] 1994).

Ryan Weller served as the Principal Investigator and Josh Engle was the Project Manager. The field crew included Matt Sanders, Brittany Vance, and Craig Schaefer. Ryan was responsible for the textual aspects of the report and Jon Walker completed the figures.

Project Description

The project will include an expansion of the existing Miles Station. The station is located between Miles Avenue NW and Woodlawn Avenue NW in the City of Canton, Ohio. All of the work will occur in the immediate vicinity of the station area. An area of approximately 1.37 ha (3.39 ac) will be included in the survey, which extends north, south, and west of the existing station. A short segment of new lines will also be constructed for the station and is considered as the tap. Since this is an existing station, it does not seem likely that an architectural survey is necessary; however, visual inspection was conducted in the vicinity of the station to verify that there are no significant aboveground resources nearby.

Environmental Setting

Climate

Stark County, not unlike all of Ohio, has a continental climate, with hot and humid summers and cold winters. About 92 cm (36 in) of precipitation fall annually on the county with the average monthly precipitation about 8 cm (3 in). November and December are the driest months, while June is the wettest month for Stark County [United States Department of Agriculture, Soil Conservation Service (USDA, SCS) 1971].

Physiography, Relief and Drainage

Stark County is located within the glaciated region of northeast Ohio. According to Brockman (1998), the project area is located within the Akron-Canton Interlobate Plateau of the Glaciated Allegheny Plateau. This region is characterized by “Hummock
area between two converging glacial lobes dominated by kames, kame terraces, eskers, kettles, kettle lakes, and bog/fens; derange drainage with many natural lakes; elevation 900’-1200’, moderate relief” (Brockman 1998). The project area is drained by unnamed tributary of Sippo Creek, which flows westward to the Tuscarawas River.

**Geology**

The underlying bedrock for this project is from the Pennsylvanian-era sedimentary rocks. The geology of the project consists of conglomerates, shales, and sandstones (Brockman 1998).

**Soils**

The project is located in the Chili-Wheeling-Shoals Association. There are three soil series types that involve this project (Table 1; USDA, SCS 1971). The project area is contained in soils that have been altered/disturbed by grading activity in urban settings. Intact soils are not expected from this area.

<table>
<thead>
<tr>
<th>Soil Symbol</th>
<th>Soil Name</th>
<th>% Slope</th>
<th>Location</th>
</tr>
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<tbody>
<tr>
<td>CuF</td>
<td>Chili urban land complex, steep</td>
<td>n/a</td>
<td>Mostly disturbed urban settings</td>
</tr>
<tr>
<td>CuC</td>
<td>Chili urban land complex, rolling</td>
<td>n/a</td>
<td>Mostly disturbed urban settings</td>
</tr>
<tr>
<td>CuB</td>
<td>Chili urban land complex, undulating</td>
<td>n/a</td>
<td>Mostly disturbed urban settings</td>
</tr>
</tbody>
</table>

**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, Illinoian, 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 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 forest 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).

The project area is located in west central Stark County. This area is dominated by mixed oak and oak-sugar maple forestation (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, and giant beaver (Bamforth 1988; Brose 1994a; McDonald 1994). Groups have been depicted as being mobile and nomadic (Tankersley 1989); artifacts include projectile points, multipurpose bifacial 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).

Certain artifacts indicate Paleoindian activity. These artifact assemblages are characteristic of transient hunter-gatherer foraging activity and subsistence patterns. The most common artifacts from the Paleoindian period are lanceolate-shaped projectile points. These may be fluted (flake removed from the base to facilitate hafting) and have some evidence of grinding on the hafting element (base and lower portion of the biface). Other artifacts that may be part of a Paleoindian assemblage include pitted stones, burins, bipolar flakes, backed knives, and bifacial endscrapers with graver spurs. Paleoindian sites in the glaciated portions of Ohio are encountered infrequently and are usually represented by isolated finds.

There are several sites that pertain to this period from northeastern Ohio, including Nobles Pond, Paleo Crossing, and Krill Cave. The Nobles Pond site in Stark County is situated in a nearly level area that had been glaciated. Based on a fairly large Paleoindian artifact assemblage recovered from this site, it has been interpreted as a semi-circular base camp occupation. The site was systematically collected for a period of 12 years by Gramly and Summers (1986). There have been over 3,000 tools recovered from this site, including Gainey style projectile points. This site appears to have been occupied from 10,000 to 11,000 years ago over a short time span (Seeman et al. 1994).

The Paleo Crossing site was occupied around 11,000 years ago. This site contained a large number of Clovis and Clovis-like points recovered from plow zone deposits. There was a lack of Upper Mercer flint contained within the Paleoindian portion of this assemblage. The majority of the flint from this site was acquired from southern and southeastern Indiana. Brose (1994a) has suggested that this site represents
one of the earliest known structural remains associated with this period. A post mold from the site has been dated to 12,250 ± 100 B.P.

Krill Cave (33SU18) is situated within Summit County. This is a stratified site that has been dated from the Paleoindian to Early Archaic periods. Little information is readily available concerning this site. It is located along an intermittent drainage with sandstone outcrops and overlooks a poorly drained marsh that is fed by springs (Prufer et al. 1989: 3).

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.

There are two Terminal Late Archaic cultures known from northeastern Ohio. Situated to the north and west of an imaginary line drawn from Cincinnati to Cleveland, the Glacial Kame culture (2950 to 2450 B.C.) is best interpreted as part of a burial cult that developed in the Late Archaic period. Glacial Kame can be considered the earliest of two Late Archaic cultural expressions in Ohio. The most diagnostic artifact of the Glacial Kame culture is the three-hole sandal-sole gorget (Converse 1979). The Meadowood culture (1,100 to 300 B.C.) is considered similar to Glacial Kame. Meadowood cultural traits are found mainly in the northeastern portions of Ohio; however, sporadic isolated finds of diagnostic artifacts are found throughout Ohio (Ritchie 1965).

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.

The Early Woodland of northern Ohio is somewhat different from that of the remainder of the State. There are fewer mounds and the artifact assemblage is more attributable to the Leimbach Phase. 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 with occasional ‘hot spots’ of activity. 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. An Early Woodland component of the Krill Cave site (33SU18) has been dated to about 145 B.C. Evidence of activity during this period, such as the 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 time period. There is a 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 Chessier) [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. The few northeastern Ohio Middle Woodland sites that have been identified include the Cole Mound in Tuscarawas County and mounds near Pippen Lake, Portage County. Other than an occasional mound and projectile point, Middle Woodland sites are rare in northeastern Ohio (Zakucia 1964). However, excavations at the Szalay Site in Summit County encountered a series of postmolds that yielded dates and artifacts that were attributable to the Middle Woodland period. This site is located on at the confluence of Furnace Run and the Cuyahoga River. Bladelets, pottery, postmolds, and radiocarbon dates obtained from the site confirm its Hopewellian affiliation (Richner and Volf 2000).

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.

The Late Prehistoric period (ca A.D. 1000-1550) is distinctive from former periods. It has been suggested that this cultural manifestation developed out of the local Middle Woodland cultures and may have lasted to be contemporaneous with the Late Prehistoric period (Barkes 1982; Baby and Potter 1965; Potter 1966).

The Late Prehistoric period in 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 Whittlesey cultural groups (A.D. 900 to 1650) inhabited most of northern Ohio in an area described as being south of Lake Erie from the Pennsylvania boundary to the western end of Lake Erie, as well as on some of the islands. Similar sites have been identified in northern Indiana and southern Michigan. These groups inhabited villages that encompassed an area of approximately 1.6 ha. These villages were often situated on top of high bluffs on stream bends, or high inaccessible areas of land located at stream junctions. These villages were usually fortified with wooden stockades or earthen embankments with ditches on the outer side (Brose 1994b).

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 Pennsylvanian 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, which was being fought between France and Britain, had finally ended. The Treaty of Paris in 1763 granted the entire Ohio region to the British. In 1783, the second Treaty of Paris ending the American Revolution granted the entire Ohio region to the Americans; however, Ohio was specifically described as Native American territory. Native Americans were not to move south of the Ohio River (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 northeastern Ohio. There was also a small band of Mingo tribes in central 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.

**Stark County History**

The State of Ohio raised Stark County in 1809 out of lands that had previously been under Territorial Washington, Jefferson, and, after statehood, Columbiana Counties. The boundary of the county changed with donations of land to neighboring Summit and Carroll County. The county takes its name from General John Stark, a hero of the American War for Independence. Stark County has the honor of holding the place of first white settlement in Ohio. Even before Marietta in 1788, a Moravian missionary named Frederick C. (or Christian F.) Post became the very first European to settle in Ohio territory. He came in 1761 and built a house at the junction of Sandy Creek and the Tuscarawas River. He came to proselytize the Delawares of the region but he did not stay long as the frontier was growing hostile (Blue 1928; Heald 1963; Lehman 1916; Perrin 1881).

The first permanent settlers were surveyors who arrived in 1805. James F. Leonard and Henry Barber came months before Butler Wells and Daniel McClure. This was the beginning of the organization, cultivation, and construction of Stark County. Philip Slusser came the same year and built the county's first gristmill. Along the first roads and streams, towns began to spring up bringing the means for easier transportation and in turn for further development. The towns of Osnaburg-1805, Canton and Navarre-1806, and Louisville-1807 were platted while under control of Columbiana County (Blue 1928; Heald 1963; Lehman 1916; Perrin 1881).

The importance of religion to the early settlers is evidenced by the fact that it was a Moravian missionary who initially settled the region. But beyond Post's endeavor, the pioneers brought organized religion with them and built churches and schools to pass on their standards and ethics to the next generations. The residents of Plain Township organized a church upon arrival in 1806 and had a church building three years later. The first school taught in the county began in 1807 in Sandy Township. It was a primitive subscription school (Blue 1928; Heald 1963; Lehman 1916; Perrin 1881).

With the erection of Stark County organization brought about more and better changes. A committee selected Canton as county seat over Osnaburg. This was the impetus for the growth and success of the former and the stagnation and eventual demise of Osnaburg. Today all that remains of that name is a township. Internal improvements that began with Stark County focused on the needs of the community: the spread information with the first newspaper in 1815, wellness with a county infirmary in 1837, and a state hospital in 1898 (Blue 1928; Heald 1963; Lehman 1916; Perrin 1881).
Other improvements focused on the economy and private businesses and individuals drove the progress. State and Federal programs also incited growth. After hearing of the Ohio Canal project, Capt. James Duncan laid out the town of Massillon in 1825-26. The canal was a driving force the quick success of Massillon. Similarly, with the railroad influence from the 1830s, the towns of Williamsport, Freedom, and Liberty decided to ally themselves in hopes that their unification would attract the rails and the city of Alliance was born in 1850 (Blue 1928; Heald 1963; Lehman 1916; Perrin 1881).

Agriculture was the most important occupation in Stark County until after the late 1800s, when the county's industrial growth eclipsed it. Staple grains, potatoes, and apples, along with livestock of all kinds did well in the county (Blue 1928; Heald 1963; Lehman 1916; Perrin 1881).

Today Stark County brings in many tourists. It is the home of the Professional Football Hall of Fame, the President William McKinley Memorial Monument, Historic Canal Fulton, as well as many smaller attractions.

**City of Canton History**

Canton is the largest city in Stark County and the focus of the trade and commerce since the early part of the nineteenth century. Its namesake is Canton, China. The city grew slowly and was often wrought with bad choices. The loss of the canal to nearby Massillon stymied the development for some time. The next loss for the city was the prospective Cleveland & Pittsburgh Railroad, which located to the east. Its initial economic boosts were derived from the establishment of various railroad lines, such as the Pittsburg, Fort Wayne & Chicago, that traversed through the city. Manufacturing and trade enterprises are what drove the economy and its access to the markets (Danner 1904; Lehman 1916). A list of various manufacturers and companies from about 1900 indicates that the city could nearly be self-sufficient with its diversity of goods it was producing. The manufacturing greatly benefitted from the abundance of coal, iron, and water power for mills (Danner 1904; Howe 1888). The good produced and manufactured in Canton were being shipped around the world. Much of this was initially derived from goods produced by the mills and focused on agricultural production. This soon changed or was concomitant with the growth of the mineral industry; which was likely propelled by B. Wells. Canton did not become a village until 1822 and a city in 1838. The city became the 'adopted' home of President William McKinley and he is buried at one of the cemeteries (Danner 1904; Howe 1888; Perrin 1881; Blue 1928; Heald 1963).

Modern Canton is still primarily associated with industry. Some of the larger industries in the area include Timken, Belden Brick, Diebold, Whirlpool, and Shearer's Foods to name a few. The commerce and businesses benefit from the location of I-77, which essentially bisects the city. The Pro Football Hall of Fame is located in Canton and is a mainstay for tourism. Malone University, Walsh University, and Stark State College are academic institutions that are located here. The atmosphere and surroundings are urban with agricultural pursuits limited to the fringe areas.
Research Design

The purpose of a Phase I survey is to locate and identify cultural resources that will be affected within the proposed project. This includes archaeological deposits as well as architectural properties that are older than 50 years. Once these resources are identified and sampled, they are evaluated for their eligibility or potential eligibility to the National Register of Historic Places (NRHP). These investigations are directed to answer or address the following questions:

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

These questions are addressed in a section following the literature review.

Archaeological Field Methods

The survey conducted within the project area used two methods of sampling and examination to verify conditions and evaluate cultural resources. These included shovel probe excavation and visual inspection.

Shovel Probe. This method was used to delineate areas of disturbance. A shovel test probe measured 30 cm square and was excavated in areas where surface visibility is lacking, but disturbance is not evident on the surface. If natural soils are identified, the probe is expanded and sampled like a shovel test unit.

Visual Inspection. Severely disturbed locations such as built landscapes, stream valleys, and steep slope were visually inspected. The means of investigation is further used to document the nature of the setting and delineate the area of potential effects.

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

Curation

There were no cultural resources identified during these investigations. Notes and maps affiliated with this project will be maintained at Weller & Associates, Inc. files.

Literature Review

The literature review was conducted for a 305 m (1,000 ft) study area. This allows for an understanding as to the amount of previously recorded resources in the vicinity of the project. In conducting the literature review, the following resources were consulted at SHPO and the State Library of Ohio:
1) An Archaeological 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) Determinations of Eligibility (DOE) files;
7) SHPO CRM/contract archaeology files; and
8) Stark County atlases, histories, historic USGS 15’ series topographic map(s),
and current USGS 7.5’ series topographic map(s);
9) Online Genealogical and Cemetery resources.

The Archeological Atlas of Ohio (Mills 1914) did not indicate any resources that
were located within the project. There is an effigy mound indicated to the east (Figure 4)
and south of Myers Lake.

A review of the SHPO topographic maps indicated no sites located in the project
or in the study area.

The OHI files indicated no previously recorded OHIIs located in the project or it’s
study area.

There were no NRHP properties located in the project area, it’s vicinity, or study
area.

A review of the SHPO online contract files indicated that there have been no
professional surveys conducted within the study area.

Cartographic/atlas resources were reviewed for the project. The USGS 1901
Canton, Ohio Quadrangle 15 Minute Series (Topographic) map does not indicate any
structures within the project (Figure 5); accordingly, this area was rural and undeveloped
as late as the early twentieth century. The USGS 2000 Canton West, OH Quadrangle 7.5
Minute Series (Topographic) map indicates that the project is within an urban setting
regarded as Whipple Heights (Figure 2).

**Evaluation of Research Questions 1 and 2**

Based on the results of the literature review, the first two research questions can
be addressed.

1) Did the literature review reveal anything that suggests the project area has 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?

The project area appears to be in a disturbed urban land setting; this is based on
inspection of soil survey maps and cartographic resources. Intact archaeological deposits
and cultural materials are not anticipated and the project is expected to be disturbed.
Archaeological Survey Results

The field investigations for this project were conducted on November 17, 2016. These investigations were conducted for an approximately 1.37 ha (3.39 ac) expansion area for the Miles Station (Figures 6-13). Generically, the weather was abnormally warm and balmy for late November with the temperatures reaching the lower 60s Fahrenheit. The field investigations involved visual inspection and shovel probe excavation. The project area was found to be contained in severely disturbed conditions. There were no cultural resources recovered during the survey.

The project area includes the existing Miles Station; it is located in the east-central part of the area. A gravel access drive to this facility stems northward from 11th Street NW/Miles Avenue NW. The area is contained entirely within an urban setting and is basically within several residential back yards. However, the taller arboreal stands and houses nearly shield the station from view to the areas outside of the block where it is located. There is a pond located along the southern boundary. Steep slope was identified in the western parts of the area. The subsurface testing consistently identified disturbed conditions throughout the project area.

Visual inspection and a subsurface documentation was conducted for this project. It was realized prior to entering the field for this project that the area was likely to be fully disturbed for two reasons. Inspection of aerial/cartographic resources and soil survey maps depicts severe disturbance that is affiliated with urban development. The area involving the extant station and its immediate surroundings was disturbed. The area had likely been graded and prepared prior to the installation of the facility, as is normal for constructions.

There were 31 shovel probes excavated during these investigations; they all encountered disturbed soils (Figure 6). The soils that were examined identified rock-free topsoil in some areas that is dark grayish brown (10YR4/2); the soil type for this area is Chili which typically contains gravels as its parent material is outwash (Figure 13). The lack of gravels in the noted topsoil is uncharacteristic of this soil series type. The boundary between the topsoil and subsoil is clear and the subsoil contains at least 20 percent gravels. The topsoil that was identified is considered to be indicative of sod and lawn decomposition and accumulation. This would be expected in urban settings such as the project area. Additionally, most of the shovel probes did not identify any topsoil, just gravelly sterile subsoil. There were no cultural materials identified during these investigations.

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. When construction is limited to underground activity, the APE may be contained within the footprint of the project. The APE includes the footprint of the project and a limited area surrounding it. The APE accounts for both architecture and
archaeology; however, architectural inspection/work was limited since this is a small expansion of an existing facility. The archaeological aspect of the APE for this part of the project can be regarded as the footprint of the construction.

The project is located within a suburb of Canton regarded as Whipple Heights. The station is located within an urban setting and centrally located within an urban block that is surrounded by single-family residences that appear to date from the latter part of the twentieth century. This station is barely visible from the roads. Archaeological investigations accounted for the footprint of the planned construction and it was found to be severely disturbed. Visual inspection of the surrounding setting identified late twentieth century housing. The planned station expansion will not involve any significant cultural resources or landmarks.

**Recommendations**

In November of 2016, Weller & Associates, Inc. completed a Phase I cultural resource management Investigation for the approximately 1.37 ha (3.39 ac) Miles Station Expansion and Tap Project in the City of Canton Township, Stark County, Ohio. The testing involved visual inspection and subsurface testing (i.e., shovel probes). The project area was found to be completely contained in disturbed soils; this is consistent with the urban land-complex soils as indicated by the soil survey. There are no buildings that are older than 50 years within view of this existing substation. There were no archaeological materials identified during these investigations as the project area was found to be disturbed. The planned station expansion will not affect any landmarks or significant cultural resources. No further work is deemed necessary for this project.
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Figures
Figure 1. Political map of Ohio showing the approximate location of the project.
Figure 2. Portion of the USGS 2000 Canton West, Ohio 7.5 Minute Series (Topographic) map indicating the location of the project and previously recorded resources in the study area.
Figure 3. Aerial map indicating the location of the project and previously recorded resources in the study area.
Figure 4. Portion of the *Archaeological Atlas of Ohio* (Mills' 1914) indicating the approximate location of the project.
Figure 5. Portion of the USGS 1901 Canton, Ohio 15 Minute Series (Topographic) map indicating the approximate location of the project.
Figure 6. Fieldwork results and photo orientation map.
Figure 7. View of the substation within the project.

Figure 8. Some of the disturbed conditions within the southern portion of the project.
Figure 9. View of the shovel tested area within the southern portion of the project.

Figure 10. Conditions within the northern portion of the project.
Figure 11. Some of the conditions within the western portion of the project.

Figure 12. Some of the conditions within the western portion of the project.
Figure 13. A disturbed shovel probe from the project.
APPENDIX B
October 21, 2016

Ms. Amy Toohey
American Electric Power
700 Morrison Road
Gahanna, OH 43230

Subject: Wetland Delineation and Stream Assessment Letter Report
Miles Avenue Station Expansion Project, Stark County, Ohio

Dear Ms. Toohey,

AECOM is pleased to provide the following Wetland Delineation and Stream Assessment letter report to AEP for the Miles Avenue Station Expansion Project (Project) in Stark County, Ohio. AECOM understands that AEP is proposing to expand the existing station layout. AECOM surveyed an extended area surrounding the approximate and preliminary proposed construction limits that totaled approximately 3.4-acres. The Project survey area is illustrated on Figure 1 in Attachment 1.

METHODS

The purpose of the field survey was to assess whether evidence of “waters of the U.S.” including wetlands, within the Project survey area. Prior to conducting field surveys, digital and published county Natural Resources Conservation Service (NRCS) soil surveys, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps, and U.S. Geological Survey (USGS) 7.5-minute topographic maps were reviewed as an exercise to identify the occurrence and location of potential wetland areas and forested habitat.

The ecological assessment on October 12, 2016, was conducted by qualified AECOM biologists that surveyed the Project survey area while utilizing the methodologies described below. The study area consisted of the AEP-owned properties surrounding the station that totaled approximately 3.4-acres.

The field survey results presented herein apply to the existing and reasonably foreseeable site conditions observed at the time of our assessment. They cannot apply to site changes of which AECOM is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of
legislation or the expansion of knowledge over time. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond the control of AECOM which occur after the presentation of this report document.

**Wetland Delineation**

The Project survey area was evaluated according to the procedures outlined in the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual (1987 Manual) (Environmental Laboratory, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Eastern Mountain and Piedmont Region (Version 2.0) (Regional Supplement) (USACE, 2012). The Regional Supplement was released in April 2012 by the USACE to address regional wetland characteristics and improve the accuracy and efficiency of wetland delineation procedures. The 1987 Manual and Regional Supplement define wetlands as areas that have positive evidence of three environmental parameters: hydric soils, wetland hydrology, and hydrophytic vegetation. Wetland boundaries are placed where one or more of these parameters give way to upland characteristics.

Since quantitative data were not available for wetlands in the vicinity of the Project, AECOM utilized the routine delineation method described in the 1987 Manual and Regional Supplement that consisted of a pedestrian site reconnaissance, including identifying the vegetation communities, soils identification, a geomorphologic assessment of hydrology, and notation of disturbance.

**Ohio Environmental Protection Agency ORAM Evaluation**

The Ohio Environmental Protection Agency (OEPA) ORAM was developed to determine the relative ecological quality and level of disturbance of a particular wetland in order to meet requirements under Section 401 of the Clean Water Act. Wetlands are scored on the basis of hydrology, upland buffer, habitat alteration, special wetland communities, and vegetation communities. Each of these subject areas is further divided into subcategories under ORAM v5.0 resulting in a score that describes the wetland using a range from 0 (low quality and high disturbance) to 100 (high quality and low disturbance). Wetlands scored from 0 to 29.9 are grouped into "Category 1", 30 to 59.9 are "Category 2" and 60 to 100 are "Category 3". Transitional zones exist between "Categories 1 and 2" from 30 to 34.9 and between "Categories 2 and 3" from 60 to 64.9. However, according to the Ohio EPA, if the wetland score falls into the transitional range, it must be given the higher Category unless scientific data can prove it should be in a lower Category (Mack, 2001).
OEPA QHEI and HHEI Stream Evaluations

Streams are identified by the presence of a defined bed and bank, and evidence of an ordinary high water mark (OHWM). The USACE defines OHWM as “that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas” (USACE, 2005).

Stream assessments were conducted using the methods described in the OEPA’s Methods for Assessing Habitat in Flowing Waters: Using OEPA’s Qualitative Habitat Evaluation Index (Rankin, 2006) and Field Evaluation Manual for Ohio’s Primary Headwater Habitat Streams, Version 3 (Davic, 2012). The QHEI method is generally considered appropriate for waterbodies with drainage basins greater than one square mile, if natural pools are greater than 40 cm, or if the water feature is shown as blue-line waterways on USGS 7.5-minute topographic quadrangle maps.

Headwater streams are typically considered to be first-order and second-order streams, meaning streams that have no upstream tributaries (or “branches”) and those that have only first-order tributaries, respectively. The stream order concept can be problematic when used to define headwater streams because stream-order designations vary depending upon the accuracy and resolution of the stream delineation. Headwater streams are generally not shown on USGS 7.5-minute topographic quadrangles and are sometimes difficult to distinguish on aerial photographs. Nevertheless, headwater streams are now recognized as useful monitoring units due to their abundance, widespread spatial scale and landscape position (Fritz, et al. 2006). Impacts to headwater streams can have a cascading effect on the downstream water quality and habitat value. The headwater habitat evaluation index (HHEI) is a rapid field assessment method for physical habitat that can be used to appraise the biological potential of most Primary Headwater Habitat (PHWH) streams. The HHEI was developed using many of the same techniques as used for QHEI, but has criteria specifically designed for headwater habitats. To use HHEI, the stream must have a “defined bed and bank, with either continuous or periodically flowing water, with watershed area less than or equal to 1.0 mi² (259 ha), and a maximum depth of water pools equal to or less than 15.75 inches (40 cm)” (Davic, 2012).
RESULTS

Within the approximately 3.4 acre Project survey area, AECOM did not identify any wetlands or streams. The Project survey area was observed to be an existing station site with adjacent mowed grass and sporadic trees on the undeveloped portion of the property. The following paragraphs discuss the results of the wetland delineation and stream assessment within the Project survey area.

Preliminary Soils Evaluation

According to the Web Soil Survey for Stark County, Ohio (USDA, 2015) and the NRCS Hydric Soils List of Ohio, three soil series (CuB – Chili-urban land complex, undulating; CuC – Chili-urban land complex, rolling; CuF – Chili-urban land complex, steep) are mapped within Project survey area. None of these soils are identified as hydric (USDA, 2015). Soil series located within the Project survey area are shown on Figure 2 in Attachment 1.

National Wetland Inventory (NWI) Map Review

NWI wetlands are areas of potential wetland that have been identified from USFWS aerial photograph interpretation which have typically not been field verified.

According to the NWI map of the Canton West, Ohio quadrangle, the Project survey area contained one mapped NWI wetland, classified as Palustrine Unconsolidated Bottom, Intermittently Exposed (PUBG). The nearest location of NWI the wetland intersects with the Project Area.

Wetlands

No wetlands were identified by AECOM within the Project survey area. AECOM biologists did observe one wetland south of the Project survey area.

Streams

No streams were identified by AECOM within the Project survey area.

Ponds

One pond was identified by AECOM along the southern Project survey area boundary. Less than 0.1 acre of the pond is within the Project area as shown in Figure 3.
SUMMARY

AECOM conducted a wetland delineation and stream assessment of the Miles Avenue Station Expansion Project in Stark County, Ohio on October 12, 2016. No wetlands or streams and were identified within the Project survey area. One pond was identified within the Project survey area (Figure 3).

The field survey results presented herein apply to the existing and reasonably foreseeable site conditions at the time of our assessment. They cannot apply to site changes of which AECOM is unaware and has not had the opportunity to review. Changes in the condition of a property may occur with time due to natural processes or human impacts at the project site or on adjacent properties. Changes in applicable standards may also occur as a result of legislation or the expansion of knowledge over time. Accordingly, the findings of this report may be invalidated, wholly or in part, by changes beyond the control of AECOM.

AECOM appreciates the opportunity to provide AEP with this wetland delineation and stream assessment to assist with the expansion activities at the Miles Avenue Station. Please do not hesitate to contact AECOM if there are any questions or comments regarding this report.

Sincerely,

AECOM

Matthew D. Thomayer
Senior Ecologist
Matt.Thomayer@aecom.com

Aaron Geckle
Principal Siting Specialist
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Attachments

Attachment 1: Figures 1 through 3

  Figure 1: Project Overview Map
  Figure 2: Soils and National Wetland Inventory Map
  Figure 3: Wetland Delineation and Stream Assessment Map

Attachment 2: Representative Project Area Photographs

Attachment 3: References
ATTACHMENT 2

REPRESENTATIVE PROJECT AREA PHOTOGRAPHS
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<td><strong>Description:</strong></td>
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<td>View looking west from the southern edge of the ecological survey area.</td>
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References


Rankin, Edward T. 2006. Methods for Assessing Habitat in Flowing Waters: Using the Qualitative Habitat Evaluation Index (QHEI). Ohio EPA Ecological Assessment Section, Division of Surface Water, Columbus, Ohio.


