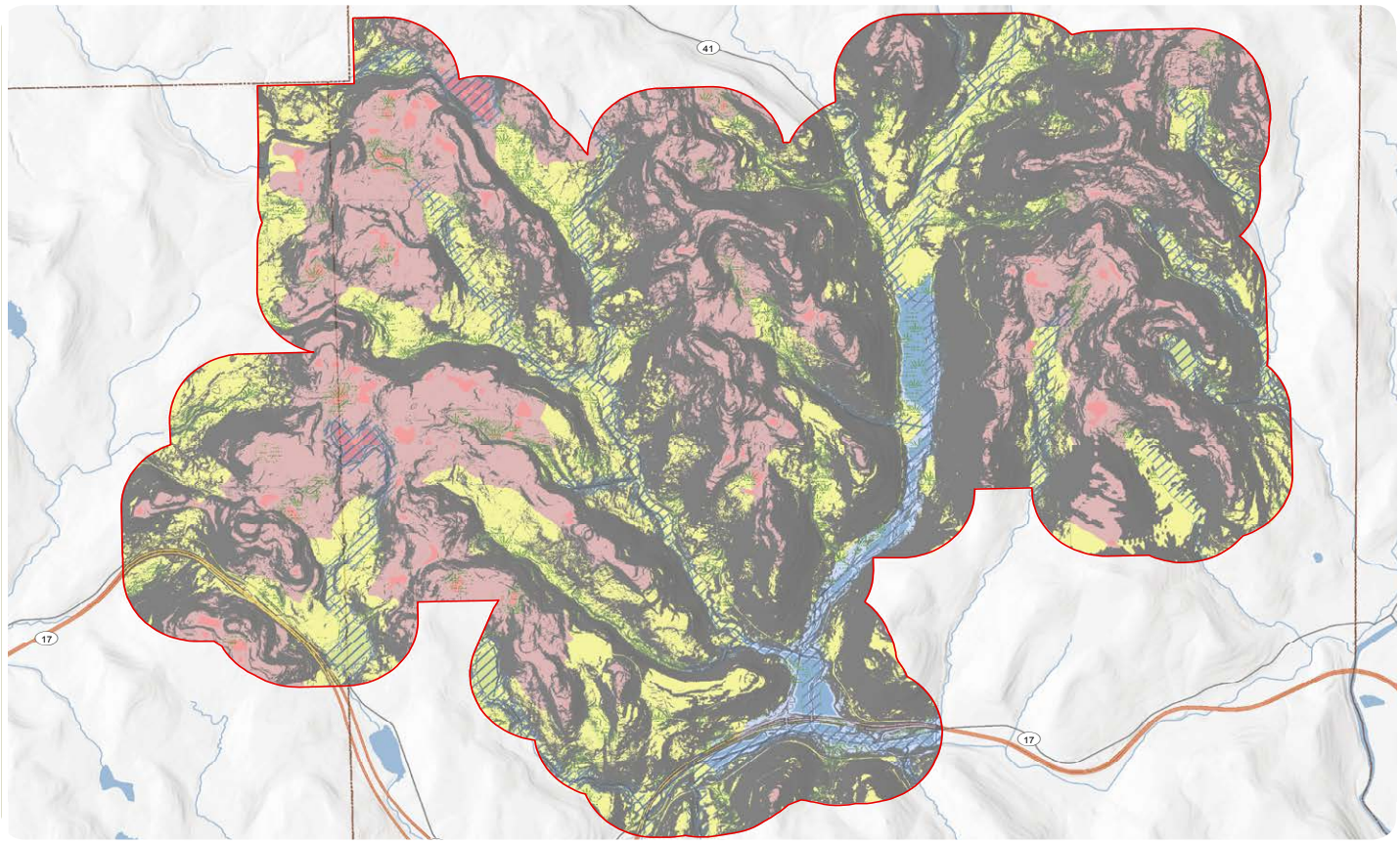

Phase IA Archaeological Resources Survey & Phase IB Fieldwork Plan

Bluestone Wind Project

Towns of Windsor and Sanford, Broome County, New York

Prepared for:

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March 2018

Phase IA Archaeological Survey & Fieldwork Plan

Bluestone Wind Project

Towns of Sanford and Windsor, Broome County, New York

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March 2018

MANAGEMENT SUMMARY

SHPO Project Review Number:	17PR01874
Involved State and Federal Agencies:	Department of Public Service (DPS), Article 10 Application
Phase of Survey:	Phase IA Archaeological Survey and Fieldwork Plan
Location Information:	Towns of Sanford and Windsor, Broome County, New York
Survey Area:	
Project Description:	Up to 40 wind turbines and associated infrastructure
Project Area:	Approximately 33 square miles (APE for Direct Effects = approximately 362 acres)
USGS 7.5-Minute Quadrangle Map:	*Afton*, *Deposit*, *Gulf Summit,* and *North Sanford, NY*
Archaeological Resources Overview:	Seventeen archaeological sites have been previously recorded within 1 mile (1.6 km) of the Archaeological Study Area. They consist of eight (47%) historic-period sites, seven (41%) pre-contact Native American sites, and two (12%) sites of unknown age. Eleven of these sites occur within the Archaeological Study Area, consisting of five historic-period sites, four pre-contact sites, and two sites of unknown age.
Report Authors:	Nicholas P. Freeland, RPA; Patrick J. Heaton, RPA; Susan Lawson, LEED AP, Andrew Roblee, Lisa Young, and Jordon D. Loucks, RPA
Date of Report:	March 2018

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1.0 INTRODUCTION

1.1 Purpose of the Investigation

On behalf of Bluestone Wind, LLC (the Applicant), Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) prepared has prepared a Phase IA archaeological survey and fieldwork plan for the proposed Bluestone Wind Project (the Facility), located in the Towns of Sanford and Windsor, Broome County, New York. The Phase IA survey supports the Preliminary Scoping Statement (PSS) being prepared as part of review of the Facility under Article 10 (Certification of Major Electrical Generating Facilities) of the New York State Public Service Law. The information and recommendations included in this report are intended to assist the Department of Public Service (DPS) and the New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP) in their review of the proposed Facility in accordance Article 10. Please note that this report addresses only archaeological resources; information concerning the Facility's potential effect on historic-architectural resources has been (and will continue to be) provided to NYSOPRHP under separate cover.

As described in 16 NYCRR § 1001.20 (Exhibit 20: Cultural Resources), an Article 10 application must include:

> (a) A study of the impacts of the construction and operation of the facility interconnections and related facilities on archaeological resources including:
>
> (1) a summary of the nature of the probable impact on any archaeological/cultural resources identified addressing how those impacts shall be avoided or minimized;
>
> (2) a Phase IA archaeological/cultural resources study for the Area of Potential Effect (APE) for the facility site and any areas to be used for interconnections or related facilities, including a description of the methodology used for such study;
>
> (3) a Phase IB study, if required, as determined in consultation with OPRHP;
>
> (4) where warranted based on study results as determined in consultation with OPRHP, a study based on intensive archaeological field investigations shall be conducted to assess the boundaries, integrity and significance of cultural resources identified in studies. It shall be designed to obtain detailed information on the integrity, limits, structure, function, and cultural/historical context of an archaeological site, as feasible, sufficient to evaluate its potential eligibility for listing on the State or National Register of Historic Places. The need for and scope of work for such investigations shall be determined in consultation with OPRHP and DPS;
>
> (5) a statement demonstrating that all archaeological materials recovered during the facility cultural resources investigation shall be cleaned, catalogued, inventoried, and curated according to New York Archaeological Council standards; that to the extent possible, recovered artifacts shall be identified as to material, temporal or cultural/chronological associations, style and function; and that the facility archaeologists shall provide temporary storage for artifacts until a permanent curatorial facility is identified; and
>
> (6) an Unanticipated Discovery Plan that shall identify the actions to be taken in the unexpected event that resources of cultural, historical, or archaeological importance are encountered during the excavation process. This plan shall include a provision for work stoppage upon the discovery of possible archaeological or human remains. In addition, the plan shall specify the degree to which the methodology used to assess any discoveries follows the most recent Standards for Cultural Resource Investigations and Curation of Archaeological Collections in New York State. Such an assessment, if warranted, shall be conducted by a professional archaeologist, qualified according to the standards of New York State Archaeological Council.

The purpose of the Phase IA archaeological survey and fieldwork plan is to:

- define the Facility's area of potential effect (APE) relative to archaeological resources;
- determine whether previously identified archaeological resources are located within the APE; and,
- propose a methodology to identify archaeological resources within the APE, evaluate their eligibility for the State/National Register of Historic Places (S/NRHP), and assess the potential effect of the Facility on those resources.

All cultural resources studies undertaken by EDR in association with the Facility have been conducted by professionals who satisfy the qualifications criteria per the Secretary of the Interior's Standards for archaeology and historic preservation (36 CFR 61), as appropriate. The Phase IA report was prepared in accordance with the *New York State Historic Preservation Office Guidelines for Wind Farm Development Cultural Resources Survey Work* (the *SHPO Wind Guidelines*; NYSOPRHP, 2006) and applicable portions of NYSOPRHP's *Phase I Archaeological Report Format Requirements* (NYSOPRHP, 2005).

1.2 Facility Location and Description

The Applicant is proposing to construct an up to 124-megawatt (MW) wind powered electric generating project located within the Towns of Sanford and Windsor, Broome County, New York. The regional Facility location and general Facility vicinity are depicted on Figures 1 and 2, respectively. The Facility will be located on leased private land that is rural in nature (Appendix A: Photographs 1-10). The actual footprint of the proposed Facility components will be located within the leased land and will enable farmers and landowners to continue with farming operations or other current land uses such as forestry practices.

The proposed Facility consists of the construction and operation of a commercial-scale wind power project, including the installation and operation of up to 40 wind turbines. Other proposed components will include: access roads, above and underground collection lines, an above ground generator lead line, collection and point of interconnection (POI) substations, permanent meteorological (met) towers, construction staging/laydown yards, and an O&M building.

The following terms are used throughout this document to describe the proposed action:

Facility: Collectively refers to all components of the proposed project, including wind turbines, access roads, buried and above ground collection lines, generator lead lines, substations, meteorological towers, staging areas, and an operations and maintenance building.

Facility Area:	An area of land within which all Facility components will ultimately be located.
Facility Site:	Those parcels currently under, or being pursued, for lease (or other real property interests) with the Applicant for the location of all Facility components (which will be defined in the Article 10 Application).
Area of Potential Effect (APE) for Direct Effects:	The Area of Potential Effect (or APE) for Direct Effects for the Facility is the area containing all proposed soil disturbance associated with the Facility. As presently envisioned, the current Facility layout has an APE for Direct Effects of 362 acres. It is anticipated that the APE for Direct Effects will change as the Facility's design advances and becomes more refined.
Archaeological Study Area	An approximately 33-square mile (86-square km) polygon around the APE for Direct Effects which serves as the limits for all analysis associated with the archaeological landscape model (see Figure 2; Section 2.0).

1.3 Project Consultation

16 NYCRR § 1001.20 indicates that the scope of cultural resources studies for a major electrical generating facility should be determined in consultation with NYSOPRHP. In addition, the *SHPO Wind Guidelines* request that cultural resources surveys for wind energy projects include consultation with NYSORPHP to determine an appropriate research design for the identification of archaeological resources.

The Public Involvement Program Plan (PIP) for the proposed Facility was prepared as part of the Article 10 process, released in October 2016.[1] The PIP is designed to initiate the Article 10 process, and includes consultation with the affected agencies and other stakeholders; pre-application activities to encourage stakeholders to participate at the earliest opportunity; activities designed to educate the public as to the specific proposal and the Article 10 review process, including the availability of funding for municipal and local parties; the establishment of a website to disseminate information to the public and updates regarding the Facility and the Article 10 process; notifications to affected agencies and other stakeholders; and activities designed to encourage participation by stakeholders in the certification and compliance process.

The Applicant initiated formal consultation with the NYSOPRHP via the online Cultural Resources Information System (CRIS) on March 22, 2017, with a follow-up meeting on March 30, 2017 between NYSOPRHP, EDR, and the Applicant. Prior to the March 30 meeting, EDR spoke with the Oneida Nation regarding the Facility. Representatives of the Oneida Indian Nation informed EDR that ceremonial stone landscapes may be located within the Archaeological Study Area. Ceremonial stone landscapes typically consist of individual or groups of stone landscape features (SLFs). SLFs may include stacked stones, modified boulders, or boulders arranged in specific ways, which may have had

[1] The Public Involvement Program Plan (PIP) for the Facility is available on DPS' website here: http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=16-F-0559&submit=Search

traditional/ceremonial importance for Native American tribes. The Oneida Nation noted that it can be difficult to definitively identify the cultural affiliation of SLFs and expressed their preference that these sites be described as "man-made", be treated as culturally significant, and be avoided by Facility-related impacts.

During the March 30, 2017 meeting, the Applicant and EDR met with NYSOPRHP staff at their offices in Peebles Island and formally introduced the Bluestone Wind Project. NYSOPRHP noted that SLFs could be present within the Facility Area and noted their preference that an effort be made to differentiate between those related to Native American activity and those related to Euro-American activity.

SLFs are discussed in detail in Section 2.3 of this report. The Applicant will continue to work with tribal representatives to identify any potential ceremonial stone landscapes of cultural significance within the APE for Direct Effects and will include an analysis of potential impacts to these features in the Phase IB report and the Article 10 Application. As part of the cultural resources studies to be performed, efforts will be made discern between Native American stone landscapes and Euro-American stone landscapes.

On August 22, 2017, the Applicant submitted the Public Scoping Statement for the proposed Facility to the NYSOPRHP via the CRIS system. NYSOPRHP responded to this submission on September 20, 2017 and requested that archaeological and historic architectural survey work plans be prepared and submitted for the Project (Perazio, 2017).

Additionally, on February 8, 2018 the Delaware Nation responded to a visual resources outreach request for the project ("Bluestone Wind Project Identification of Visually Sensitive Resources Official Request for Information"), stating in part:

> "Our main concerns at the Delaware Nation on these types of projects are as follows:
> 1. Keeping a 50-100 ft (at least) area of protection around known sites.
> 2. Maintaining the buffer area and not allowing heavy equipment to impact these areas. Compression is an issue of concern for us.
> 3. Protection of indigenous plants and/or re-introduction of the indigenous plants to the area is important to the Delaware Nation. Many of these are considered Traditional Cultural Properties for our people.
> 4. And if something is found, halting all work, contacting us within 48 hours and when work resumes discussion of a monitor if needed."

The submission of this Phase IA archaeological survey and fieldwork plan via the CRIS system continues NYSOPRHP consultation. This Phase IA archaeological survey report has been prepared in accordance with the requirements of 16 NYCRR § 1001.20 (Exhibit 20: Cultural Resources) and in anticipation of a request for such a study from NYSOPRHP. This report includes a map of the Archaeological Study Area, as well as a review of archaeological resources within and near the Archaeological Study Area, and a work plan for a subsequent Phase IB archaeological survey, including a definition of the APE for Direct Effects. Following submission and review of this work plan by

NYSOPRHP, it is anticipated the Applicant will retain a qualified cultural resources consultant who meets the Secretary of the Interior's Standards for Archaeology (36 CFR 61) to conduct a Phase IB archaeological survey as described herein. As stated in Section 1.1, this report addresses only archaeological resources; information concerning the Facility's potential effect on historic architectural resources is being provided to NYSOPRHP under separate cover via the CRIS website.

1.4 Facility's Area of Potential Effect and Study Area

The Facility's APE for Direct Effects relative to archaeological resources is defined as those areas where soil disturbance is proposed to occur during construction. The potential impact assumptions included below describe the Facility layout as presently envisioned and characterize anticipated limits of soil disturbance for each proposed Facility component, which cumulatively make up the Bluestone Wind Project's APE for Direct Effects (Table 1). For the purposes of describing the APE, the areas of disturbance listed below represent the temporary extent of soil disturbance anticipated to occur during Facility construction and do not represent permanent soil disturbance associated with the Facility. Note that the final Facility layout is still being determined. The assumptions provided below present the anticipated size of the Facility (based on the current, preliminary design) and areas of disturbance associated with proposed Facility components. These assumptions provide a basis for preparing an archaeological survey research design (as presented herein in Section 4.4). The archaeological survey will be conducted concurrently with wetland survey and delineation and a limited number of proposed Facility components will likely be moved following these surveys to reduce impacts to wetlands and archaeological sites.

Table 1. Impact Assumptions for the Proposed Bluestone Wind Project.

Facility Components	Typical Area of Vegetation Clearing	Typical Area of Total Soil Disturbance (temporary and permanent)	Typical Area of Permanent Soil Disturbance
Wind Turbines and Workspaces	Up to 265' radius per turbine	Up to 265' radius per turbine (up to 5.1 acres per turbine)	0.20 acre per turbine (pedestal plus crane pad)
Access Roads	100' wide per linear foot of road	80' wide per linear foot of road	40' wide per linear foot of road
Buried Electrical Collection Lines	75' wide per linear foot of line per collection line circuit	15' wide per linear foot of line per collection line circuit	None (topsoil and ground vegetation restored after construction)
Overhead Electrical Collection Lines	100' wide per linear foot of line	15' wide per linear foot of line	0.10 acre per pole
Permanent Meteorological Towers	1.5 acre per tower	0.10 acre per tower	0.05 acre per tower

Facility Components	Typical Area of Vegetation Clearing	Typical Area of Total Soil Disturbance (temporary and permanent)	Typical Area of Permanent Soil Disturbance
O&M Building and associated site (4,000 – 6,000 sf)	5 acres	5 acres	5 acres
Staging Area	5 acres per staging area	5 acres per staging area	None
Collection substation	5 acres	5 acres	5 acres

- Wind Turbines. Up to a 265-foot radius around each proposed wind turbine site will be cleared of vegetation, temporarily stripped of topsoil, and graded to create a workspace for turbine assembly and erection. This will result in temporary soil disturbance of up to approximately 5.1 acres per turbine. Up to 40 wind turbines may be constructed for the proposed Facility; however, at present only 29 turbines have been preliminarily sited. Therefore, all the analyses presented herein are based on a 29-turbine layout. If additional wind turbines are added, the APE calculations will be revised accordingly.
- Access Roads. The total length of gravel-surfaced access roads to be constructed for the Facility has not yet been determined. However, for the purposes of this report and work plan, it is assumed that the Facility will include up to 18.8 miles (30.3 kilometers [km]) of gravel-surfaced access roads. As the Facility design is developed, this number may change, and the APE calculations will be revised accordingly. anticipated permanent width of access roads will be 20 feet. During construction, the anticipated width of access roads will be up to 40 feet, within a 100-foot wide road corridor cleared of vegetation (to allow for crane movement and oversized vehicles delivering turbine components). The APE for Direct Effects for the proposed access roads consists of the maximum extent of soil disturbance (i.e., up to 80 feet).
- Collection Lines. The total length of combined overhead and underground collection lines that will collect power from the turbines to deliver to the collection substation has not yet been determined. However, for the purposes of this report and work plan, it is assumed that the Facility will include up to 30.0 miles (48.3 km) of overhead and underground collection lines. As the Facility design is developed, this number may change, and the APE calculations will be revised accordingly. Although underground cabling is the primary option for the electrical collector system, overhead cables will also be used where requested by landowners or where underground installation is prohibitive or infeasible due to constraints such as steep slopes, rivers, streams or creek crossings, bedrock etc. The maximum width of temporary soil disturbance is currently assumed to be 15 feet for both buried and overhead collection line construction.

- Meteorological Tower. Up to two permanent meteorological towers are proposed for the Facility. During construction, it is anticipated that up to 1.5 acres of vegetation clearing and up to 0.1 acre of temporary soil disturbance may be necessary. Following construction, each meteorological tower will occupy approximately 0.05-acre.
- O&M Facility. Construction of the Facility's proposed O&M building is anticipated to require up to 5 acres of soil disturbance.
- Staging Area. Up to two temporary staging areas/laydown yards, up to 5 acres in size each, are proposed for the Facility. Construction of the staging areas/laydown yards will include stripping/stockpiling topsoil, grading and compacting the subsoil, and installation of geotextile fabric and gravel.
- Substation. The Facility will require one combined collection and point-of-interconnect (POI) substation, the construction of which is anticipated to disturb up to 5 acres.

As noted above, the final Facility layout is still being determined and may include up to 40 wind turbines. However, for the purpose of proposing a Phase IB methodology and approximate level of effort for an archaeological survey, this archaeological survey fieldwork plan is based on a preliminary Facility layout that includes the installation and operation of up to 29 wind turbines, together with approximately 30.0 miles (48.3 km) of associated 34.5 kV collection lines (below grade and overhead), approximately 18.8 miles (30.3 km) of access roads, up to two permanent meteorological towers, one operation and maintenance (O&M) building, and up to two temporary construction staging/laydown areas. In addition, the Facility will include one collection substation.

Based on these impact assumptions, the Facility's APE for Direct Effects is anticipated (based on the preliminary layout) to be approximately 362 acres in size. Note that this represents the total areas that will be temporarily disturbed by construction. Following construction, the operating Facility is anticipated to have a permanent footprint that is significantly smaller, and the remaining portions of the APE will be restored to their current use and/or condition. Note that as the Facility design is further refined, the APE relative to archaeological resources may be revised in association with subsequent layout changes during the permitting process, and that changes in the layout of the Facility are likely to result in changes in the size of the APE, which will be documented in the Phase IB archaeological survey report.

2.0 BACKGROUND AND SITE HISTORY

2.1 Geology and Soils

The proposed Facility is located in southeastern Broome County, with the Archaeological Study Area situated approximately 2.6 miles (4.2 km) north of the Pennsylvania/New York State line, and approximately 0.4 mile (0.6 km) west of the Delaware County/Broome County line. Southeastern Broome County occurs within the Catskill Mountains, part of the glaciated Appalachian Plateau physiographic province (Soil Conservation Service [SCS], 1971). This portion of the Catskill Mountains is characterized by steep-sided round-topped hills and small mountains separated by flat-bottomed valleys (Figure 2). The eastern part of Broome County contains the highest elevations and the lowest elevations in the county area found along the Susquehanna River. In this area, north-facing slopes are approximately twice as steep as south-facing slopes (SCS, 1971:92). Broome County contains several major rivers: the Susquehanna, Chenango, and Tioughnioga all pass through the county, and the Delaware River forms the county boundary in its southeast corner (SCS, 1971).

Elevations within the Archaeological Study Area range from approximately 1,080 feet (329 meters) above mean sea level (amsl) at the southeastern edge along Oquaga Creek to 2,024 feet (617 meters) amsl in the northern portion of the Study Area at an unnamed nob on the divide between Oquaga Creek to the east and Marsh Creek to the west. The majority of the Archaeological Study Area drains east and southeast into the West Branch of the Delaware River via Oquaga Creek and Big Hollow. A small area along the western edge of the Archaeological Study Area drains into the Susquehanna River via Tuscarora Creek and an unnamed drainage. The drainage divide between the Susquehanna and Delaware watersheds consists of a dissected ridgeline that trends roughly north south through the Archaeological Study Area (Figure 2).

Three bedrock units occur within the Archaeological Study Area (Dicken et al., 2005). The dominant bedrock unit is the Upper Devonian (approximately 372 to 383 million years ago) Upper Walton Formation which contains shale, sandstone, and conglomerate and underlies approximately 78% of the Study Area. The two other bedrock units, the Gardeau Formation and the Slide Mountain Formation, (which comprise 15% and 7% of the Archaeological Study Area, respectively) also date to the Upper Devonian Period and consist of sedimentary rocks (Dicken et al., 2005).

EDR reviewed the *Soil Survey of Broome County, New York* (SCS, 1971) for data concerning soils within the Archaeological Study Area as well as electronic data for the Upper Delaware and Upper Susquehanna subbasins from the Environmental Systems Research Institute (ESRI) and Natural Resources Conservation Service (NRCS) online SSURGO service (ESRI and NRCS, 2018a; 2018b). Forty-four mapped soil units occur within the Archaeological Study Area (Figure 3); however, only 14 soil units make up more than 2% of the Archaeological Study Area, individually. They are summarized in Table 2 and depicted in Figure 3. The major mapped soil units consist primarily of silty loams

as well as stony and rocky soils and range from somewhat poorly drained to well drained. The majority of major soil units are moderately well drained to well drained (see Table 2).

It is worth noting that of the soil units making up less than 2% of the Archaeological Study Area, four are alluvial soils occurring on flood plains (Middlebury silt loam, Alluvial land, Tioga gravelly silt loam, fan, Tioga silt loam) and one is an alluvial soil occurring on deltas and outwash plains (Braceville gravelly silt loam). All five of these soil units have the potential to contain deeply buried cultural deposits and, therefore, could require special consideration during archaeological testing. Special methodologies for flood plain soils area discussed in Section 4.1.2 of this report.

Table 2. Major Mapped Soil Units within the Archaeological Study Area (ESRI and NRCS, 2018a; 2018b).

Map Unit Name	% of Facility APE	Soil Horizon Depth (inches)	Color	Texture, Inclusions	Slope %	Drainage	Landform
Lordstown and Oquaga extremely stony and rocky soils	15.0%	*Lordstown* Ap:0 - 7 B21:7 - 16 B22:16 - 26 C:26 - 28 R:28 - 36 *Oquaga* Ap: 0-6 B21:6-16 B22:16-32 R:32+	 DkGrBr YlBr YlBr LiOlBr Gr DkBr StBr RdBr	 ChSiLo ChSiLo ChSiLo VChSiLo Sandstone bedrock ChSiLo ChSiLo ChSiLo Sandstone	0-35%	Well drained	Benches, hills, ridges
Morris channery silt loam	10.7%	Ap:0-7 B2:7-13 A'2:13-15 B'x1:15-25 B'x2:25-49 Cx:49-85	Br Br PiGr RdBr RdBr DkRdBr	ChSiLo ChLo ChVFiSaLo ChSiLo VChSiLo ChSiLo	8-15%	Somewhat poorly drained	Drumlinoid ridges, hills, till plains
Cattaraugus channery silt loam	9.9%	Ap:0-6 B21:6 - 16 B22:16 – 23: B23:23 - 28 Bx:28 - 48 Cx: 48 - 52	DkBr Br DkBr DkBr RdBr Br	ChSiLo ChSiLo ChSiLo ChSiLo VChSiLo VChSiLo	15-25%	Well drained	Drumlinoid ridges, hills, till plains
Cattaraugus channery silt loam	7.9%	Ap:0-6 B21:6 - 16 B22:16 – 23: B23:23 - 28 Bx:28 - 48 Cx: 48 - 52	DkBr Br DkBr DkBr RdBr Br	ChSiLo ChSiLo ChSiLo ChSiLo VChSiLo VChSiLo	5-15%	Well drained	Drumlinoid ridges, hills, till plains
Oquaga channery silt loam	7.3%	Ap: 0-6 B21:6-16 B22:16-32 R:32+	DkBr StBr RdBr	ChSiLo ChSiLo ChSiLo Sandstone	15-25%	Well drained	Benches, hills, ridges
Morris channery silt loam	5.5%	Ap:0-7 B2:7-13 A'2:13-15 B'x1:15-25 B'x2:25-49 Cx:49-85	Br Br PiGr RdBr RdBr DkRdBr	ChSiLo ChLo ChVFiSaLo ChSiLo VChSiLo ChSiLo	2-8%	Somewhat poorly drained	Drumlinoid ridges, hills, till plains
Culvers channery silt loam	4.7%	Ap:0-7 B21:7-13 B22:13-18 A'2:18-20	DkBr RdBr&Br RdBr LiBr	ChSiLo ChSiLo ChSiLo ChLo	8-15%	Moderately well drained	Drumlinoid ridges, hills, till plains

Map Unit Name	% of Facility APE	Soil Horizon Depth (inches)	Color	Texture, Inclusions	Slope %	Drainage	Landform
		B'xl:20-27 B'x2:27-55 Cx:55-91	RdBr DkRdGr RdBr	ChSiLo FiSiLo ChSiLo			
Volusia channery silt loam	4.1%	Ap:0-6 B2:6-13 A'2:13-17 B'xl:17-35 B'x2:35-54 Cx:54-64	VDkGrBr OlBr Gr DkGrBr DkGrBr OlBr	ChSiLo ChSiLo ChSiLo ChSiLo ChSiLo ChSiLo	8-15%	Somewhat poorly drained	Hills on uplands
Cattaraugus channery silt loam	3.2%	Ap:0-6 B21:6-16 B22:16–23: B23:23-28 Bx:28-48 Cx: 48-52	DkBr Br DkBr DkBr RdBr Br	ChSiLo ChSiLo ChSiLo ChSiLo VChSiLo VChSiLo	25-35%	Well drained	Drumlinoid ridges, hills, till plains
Oquaga channery silty loam	3.0%	Ap: 0-6 B21: 6-16 B22: 16-32	DkBR StBr RdBr	ChSiLo ChSiLo ChSiLo	5-15%	Well drained	Benches, hills, ridges
Lordstown and Oquaga channery silt loams	2.9%	*Lordstown* Ap:0 - 7 B21:7 - 16 B22:16 - 26 C:26 - 28 R:28 - 36 *Oquaga* Ap: 0-6 B21:6-16 B22:16-32 R:32+	 DkGrBr YlBr YlBr LiOlBr Gr DkBr StBr RdBr	 ChSiLo ChSiLo ChSiLo VChSiLo Sandstone ChSiLo ChSiLo ChSiLo Sandstone	25-35%	Well drained	Benches, hills, ridges
Culvers channery silt loam	2.7%	Ap: 0-7 B21: 7-13 B22: 13-18 A'2: 18-20 B'xl: 20-27 B'x2: 27-55 Cx: 55-91	DkBr RdBr+Br +DkBr RdBr LiBr RdBr DkRdGr RdBr	ChSiLo ChSiLo ChSiLo ChLo ChSiLo FiSiLo ChSiLo + SiCl	2-8%	Moderately well drained	Drumlinoid ridges, hills, till plains
Lordstown and Oquaga soils	2.3%	*Lordstown* Ap:0 - 7 B21:7 - 16 B22:16 - 26 C:26 - 28 R:28 - 36 *Oquaga* Ap: 0-6 B21:6-16 B22:16-32 R:32+	 DkGrBr YlBr YlBr LiOlBr Gr DkBr StBr RdBr	 ChSiLo ChSiLo ChSiLo VChSiLo Sandstone ChSiLo ChSiLo ChSiLo Sandstone	35-60%	Well drained	Benches, hills, ridges
Mardin channery silt loam	2.2%	Ap:0-7 B2:7-15 A'2:15-18 B'xl:18-28 B'x2:28-58 Ox:58-70+	DkYlBr YlBr Br DkYlBr YlBr to OlBr PaOl	ChSiLo ChSiLo ChSiLo ChSiLo ChSiLo VChSiLo	8-15%	Moderately well drained	Drumlinoid ridges, hills, till plains

2.2 Previous Archaeological Resources Surveys within the Archaeological Study Area

According to the NYSOPRHP's CRIS database, nine previous archaeological surveys/investigations have been conducted within 1 mile (1.6 km) of the Archaeological Study Area, and five of these occur partially or wholly within the Archaeological Study Area (Table 3; Figure 4[2]). The five previous surveys/investigations conducted within the Archaeological Study Area consist of one Phase I survey for the construction of a pond at a private residence, one Phase II site investigation for the Constitution Pipeline, and three Phase I surveys for different stages of the Constitution Pipeline. The remaining four surveys were conducted outside the Archaeological Study Area itself (but still within 1 mile [1.6 km]). These consist of four combination Phase IA/IB surveys conducted in support of three municipal infrastructure projects and one communications tower.

Table 3. Previous Cultural Resources Surveys within 1 mi. (1.6 km) of the Archaeological Study Area.

Year	NYSOPRHP Survey Number	Report Name	Sites Identified/ Examined[3]	Distance from Archaeological Study Area	Reference
2003	03SR54140	Phase 1 Archaeological Survey Deposit Pond Project	N/A	0 miles (within Archaeological Study Area)	PAF, 2003
2013	N/A (survey not in CRIS)	Phase I Archaeological Survey of the New York Portion of the Constitution Pipeline Project (Updated November 2013)	00712.000040 00712.000036 00712.000037	0 miles (within Archaeological Study Area)	URS Corporation (URS), 2013
2015	15SR00662	Phase I Archaeological Survey of the New York Portion of the Constitution Pipeline (2014 Survey Results)	00712.000088	0 miles (within Archaeological Study Area)	URS, 2015a
2015	15SR00664	2015 Update: Phase I Archaeological Survey of the Constitution Pipeline	--	0 miles (within Archaeological Study Area)	AECOM, 2015a
2015	15SR00666	Phase II Archaeological Testing of Broome County Portion of Constitution Pipeline	00712.000036 00712.000037 00712.000040	0 miles (within Archaeological Study Area)	URS, 2015b
2001	01SR52220	Section 106 Consultation Gulf Summit	N/A	1.0 mile southeast	Grubb, 2001
2003	03SR53568	Stage 1 Cultural Resource Investigation for the WCT Village 120' Monopole Cell Tower	N/A	1.0 mile southeast	Pierce, 2003
2009	09SR59127	Phase 1 Archaeological Survey, Deposit Second Street Drainage Project	N/A	1.0 mile southeast	PAF, 2009
2014	14SR63042	Phase 1 Cultural Resource Survey, Deposit Central School Athletic Field Project	02544.000020	1.0 mile east	PAF, 2014

[2] The Phase I surveys for the Constitution Pipeline (URS, 2013; AECOM, 2015a; URS, 2015a) have not been digitized in CRIS and the Phase II Investigations for the Constitution Pipeline in Broome County (URS, 2015b) was digitized as a very large, generalized polygon. The Phase I and II investigations associated with the Constitution Pipeline were digitized based on the maps included in the survey/investigation reports.
[3] Note: for archaeological surveys extending outside the 1-mile (1.6-km) search radius, only sites within 1 mile (1.6 km) of the Archaeological Study Area are included here.

2.3 Previously Identified Archaeological Sites within the Archaeological Study Area

The NYSOPRHP *Phase I Archaeological Report Format Requirements* (NYSOPRHP, 2005) indicate that Phase IA survey reports should include a summary of previously identified archaeological sites located within 1 mile (1.6 km) of the project. According to the CRIS database, 17 archaeological sites have been previously recorded within 1 mile of the Archaeological Study Area. They consist of eight (47%) historic-period sites, seven (41%) pre-contact Native American sites, and two (12%) sites of unknown age. Eleven of these sites occur within the Archaeological Study Area: five historic-period sites, four pre-contact Native American sites, and two sites of unknown age. The sites are summarized below in Table 4. It is important to note that one of the sites of unknown temporal and cultural affiliation (USN 00712.000088) contains stone piles (or stone landscape features, here in referred to as SLFs) which are potentially culturally significant. These types of features are discussed in Section 3.3 of this report.

Table 4. Archaeological Sites within 1 mi. (1.6 km) of the Archaeological Study Area

Site Number	Site Name	S/NRHP-Eligibility	Time Period	Site Type	Distance from Project
00712.000004	Millennium Pipeline-BRO-300	Undetermined	Unknown	Unknown	0 miles (within Archaeological Study Area)
00712.000005	Millennium Pipeline-BRO-181 Prehistoric (FLAKE)	Undetermined	Pre-contact	Isolated flake	0 miles (within Archaeological Study Area)
00712.000006	Millennium Pipeline-BRO-301 Historic Stone Walls	Undetermined	Historic-period	Stone walls	0 miles (within Archaeological Study Area)
00712.000007	Millennium Pipeline-BRO-303, Historic Foundation and Scatter	Undetermined	Historic-period	Foundation & artifact scatter	0 miles (within Archaeological Study Area)
00712.000008	Millennium Pipeline-BRO-190, Historic Well	Undetermined	Historic-period	Well	0 miles (within Archaeological Study Area)
00712.000032	Millennium Pipeline BRO-0603	Undetermined	Historic-period	Slate quarry w/structure	0 miles (within Archaeological Study Area)
00712.000033	Millennium Pipeline BRO-0604 Slate Quarry	Undetermined	Historic-period	Slate quarry	0 miles (within Archaeological Study Area)
00712.000037	NYBr213-Site 1	Undetermined	Pre-contact	Lithic scatter	0 miles (within Archaeological Study Area)
00712.000055	URS Survey #16001	Not Eligible	Pre-contact	Isolated artifact (unknown type)	0 miles (within Archaeological Study Area)
00712.000088	NYBr206-SP27 to SP30	Undetermined	Unknown	Stone Piles (unknown cultural affiliation)	0 miles (within Archaeological Study Area)
NYSM Area 2669	The Lee Site	Undetermined	Pre-contact	Possible Paleoindian. Lithic artifacts (Pennsylvania Jasper)	0 miles (within Archaeological Study Area)
00712.000036	NYBr205-Site 1	Undetermined	Historic-period	Foundation & artifact scatter	0.3 miles south
00716.000051	Millennium Pipeline-BRO-171, Historic Foundation	Undetermined	Historic-period	Foundation & artifact scatter	0.6 miles west

Site Number	Site Name	S/NRHP-Eligibility	Time Period	Site Type	Distance from Project
NYSM 8407	--	Undetermined	Pre-contact	Traces of occupation	0.8 mile southeast
NYSM 5351	NYSM 5351	Undetermined	Pre-contact	Traces of occupation	0.9 miles southeast
02544.000008	NKW Sash Factory, Butler Brook	Undetermined	Historic-period	Industrial historic site	1.0 mile southeast
02544.000020	Butler Brook Precontact Site	Undetermined	Pre-contact	Lithic scatter	1.0 mile southeast

2.4 Historic Context

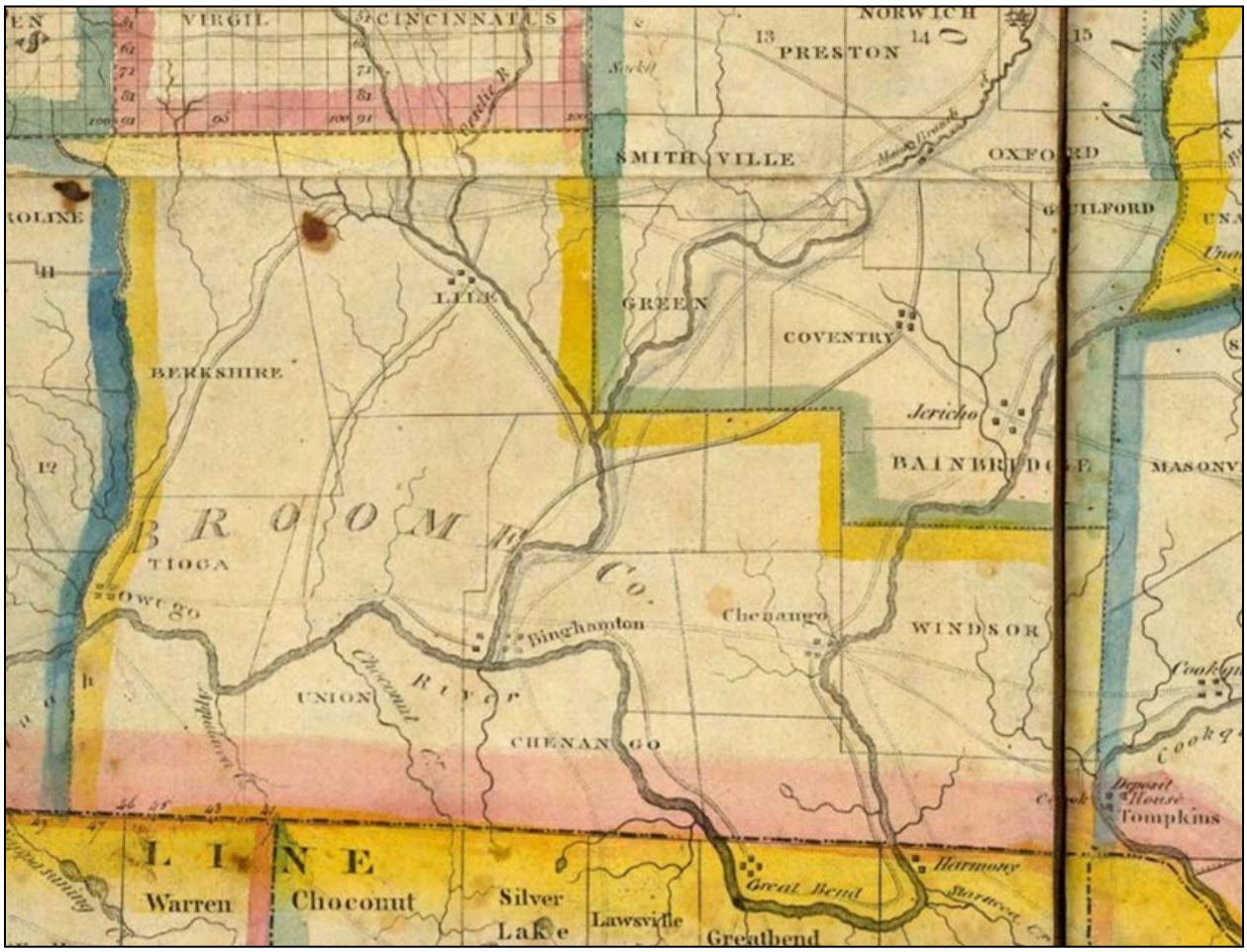
Archives and repositories consulted during EDR's background research for the Archaeological Study Area and surrounding vicinity included EDR's in-house collection of reference materials, and online digital collections of the Library of Congress, the New York State Library, and the New York Public Library; and the David Rumsey Map Collection.

Maps reviewed included the 1855 Gifford *Map of Broome County, New York* (Figure 5), the 1876 Everts *Combination Atlas Map of Broome County* - Towns of Colesville, Sanford and Windsor plates (Figure 6) the 1905 *Nineveh,* and the 1924 *Deposit, NY* USGS topographic quadrangle maps (Figure 7). Sources reviewed included *The Historical and Statistical Gazetteer of the State of New York* (French, 1860), *History of Broome County, New York* (Everts, 1876) and *The History of Broome County* (Smith, 1885).

The Facility is located in the Towns of Windsor and Sanford, Broome County, New York. Broome County's 607 square miles are divided into the City of Binghamton and 16 towns which contain seven incorporated villages. European explorers had come to the area that would become Broome County as early as 1618, with subsequent visits by Moravian missionaries from Pennsylvania in 1748. A missionary outpost was located at Oquaga[4], which previously served as a large Native American resting place for the traveling tribes of the Wyoming Valley just north of what would become the Village of Windsor. Mohawk Chief Joseph Brant used Oquaga as a headquarters to raid New York colony settlements (Hinman, 1975). In response, the fortification was destroyed by the colonial forces. Further European settlement was excluded due to the 1768 Treaty of Fort Stanwix which established Haudenosaunee territory as beginning at the Pennsylvania line and extending northward, and Oquaga served as a refugee settlement for Haudenosaunee feeling the ravages of war in the late eighteenth century[5] (Seeber, 2017). Settlement in the vicinity of modern Broome County did not begin again until after the treaty line was rescinded during the Revolutionary War (Smith 1885; Smith, 2005).

[4] Martial R. Hulce of Deposit (grandson of David Hotchkiss, early settler of the Town of Windsor) obtained as many as fifty different spellings for the Haudenosaunee Village that predated Windsor. These include Onoquaga, Onoquagee, Onohogiquage and so forth. Oquaga became the generally accepted spelling (Smith, 1885).

[5] Oquaga was listed on the New York State Register of Historic Places (SRHP) in 1974 (97NR03275) but was never listed on the National Register of Historic Places (NRHP).



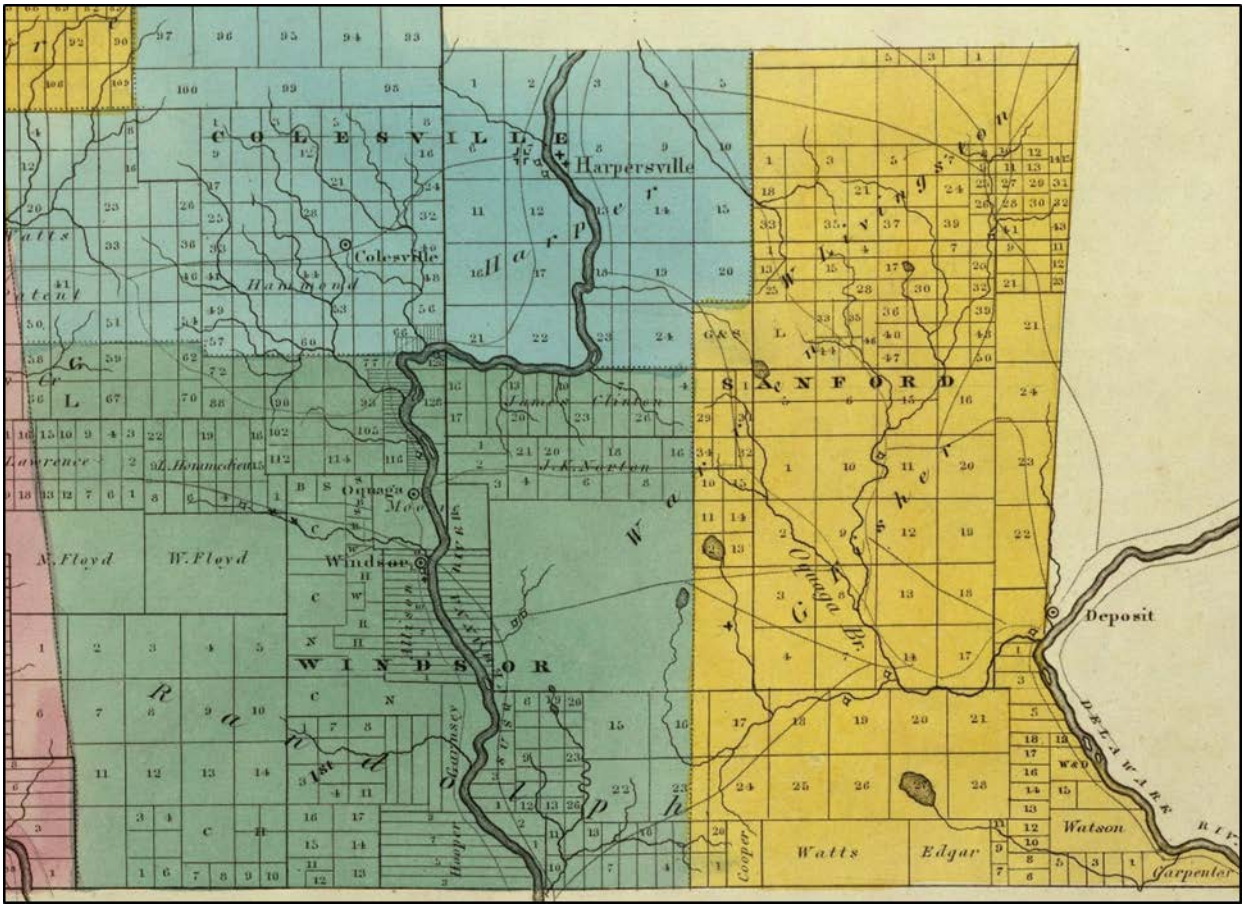
Inset 1. 1812 Lay *Map of the State of New York*
Broome County, created from Tioga County in 1806, experienced gradual settlement in the early nineteenth century, with only a handful of village centers established at the junctions of surface roads and waterways. By 1812, though Sanford Township was not yet established, the settlements of Owego, Binghamton and Chenango had formed along the Susquehanna River (Lay, 1812; collections of David Rumsey).

The earliest non-Native settlers were from New England and Pennsylvania, most having purchased large land tracts from proprietors (see Inset 1). Their journey was difficult, using only narrow Indian trails through unending forests and streams (Smith 2005). The entire county is in the Appalachian uplands, with hills of considerable topographical relief. The pioneers felled trees to build modest log cabins and planted some crops in what remained of their clearing, which helped eased the hardships of the harsh winters (Everts, 1876; Smith 1885).

Perseverance won out, and by 1855, the census revealed Broome County manufacturing to include an extensive list of articles, surpassing agriculture in variety. This included: 33 blacksmith shops, 16 boot and shoe shops, one brewery, one brick manufacturer, five cabinet makers shops, four carding and cloth dressing establishments, one candle and soap factory, 15 carriage and wagon manufacturers, seven cooper shops, 27 gristmills, six saddle and trunk manufactories, one line manufactory, five machine shops, two marble manufactories, two millenaries, one paper mill, two plaster mills, 159 sawmills, four stair building establishments, 20 tanneries, eight tin and sheet iron manufactories,

and one turning shop (French, 1860). By 1855, the 36,500 residents of Broome County were served by 63 churches, and the 1859 Report of the Superintendent of Public Instruction counted 211 schoolhouses, 214 districts, and 221 employed teachers serving 13,510 students (French, 1860).

One of the earliest Broome County settlers, David Hotchkiss of Waterbury, Connecticut, purchased ten lots of Allison's Class Rights Patent in 1789 and had it surveyed for subdivision. It was from the Hotchkiss Tract that the Village of Windsor was founded (see Inset 2). Other Connecticut families followed in that same year, who collectively became known as the early settlers of Windsor: the Guerseys, Stows, Atwells, Knoxes, Russells, Springsteens, and Beechers among them. A 1794 flood of the Susquehanna River caused much suffering for those in Windsor, with the loss of homes, industry, and food. In the following years, without lumber and grain mills, the villagers had to travel 40 miles to the nearest facilities. Consequently, when Windsor was first settled in 1797, a grist and saw mill on Castle Creek were among the first buildings constructed. The industries that grew from this initial period necessitated the dams and bridges built in the early nineteenth century (Smith, 1885).



Inset 2. 1829 Burr *Map of the County of Broome*
By 1829, significant development had occurred in southeast Broome County with the settlement of the Village of Windsor, and establishment of Sanford Township which occurred in 1821. Much of southeastern Broome County was still wilderness, yet to be subdivided into the long narrow farming lots as seen along the Susquehanna River in Windsor (Burr, 1829; collections of David Rumsey).

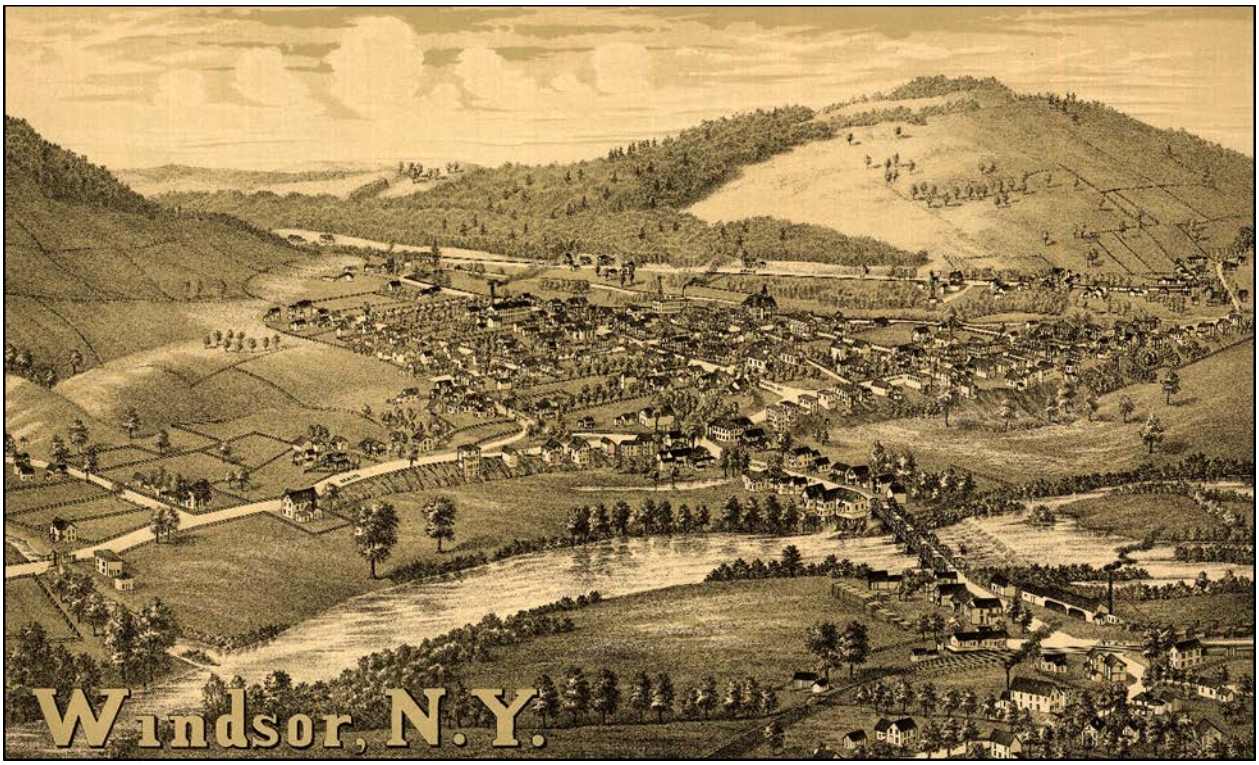
Hotchkiss modeled Windsor after a typical rural New England village, complete with a village green that remains extant today. Mail service began by a four-horse coach in 1815 and its schools were established shortly thereafter. The density of Windsor changed as mills, homes, churches and businesses were established around the village green in the 1830s and 40s, although during those decades its early economy continued to be centered on agriculture and small-scale milling operations (Broome County Department of Planning, 1979). The hills back from the river were mostly covered in pine, and the Susquehanna River allowed for lumber and produce to be floated south to the Pennsylvania markets. The abundance of lumber and its low price allowed for the conversion of log homes to frame, far earlier than the other neighboring villages in Broome County. In 1840, Windsor's population was 2,368, increasing to 3,286 by 1880 (Smith, 2005; Smith, 1885).

Smaller businesses such as tanneries, foundries and manufacturers also contributed to the village's early success, which was further boosted by the arrival of the New York and Erie railroad in 1849. By the 1850s, the major industry in Windsor was the manufacturing of buggy whips, which lead to a long period of economic success. This growth was illustrated by the construction of five churches to serve the village (French, 1860; Breyer, 1979; Browne, 2005a). During these decades, many of Windsor's most elegant residences and businesses were constructed (see Inset 3). Dairy based agriculture enjoyed huge success in the 1880s, with two cheese factories built that decade, whose products were brought to other markets by the railroad (Smith, 1885).

The Village of Windsor was incorporated in 1897. At the turn of the twentieth century, the population began to decline. The whip industry collapsed as the automobile replaced the horse-drawn carriage in the early decades of the twentieth century. By 1920, Windsor's population had decreased to 2,137 as labor opportunities expanded elsewhere in Broome County (Breyer, 1979). Grove Street, on the north side of the Village, experienced a boost in development with school consolidation in 1931, and the construction of the Central School on the corner of Main Street and Grove Avenue. With the introduction of highways, Windsor later reemerged as a residential bedroom community to nearby Binghamton, and the population had risen to 4,373 by 1960 (Browne, 2005a).

The Town of Sanford was formed from the Town of Windsor in 1821 and has since remained largely rural in character (see Inset 2). Its early settlement can be traced back to William McClure in 1787, a surveyor from New Hampshire who became the first Town Supervisor in 1822 (Everts, 1876). McClure settled about 5 miles (8.1 km) west of the current Village of Deposit and surveyed the Fisher and Norton tracts into lots of 1 square mile each. Much like Windsor, Sanford's early economy and success was based in lumbering thanks to its river access to Pennsylvania markets. Sanford also benefitted from leather production at its many tanneries. By and large it was an agricultural town, and therefore its population growth was slow when compared to the Town of Windsor. In 1821, there "was not a sufficient number of freeholders in Sanford to form a jury, and an act was passed constituting any…. resident a competent juror"

(Everts, 1876:29). The 1855 census which described the yield of the previous year indicated the local agricultural products included over 2,000 bushels of winter grain, over 36,000 bushels of spring grain, over 4,000 tons of hay, over 11,000 bushels of potatoes, over 7,000 bushels of apples, over 238,000 pounds of butter and over 1,000 pounds of cheese. In 1860, Sanford boasted a livestock collection of 344 horses, 1,630 working oxen, 1,067 cows, 2,366 sheep and 673 pigs (French, 1860).



Inset 3. 1887 Burleigh Lithograph of Windsor, New York.
View northwest into the Village of Windsor. A variety of businesses and churches were present at the Village center, with residences and schools along side streets. Development was sparse along the floodplains of the Susquehanna River. Farmsteads were located south, west and north of the Village (Burleigh, 1887; collections of Library of Congress).

The largest village in The Town of Sanford is Deposit, which is located approximately 2 miles (3.2 km) east of the Archaeological Study Area in both Broome and Delaware counties, and was formerly known as the location of the Lenape settlement of Cokeose[6] (Browne, 2005b). Deposit was settled in 1791 by Captain Nathan Dean who purchased the portion of the village within Broome County, and opened a saw mill there that same year, a gristmill in 1792, a school in 1793 and an inn in 1794. The first store in Deposit was built in 1795 by Benjamin and Peter Gardiner, merchants who brought in eight sleighs of goods from New York (Smith, 1885). Growth was slow in Deposit during its first five decades due to the difficulty of settling such densely forested, hilly land. Most of the early settlement was on

[6] Locally, this was pronounced and written as Cookhouse by European settlers.

the east side of the Delaware River in Delaware County. In 1811 when the Village was incorporated, there were only 12 dwellings on the west side of the river (Smith, 1885).

The 1840 census for the Broome County portion of Deposit indicated a population of just 1,173. The 1840s changed that with the construction of the railroad through the village which brought jobs to the area. By 1849, several hotels, a railroad depot, and half of Sanford's dwellings were located in Deposit. The population had more than doubled to 2,508 in 1850 (Everts, 1876). A year later, the village charter was extended to include 828 acres, 400 of which were in Broome County. Deposit had few mercantile interests in this period aside from a grocery and general store which changed hands every few decades. A bootery, hardware store, book store, druggist and furniture store didn't arrive until 1870s. These businesses were largely located on Front Street, which followed the path of the old Indian trail from Deposit to Oquaga (Smith, 1885).

Historic maps reflect the slow rate of nineteenth century settlement in the vicinity of the Archaeological Study Area, and the continued lack of significant expansion throughout the twentieth century. The 1855 Gifford *Map of Broome, New York* (Figure 5) shows that the Villages of Windsor and Deposit are the most significant population and commercial centers nearest to the Facility, with a secondary center located at the hamlet of Harpursville to the north. Most of the Archaeological Study Area can be characterized as forested with scattered residences and farmsteads spaced along roadways and no notable commercial operations or schools located nearby. Most roads follow alluvial valleys between the higher hills and ridges. The New York and Erie railroad trends roughly northeast/southwest through the southern portion of the Archaeological Study Area between the Village of Deposit and the Pennsylvania State line south of the Village of Windsor.

The 1876 Everts *Combination Atlas Map of Broome County, New York* (Figure 6) depicts settlements in the vicinity of the Archaeological Study Area concentrated at crossroads or around the major waterways. By 1876, the early tracts and patents had all been subdivided into rectangular lots and sold. Owners, their built improvements, and early roads are depicted on the Everts Map. Roadways were diagonal thoroughfares that crossed the grid of parcels, driven by topography and connections to Windsor and Deposit, rather than a product of town-wide planning.

The 1905 USGS 15-minute *Nineveh NY* topographic quadrangle (Figure 7) shows similar road conditions to the 1876 Everts maps, though the 1924 7.5-minute *Deposit, NY* topographic quadrangle depicts a more formalized and defined network of roads located throughout the vicinity, thanks to the introduction of the automobile. Additional residential growth is depicted in the Towns of Windsor and Sanford, particularly in the Villages of Windsor and Deposit and the smaller hamlets of the Towns, but development is relatively sparse in the remainder of the Archaeological Study Area

The Broome County population reached its maximum of 221,815 people in 1970, and has steadily decreased since then (Forstall, 1996). Major population and employment centers in the twenty-first century include the City of Binghamton, and the Towns of Union and Vestal. The 2010 population of Broome County was 200,600, with the Town of Windsor housing 6,274 residents and the Town of Sanford housing 2,407 (USCB, 2017).

2.5 Existing Conditions

The Facility is proposed in rural Broome County, which is characterized by a mix of agricultural and forested land, dominated by forest (see Appendix A: Photographs 1-8). Currently, the APE for Direct Effects occurs in agricultural lands (approximately 10%) (see Appendix A: Photographs 1-7) and undeveloped forest (approximately 90%) (see Appendix A: Photographs 1-10). Existing conditions within the Archaeological Study Area have been observed and evaluated during site visits and via examination of aerial imagery. Land-use in the area is typical of the Southern Tier of New York and consists of agricultural hay, corn, and soy bean fields within flat land in alluvial valleys (see Appendix A: Photographs 1-5), scattered residential development along area roadways, and large tracts of undeveloped second-growth forest, concentrated on upland slopes and ridges (see Appendix A: Photographs 1-10). General observations of existing conditions within the vicinity of the Facility site include the following:

- Agricultural areas are concentrated along the bottoms of major alluvial valleys. In these areas, the agricultural development is nearly continuous with fields often separated only by thin tree lines, roads, or small residential lots (Appendix A: Photographs 1-5).
- Second-growth forests make up the majority (approximately 90%) of the Archaeological Study Area and are typically present in large uninterrupted swathes throughout the uplands in the area. Forested tracts are occasionally interrupted by roadways and small cleared residential lots, as well as larger areas of agricultural development (Appendix A: Photographs 1-10).
- New York State Route 17 trends roughly east/west, following the courses of Fly and Tuscarora Creeks through the southern portion of the Archaeological Study Area. It consists of a divided highway, with two lanes in either direction.
- The other roads in the Archaeological Study Area consist of the north/south trending State Route 41 as well as numerous County and Town-level roads. The majority of the roads within the Archaeological Study Area are paved and they are typically located in alluvial valleys, although some also traverse ridgelines and slopes (Appendix A: Photographs 3-4).
- The western half of the Archaeological Study Area contains several ponds and small lakes: Deer Lake, Marsh Pond, and Sky Lake. There is a concentrated housing development surrounding Deer Lake but only a small number of residences surround the other waterbodies.
- Other than the development around Deer Lake, the Archaeological Study Area does not contain any areas of concentrated development.

- Where present, residences are typically scattered along area roadways, with small groups of structures present at crossroads hamlets such as McClure, Mt. Carmel and Sanford.
- Aside from agricultural and residential development, the Archaeological Study Area also contains several small slate mines or gravel pits. These are strip-mined areas that are typically in isolated hilltop or hillside locations surrounded by forest (Appendix A: Photograph 11).

3.0 ARCHAEOLOGICAL SENSITIVITY ASSESSMENT

3.1 Pre-Contact Native-American Archaeological Sensitivity Assessment

As described in Section 2.3 of this report, seven previously recorded pre-contact Native American archaeological sites occur within 1 mile (1.6 km) of the Archaeological Study Area. These sites range from single isolated artifacts to more substantial lithic scatters and camp sites. Furthermore, the Archaeological Study Area is dominated by well-drained soils which were often preferred by pre-contact peoples for habitation sites. The most substantial pre-contact sites in the region are concentrated along the Susquehanna River and major creeks (i.e., generally outside the Archaeological Study Area); however, scattered smaller pre-contact sites are also known from upland settings. Therefore, the Archaeological Study Area is moderately sensitive for pre-contact Native American archaeology, with elevated sensitivity for those areas in close proximity to streams and wetlands. Pre-contact archaeological sites are most likely to be encountered near streams and wetlands (i.e., within approximately 100 meters [328 feet]) and least likely to be encountered in upland areas away from streams or wetlands (see additional discussion below and in Section 4 of this report).

As part of the background research for the current Phase IA archaeological survey and fieldwork plan, EDR reviewed several previous Phase IB archaeological surveys conducted for wind facilities in the Southern Tier of New York. The studies reviewed were conducted in Cattaraugus, Chautauqua, and Steuben Counties in similar landscapes and environmental settings to the currently proposed Bluestone Wind Project (i.e., all were conducted within the northern Allegheny Plateau, in areas characterized by moderate to high topographic relief). Table 5 summarizes the pre-contact archaeological resources (sites and isolated finds) identified during these surveys, and Table 6 summarizes the number of resources identified within each landscape classification zone. Due to the different terminologies used to describe landscape zones by different researchers, the following tables employ landscape classifications that are simpler and more general than those used in the landscape model presented in Section 4.3 of this report. It should be noted that EDR also reviewed the Phase IB surveys for the (proposed) Allegany and (constructed) Howard wind projects. The Phase IB surveys for these projects included 1,451 and 880 STPs, respectively, but did not identify any pre-contact archaeological sites or isolated finds.

Per the data summarized in Tables 5 and 6, it is immediately evident that more pre-contact cultural resources (both sites and isolated finds) have been identified in upland settings (ridges or saddles) than in any other setting, with sites preferentially located near water and isolates split between upland settings with and without water. Part of this is due to the siting of windfarms which preferentially selects upland locations. Therefore, upland settings have seen more extensive archaeological survey than valley walls and valley bottoms. For instance, in the recent archaeological survey for the Cassadaga Wind Project (EDR, 2016a) approximately 63% of the archaeological survey was undertaken on

upland landforms (both near water features and away from them). However, the trend for archaeological sites to be located in upland locations near water features is notable and should be considered significant. It is not surprising that pre-contact peoples preferred locations proximate to streams or wetlands because these water features offer not only fresh water for drinking and cooking, but also more diverse floral and faunal resources than areas away from water.

Table 5. Pre-contact archaeological sites and isolated finds identified during archaeological surveys for wind projects in western New York State.

Project	Site Name/Number	Site Type[A]	S/NRHP Eligibility	Landscape Class	Equivalent EDR Landscape Class
Allegany Wind (Cattaraugus County) (John Milner Associates, Inc. [JMA], 2010)	No pre-contact archaeological sites	N/A	N/A	N/A	N/A
Howard Wind (Steuben County) (JMA, 2006)	No pre-contact archaeological sites	N/A	N/A	N/A	N/A
Cohocton Wind (Steuben County) (PAF, 2006a)	Pine Hill 1 (SUBi-2612)	Isolated find	Not eligible	Uplands overlooking headwaters	Upland ridge/saddle near wetland/stream
	Pine Hill 2 (SUBi-2613)	Isolated find	Not eligible	Uplands overlooking headwaters	Upland ridge/saddle near wetland/stream
	Lent Hill 1 (SUBi-2614)	Isolated find	Not eligible	Uplands – no headwaters	Upland ridge/saddle – no water
	Lent Hill 2 (SUBi-2615)	Isolated find	Not eligible	Uplands overlooking headwaters	Upland ridge/saddle near wetland/stream
	Dutch Hill 1 (SUBi-2618)	Site	Unevaluated	Uplands overlooking headwaters	Upland ridge/saddle near wetland/stream
Prattsburg Wind (Steuben County) (PAF, 2006b)	Burke Road (SUBi-2545)	Isolated find	Not eligible	Upland plateau overlooking feeder drainage	Upland ridge/saddle near wetland/stream
Arkwright Wind (Chautauqua County) (Tetra Tech, 2008a; 2009a; 2009b)[B]	AR-AA IF-1	Site	Not eligible	Upland near water	Upland ridge/saddle near wetland/stream
	Arkwright Campground I	Site	Not eligible	Upland near water	Upland ridge/saddle near wetland/stream
	C23 IF-1	Site	Not eligible	Upland near water	Upland ridge/saddle near wetland/stream
	Cannon I	Site	Unevaluated	Valley wall near water	Valley wall near wetland/stream
	Cannon II	Site	Unevaluated	Upland near water	Upland ridge/saddle near wetland/stream
	Isolated Find T27/I	Site	Unevaluated	Valley wall – no water	Valley wall – no water
	Isolated Find T46R/I	Isolated Find	Unevaluated	Upland near water	Upland ridge/saddle near wetland/stream
	Jurczak I Site	Site	Unevaluated	Upland no water	Upland ridge/saddle - no water
	Lehman I	Site	Unevaluated	Valley wall near water	Valley wall near wetland/stream
	Maslach I	Site	Unevaluated	Upland near water	Upland ridge/saddle near wetland/stream
Cassadaga Wind (Chautauqua County) (EDR, 2016)	Allenbrand Precontact Site 2 (USN 01304.002069)	Site	Not eligible	Upland ridge near wetland	Upland ridge near wetland
	Allenbrand Precontact Site 3 (USN 01304.002070)	Site	Not eligible	Upland saddle near wetland	Upland saddle near wetland

Project	Site Name/Number	Site Type[A]	S/NRHP Eligibility	Landscape Class	Equivalent EDR Landscape Class
	Charrington Creek Precontact Site 1 (USN 01306.000351)	Site	Not eligible	Upland ridge near wetland	Upland ridge near wetland
	Green Highlands Precontact Site 1 (USN 01304.002072)	Isolated Find	Unevaluated	Upland ridge – no water	Upland ridge – no water
	Williams Precontact Site 1 (USN 01304.002079)	Site	Not eligible	Valley wall – no water	Valley wall – no water
	Williams Precontact Site 2 (USN 01304.002080)	Site	Not eligible	Valley wall – no water	Valley wall – no water
Baron Winds Project (Steuben County) (EDR, 2017)	C5.09 Pre-contact Isolate	Isolated Find	Not eligible	Upland ridge – no water	Upland ridge – no water
	Conderman Pre-contact Site (USN 10113.000026)	Site	Unevaluated	Upland ridge – no water	Upland ridge – no water
	D1 Pre-contact Isolate	Isolated Find	Unevaluated	Upland ridge – no water	Upland ridge – no water
	H2.56 Isolate	Isolated Find	Not eligible	Upland saddle – no water	Upland saddle – no water
	H3 Pre-contact Site 1	Site	Unevaluated	Upland ridge – no water	Upland ridge – no water
	I4 Pre-contact Site	Site	Unevaluated	Upland saddle – no water	Upland saddle – no water
	Mack School Pre-Contact Site	Site	Unevaluated	Steep slopes (adjacent to upland saddle – no water)	Steep slopes (adjacent to upland saddle – no water)
	Van Keuren Pre-contact Site 1	Isolated Find	Not eligible	Upland ridge – no water	Upland ridge – no water
	Van Keuren Pre-contact Site 2	Site	Not eligible	Upland ridge – no water	Upland ridge – no water

[A]To compensate for differing methodologies and terminologies, an Isolated Find is defined as a single pre-contact artifact with no associated artifacts or features; whereas a Site was defined as two or more pre-contact artifacts.
[B]AR-AA IF-1, C-23 IF-1, and Jurczak Site I were not assigned specific landscape classifications by Tetra Tech (2009a), so classification was derived from the site descriptions for the purposes of this analysis.

Table 6. Summary of Pre-contact Archaeological Sites and Isolated Finds by Generalized Landscape Class for Wind Projects in Western New York State.

Generalized landscape class (simplified from EDR's classification)	Pre-contact Sites	Pre-contact Isolated finds
Upland near water	9 (45%)	4 (40%)
Upland – no water	5 (25%)	6 (60%)
Valley wall near water	2 (10%)	0 (0%)
Valley wall – no water	3 (15%)	0 (0%)
Steep Slope	1 (5%)	0 (0%)
Total	20 (100%)	10 (100%)

Based on EDR's experience conducting archaeological surveys for other wind energy projects, the majority of archaeological sites that are identified during surveys for wind projects are historic period sites (e.g., farmsteads and similar). This is typically attributed to the upland and relatively marginal (from a natural resource perspective) character of many wind project sites, which are often located on ridges or other elevated areas away from the river valleys and waterbodies that served as attractive resources for larger Native American settlements. This is also the case for the currently proposed Facility. As previously discussed, the majority of the pre-contact Native American sites previously

recorded in the vicinity of the Archaeological Study Area occur along major rivers and creeks, such as the Susquehanna River, the West Branch of the Delaware River, Marsh Creek, and Tuscarora Creek. Therefore, the Archaeological Study Area is moderately sensitive for pre-contact Native American archaeology, with elevated sensitivity for those areas in close proximity to streams and wetlands.

It should also be noted that the Archaeological Study Area is sensitive for two site types which would not necessarily be correlated with streams or wetlands: Stone Landscape Features (or SLFs) and rockshelters. As discussed in Section 3.3 of this report, SLFs often occur on slopes and are not preferentially cited near water resources. One previously recorded SLF (USN 00712.000088) is located within the Archaeological Study Area. At present, the archaeological understanding of these features is not sufficient to predict their locations on the landscape, even in a general sense. Therefore, the entire APE for Direct Effects is considered moderately sensitive for SLFs. The second unusual site type, rockshelter, is likely to be present at overhanging bedrock exposures on slopes, of which there are many, within the APE. Therefore, areas in close proximity to bedrock exposures within the APE are considered moderately sensitive to contain pre-contact rockshelter sites. Specific methodologies for identifying and recording these site types within the APE are discussed in Section 4.1 of this report.

3.2 Historic Period Archaeological Sensitivity Assessment

As described in Section 2.4 and illustrated on historic maps (see Figures 5-7), the Archaeological Study Area has been occupied historically since at least the early nineteenth century. There are eight previously recorded historic archaeological sites within 1 mile (1.6 km) of the Archaeological Study Area. The locations of former structures within and near the Facility Site are shown on the 1855 Gifford *Map of Broome, New York* (Figure 5), the 1876 Everts *Combination Atlas Map of Broome County, New York* (Figure 6), the 1905 USGS 15-minute *Nineveh NY* topographic quadrangle (Figure 7), and the 1924 USGS 15-minute *Deposit, NY* topographic quadrangle (Figure 7).

Map Documented Structures (MDSs) within the Archaeological Study Area are generally located adjacent to existing roadways. In some instances, MDSs represent existing buildings and/or farms. In other instances, they are abandoned structures that now may be represented only by archaeological remains. Potential archaeological resources associated with these MDS locations could include abandoned residential and/or farmstead sites, where the complete residential and/or agricultural complex consisting of foundations, structural remains, artifact scatters, and other features, would constitute an archaeological site. In other locations more limited remains of these sites, perhaps represented by only a foundation or an artifact scatter, may be present. In addition to the MDS locations, the Archaeological Study Area also contains numerous bluestone (slate/shale) quarries, some of which date to the historic-period. Small scale quarries would not necessarily have been depicted on historical maps of the area.

Areas located in the immediate vicinity (within approximately 200 feet [61 meters]) of MDS locations are considered to have high potential for the presence of historic-period archaeological resources. The remaining (non-MDS) portions of the Archaeological Study Area exhibit moderate sensitivity to contain sites such as bluestone quarries and logging camps which would not have been documented on historical maps, as well as early outlying structures, camps, or settlements associated with Fort Oquaga that predate the historical maps reviewed.

3.3 Stone Landscape Features

Broome County contains numerous SLFs (or stone landscape features). SLFs are a type of cultural features made from stacked, aligned, modified, or otherwise cultural significant stones (Rush, 2017). These features, once attributed entirely to historic-period agricultural land clearance, have recently been recognized throughout the eastern United States as being potentially of Native American origin (United South and Eastern Tribes, Inc. [USET], 2007; National Park Service, 2008; Moore and Weiss, 2016; Rush, 2017) and may be considered sacred or otherwise significant. In 2007, USET released a resolution regarding "Sacred Ceremonial Stone Landscapes", in which they emphasized the cultural significance of ceremonial stone features present throughout the eastern United States which had frequently been misidentified by archaeologists as the results of historic-period agricultural activities (USET, 2007).

The difference between stone features created by historic-period land clearance and those attributable to Native American ceremonial practice is not always obvious. However, Moore and Weiss (2016:52) note that Native American SLFs can often be identified based on:

> "…alignment of stones to celestial objects or events (e.g., solstices, seasonal indicators, culturally significant events) on natural or artificially-created horizons, standing stones, effigies (e.g., turtles, bears, and snakes), paired stones, and split boulders (which may be natural or anthropogenic), observation seats, associated distinctive or culturally-significant flora (e.g., Rush 2015), the use of non-local stone transported from a distance away, post molds along alignments (which could be used as temporary construction markers;, and evidence of modifications to or moving of stones (e.g., flaking, soil deformation)."

Furthermore, non-Native American stone walls dating to the historic-period can be identifiable if they correspond with historical property parcel, town, county, and/or state boundaries (e.g., Windsor, 2000), or field edges; or if there are plough marks or scratches on the stones (Moore and Weiss, 2016).

The most extensive research into SLFs in New York has occurred at Fort Drum in Jefferson County (e.g., Rush, 2015; 2017). Archaeological survey at Fort Drum, in consultation with Native American tribal nations, has identified numerous pre-contact SLFs including cairns, possible stone circles, possible standing stones, monumental boulders, modified boulders, and geometric stone alignments (Rush, 2017). In southern New York and southwest New England, the

Public Archaeology Laboratory, encountered several different types of pre-contact SLFs while conducting archaeological survey for the Algonquin Gas Transmission Project. These included dry-laid stone walls, rock piles (cairns), stone chambers, unusually shaped boulders, split boulders with stones inserted into the split, and boulders propped off the ground with smaller rocks (Dubell, 2016).

Broome County, as well as the nearby Chenango and Delaware Counties to the north and east, respectively, also contain SLF sites. The high density of SLFs in this area is due in part to the extensive recent archaeological surveys conducted for the Constitution Pipeline which identified three archaeological sites containing SLFs in Broome County, and 29 total sites containing SLFs along the New York segment of the pipeline that passed through Broome, Chenango, Delaware and Schoharie Counties (AECOM, 2015a; URS, 2013; 2015a). However, prior to the surveys for the Constitution Pipeline, Windsor (2000) reported that Dolores Elliot of Broome County was aware of nearly 200 sites containing SLFs throughout the region.

Windsor (2000), AECOM (2015a), and URS (2013; 2015a) all report that the majority of these features are constructed on exposed bedrock. Windsor (2000) notes that the SLFs present in Chenango County are typically made of locally available tabular Devonian shale with occasional rounded glacially transported rocks incorporated. This is also true of the 29 SLF sites recorded during the Constitution Pipeline Surveys (AECOM, 2015a; URS, 2013; 2015a). Additionally, AECOM (2015a) and URS (2013; 2015a) recorded the physiographic landscape setting of the sites recorded during their surveys. Of the 29 sites containing SLFs, 10 (35%) occur on uplands[7], 8 (28%) occur on side slopes, seven (24%) occur on benches on side slopes, two (7%) occur on toes of slopes, one (3%) occurs on a slope above a drainage, and one (3%) occurs on a slope above a wetland.

As discussed above, although there are certain lines of evidence that can be used to assess the cultural origins and affiliations of SLFs, it remains a difficult task for many of these features. Therefore, in their assessment of SLF sites (referred to as "stone pile sites" in the report) identified during the Phase I archaeological surveys for the Constitution Pipeline, URS (2013:157) stated:

> "The stone pile sites may be associated with Native American pre-contact occupation of the region, or they may be associated with historic-period land use activities. The stone pile sites have not been formally evaluated for NRHP eligibility, but they have been provisionally designated as "culturally sensitive," and avoidance of impacts to these sites is recommended where possible."

[7] Note: terminology is slightly inconsistent between reports. Therefore, settings designated as "upland" in one report may have been split between "side slopes" and "benches on side slopes" in others. Additionally, the category "upland side slope" has been included in "side slope" and the categories "upland bench" and "narrow bench on side slope" has been included in "bench on side slope."

3.4 Prior Ground Disturbance

The *NYAC Standards* indicate that Phase I archaeological survey is not necessary in wetland areas, previously disturbed areas, and areas where slopes exceed 12-15% (NYAC, 1994). Slope is anticipated to be a significant factor, as much of the APE for Direct Effects occurs on steeply sloping interfluvial ridges and slopes. Proposed field methodologies for steeply sloped areas are discussed in detail in Section 4.1 of this report. Wetland communities within the Facility Site are being investigated as part of the environmental review for the Facility. In general, Facility components have been and will be sited to minimize impacts to wetland communities. Previous ground disturbance within the APE for Direct Effects is for the most part limited to previous or ongoing agricultural activities. Farming is not considered significant in terms of its potential to affect the integrity of archaeological resources (NYAC, 1994; NYSOPRHP, 2005). Additionally, areas within existing mines or gravel pits are considered significantly disturbed. Some areas immediately adjacent to existing roads within the Facility Site include drainage ditches, culverts, and areas of cut and/or fill. With the exception of these areas, the Facility Site in general does not appear to have been subjected to significant previous disturbance.

4.0 ARCHAEOLOGICAL RESOURCES SURVEY WORK PLAN

4.1 Phase IB Archaeological Survey Methodology

The Phase 1B survey is anticipated to include a complete pedestrian reconnaissance of the APE for Direct Effects, as well as shovel testing in selected areas (determined per a landscape model, described below) and systematic pedestrian surface survey in cultivated areas, if any are present within the APE. These methods are described below:

4.1.1 Pedestrian Reconnaissance

The Bluestone Wind Archaeological Study Area presents some unusual considerations in that it has the potential to contain SLF and rockshelter sites. These sites are notably different from more typical historic-period farmsteads and pre-contact camps and villages found in New York in that they frequently occur in steeply sloped areas. Therefore, the entire APE for Direct Effects, including steep slopes, will be subjected to pedestrian reconnaissance, regardless of ground surface visibility. Pedestrian reconnaissance will consist of individual archaeologists or small teams traversing the entirety of the APE on foot, spaced at 25- to 50-foot (approximately 8- to 15-meter) intervals. The purpose of pedestrian reconnaissance is to identify above-ground features such as SLFs, rockshelters, and historic-period foundations; not to identify individual or isolated artifacts. Therefore, the goals and methods of pedestrian reconnaissance are significantly different from those of systematic pedestrian surface survey which is discussed below. It is currently anticipated that the pedestrian reconnaissance stage of the Phase IB survey will occur prior to or concurrent with the shovel testing/pedestrian surface survey stage of the survey.

4.1.2 Shovel Testing

In addition to the pedestrian reconnaissance described above, archaeologists will excavate shovel tests in selected areas within the APE to determine whether archaeological sites are present. Shovel tests will be excavated along transects or in grid patterns at 5-meter (16-foot) intervals within selected areas to provide for intensive sampling of the various environmental zones within the Facility Site (per the *SHPO Wind Guidelines*; see Section 4.3 below). Shovel tests excavated for the Project will be 30-50 cm (12-20 inches) in diameter and excavated to sterile subsoil or the practical limits of hand excavation (in accordance with *the NYAC Standards*; NYAC, 1994). As noted above in Section 2.1, alluvial soils with the potential for deeply buried deposits are present within a small percentage of the Archaeological Study Area. If portions of the APE overlap with these soils, any shovel tests excavated in these areas will extend to a minimum depth of 1 m (approximately 3 feet 4 inches), below the ground surface. Field notes for each shovel test will be recorded on standardized forms that describe soil stratigraphy, record whether any artifacts were recovered, and note any other relevant observations. All soils excavated from shovel tests will be screened through 0.25-inch hardware cloth. If pre-contact Native American artifacts are recovered from an isolated shovel test, then up to eight additional shovel tests will be excavated at 1-meter and 3-meter intervals around the original shovel test to

determine whether the artifacts represent an isolated find or may indicate the presence of a more substantial archaeological site.

4.1.3 Pedestrian Surface Survey

If any corn fields and/or previously cultivated areas with greater than 80% ground-surface visibility are present within the APE, archaeologists will conduct systematic pedestrian surface survey to determine whether archaeological sites are present (in accordance with *the NYAC Standards*; NYAC, 1994). In these areas, archaeologists will traverse the APE for Direct Effects along transects spaced at 3- to 5-meter (10- to 16-foot) intervals while inspecting the ground surface for artifacts and/or archaeological features. The timing for this work is critical because surface survey needs to be conducted after a field has been freshly plowed and disked, and preferably following a rain event. If any artifacts or other indications of an archaeological site are observed on the ground surface, then the location of all finds will be recorded using professional-grade Global Positioning System (GPS) equipment. After recording the locations of all artifacts and/or features in a given area, archaeologists will collect observed artifacts (or a sample thereof) for subsequent laboratory identification and analysis, in accordance with standard archaeological methods.

4.1.4 Identification of Stone Landscape Features (SLFs)

Due to the unique considerations presented by SLFs, additional discussion of the methodology proposed to record these features is warranted. In the event that SLFs are encountered during the Phase IB survey, a preliminary attempt to evaluate the cultural origin of the feature (i.e., historic-period Euro/African American vs. Pre-contact Native American) will be made. However, it is difficult to accurately evaluate many of these features in the absence of consultation with Native American experts. Therefore, it is anticipated that only obviously historic-period stone walls at existing field or pasture edges will be assigned definitive origins. For the remainder of stone features within the APE for Direct Effects, the approach employed during the Phase I archaeological surveys for the Constitution Pipeline (URS, 2013; 2015a; AECOM, 2015a) will be followed. As discussed above, URS (2013:157) treated all SLFs as culturally sensitive and potentially significant, and recommended they be avoided by all project related impacts but did not formally evaluate them for the S/NRHP. The same approach will be followed for the current Phase IB survey. If a site containing SLFs cannot be avoided, a plan for additional documentation/mitigation will be developed in consultation with the NYSOPRHP and interested Tribal Nations. It is anticipated that documentation/mitigation for SLFs that cannot be avoided will follow a protocol similar to the one developed for SLFs impacted by the Constitution Pipeline (AECOM, 2015b), including the NYSOPRHP's additional recommendations (Perazio, 2016), which committed to thorough documentation and removal of features to be impacted by the project, as well as documentary research and cultural context development.

To ensure complete and consistent recording of SLFs, it is proposed that a standardized field form should be employed in recording of these features. An example field form is reproduced below as Inset 4. This form is loosely based on

the Montana SHPO's *Stone Circle Attribute Form* (Montana SHPO, n.d.), but modified extensively to apply specifically to SLFs in the northeastern United States. In addition to the completion of the standard field form, all SLFs encountered will be photographed from multiple angles and their locations will be recorded with survey-grade GPS units. Due to their potential cultural sensitivity, these features will not be disturbed, no stones will be removed from them, and no shovel tests will be excavated immediately adjacent to the features.

Stone Landscape Feature Field Record Sheet
Environmental Design & Research,
Landscape Architecture, Engineering, & Environmental Services, D.P.C.
217 Montgomery Street, Syracuse, NY 13202

Site No._____ Project No._____ Initials_____ Date_____

Feature No./ Type	Diameter/ width (N/S & E/W)	Height	Substrate	Collapsed or Standing	Number of Intact Courses	Type(s) of Stone Making up Feature (material & local/ non-local)	Lichen Development H = High M = Moderate L = Low N = None	Assoc. Artifacts	Photos	Comments
Feature 1/ Circular stacked rock cairn	*3.3 x 3.0 m*	*1.75 m*	*Limestone bedrock*	*Standing*	*8*	*90% local tabular limestone; 10% nonlocal glacially tranrported rounded metamorphic cobbles*	*M*	*1 strand braided wire on top of feature*	*11:02 – 11:06 (6 total)*	*Prominent black cobble placed on top of feature*

Inset 4. Proposed Stone Landscape Feature Standard Field Form (excerpt)

4.2 Archaeological Work Scope

The Phase IB survey methodology proposed in this fieldwork plan was designed in accordance with the 2006 *SHPO Wind Guidelines* (NYSOPRHP, 2006), with consideration given to the unusual archaeological considerations present in the Archaeological Study Area, as discussed above. This approach entails using the acreage of the project's archaeological APE (i.e., the APE for Direct Effects) to determine the appropriate level of effort required for the Project, and then concentrating survey efforts within selected portions of each landscape class identified in the Geographic Information System (GIS) model.

Table 7 provides the APE for Direct Effects associated with each Facility component (based on the current preliminary Facility design, as described in Section 1.4 of this report), distinguishing proposed pedestrian surface survey areas (i.e., cultivated areas) from proposed shovel testing areas (i.e., wooded or idle areas). Based on review of aerial imagery for the Facility Site, it is estimated that approximately 10% of the APE for Direct Effects occurs in agricultural fields where pedestrian surface survey will be possible. This is only an estimate and the actual proportion of pedestrian surface survey conducted during the Phase IB survey effort may be higher or lower than this. The extent of shovel testing will be adjusted in accordance with any adjustments to the extent of pedestrian surface survey so that the overall

extent of survey coverage proposed in this work plan will remain the same. As discussed above, the entire APE for Direct effects will also be subjected to pedestrian reconnaissance.

Table 7. Anticipated Phase IB Archaeological Survey APE and Methods.

Project Component	APE for Direct Effects (acres)	Portion of APE in Steeply Sloped Areas Exempt from Phase IB Survey (acres)	Portion of APE within Agricultural Areas Potentially Suitable for Pedestrian Surface Survey (acres)	Portion of APE within Non-Agricultural Areas Where it is Assumed Archaeological Survey Would be Accomplished via Shovel Testing[2] (acres)
Wind Turbines	146.8	63.1	0	83.7
Access Roads[1]	163.9	62.0	2.2	99.7
Buried & Overhead Collection Lines[1]	26.1	12.6	0.9	12.6
Meteorological Towers	0.2	0	0	0.2
Staging Areas[3]	10	--	--	--
O&M Facility[3]	5	--	--	--
Collection Substation[3]	5	--	--	--
POI Substation	5	1.3	0	3.7
Total	362.0	139.0	3.1	199.9

[1] In areas where access roads or collection lines overlap turbine workspaces, the overlapping acreage is included under turbine workspaces (and excluded from access road and collection lines) to avoid duplication. Similarly, in areas where collection lines are within the access road width of disturbance, the overlapping acreage is included under access roads.
[2] For instance, forested and/or idle areas are typically not suitable for pedestrian surface survey.
[3] These components have not been sited as of this Phase IA report. Therefore, they are not attributed to specific survey techniques (i.e., shovel testing or pedestrian surface survey) or landscape classifications (see Section 4.2).

4.3 Landscape Classification GIS Model

EDR performed a GIS-based landscape classification analysis for the Archaeological Study Area in accordance with the *SHPO Wind Guidelines*. The landscape classification identified environmental zones within the Archaeological Study Area following the example set forth in the New York State Museum Bulletin entitled *Archeological Investigations in the Upper Susquehanna Valley, New York State* (Funk, 1993).

The landscape classification model was created based on 2-meter resolution bare earth digital elevation model (DEM) data obtained from the New York State Orthoimagery Application (NYS Orthos Online). According to these data, the elevation within the Archaeological Study Area site ranges from approximately 1,050 to 2,020 feet (320 to 615 meters). Based on elevation alone, the area would fall within all three environmental zones defined by Funk (1993): valley floor, valley wall, and upland (or interfluve). Review of the DEM and USGS topographic mapping confirmed that the Archaeological Study Area includes characteristic features of each of these zones, with only slight modifications to the elevation thresholds identified by Funk (1993) needed to more accurately reflect where the transitions between environmental zones occur in this landscape. The three environmental zones were further divided into the following 16 landscape classes identified within the Archaeological Study Area site:

1. Upland knolls and ridges near streams
2. Upland knolls and ridges near wetlands/hydric soils
3. Upland knolls and ridges without associated water features
4. Upland saddles near streams
5. Upland saddles near wetlands/hydric soils
6. Upland saddles without associated water features
7. Valley Wall near streams
8. Valley Wall near wetlands/hydric soils
9. Valley Wall without associated water features
10. Valley Floor knolls and ridges near streams
11. Valley Floor knolls and ridges near wetlands/hydric soils
12. Valley Floor knolls and ridges without associated water features
13. Valley Floor near streams
14. Valley Floor near wetlands/hydric soils
15. Valley Floor without associated water features
16. Steep slopes (>12%)

The 16 landscape classes were identified by applying the following methods and definitions to the Archaeological Study Area through the use of ArcGIS software and the associated Spatial Analyst extension:

- *Steep Slopes*. Slope was calculated from the DEM and areas of greater than 12% slope were extracted for this landscape class.
- *Upland, Valley Wall, and Valley Floor*. Based on review of the DEM and USGS topographic mapping, areas with elevations less than 1,150 feet (351 meters) were designated as valley floor. Areas ranging in elevation from 1,150 feet up to 1,650 feet (503 meters) were designated as valley walls, and areas of elevation greater than 1,650 feet were designated as falling within the upland environmental zone.
- *Saddles*. With the intent of identifying relatively level areas sheltered by surrounding topography, saddles were defined as areas of less than 5% slope and an elevation at least 50 feet (15 meters) below the local maximum elevation, where 'local' is defined as a 1,000-foot (1,000-meter) radius neighborhood around each cell of the DEM.
- *Knolls and Ridges*. Areas that were not identified saddles or steep slopes were considered to be ridges/knolls.
- *Streams and Wetlands/Hydric Soils*. Areas near streams/water bodies and wetlands/hydric soils were defined by 328-foot (100 meters, per Funk, 1993) buffers applied to Environmental Systems Research Institute (ESRI) mapped streams, rivers, lakes, and ponds; National Wetland Inventory (NWI) and New York State Department of Environmental Conservation (NYSDEC) mapped wetlands; and soil map units with greater than 66 percent hydric soil components. Hydric soils were included in the analysis as a representation of potential historic/paleo wetlands, which are often significant predictors of pre-contact Native American archaeological

sites in landscape sensitivity studies (PAF, 2009). The NRCS Web Soil Survey defines five ratings of hydric soils based on percent of hydric components (NRCS, 2015). Although not explicitly defined, these ratings could reasonably be considered to represent non-hydric (less than 1 percent hydric components), mostly non-hydric (1 to 32 percent hydric components), partially hydric (33 to 65 percent hydric components), mostly hydric (66 to 99 percent hydric components), and hydric (100 percent hydric components). Therefore, a cut off of 66 percent hydric components was selected for this analysis to include areas of mapped soil types most likely to support wetlands, either currently or historically (i.e. prior to significant development/drainage). Areas where a stream/water body and wetland/hydric soil buffer overlapped were classified as near stream/water body.

The final landscape classification was created by combining the files resulting from the list above into one shapefile representing the spatial extent of each of the 16 landscape classes within the Archaeological Study Area. This file was then evaluated with respect to the proposed Facility layout to determine the acreage of soil disturbance anticipated to occur in each of the landscape classes. Note that the proposed staging areas, collection station, and O&M building have not been sited yet. Therefore, although their proposed disturbance is taken into account in the calculations of overall survey extent/APE for Direct Effect, they are not included in the landscape model calculations presented below.

4.4 Archaeological Survey Research Design

The resulting landscape classification for the Facility is presented in Table 8 and Figure 8. Table 8 provides the acreage of APE for Direct Effects associated with each Facility component (based on the current preliminary Facility design, as described in Section 1.4 of this report) within each of the identified landscape classes. Figure 8 depicts the extent of the 16 landscape classes within the APE for Direct Effects in relation to the proposed Facility layout. As shown in Table 8, approximately 173.9 acres of the APE occurs on uplands, 28.5 acres on valley walls, 0.5 acres on valley floors, and 139.1 acres of the APE occur on steep slopes[8]. A relatively small portion of the Project APE occurs near streams or wetlands/hydric soils (only 9.1 acres of APE within 328 feet of a mapped stream and 8.6 acres of APE within 328 feet of a mapped wetland or hydric soil). The vast majority of the APE lies in areas with no associated water features (185.2 acres, excluding steeply sloped areas).

[8] Note, this does not include the impacts associated with the proposed staging areas and O&M building. The impacts associated with these Facility components (which total 25.5 acres) will be incorporated into the landscape model, using the same logic applied to the other Facility components discussed herein, prior to the initiation of Phase 1B fieldwork.

Table 8. APE for Direct Effects by Facility Component and Landscape Class

Landscape Classification	Archaeological APE by Project Component (Acres)					Total Archaeological APE (Acres)
	Wind Turbine	Access Road[1]	Buried Collection Line[1]	POI Substation and Met Towers	Collection Substation, O&M Facility, and Staging Areas	
Steep Slopes (>12%)	63.1	62.1	12.6	1.3	0	139.1
Upland Ridges and Knolls						
No Associated Water	78.3	76.9	6	0.1	0	161.3
Near Wetland/Hydric Soil	1.5	2.3	0.1	0	0	3.9
Near Stream	0	0	0.3	0	0	0.3
Upland Saddles						
No Associated Water	3.9	4	0.4	0.1	0	8.4
Near Wetland/Hydric Soil	0	0	0	0	0	0
Near Stream	0	0	0	0	0	0
Valley Wall						
No Associated Water	0	12.6	2.9	0	0	15.5
Near Wetland/Hydric Soil	0	3.2	1.2	0	0	4.4
Near Stream	0	2.8	2.2	3.6	0	8.6
Valley Floor Ridges and Knolls						
No Associated Water	0	0	0	0	0	0
Near Wetland/Hydric Soil	0	0	0	0	0	0
Near Stream	0	0	0.1	0	0	0.1
Valley Floor						
No Associated Water	0	0	0	0	0	0
Near Wetland/Hydric Soil	0	0	0.3	0	0	0.3
Near Stream	0	0	0.1	0	0	0.1
Landscape Classification TBD	0	0	0	0	20	20
Total	146.8	163.9	26.6	5.1	20	362.4

[1]In areas where access roads or collection lines overlap turbine workspaces, the overlapping acreage is included under turbine workspaces (and excluded from access road and buried electrical lines) to avoid duplication. Similarly, in areas where collection lines are within the access road width of disturbance, the overlapping acreage is included under access roads.

[2] These components have not been sited as of this Phase IA report. Therefore, they are not attributed to specific survey techniques (i.e., shovel testing or pedestrian surface survey) or landscape classifications (see Section 4.2).

As described in Section 3.1, wind energy projects are typically sited on ridges or other uplands away from the river valleys and waterbodies that served as attractive resources for larger Native American settlements. In most instances, pre-contact sites are located in relatively close proximity to drainages and/or wetlands, both because of the availability of freshwater and diverse natural resources (e.g., Funk, 1993; PAF, 2009). Therefore, those portions of the APE for Direct Effects generally located proximate to drainages and/or wetlands should be considered as having a relatively higher potential for the presence of pre-contact Native American residential sites. In general terms, areas that are not located close to freshwater sources (and associated ecological habitats) are less likely to include major pre-contact Native American habitation sites, although they could contain isolated finds and/or non-habitation sites. However, it is assumed that SLFs may be located anywhere within the Archaeological Study Area, including steeply sloped areas and/or areas located away from water sources

The entire APE will be subject to pedestrian reconnaissance to identify SLFs and other visible archaeological features, such as foundations or structural remains. Given the steep topography and shallow soils throughout most of the APE, it is anticipated that this pedestrian reconnaissance will be adequate to identify most potential archaeological resources in the APE. In other words, there is relatively less potential for buried archaeological resources to be located within the APE. However, to ensure that a reasonable effort is made to identify potential archaeological sites, shovel testing will also be conducted within selected areas within the APE. Per the landscape classification model described in Section 4.3 and depicted in Figure 8, areas within the Facility Site classified as "No Associated Water" include those areas located more than 100 meters (or 328 feet) from a mapped stream, wetland, or areas with greater than 66% hydric soils. To allow for a cost-effective and efficient archaeological survey for the Project, it is proposed that within those portions of the APE for Direct Effects that are identified as "No Associated Water", only 25% of the overall level of effort (for shovel testing) that would be typically required for the acreage of the APE be sampled (shovel tested) as part of the Phase IB survey. In other words, approximately 185.2 acres of the APE for Direct Effects are in areas with "No Associated Water". The typical level of shovel testing for these areas would be equivalent to 2,963 shovel tests (at 16 shovel tests/acre). However, because these areas have a relatively lower potential for Native American archaeological sites to be present, it is proposed that approximately 740 shovel tests (or 25% of the typical level of effort) be excavated in areas with "No Associated Water" (see Table 9). This is consistent with the research design approved by NYSOPRHP and employed for the Phase IB archaeological survey of the Baron Winds Project in Steuben County (EDR, 2017).

Table 9 provides the research design for the Phase IB Archaeological Survey, based on the currently preliminary Facility layout. The locations of areas selected for intensive archaeological sampling within the APE for Direct Effects will be made on a judgmental basis in the field under the direction of a Registered Professional Archaeologist. Selection of areas for shovel testing, in accordance with the research design presented in Table 8, will prioritize areas of high sensitivity for historic or pre-contact archaeological sites within or adjacent to proposed Facility components. In general, high pre-contact archaeological sensitivity will be assigned to areas with little to no slope, moderate- to well-drained soils, and close proximity to water sources (including wetlands). However, based on several surveys in the northern Allegheny Plateau of New York, Versaggi and Hohman (2008) found that upland drainage divides (typically consisting of major ridgelines) were at times highly sensitive for pre-contact archaeology, regardless of proximity to water. They also noted a correlation between pre-contact Native American lithic scatters and glacial erratic boulders. Therefore, selection of locations for intensive shovel testing will also consider the elevated sensitivity of drainage divides (with or without water sources) and glacial erratic boulders for pre-contact archaeology. High historic archaeological sensitivity will be assigned to areas of the APE in close proximity to historical MDS locations. Additionally, shovel testing at or near MDS locations will emphasize archaeological site boundary definition for the purposes of site avoidance. This may involve testing adjacent to identified archaeological features such as foundations; or testing within the APE for Direct Effects in the vicinity of MDS locations with or without identified archaeological features. As previously noted,

prior to or concurrent with the shovel testing and pedestrian surface survey of select areas of the Facility APE, the entire APE will be subjected to pedestrian reconnaissance aimed at identification of SLFs, rockshelter sites, and historic-period foundations. The total level of effort proposed for the archaeological survey for the Bluestone Wind Project is expected to generate an adequate testing sample to evaluate the Facility's potential effect on archaeological resources (see Table 9).

Table 9. Summary of Archaeological Survey Method by Landscape Class.

Landscape Classification	Proposed Shovel Tests	Pedestrian Reconnaissance
Steep Slopes (>12%)	n/a	100% of APE
Upland Ridges and Knolls		
No Associated Water	645[1]	100% of APE
Near Wetland/Hydric Soil	56	100% of APE
Near Stream	4	100% of APE
Upland Saddles		
No Associated Water	34[1]	100% of APE
Near Wetland/Hydric Soil	0	100% of APE
Near Stream	0	100% of APE
Valley Wall		
No Associated Water	62[1]	100% of APE
Near Wetland/Hydric Soil	63	100% of APE
Near Stream	124	100% of APE
Valley Floor Ridges and Knolls		
No Associated Water	0	100% of APE
Near Wetland/Hydric Soil	0	100% of APE
Near Stream	1	100% of APE
Valley Floor		
No Associated Water	0	100% of APE
Near Wetland/Hydric Soil	4	100% of APE
Near Stream	1	100% of APE
Landscape Classification TBD[2]	288	100% of APE
Total	1,284	100% of APE

[1] The proposed number of shovel tests in areas with "No Associated Water" (i.e., those areas located more than 100 meters or 328 feet from a mapped stream, wetland, or areas with greater than 66% hydric soils) was reduced by 50% to reflect that Native American archaeological sites are not typically located in these areas. Additionally, 50% of the required survey in these areas will be undertaken via pedestrian surface survey and 50% will be undertaken via shovel testing.

[2] As previously noted, these include the proposed staging areas, collection substation, and O&M building.

As noted in Section 1.4 of this report, the final Facility layout is still being determined. For the purpose of proposing a Phase IB methodology and approximate level of effort for an archaeological survey, this Phase IB work plan is based on a preliminary Facility APE for Direct Effects (based on the preliminary layout) of 362 acres. As the Facility design is further refined, the APE for Direct Effects for the Facility is anticipated to change. Changes in the layout of the Facility are likely to result in changes in the size of the APE and corresponding level of effort. However, the final level of effort for the Phase IB archaeological survey will be determined based on the Facility layout at the time the survey is conducted in accordance with the landscape model and assumptions regarding proposed level of effort described herein, which will be documented in the subsequent Phase IB archaeological survey report.

4.5 Phase IB Archaeological Survey Report and Delivery of Electronic Data

Results of the Phase IB archaeological survey will be summarized in an illustrated report or reports prepared in accordance with the *New York State Historic Preservation Office (SHPO) Phase I Archaeological Report Format Requirements* issued in April 2005 (NYSOPRHP, 2005). Descriptive information for any archaeological sites identified during the Phase IB survey will be uploaded to NYSOPRHP's online CRIS database at the same time as the survey report (or reports). In accordance with the *SHPO Wind Guidelines* (NYSOPRHP, 2006), the archaeological consultant will also provide accurate location information for any sites identified during the Phase IB survey. It is anticipated that these data will be provided when uploading site descriptions into the CRIS database.

5.0 SUMMARY AND CONCLUSIONS

5.1 Potential Effect on Archaeological Resources

Proposed construction of the Facility will include ground disturbing activities that have the potential to impact archaeological resources. The APE for Direct Effects includes all areas within the limits of disturbance for proposed construction activities. These areas include proposed turbine pad and assembly areas, access roads, buried and overhead collection lines, overhead transmission lines, laydown and staging areas, operations and maintenance facilities, and substations. Any archaeological sites located within the Facility Site, or within the broader Archaeological Study Area, that are not within the limits of disturbance for proposed Facility components will not be affected by the Facility. Relative to the potential for archaeological sites to be located in the Facility Site, the results of the Phase IA archaeological resources survey for the proposed Bluestone Wind Facility can be summarized as follows:

- Seven previously recorded pre-contact Native American archaeological sites occur within 1 mile (1.6 km) of the Archaeological Study Area, four of which occur within the Archaeological Study Area. All potentially significant (i.e., S/NRHP-eligible or unevaluated) previously recorded sites will be avoided by all Facility-related impacts. Based on the high density of previously recorded sites in the vicinity, the Archaeological Study Area is moderately sensitive for pre-contact Native American archaeology, with elevated sensitivity for those areas in close proximity to streams and wetlands. Pre-contact archaeological sites are most likely to be encountered near streams and wetlands (i.e., within approximately 100 meters [328 feet]) and least likely to be encountered in upland areas away from streams or wetlands. Additionally, the Archaeological Study Area contains many bedrock exposures on steep slopes that create rockshelters potentially suitable for human habitation. Therefore, steep slopes within the APE are also considered moderately sensitive for pre-contact rockshelter sites.
- There are eight previously recorded historic archaeological sites within 1 mile (1.6 km) of the Archaeological Study Area, five of which occur within the Archaeological Study Area. All potentially significant (i.e., S/NRHP-eligible or undetermined) previously recorded sites will be avoided by all Facility-related impacts. Historic maps (see Figures 5-7) identify the locations of farmsteads and other potential historic-period archaeological sites within the Facility site; archaeological resources associated with these sites could include foundations, structural remains, artifact scatters, and/or other features. Areas located in the immediate vicinity (within approximately 200 feet [61 meters]) of MDS locations are considered to have high potential for the presence of historic-period archaeological resources. The remaining (non-MDS) portions of the Archaeological Study Area exhibit moderate sensitivity to contain sites such as bluestone quarries and logging camps which would not have been documented on historical maps.

- In addition to the previously recorded pre-contact and historic-period archaeological sites within and surrounding the Archaeological Study Area, there are two sites within the Archaeological Study Area of unknown temporal affiliation. One of these (USN 00712.000088), consists of stone piles (or stone landscape features) which are potentially significant.
- As discussed above, SLFs are assumed to be present within the Archaeological Study Area. The landscape distribution of these features is not fully understood; however, they are known to occur within steeply sloped areas. Therefore, steep slopes within the APE for Direct Effects are considered moderately sensitive to contain SLFs. All portions of the APE for Direct Effects will be subject to pedestrian reconnaissance to determine the presence of SLFs.

5.2 Summary of Archaeological Survey Work Plan

On behalf of Bluestone Wind, LLC EDR has prepared a Phase IA archaeological survey and fieldwork plan for the proposed Bluestone Wind Project, located in the Towns of Sanford and Windsor, Broome County, New York. Per the *SHPO Wind Guidelines*, a project's APE for Direct Effects is defined as those areas where soil disturbance is proposed to occur during construction (NYSOPRHP, 2006). Based on the current (preliminary) Facility design, the Facility's APE for Direct Effects is 362 acres in size. Please note that the Facility layout may be revised prior to conducting the Phase IB survey. The Facility APE and survey effort will be adjusted in accordance with Facility layout modifications consistent with the assumptions and methodology for determining the APE as presented herein.

Based on the current Facility design, it is anticipated that the Phase IB archaeological survey for the Facility will include:

- Pedestrian reconnaissance of the entire APE for Direct Effects.
- The excavation of approximately 1,284 shovel tests and pedestrian survey in suitable portions of the APE (i.e., areas with >80% ground surface visibility).
- Preparation of a Phase IB archaeological survey report or reports, to be submitted to NYSOPRHP via the CRIS website. The report (or reports) will be prepared in accordance with NYSOPRHP's *Phase I Archaeological Report Format Requirements* (NYSOPRHP, 2005).
- Submission of site information for any identified archaeological sites via the CRIS website.

This work plan is being provided to NYSOPRHP and other interested parties in advance of Phase IB archaeological survey fieldwork to confirm the landscape classification model, proposed sampling strategy, and anticipated field methodology and to ensure that the proposed scope of the survey is consistent with NYSOPRHP's expectations. Please provide a formal response indicating NYSOPRHP's concurrence with and/or comments on the work plan described herein.

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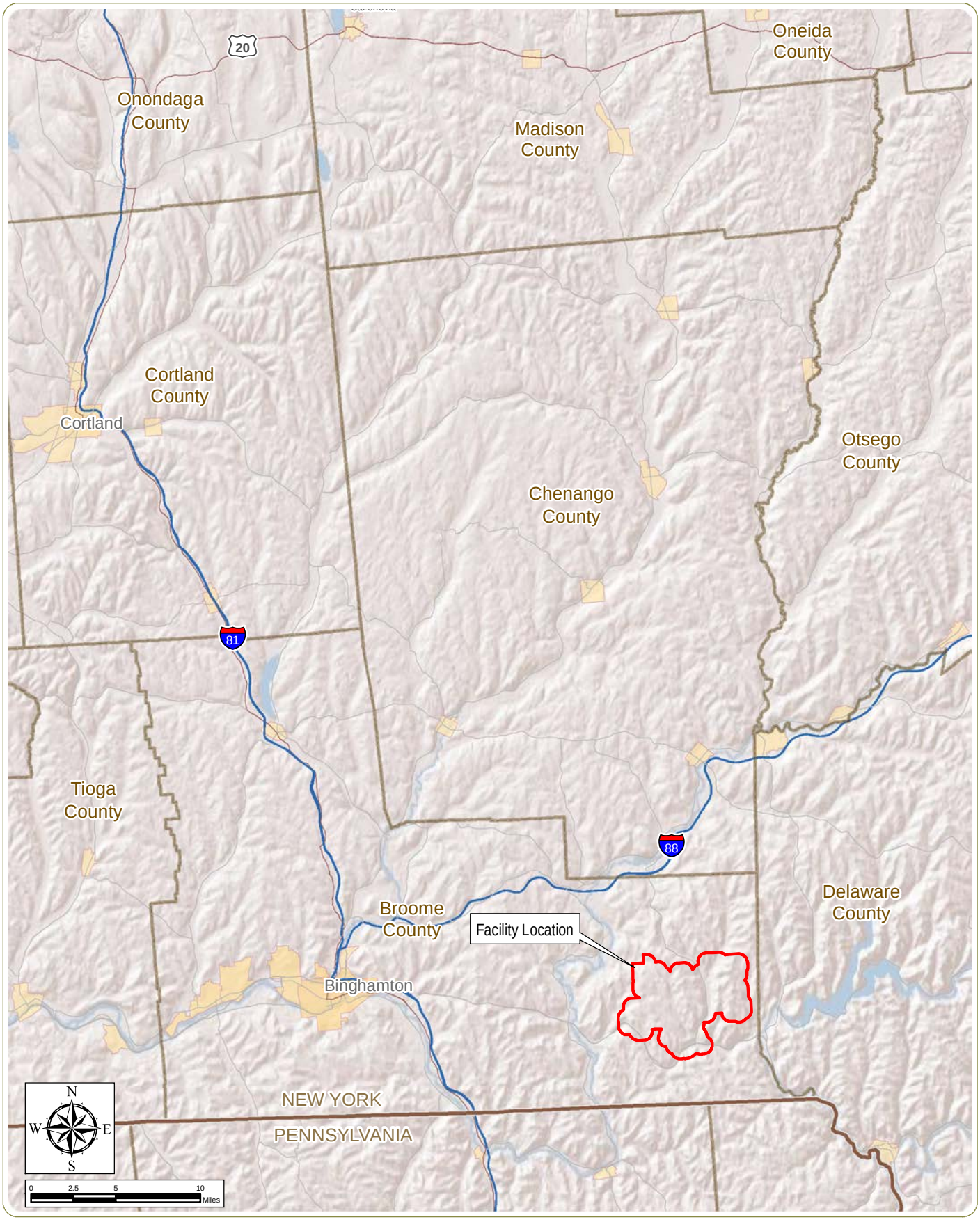
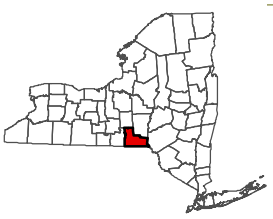
Figures



Bluestone Wind Project

Town of Windsor and Sanford - Broome County, New York

Figure 1: Regional Facility Location



Notes: 1. Basemap: ESRI ArcGIS Online "Shaded Relief" map service, and ESRI StreetMap North America, 2008.
2. This map was generated in ArcMap on March 2, 2018.
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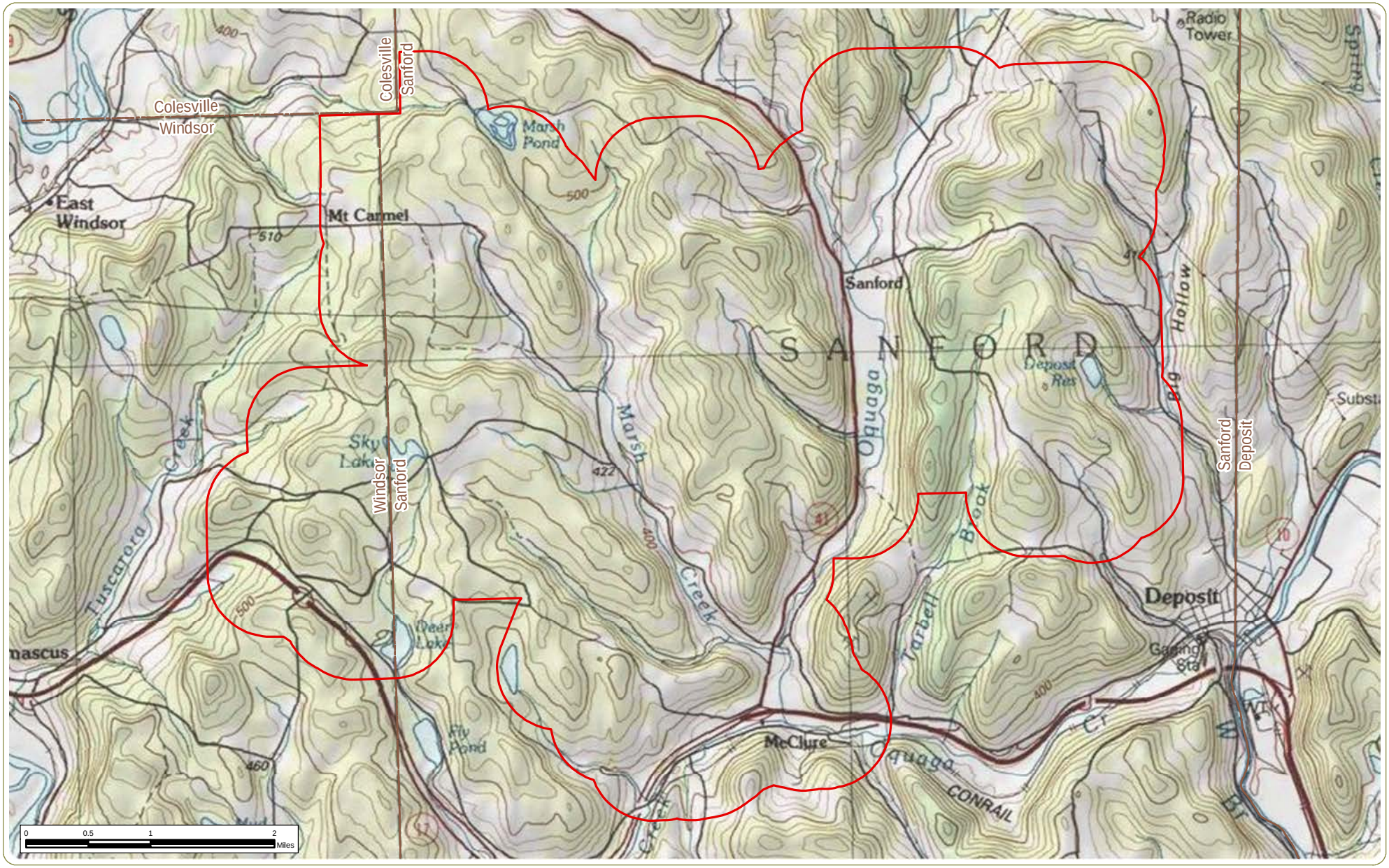

Bluestone Wind Project

Towns of Windsor and Sanford, Broome County, NY

Figure 2: Archaeological Study Area Topography

Archaeological Study Area

Notes: 1. Basemap: ESRI ArcGIS Online "USA Topo Maps" map service.
2. This map was generated in ArcMap on March 2, 2018.
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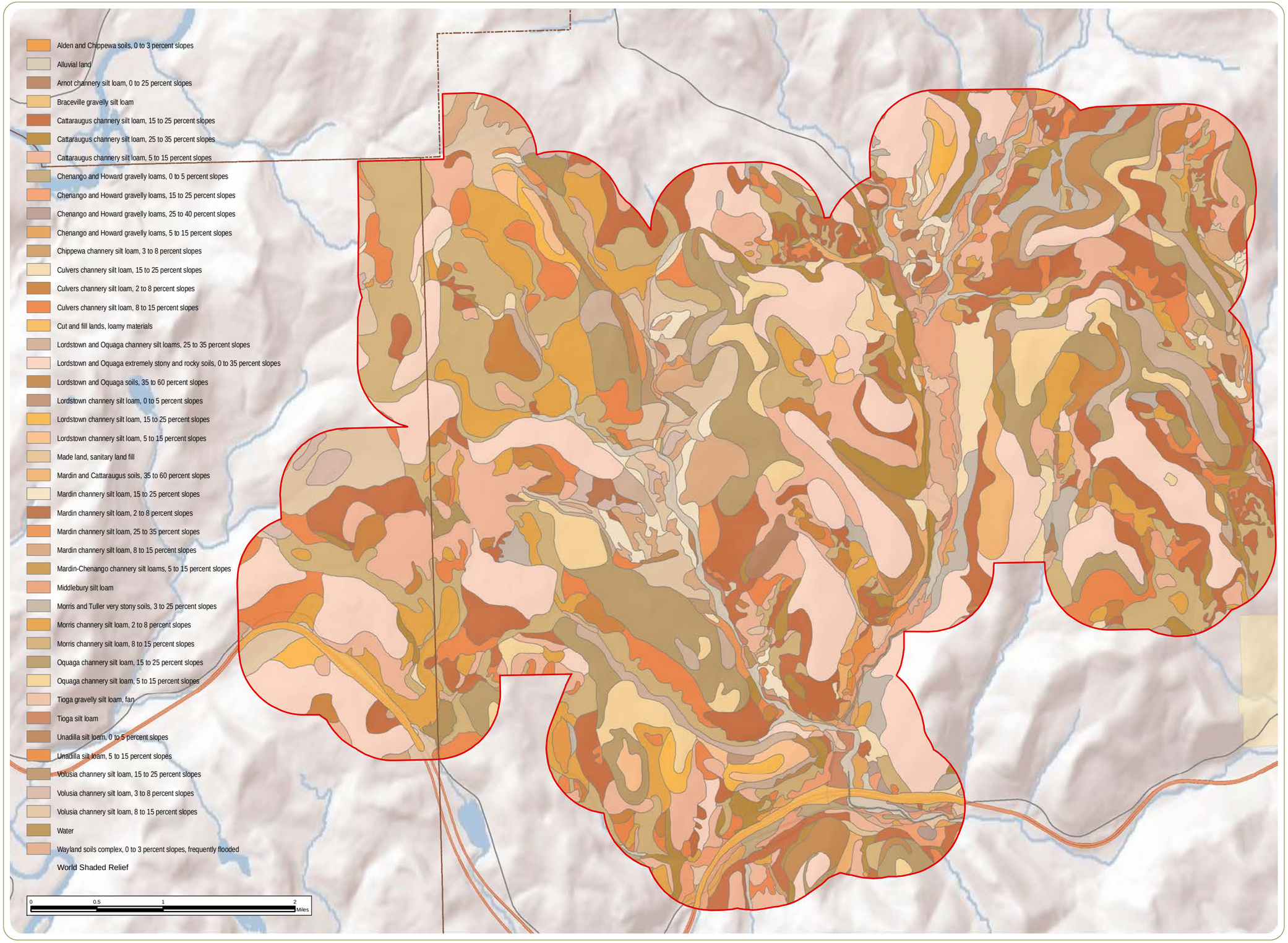

Bluestone Wind Project

Towns of Windsor and Sanford, Broome County, NY

Figure 3: Archaeological Study Area Topography

Archaeological Study Area

Town Boundary

Notes: 1. Basemap: ESRI ArcGIS Online "World Shaded Relief" map service. 2. This map was generated in ArcMap on March 2, 2018. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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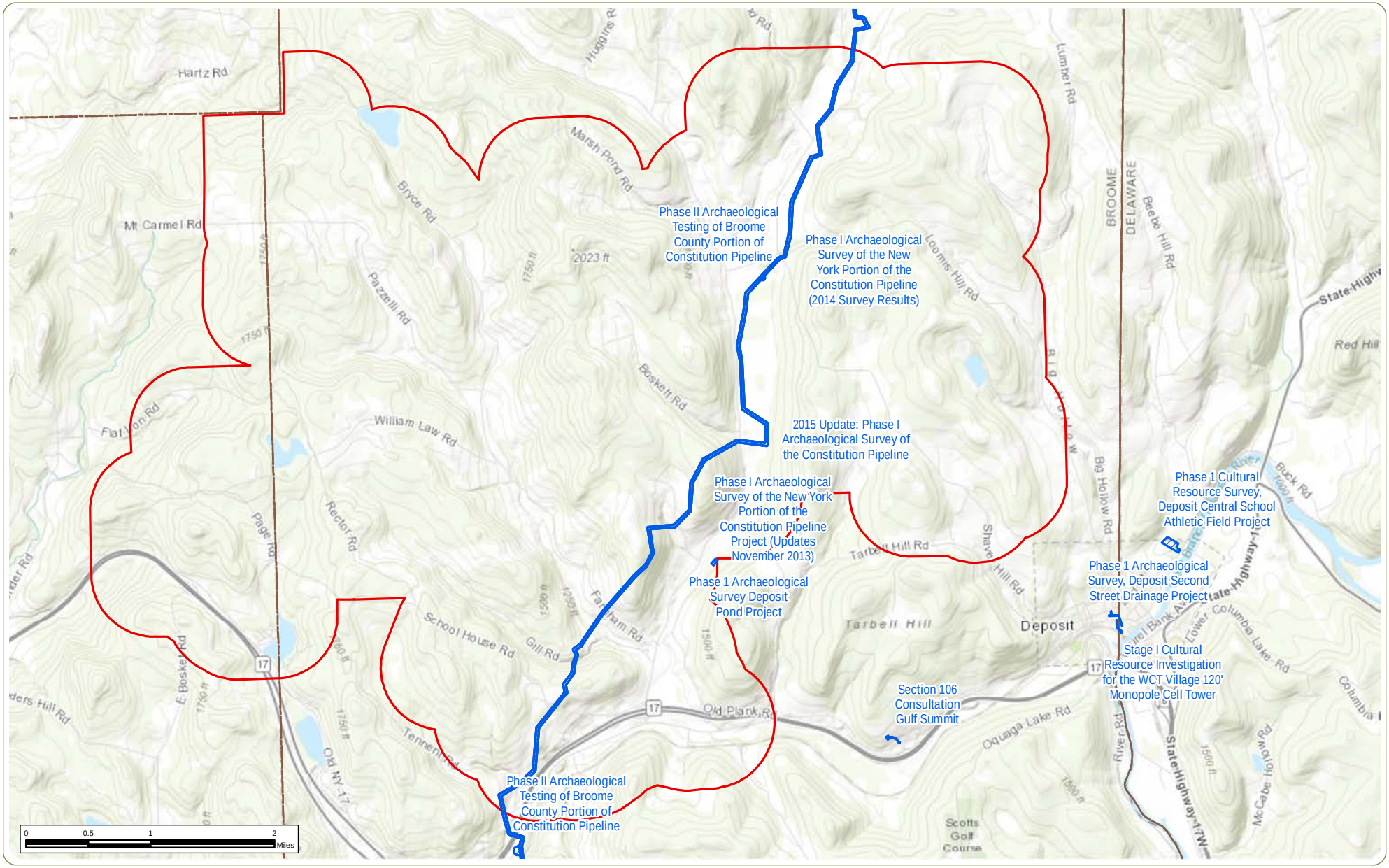

Bluestone Wind Project

Towns of Windsor and Sanford, Broome County, NY

Figure 4: Previous Archaeological Surveys

Archaeological Study Area

Previous Archaeological Survey

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service.
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Bluestone Wind Project

Towns of Windsor and Sanford
Broome County, New York

Figure 5: 1855 Gifford *Map of Broome County*

Archaeological Study Area

Notes:

1. Basemap: 1855 Gifford *Map of Broome County*
2. This historic map has been geo-referenced with modern map features. Potential sources of error inherent in this process include cartographic inaccuracies, differences in scale, and changes in the modern landscape. The geo-referenced map therefore presents approximate locations of historic map-documented features, and is not intended to depict survey-accurate information.
3. This map was generated in ArcMap on March 2, 2018.
4. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Bluestone Wind Project

Towns of Windsor and Sanford
Broome County, New York

Figure 6:
1876 Everts, Ensign and Everts *Combination Atlas Map of Broome County, New York* - Towns of Colesville, Sanford and Windsor plates

Archaeological Study Area

Notes:
1. Basemap: 1876 Everts, Ensign and Everts *Combination Atlas Map of Broome County, New York* - Towns of Colesville, Sanford, and Windsor plates.
2. This historic map has been geo-referenced with modern map features. Potential sources of error inherent in this process include cartographic inaccuracies, differences in scale, and changes in the modern landscape. The geo-referenced map therefore presents approximate locations of historic map-documented features, and is not intended to depict survey-accurate information.
3. This map was generated in ArcMap on March 2, 2018.
4. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Bluestone Wind Project

Towns of Windsor and Sanford
Broome County, New York

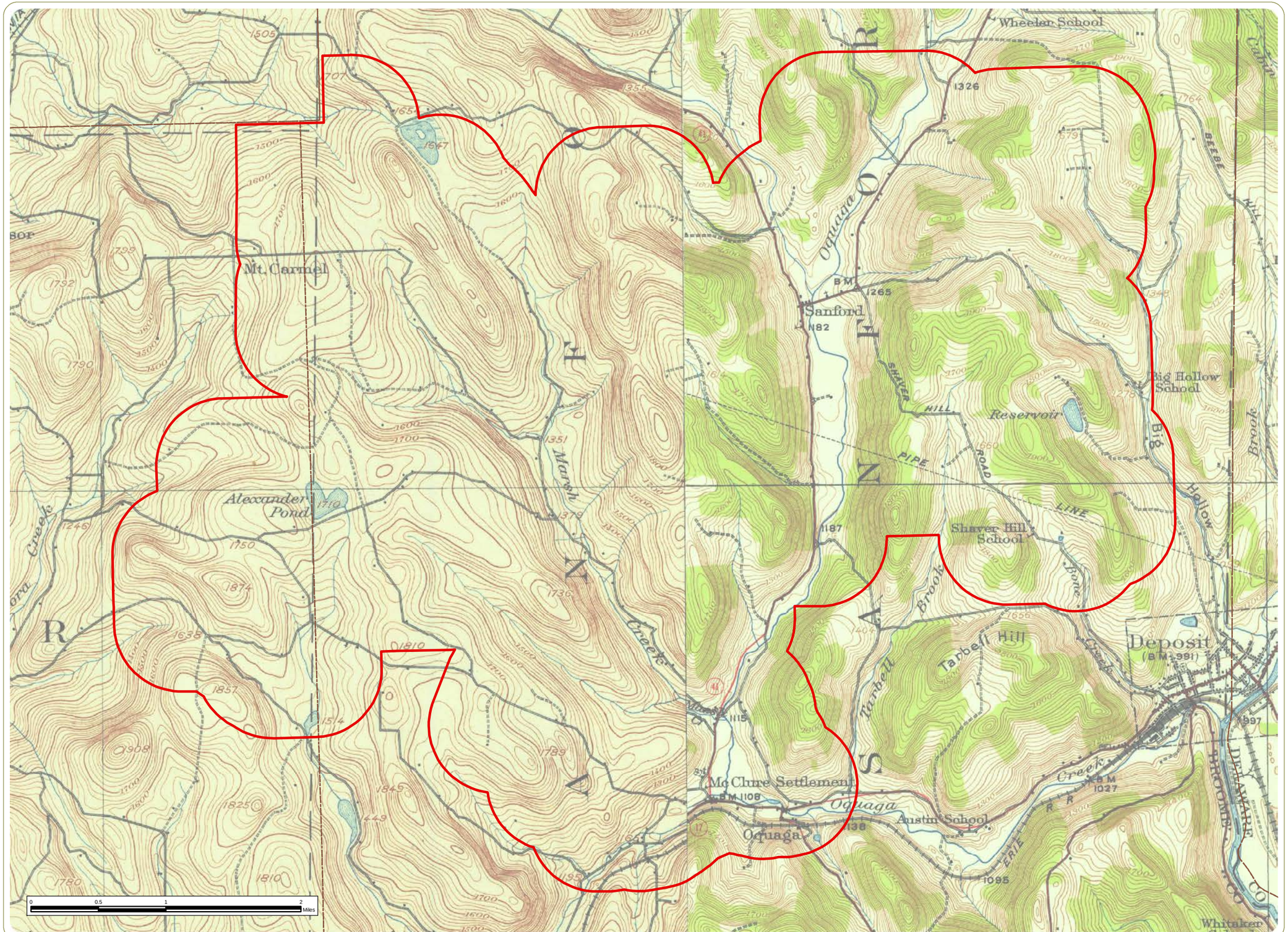

Figure 7: 1905 USGS *Ninevah, NY* and *1924 Deposit, NY* 15-minute Topographic Quadrangles

Archaeological Study Area

Notes:

1. Basemap: 1905 USGS *Ninevah, NY* and *1924 Deposit, NY* 15-minute Topographic Quadrangles
2. This historic map has been geo-referenced with modern map features. Potential sources of error inherent in this process include cartographic inaccuracies, differences in scale, and changes in the modern landscape. The geo-referenced map therefore presents approximate locations of historic map-documented features, and is not intended to depict survey-accurate information.
3. This map was generated in ArcMap on March 2, 2018.
4. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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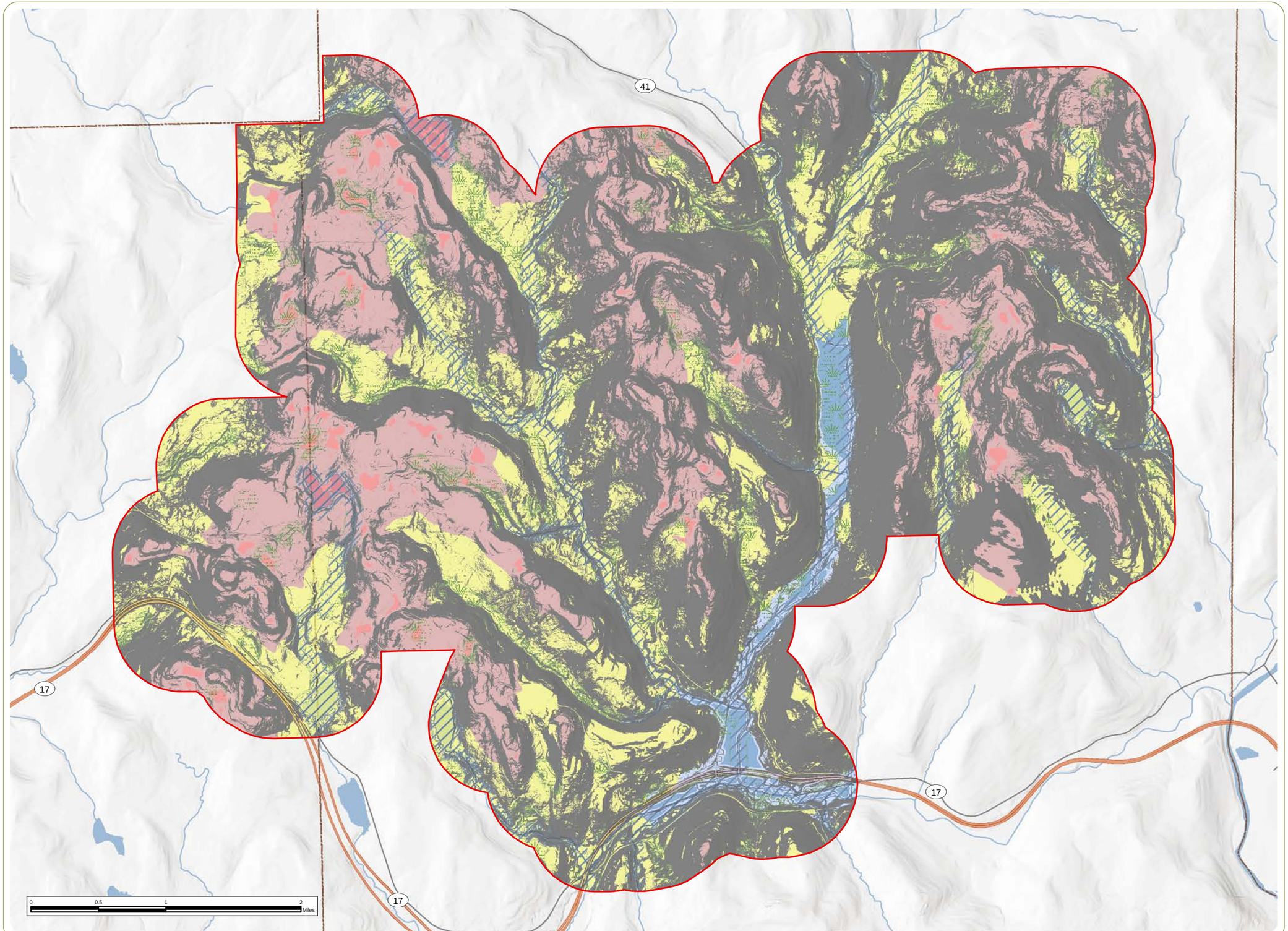
Bluestone Wind Project

Towns of Windsor and Sanford
Broome County, New York

Figure 8: Archaeological Survey Landscape Model



- Archaeological Study
- Steep Slope
- Upland, Ridge/Knoll, Near River/Stream/Lake
- Upland, Ridge/Knoll, Near Wetland/Hydric Soil
- Upland, Ridge/Knoll, No Water
- Upland, Saddle, Near River/Stream/Lake
- Upland, Saddle, Near Wetland/Hydric Soil
- Upland, Saddle, No Water
- Valley Floor, Ridge/Knoll, Near River/Stream/Lake
- Valley Floor, Ridge/Knoll, Near Wetland/Hydric Soil
- Valley Floor, Ridge/Knoll, No Water
- Valley Floor, Saddle, Near River/Stream/Lake
- Valley Floor, Saddle, Near Wetland/Hydric Soil
- Valley Floor, Saddle, No Water
- Valley Wall, Near River/Stream/Lake
- Valley Wall, Near Wetland/Hydric Soil
- Valley Wall, No Water

Notes:
1. Basemap: ESRI ArcGIS Online "Terrain: Multi-Directional Hillshade" map service.
2. This map was generated in ArcMap on March 2, 2018.
3. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Appendix A:
Photographs

Photo 1

Typical topography in the vicinity of the Facility Area, looking northwest across Big Hollow.

Photo 2

Typical topography and vegetation in the Facility Area with a successional field in the foreground, active agricultural fields on the slopes, and forest on the slopes and ridge. View to the south.

Photo 3

Typical topography and vegetation in the Facility Area with an active agricultural field in the valley bottom (foreground) and forested uplands (background). View to the south.

Photo 4

View of a narrow valley with typical successional vegetation in the valley bottom and forest on the surrounding slopes and ridges, looking northwest.

Photo 5

View of the Susquehanna River west of the Facility Area, looking east.

Photo 6

An example of a successional field in the Facility Area. View to the west.

Photo 7

An example of a successional field and a mowed lawn within the Facility Area. View to the west.

Photo 8

An example of a typical woods road/logging road within the Facility Site. View to the north.

Photo 9

A slope within the Facility Area with shale bedrock exposures and boulders. View to the northeast.

Photo 10

Large shale bedrock exposures with overhangs within the Facility Area. View to the north.

Photo 11

A small slate quarry within the Facility Area. View to the north.