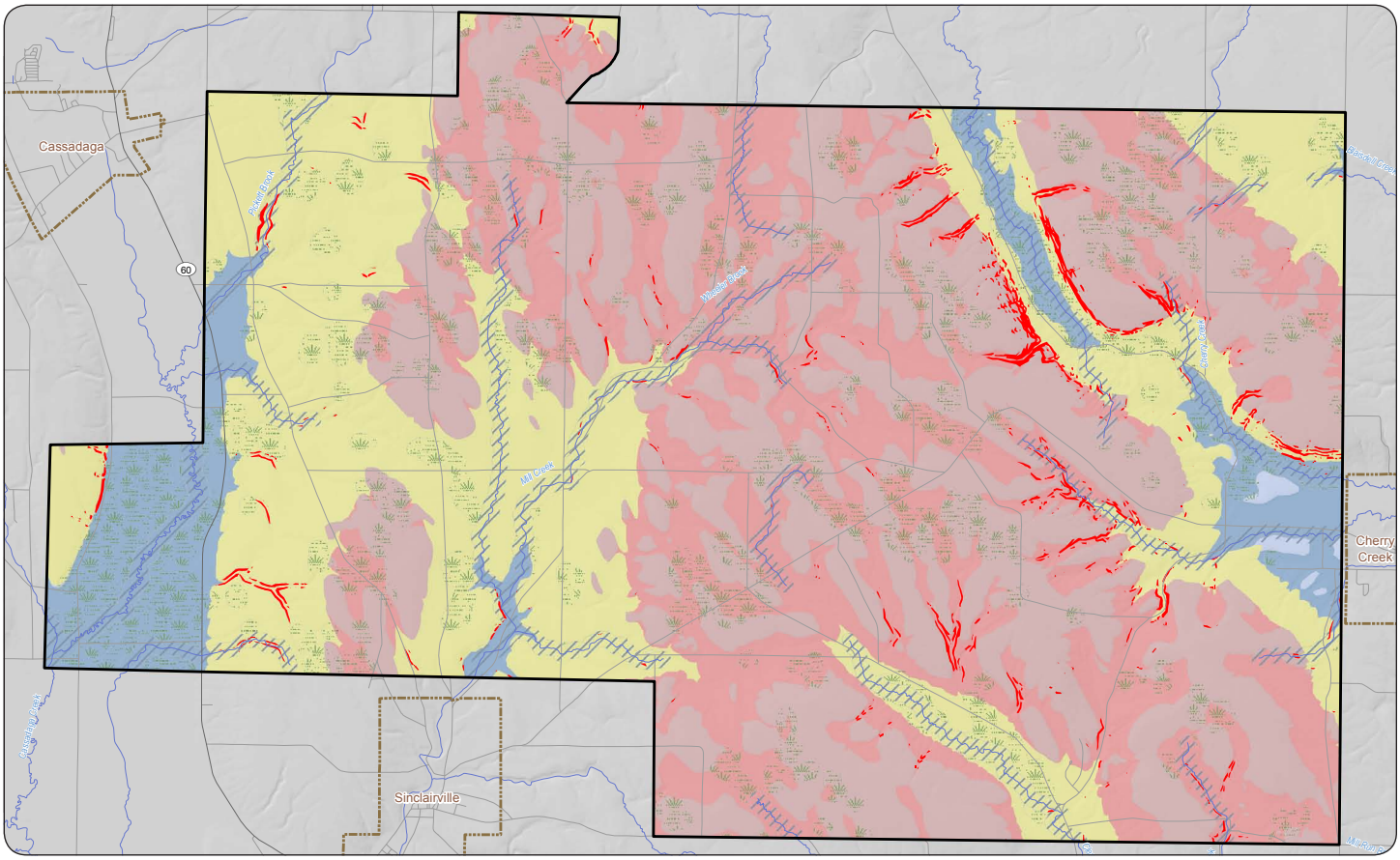

Phase 1A Archaeological Resources Survey & Phase 1B Fieldwork Plan

Cassadaga Wind Project

Towns of Charlotte, Cherry Creek, Arkwright, and Stockton, Chautauqua County, New York

Prepared for:

EverPower Wind Holdings, Inc.
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July 2015

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MANAGEMENT SUMMARY

SHPO Project Review Number:	15PR02730
Involved State and Federal Agencies:	Department of Public Service (DPS), Article 10 Application
Phase of Survey:	Phase 1A Archaeological Resources Survey
Location Information:	Towns of Arkwright, Charlotte, Cherry Creek, and Stockton Chautauqua County
Survey Area:	
Project Description:	Up to 62 wind turbines and associated infrastructure 5.5-mile-long 115kV transmission line
Project Area:	Approximately 297 square miles
USGS 7.5-Minute Quadrangle Map:	*Cassadaga, Hamlet, Cherry Creek and Forestville, NY*
Archaeological Resources Overview:	Two previously recorded archaeological sites (Zollinger Prehistoric Scatter Site [A01306.000349] and the multicomponent Melinski Saw Mill Site [A01306.000350]), both of which have not been formally evaluated with regard to S/NHRP eligibility criteria. There are eight additional archaeological sites within a 1-mile radius of the Project site. Four of these have undetermined eligibilities, two are eligible, and two are not eligible for listing on the S/NRHP.
Report Authors:	Nicholas P. Freeland, RPA; Patrick J. Heaton, RPA; Grant Johnson
Date of Report:	July 2015

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1.0 INTRODUCTION

1.1 Purpose of the Investigation

On behalf of EverPower Wind Holdings, Inc., Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR) has prepared a Phase 1A archaeological resources survey and work plan for the proposed Cassadaga Wind Project (the Project), located in the Towns of Charlotte, Cherry Creek, Arkwright and Stockton in Chautauqua County, New York. The Phase 1A survey supports the Preliminary Scoping Statement (PSS) being prepared as part of review of the Project 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 Project in accordance Article 10. Please note that this report addresses only archaeological resources; information concerning the Project'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 probably impact on any archaeological/cultural resources identified addressing how those impacts shall be avoided or minimized;
>
> (2) a Phase 1A 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 1B study, if required, as determined in consultation with OPRHP;
>
> (4) where warranted based on Phase I study results as determined in consultation with OPRHP, a Phase II study based on intensive archaeological field investigations shall be conducted to assess the boundaries, integrity and significance of cultural resources identified in Phase I studies. Phase II 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 1A archaeological resources survey and work plan is to:

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

All cultural resources studies undertaken by EDR in association with the Project have been conducted by professionals who satisfy the qualifications criteria per the Secretary of the Interior's Standards for archaeology (36 CFR 61). The Phase 1A 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 1 Archaeological Report Format Requirements* (NYSOPRHP, 2005).

1.2 Project Location and Description

EverPower Wind Holdings, Inc. is proposing to construct an up to 126 megawatt (MW) wind-generating facility (or the Project), portions of which will be located in the Towns of Charlotte, Cherry Creek, Arkwright and Stockton, in Chautauqua Country, New York (see Figures 1 and 2). The Project will be located on leased private land that is rural in nature. The actual footprint of the proposed facilities will be located within the leased land, and will enable farmers and landowners to continue with farming operations or other land uses.

As presently envisioned, the proposed Project consists of the construction and operation of a commercial-scale wind power project, including the installation and operation of up to 62 wind turbines, together with approximately 36 miles of associated collection lines (below grade and overhead), approximately 20 miles of access roads, two permanent meteorological towers, one operation and maintenance (O&M) building, and up to four temporary construction staging/laydown areas. To deliver electricity to the New York State power grid, the Applicant proposes to construct a collection substation, a 115 kV electrical transmission line and an interconnection substation, which will interconnect with National Grid's Dunkirk-Moon 115 kV transmission line. It is anticipated that the newly constructed 115 kV transmission line will be approximately 5.5 miles in length.

1.3 NYSOPRHP 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 the scope and

methodology to identify and evaluate archaeological resources. EDR initiated consultation with NYSOPRHP via the Cultural Resources Information System (CRIS) website on June 1, 2015. The consultation submission included a copy of the Public Involvement Program Plan (PIP) prepared as part of the Article 10 process, and released in January 2015[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 Project 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.

On June 24, 2015, NYSOPRHP provided a response to EDR's June 1, 2015 consultation submission. NYSOPRHP's response requested the following additional information (see Appendix A):

> Please submit a Historic Resources Study to address potential visual impacts to properties 50 years or older within a five-mile radius of the APE.
>
> [and]
>
> The SHPO will be pleased to offer archaeological recommendations once we receive a map of the direct Area of Potential Effects. An attachment token has been provided to facilitate this request.

A Phase 1A historic architectural survey report and work plan (EDR, 2015) has been prepared in response to NYSOPRHP correspondence dated June 24, 2015, and was submitted to NYSOPRHP via the CRIS website on July 10, 2015. Following review and approval of this work plan by NYSOPRHP, an architectural resources survey will be conducted to identify historic resources that may be affected by the Project.

This Phase 1A archaeological survey report and work plan is being prepared in response to NYSOPRHP correspondence dated June 24, 2015, which requested that a map of the direct area of potential effect (APE) be provided. This report includes a map of the overall Project site, as well as a review of archaeological resources within and near the Project site, and a work plan for a subsequent Phase 1B archaeological survey. Following submission and review of this work plan by NYSOPRHP, EDR anticipates that a Phase 1B archaeological survey will be conducted, as described herein. As stated in Section 1.1, this report addresses only archaeological resources; information concerning the Project's potential effect on historic architectural resources was provided to NYSOPRHP under separate cover on July 10, 2015 via the CRIS website.

[1] The Project's Public Involvement Program Plan (PIP) is available on DPS' website here: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={34972B4A-D254-4D7B-B0BB-65B3DC1C75E2}.

1.4 Project's Area of Potential Effect and Study Area

The Project's area of potential effect (APE) relative to archaeological resources is defined as those areas where soil disturbance is proposed to occur during construction. The descriptions below characterize anticipated limits of soil disturbance for each proposed Project component, which cumulatively make up the Cassadaga Wind Project's archaeological APE. Note that the final Project layout is still being determined. For purposes of describing the APE, the areas of disturbance listed below represent the temporary extent of soil disturbance anticipated to occur during Project construction and do not represent permanent soil disturbance associated with the Project. The assumptions provided below present the anticipated size of the Project (based on the current, preliminary design) and areas of disturbance associated with proposed Project facilities. 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 that a limited number of proposed Project components will likely be moved following these surveys to reduce impacts to wetlands and archaeological sites.

- **Wind Turbines**. A 200-foot radius around each of the 62 proposed turbine sites 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 approximately 2.9 acres per turbine.
- **Access Roads**. The Project is proposed to include approximately 20 miles of gravel-surface access roads. The anticipated permanent width of access roads will be 20 feet. During construction access roads, the anticipated width if access roads will be up to 40 feet, within a 75 foot-wide road corridor cleared of vegetation (to allow for crane movement and oversized vehicles delivering turbine components).
- **Collection Lines**. The Project is proposed to include approximately 36 miles of buried and/or overhead 34.5 kV electrical collection lines. The locations of buried and overhead collection lines within the overall Project layout have not been determined. Buried collection lines will be installed within a trench three to four feet-deep, and each circuit will require a construction corridor with a maximum width of 15 feet of soil disturbance. In most instances, buried collection lines will be collocated within proposed access roads, so the area of anticipated disturbance for the collection lines will be subsumed within the area of anticipated disturbance for the access roads.
- **Overhead Transmission Line.** The Project is proposed to include approximately 5.5 miles of overhead transmission line. Overhead transmission line will require a 100-foot wide corridor of temporary soil disturbance and vegetation clearing. This is a conservative estimate because in open/active agricultural areas where no vegetation clearing will be necessary disturbance will be limited to pole locations, which will not require ground disturbance of the entire 100-foot-wide corridor.

- **Meteorological Tower**. Two permanent meteorological towers are proposed for the Project. During construction, it is anticipated that up to 1-acre of vegetation clearing and temporary soil disturbance may be necessary. Following construction, each meteorological tower will occupy approximately 0.1-acre.
- **Staging Area**. Up to four temporary staging areas/laydown yards, up to 5 acres in size each, are proposed for the Project. Construction of the staging areas/laydown yards will include stripping/stockpiling topsoil, grading and compacting the subsoil, and installation of geotextile fabric and gravel.
- **O&M Facility**. The Project's O&M facility will be housed in a 4,000-6,000 square-foot building. Construction of the proposed O&M facility is anticipated to require up to 2.5 acres of soil disturbance.
- **Collection and Interconnect Substations**. The Project will require one collection substation and one interconnection station to allow connection to the existing power grid. Construction of these facilities is anticipated to disturb approximately 3 acres at the collection station and up to 5 acres at the interconnection substation (total 8 acres).

Based on these impact assumptions, the Project's archaeological APE is anticipated to be approximately 435 acres in size. Note that this represents the total areas that will be temporarily disturbed by construction. Following construction, the operating Project 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 Project design is further refined, the archaeological APE for the Project may change.

2.0 BACKGROUND AND SITE HISTORY

2.1 Geology and Soils

Chautauqua County is a 1,062 square-mile area bounded on the northwest by Lake Erie, on the west and south by Pennsylvania, and on the east by Cattaraugus County (New York) and the Cattaraugus Indian Reservation. The bedrock underlying Chautauqua County consists of Devonian shales. The county (and Project site) lies within the Appalachian Plateau and Erie-Ontario Lake Plain physiographic provinces. The Erie-Ontario Lake Plain consists of a strip of lowland (that was previously lakebed) between two and six miles wide that extends along the shore of Lake Erie within the northwestern portion of the county. The lake plain ranges in elevation from approximately 570 to 850 feet above mean sea level (AMSL). The Appalachian Plateau is defined by glacial topography, hills and ridgelines ranging in elevation from approximately 1600 to 2190 feet AMSL that are separated by wide, flat, steep-sided valleys. The lake plain and adjacent upland areas drain into the Lake Erie-St. Lawrence River watershed while most of the rest of the county drainage flows into the Allegheny-Ohio-Mississippi watershed (Kirst, 2005; SCS, 1994). The Project site is located entirely within the northern edge of Appalachian Plateau (Figure 2). Elevations within the Project site range between approximately 1,411 feet AMSL along Picket Brook in the northwestern portion of the Project site and 2,083 feet AMSL at the summit of Pickett Hill in the southeastern portion of the Project site.

EDR reviewed the *Soil Survey of Chautauqua County, New York* (SCS, 1994) for data concerning soils within the Project site as well as electronic data for Chautauqua County from the Natural Resources Conservation Service (NRCS, 2015). A total of 91 mapped soil units occur within the Project site (see Figure 3); however, only four soil units make up more than 5% of the Project site individually. These soils are Busti Silt Loam, two units of Chautauqua Silt Loam (one on 3-8% slopes and one on 8-15% slopes), and Fremont Silt Loam, and together they make up 49% of the Project site. The characteristics of these four soil units are summarized in Table 1.

Table 1. Major Project Site Soils.

Map Unit Name	% of Project Site	Soil Horizon & Depth	Description	Slope, Drainage, & Landform
Busti Silt Loam (BsB)	24%	H1: 0 to 8 inches H2: 8 to 19 inches H3: 19 to 27 inches H4: 27 to 72 inches	Silt loam Silt loam Gravelly silt loam Gravelly silt loam	3 to 8% slopes, somewhat poorly drained, till plains, drumlinoid ridges, hills.
Chautauqya Silt Loam (CkB)	9%	H1: 0 to 7 inches H2: 7 to 34 inches H3: 34 to 72 inches	Silt loam Gravelly silt loam Gravelly silt loam	3 to 8% slopes, moderately well drained, till plains, drumlinoid ridges, hills.

Map Unit Name	% of Project Site	Soil Horizon & Depth	Description	Slope, Drainage, & Landform
Chatauqua Silt Loam (CkC)	13%	H1: 0 to 7 inches H2: 7 to 34 inches H3: 34 to 72 inches	Silt loam Gravelly silt loam Gravelly silt loam	8 to 15% slopes, moderately well drained, drumlinoid ridges, hills, till plains.
Fremont Silt Loam (FmB)	6%	H1: 0 to 8 inches H2: 8 to 35 inches H3:35 to 72 inches	Silt loam Channery silty clay loam Channery silty clay loam	3 to 8% slopes, somewhat poorly drained, till plains, drumlinoid ridges, hills.

2.2 Prehistory and History of the Project Site

Paleoindian (approximately 11,500 to 10,000 years ago)

The prehistory of western New York begins with the initial colonization of the area by Paleoindian groups following the retreating continental glaciers around 11,500 years ago. These groups appear to have specialized in hunting large game (likely Caribou; and possibly mammoth and mastodon) in the recently exposed periglacial tundra and boreal forests, although they exploited diverse floral resources, small game, and fish as well (Ritchie and Funk, 1973). Although these early groups were highly mobile, there is also evidence of moderate to large aggregations at certain times and places (e.g., the Bull Brook sites in Massachusetts) (Curran, 1999).

Early and Middle Archaic (approximately 10,000 to 6,000 years ago)

As occurred in many areas in North America, the Archaic Period in New York can be understood as a time of "settling in" to the landscape. Post-Glacial conditions had stabilized by approximately 10,000 years ago, and small groups of hunter-gatherers reduced their mobility and exploited the diverse resources available to them in the newly emerging mixed deciduous/coniferous forests. The megafauna was gone at this point, but big game such as deer, elk, and moose, and perhaps woodland caribou was still available, as well as small game, fish, and wild plants. In general, Archaic sites are often larger and denser than Paleoindian sites (Funk, 1978).

In New York, the Archaic period is often broken into the Early (approximately 10,000 to 8,000 years ago), Middle (approximately 8,000 to 6,000 years ago) and Late (approximately 6,000 to 3,500 years ago) subperiods with the Transitional Period as a brief interval between the Late Archaic and the subsequent Early Woodland. Early and Middle Archaic sites are generally more common in southern and coastal New England and New York than in the northern portion of this region, where they are actually quite rare. Bifurcate-base points are the most common Early Archaic time markers in Upstate New York. The Middle Archaic is characterized by stemmed and corner-notched projectile points as well as the first appearance of notched stone net-sinkers (Funk, 1978).

Late Archaic (approximately 6,000 to 3,500 years ago)

There are far more Late Archaic sites than Early or Middle in the northeast, leading many archaeologists to argue for population increase, likely driven by changing environmental conditions, during this period. The Late Archaic is characterized by broad side-notched projectile points as well as gouges, plummets, and ground slate artifacts (Funk, 1978). Groundstone plant processing technology, including nutting stones which presumably indicate the first systematic exploitation of mast resources such as acorns and chestnuts, first appear during the Late Archaic (Funk, 1978; Ritchie and Funk, 1973:7). The Late Archaic has been characterized as a period of regional specialization (e.g., Tuck, 1978), and the current Project site in western New York occurs near the transition between Tuck's (1978: Figure 1) Late Archaic Lake Forest and Narrow Point Traditions. The Lake Forest Tradition occurs primarily within the watershed of the Great Lakes, northern New England, and eastern inland Canada and is characterized by a subsistence pattern that appears to have emphasized mammal hunting with some emphasis on fishing and relatively little emphasis of heavy plant processing (likely due to an overall lack of mast producing trees in this area). The lithic technology of the Lake Forest Tradition is characterized by concave-base side-notched projectile points, endscrapers, expanded-base drills, and bifacial knives (Tuck, 1978).

The Narrow Point Tradition is known south of the Lake Forest Tradition in the interior and coastal riverine valleys of the northeast and mid-Atlantic. In the interior, Narrow Point subsistence was based on hunting of white-tailed deer, turkey, and other mammals, and birds, fishing and gathering shellfish, and gathering and processing oak, chestnut, and hickory nuts. The lithic assemblage of these groups was characterized by narrow-bladed broad-stemmed projectile points, some of which were side-notched. Other chipped stone tools included awls, scrapers, gravers, and drills, and groundstone technology included abraders, manos, and nutting stones (Tuck, 1978).

Transitional (approximately 4,000 to 3,000 years ago)

The Transitional Period is not necessarily a cultural complex unto itself but rather, as the name implies, a period of transition between the technological complexes identified with the Late Archaic and the Early Woodland Periods (Ritchie and Funk, 1973). Whitthoft (1949) defined the Transitional Cultural Complexes of the northeast by their manufacture and use of steatite bowls, early ceramic vessels, heavy soapstone gorgets, and broad-stemmed projectile points and drills as well as the appearance of burial ceremonialism (Ritchie and Funk, 1973). The latter portion of the Transitional Cultural Complex is also characterized by fishtail style points in much of the northeast (Tuck, 1978). Tuck (1978: 38) argues that, despite the distinctive technology of Transitional peoples, their subsistence and mobility patterns did not differ significantly from the preceding Late Archaic or subsequent Early Woodland.

Early Woodland (approximately 3,000 to 2,300 years ago)

Early Woodland groups in northeast are characterized by the earliest beginnings of agriculture (although no agricultural sites are known from central or western New York for this period), ceramics, stylized ornamental luxury goods such as tobacco pipes and worked copper, and an elaborate ritual system involving complex burial traditions, all of which appear to have spread north and east from the Mississippi River Valley (Tuck, 1978). Aside from these changes, the overall subsistence pattern in the region does not change drastically from the Late Archaic to the Early Woodland, aside from a possible increased influence on fishing in central and western New York (Ritchie and Funk, 1973:96; Tuck, 1978:41). The Early Woodland, appears itself to be a somewhat transitional period, with the first indicators of cultural change beginning to filter in from the Midwest, but no drastic changes in everyday subsistence and mobility yet evident.

Middle Woodland (approximately 2,300 to 1,000 years ago)

The first substantial and widespread development of agriculture in northeastern North America occurred during the Middle Woodland Period, possibly in response to favorable climatic conditions during the Medieval Climatic Anomaly (Fitting, 1978:44). Western New York during the Middle Woodland Period was within the northeastern edge of the Hopewell cultural sphere, although agriculture is not known in the region during this period. This was characterized by mound burials and other earthworks, dentate-stamped and rocker-stamped ceramic vessels, elaborate tobacco pipes, and stemmed, side-notched, and triangular unnotched Levanna projectile points (Engelbrecht, 2014; Ritchie and Funk, 1973). Groups in the northeast during this period also maintained extensive trade networks, evidenced by the presence of exotic goods (Fitting, 1978; Ritchie 1980; Ritchie and Funk, 1973). Ritchie and Funk (1973:118) note the emphasis on fishing apparent at many Early Woodland sites in New York appears to continue during this period (Ritchie and Funk, 1973:118). Settlement occurs in small villages during this period, but larger agricultural settlements are unknown in western New York until the Late Woodland (Ritchie and Funk, 1973). Generally, the diversity observed across the northeast and Midwest during the Middle Woodland can be viewed as regional and local interpretations and manifestations of Hopewellian cultural influence.

Late Woodland (approximately 1,000 to 500 BP)

Middle Woodland cultural manifestations disappear in the southern northeast by 1,000 years ago; however, they appear to persist for one or two centuries longer in the northern portion of the region, until as late as 800 years ago in some places. During the early Late Woodland, Hopewell cultural influence fades, to be later replaced by Mississippian cultural influence around 1,000 years ago or later. Like the Middle Woodland, local and regional expressions of the Late Woodland Period are also diverse (Fitting, 1978). Fitting (1978:57) characterizes the transition from a Hopewell-derived Middle Woodland set of cultural practices to a Mississippian-derived Late Woodland set, as a change in artistic emphasis; however, in western New York, it also represents the first appearance of maize/bean/squash agriculture and substantial village sites, including some with palisades and earthwork fortifications (Ritchie and Funk, 1973).

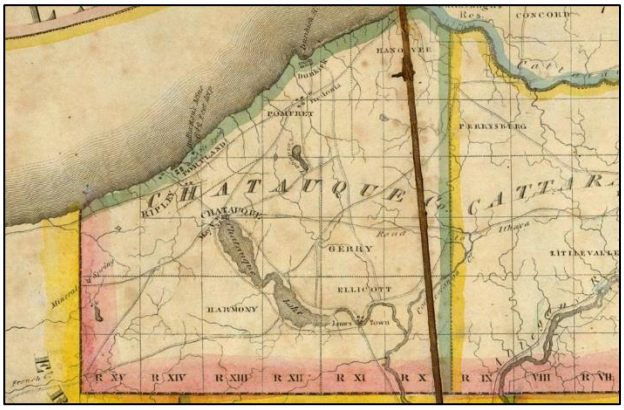
Ritchie and others (Ritchie, 1980; Ritchie and Funk, 1973) have argued for a continuity between the Late Woodland cultural complex in Central New York, the Owasco culture, and historic and modern Haudenosaunee groups.

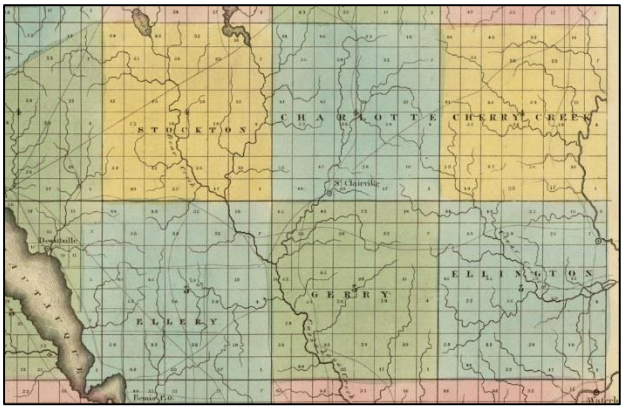
Historic Period

Archives and repositories consulted during EDR's historic research for the Project included EDR's in-house collection of reference materials, and online digital collections of the New York State Library, Ancestry.com, New York Heritage, David Rumsey Map Collection, and USGS. Sources reviewed for the Project included the *History of Chautauqua County* (Young, 1875), and the *History of Chautauqua County New York and Its People* (Downs and Hedley, 1921). Historic maps reproduced in the report include Keeney's 1854 *Wall Map of Chautauqua County, NY* (Figure 5), the 1881 F.W. Beers & Co. *Illustrated Historical Atlas of the County of Chautauqua, New York* (Figure 6), the 1900 USGS *Cherry Creek, NY* and *Dunkirk, NY* topographic quadrangles (Figure 7), and 1941 USGS *Cherry Creek, NY and* 1943 USGS *Dunkirk, NY* topographic quadrangle maps (Figure 8).

The Project is located primarily in the towns of Charlotte and Cherry Creek, and includes portions of the Towns of Stockton and Arkwright in central Chautauqua County, New York. At the time of European contact and colonization in the eighteenth century, the Project site was located within the territory of the Seneca Nation of the Iroquois Confederacy, though it was previously territory of the Erie Nation. Erie territory encompassed modern-day Chautauqua County, extending westward along the southern shore of Lake Erie, and eastward toward the lands of the Iroquois Confederacy. From 1654 to 1656, it is reported that between one and two thousand Iroquois warriors invaded Erie territory, and began an assault so brutal that it destroyed the Erie Nation entirely. For the next century, this remained primarily Seneca territory (Downs and Hedley, 1921; Kirst, 2005).

The French began utilizing the western end of Chautauqua Lake by 1679, setting the stage for later European land claims. By the eighteenth century, France had claimed the land around Chautauqua Lake for their own, which they ceded to Great Britain in 1763. By 1797, the land had been bought by the Holland Land Company, which subdivided and sold it to early European American settlers. Chautauqua County was created in 1811 after being split from Genesee County along with the land that is now Niagara County in 1808. Within a decade, major settlements began to form adjacent to water bodies, including Dunkirk and Portland along Lake Erie, Mayville at the northern end of Chautauqua Lake, and Jamestown along the Chadakoin River in the southern part of the county (Inset 1). In 1829, several new towns were formed from existing early town parcels, establishing the general land patterns that would define Chautauqua County throughout the nineteenth and twentieth centuries (Inset 2). The opening of the Erie Canal to the north brought new trade and settlers to western New York, and by 1835, the population of Chautauqua County had reached 35,000, concentrated along the borders of the Chautauqua Lake and Lake Erie (Beers, 1881; Kirst, 2005).





Inset 1. 1817 Lay *Map of the State of New York* (left)
By 1817, most parts of Chautauqua County had begun to be settled, though there were only a few organized townships. Much of the town remained rural throughout the subsequent decade (Lay, 1817; collections of David Rumsey).

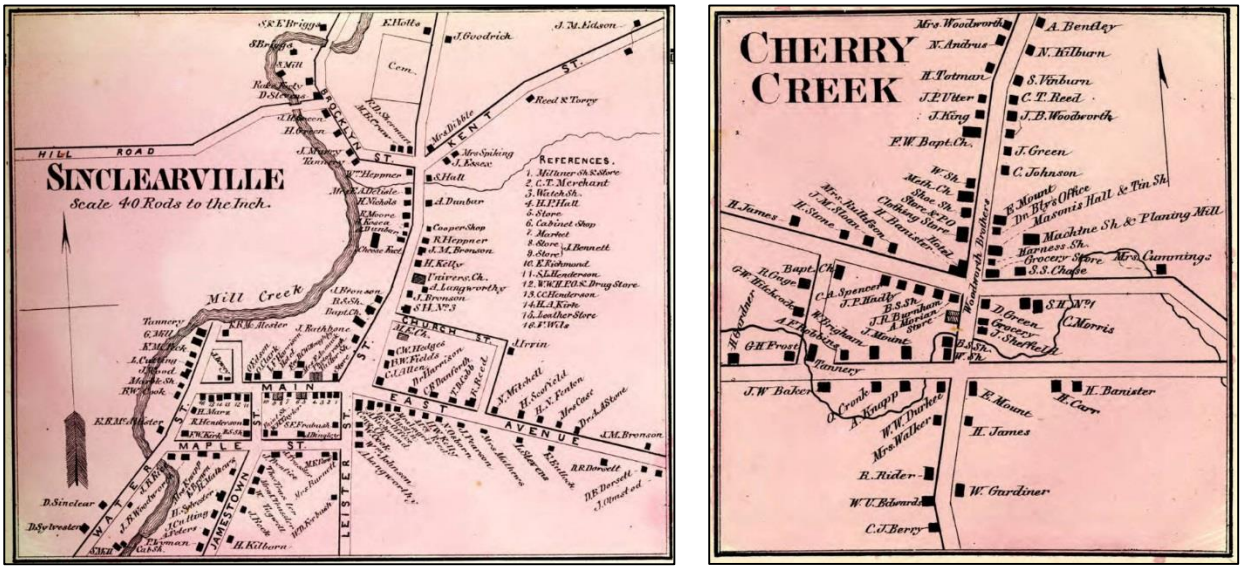
Inset 2. 1829 Burr *Map of the County of Chautauque* (right)
By 1829, several new towns had been formed, and laid out in a generally grid-like pattern (Burr, 1829; collections of David Rumsey).

Chautauqua County experienced slow economic growth throughout the early nineteenth century, as an extensive transportation system was not in place until the 1850s. In addition to a road network across the northern half of the county, rail service was constructed along Lake Erie including the New York and Erie Railroad (later known as the Erie Railroad) and the Buffalo and State Line Railroad (later known as the New York Central Railroad) beginning in 1850. The Erie Railroad allowed Brooks Locomotive Works to be established in Dunkirk, which facilitated growth of the city's population and encouraged expansion of the steel and textile industries at the northern end of the county. Economic development in smaller towns and rural areas in the southern portions of the county included creameries, sawmills, tanneries, peach and grape crops, fishermen, wool mills, furniture factories, paper mills, canning plants and basket works. Northern Chautauqua County is particularly known for its grape crop, as part of the largest Concord grape belt in the northeastern United States. The Town of Westfield was home to Welch's Grape Juice Co. from 1897-1983 (Young, 1875; Downs and Hedley, 1921; Kirst, 2005).

The Town of Charlotte was formed in 1829 from the Town of Gerry. Although the area comprising the town was initially settled as early as 1809, remnants of fourteenth and fifteenth-century Native American villages have been discovered within the limits of the town (Henry, 2005a). Initial European settlement centered on the villages of Charlotte Center and Sinclairville (original Sinclearville after early prominent settler Major Samuel Sinclear) beginning in 1809. Early industry focused on wool production, and mills constructed on creeks. The first sawmill was constructed in Sinclairville in 1810 and the first grist mill the following year. Settlement was slow until the opening of the Erie Canal to the north in 1824. With the opening of the canal, Charlotte Center and Sinclairville began to grow, with numerous new commercial enterprises including various stores operating by the 1830s. By 1867, Sinclearville (which would change its name just two years later) included multiple tanneries, a cheese factory, cooper shop, and shoe, drug and leather

stores, among other businesses, and a strong concentration of residences at the village center, which radiated east from Mill Creek (Inset 3). The village of Sinclairville incorporated in 1887. The county remained predominantly agricultural throughout the twentieth century (Stewart, 1867; Downs and Hedley, 1921; Henry, 2005a).

The Town of Cherry Creek was initially settled in 1815, and formed from Ellington in 1829. The town was originally known as Puckrum, but was renamed for the creek located within the town as well as the abundance of cherry trees once found there (Shults, 1900). Early industry focused on charcoal, cheese boxes, and iron, though the town remained predominantly rural in character throughout the nineteenth century. By 1867, the Village of Cherry Creek included a hotel, machine shop and planning mill, harness shop, and multiple grocery stores among other businesses (Inset 4). The construction of the Buffalo and Southwestern Railroad through town in 1875 encouraged further settlement, and the village of Cherry Creek was incorporated in 1893. The opening of the Cherry Creek Canning Company in 1900 provided jobs to hundreds of local residents during the growing season (Stewart, 1867; Downs and Hedley, 1921).



Inset 3. 1867 Stewart *New Topographical Atlas of Chautauqua County,* village of Sinclearville (left)
By 1867, Sinclearville was the main population center within the Town of Charlotte (Stewart, 1867; collections of SUNY Fredonia).

Inset 4. 1867 Stewart *New Topographical Atlas of Chautauqua County*, village of Cherry Creek (right)
By 1867, the village of Cherry Creek was the center of commerce for the town of the same name (Stewart, 1867; collections of SUNY Fredonia).

Dairy farming and agriculture are the primary industries in the twenty-first century. The Cockaigne Ski Area is a prominent winter recreation destination in the town (Chase, 2005).

The Town of Arkwright was formed from the Towns of Pomfret and Villenova in 1829, though the area had been settled since 1807. In 1818 it saw the development of the first of several sawmills. Dairy was an early and important industry of Arkwright, helped by Asahel Burnham, who built the first cheese factory in the county in 1861, and was known as

the "Cheese King" for his successes in cheese production in Chautauqua County throughout the nineteenth and twentieth centuries. By 1867, the town was still predominantly rural and agricultural in nature compared to neighboring towns, with only a few centers of population, such as the hamlets of Arkwright and Arkwright Summit (Inset 5). The town has since relied primarily on agriculture for livelihood, particularly the dairy and beef industry, though maple sugar production and farming of horses, deer and elk have also become important sources of livelihood in recent years (Stewart, 1867; Beers, 1881; Downs and Hedley, 1921; Curtin, 2005).

Inset 5. 1867 Stewart *New Topographical Atlas of Chautauqua County,* Town of Arkwright.
By 1867, settlement within the Town of Arkwright was fairly scattered, with only the hamlets of Arkwright and Arkwright Summit serving as notable centers of population (Stewart, 1867; collections of SUNY Fredonia).

The Town of Stockton was formed from Chautauqua in 1821, but was initially settled circa 1810. The first sawmill and gristmill were constructed circa 1817, and additional steam and other mills soon followed throughout the town in the 1820s. Dairy was an early important industry of the town, which included numerous butter and cheese factories by the 1830s. The original area of the town was increased in 1850, annexing land from the adjacent Town of Ellery. By 1867, settlement was concentrated in multiple hamlets throughout the town, including Cassadaga on the north and South Stockton in the south part of the town (Inset 6) (Beers, 1881; Downs and Hedley, 1921).

By the late nineteenth century, cement production was a major industry in the town, spear-headed by the Chautauqua Cement Company. A grape basket factory was also a major employer in the early twentieth century, though dairy remained the dominant industry into the twenty-first century (Henry, 2005b).

Throughout Chautauqua County, manufacturing and large industry greatly decreased by the late-twentieth century, and with it the population of the county. Agriculture and maple syrup have remained as major industries in Chautauqua County. Education also plays a large role in the local economy, due to the locations of SUNY Fredonia, Jamestown Community College, the Chautauqua Institution, and BOCES (Kirst, 2005).

Historic maps reflect the nineteenth century settlement and expansion of the towns within the county and the Project area, and the relative lack of population growth throughout the twentieth century. The 1854 Keeney *Map of Chautauqua County, New York* (Figure 5) shows populations within the Project study area concentrated around the villages of Charlotte Center and Sinclearville (Sinclairville) in the Town of Charlotte, and the village of Cherry Creek in the Town of Cherry Creek. The 1888 Beers *Historical Atlas of the County of Chautauqua, New York* (Figure 6) reflects the grid-like agricultural settlement of the towns of Charlotte and Cherry Creek outside of areas of concentrated settlement, with houses noted to be located along roadways and large, rectangular lots likely used for dairy and crops located behind the structures. The 1900 USGS *Cherry Creek, NY* and *Dunkirk*, *NY* topographic quadrangle maps (Figure 7) do not reflect a significant change from the previous historic map, though the 1941 USGS *Cherry Creek* and 1943 USGS *Dunkirk, NY* topographic quadrangle maps (Figure 8) show a moderate increase in the number of structures located along major roads within the towns of Charlotte and Cherry Creek within the Project area. The portions of the Project study area located within the towns of Arkwright and Stockton contain no hamlets or villages, few roads and structures, and do not reflect any significant growth or change during the periods represented by the historic maps herein.

Inset 6. 1867 Stewart *New Topographical Atlas of Chautauqua County*, Town of Stockton.
By 1867, settlement within the Town of Stockton was focused adjacent to water bodies such as Cassadaga Lake and Cassadaga Creek that provided water power and resources necessary for industry (Stewart, 1867; collections of SUNY Fredonia).

2.3 Previous Archaeological Resources Surveys within the Project Site

Two previous Phase 1A/B archaeological survey have been undertaken within the Project site (see Figure 4). A Phase 1 cultural resources investigation for the Crown Castle Charlotte Cellular Communications Tower Project in the Town of Charlotte was conducted by Panamerican Consultants, Inc. (Panamerican) in 2001 (Panamerican, 2001) and a Phase 1A/1B cultural resources survey for the Conewango Site 6 Dam Rehabilitation Project in the Town of Cherry Creek was conducted in 2009 by Environment and Archaeology, LLC (EA) (EA, 2009). Panamerican (2001) excavated

30 shovel tests at a 50 foot (15 meter) interval and identified no archaeological resources during their Phase 1B survey for the Crown Castle Charlotte Cellular Communications Tower Project. EA (2009) conducted pedestrian surface survey at 15 meter transect spacing for the majority of the 43.2 acre APE and excavated 442 STPs at a 50 foot (15 meter) interval and 32 STPs at a 100 foot (30 meter) interval. EA (2009) identified two archaeological sites during their Phase 1B survey: the Zollinger Prehistoric Scatter Site (A01306.000349) and the multicomponent prehistoric/historic archaeological site Melinksi Saw Mill Site (A01306.000350) (see Figure 4).

2.4 Previously Identified Archaeological Sites within the Project Site

The NYSOPRHP *Phase 1 Archaeological Report Format Requirements* (NYSOPRHP, 2005) indicate that Phase 1A survey reports should include a summary of previously identified archaeological sites located within one mile of the Project. There are 10 previously reported archaeological sites located within approximately one mile of the Project site, as described in Table 2 and depicted in Figure 4. As previously noted, two of these sites occur within the Project Site (Zollinger Prehistoric Scatter Site and the Melinski Saw Mill Site).

Table 2. Archaeological Sites Located in the Vicinity of the Project

Site Identifier	Site Name	Time Period	Site Description	Distance from Project	S/NRHP Eligibility
A01306.000349	Zollinger Precontact Scatter Site	Prehistoric	Six flakes	Within Project site	Undetermined
A01306.000350	Melinski Saw Mill Precontact & Historic Site	Multicomponent	1860s sawmill and historic debris scatter with two prehistoric artifacts	Within Project site	Undetermined
A01351.000066	Cherry Creek Corduroy and Plank Road	Historic	Remnants of historic plank and corduroy road beds	0.66 miles	Undetermined
A01351.000008	Kent Historic Site (SUBi 1457)	Historic	Historic architectural material and domestic debris scatter	0.67 miles	Not Eligible
A01351.000009	Bronson School Hotel Site (SUBi 1458)	Historic	Fieldstone wall, historic architectural material and domestic debris scatter	0.68 miles	Undetermined
A01356.000005	Sinclair Cabin	Historic	Historic cabin	0.75 mles	Undetermined
A01351.000010	Kilbourne Historic Site (SUBi 1459)	Historic	Fieldstone wall, historic architectural material and domestic debris scatter	0.76 miles	Eligible
A01311.000038	Bentley Hill Prehistoric Site	Prehistoric	Late Woodland lithic and ceramic scatter	0.84 miles	Not Eligible
A01311.000051	Livermore/Wright Prehistoric Site	Prehistoric	Late Woodland lithic scatter	0.87 miles	Eligible
A01306.000300	Chase I Prehistoric Site, SUBi 1462	Prehistoric	Two flakes	0.94 miles	Undetermined

The Zollinger Prehistoric Scatter Site consisted of a total of six tertiary flakes of gray chert recovered from two shovel test pits (STPs). The site was recommended as not eligible for listing on the State or National Registers of Historic

Places (S/NRHP) based on the low artifact density and lack of diagnostic artifacts (EA, 2009:27). No further work was recommended at the site. The Melinski Saw Mill Site consisted of the remains of an 1860s saw mill, later historic and modern debris resulting from dumping activities in the area, and two prehistoric artifacts (one pecked groundstone net sinker and one fragment of gray chert shatter). Based on the low prehistoric artifact density, the prehistoric component of the site was recommended as not eligible for listing on the S/NRHP with no further work (EA, 2009:31). The site was recommended as unevaluated with regard to the S/NRHP due to the possible presence of additional components of the 1860s saw mill outside the area surveyed by EA. EA (2009:31) recommended no further work at the site because the proposed Conewango Site 6 Dam Rehabilitation Project would have no adverse impact to the portion of the site within the Project APE. The two sites identified by EA (2009) do not occur within the APE for the current Project.

2.5 Existing Conditions

Existing conditions within the Project site were observed and photographed during a reconnaissance-level field visits on April 24 and June 9, 2015. The field visit included observations and photography from public rights of way, except where participating parcels within the Project site were surveyed. Representative existing conditions within the Project study area are included in Appendix B. General observations of existing conditions within the Project site include the following:

- The Project site is characterized by a patchwork of forested woodlots, open agricultural fields (primarily hay), pasture, reverting former agricultural lands in various stages of secondary succession, and scattered residences and farms (Photographs 1-6).
- No areas of concentrated settlement occur within the Project site. The hamlet of Charlotte is the only named hamlet present within the Project site, and is comprised of a church, cemetery and scattered residences at the intersection of County Route 49 and Hooker Road.

3.0 ARCHAEOLOGICAL SENSITIVITY ASSESSMENT

3.1 Prehistoric Native-American Archaeological Sensitivity Assessment

As described in Section 2.3 of this report, two previously recorded archaeological sites with prehistoric components (A01306.000349 and A01306.000350) occur within the Project site. These sites consist of one prehistoric lithic scatter and one multicomponent prehistoric lithic scatter and historic saw mill. Three previously recorded archaeological sites with prehistoric components (A01306.000300, A01311.000038, and A01311.000051) occur within 1.0 mile (1.6 km) of the Project site. These sites consist of two prehistoric lithic scatters and one prehistoric lithic and ceramic scatter. All the prehistoric sites are located in close proximity to major drainages, usually within the floodplain or on a lower terrace (see Figure 4). Furthermore, historic sources suggest the presence of a Native American village in the Town of Charlotte, within the Project site (Henry, 2005a).

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 resources perspective) character of many wind project sites, which are often sited on ridges or other elevated areas away from the river valleys and waterbodies that served as attractive resources for larger Native American settlements. However, due to the proximity of several recorded Native American archaeological sites, portions of Project site should be considered to have a relatively high potential for the presence of prehistoric Native American archaeological resources. In most instances, pre-contact sites are located in relatively close proximity to of drainages and/or wetlands, both because of the availability of freshwater and diverse natural resources (e.g., Funk, 1993; PAF, 2009). In general terms, areas that are not located close to freshwater sources (and associated ecological habitats) are less likely to include pre-contact Native American archaeological sites. Therefore, those portions of the Project site generally located proximate to drainages and/or wetlands should be considered as having a relatively higher potential for the presence of prehistoric Native American archaeological resources.

3.2 Historic Period Archaeological Sensitivity Assessment

As described in Section 2.4 and illustrated on historic maps (see Figures 5-8), the Project site has a historic-period occupation history since at least the early-nineteenth century. There are six previously recorded archaeological sites within 1 mile of the Project site (NYSOPRHP Sites A01306.000350, A01351.000008, A01351.000009, A01351.000010, A01351.000066, and A01356.000005). These consist of one historic cabin, two historic fieldstone walls with architectural and domestic debris, one architectural and domestic debris scatter, one plank and corduroy road remnant, and one multicomponent historic 1860s saw mill and prehistoric lithic scatter site.

Historic-period archaeological sites located in the vicinity of the Project site could include settlements, farms, or early industrial/agricultural sites (e.g., mills, creameries) dating from the nineteenth and early-twentieth centuries. The locations of former structures within and near the Project site are shown on the Keeney's 1854 *Wall Map of Chautauqua County, NY* (Figure 5), the Beers 1881 *Illustrated Historical Atlas of the County of Chautauqua, New York* (Figure 6), the 1900 USGS *Cherry Creek, NY* and *Dunkirk, NY* topographic quadrangle maps (Figure 7), and 1941 USGS *Cherry Creek, NY and* 1943 USGS *Dunkirk, NY* topographic quadrangle maps (Figure 8).

Map-documented structures (MDS) within the Project site are generally located adjacent to existing roadways. In some instances MDS represent existing buildings and/or farms. In other instances, the MDS are abandoned structures that now may be represented only by archaeological remains. Potential archaeological resources associated with these MDS could include abandoned residential and/or farmstead sites, wherein 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 extant.

Areas located in the immediate vicinity (within approximately 200 feet) of MDS locations are considered to have a high potential for the presence of historic-period archaeological resources. The remaining portions of the Project site exhibit minimal (if any) likelihood for significant historic period archaeological sites to be present.

3.3 Prior Ground Disturbance

The *NYAC Standards* indicate that Phase 1 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 relatively minor factor in the archaeological sensitivity of the Project site, as steep slopes are fairly limited within the Project site, and much of the APE occurs on relatively flat to rolling ridge tops and saddles. Wetland communities within the Project site are being investigated as part of the environmental review for the Project. In general, Project facilities have bene and will be sited to minimize impacts to wetland communities.

Previous ground disturbance within the Project site 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, some areas immediately adjacent to existing roads within the Project site include drainage ditches, culverts, and areas of cut and/or fill. With the exception of these areas, the Project site in general does not appear to have been subjected to significant previous disturbance.

4.0 ARCHAEOLOGICAL RESOURCES SURVEY WORK PLAN

4.1 Phase 1B Archaeological Survey Methodology

The archaeological APE for the Project includes active agricultural lands (including pastures, corn and hay fields), open meadows, forested/shrubland areas, and steeply sloped areas (i.e., areas in excess of 12-15% slopes per the NYAC Standards [NYAC, 1994]). Following previously used fieldwork methods, it is anticipated that EDR's additional archaeological survey work in these areas will consist of the following:

- **Corn fields**. In existing corn fields and/or previously cultivated areas with greater than 80% ground-surface visibility, EDR personnel will conduct a pedestrian surface survey to determine whether archaeological sites are present (in accordance with the NYAC Standards; NYAC, 1994). In these areas, EDR personnel will traverse the archaeological APE along transects spaced at three to five-meter 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 indication of an archaeological site is observed on the ground surface, then the location of all finds will be recorded using sub-meter accuracy Global Positioning System (GPS) equipment. After recording the locations of all artifacts and/or features in a given area, EDR personnel will collect observed artifacts for subsequent laboratory identification and analysis, in accordance with standard archaeological methods.
- **Hay fields, forests, and shrubland**. In selected areas not suitable for pedestrian surface survey, EDR personnel will excavate STPs to determine whether archaeological sites are present. STPs will be excavated along transects or in grid patterns at 5-meter intervals within selected areas to provide for intensive sampling of the various environmental zones within the project site (per the SHPO Wind Guidelines; see *Landscape Classification Geographic Information System [GIS] Model* section below). STPs excavated for the Project will be 30-50 cm in diameter and excavated to sterile subsoil or the practical limits of hand excavation (in accordance with the NYAC Standards; NYAC, 1994). Field notes for each STP 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 STPs will be screened through 0.25-inch hardware cloth. If prehistoric Native American artifacts are recovered from an isolated STP, then up to eight additional STPs will be excavated at one-meter and three-meter intervals around the original STP to determine whether the artifacts represent an isolated find or may indicate the presence of a more substantial archaeological site.
- **Steeply sloped, wetland, and disturbed areas**. No systematic archaeological survey work is proposed in steeply sloped areas, delineated wetlands, or areas where visual inspection can confirm previous soil disturbace (per the NYAC Standards; NYAC, 1994). In these areas, archaeological survey will be restricted

to pedestrian walkover supplemented by judgmental shovel testing if indications of a potential archaeological site are observed (e.g., foundations, structural remains, or rock overhangs suitable for use as shelters).

4.2 Archaeological Work Scope

The Phase 1B survey methodology proposed in this Work Plan was designed in accordance with the 2006 *SHPO Wind Guidelines*. This approach entails using the acreage of the Project's archeological APE 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 GIS model. Table 3 provides the archaeological APE for each Project component, 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 Project site, it is estimated that approximately 25% of the archaeological APE 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 1B 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.

Table 3. Anticipated Phase 1B Archaeological Survey APE and Methods

Project Component	Archaeological APE (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	193.1	17.2	175.9
Access Roads[1]	79.2	11.4	67.8
Collection Lines[1]	64.1	4.6	59.5
Transmission Line	66.9	10.8	56.1
Meteorological Towers	2	0	2
Staging Areas	20	20	0
O&M Facility	2.5	0	2.5
Collector Substation	3	0	3
POI Substation	5	5	0
Total	**435.8**	**69**	**366.8**

[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 buried electrical 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. However, these estimates do not take into account steeply sloped areas, where no systematic shovel testing will be conducted (see Section 3.3, above).

4.3 Landscape Classification GIS Model

EDR performed a Geographic Information System (GIS)-based landscape classification analysis for the Project site in accordance with the *SHPO Wind Guidelines*. The landscape classification identified environmental zones within the Project 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 a digital elevation model (DEM) obtained from the United States Geologic Survey (USGS) National Elevation Dataset (NED), which provides basic elevation information for earth science studies and mapping applications in the United States (USGS, 2015). The resolution of the DEM used for this analysis was 10 by 10 meters. According to this data, the elevation within the Project site ranges from approximately 1,280 to 2,135 feet. Based on elevation alone, the Project site would fall within the valley wall and upland, or interfluve, environmental zones defined by Funk (1993). However, the Project site includes notable valley areas associated with Cassadaga Creek, Mill Creek, Cherry Creek, and an unnamed tributary to the West Branch of Conewango Creek. Review of the DEM, confirmed by site visits, indicates that the Project site more accurately includes all three environmental zones: valley floor, valley wall and upland. These three environmental zones were further divided into the following 16 landscape classes identified within the Project 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 Project site 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 along Cassadaga Creek with elevations less than 1,350 feet and all other areas less than 1,475 feet in elevation were designated as valley floor. The Cassadaga Creek valley floor was defined separately from the rest of the Project site because it is a lower lying valley and the topography clearly reflects a transition from valley wall to valley floor at approximately 1,350 feet. Areas ranging from the defined valley floors up to an elevation of 1,650 feet were designated as valley walls and areas of elevation greater than 1,650 feet were designated as falling within the upland environmental zone.
- *Knolls and Ridges*. For the purposes of this analysis, ridges and knolls were defined as areas of elevation more than five meters greater than the local average elevation, where 'local' is defined as a 1,500-foot radius neighborhood around each cell of the DEM.
- *Saddles*. Areas that were not identified ridges/knolls or steep slopes were considered to be saddles.
- *Streams and Wetlands/Hydric Soils*. Areas near streams and wetlands/hydric soils were defined by 328-foot (100 meters, per Funk, 1993) buffers applied to Environmental Systems Research Institute (ESRI) mapped streams; 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 and wetland/hydric soil buffer overlapped were classified as near stream.

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 Project site. This file was then evaluated with respect to the proposed Project layout to determine the acreage of soil disturbance anticipated to occur in each of the landscape classes.

4.4 Archaeological Survey Research Design

The resulting landscape classification for the Project is presented in Table 4 and Figure 9. Table 3 provides the acreage of archaeological APE associated with each Project component within each of the identified landscape classes. Figure 9 depicts the extent of the 16 landscape classes within the Project Area in relation to the proposed Project layout.

Table 4. Archaeological APE by Project Component and Landscape Class

Landscape Classification	Archaeological APE by Project Component (Acres)					Total Archaeological APE (Acres)
	Wind Turbine	Access Road[1]	Buried Interconnect[1]	Transmission Line	Substations, Met Towers O&M Facility and Staging Areas	
Steep Slopes (>12%)	0.2	0	0.1	0.1	0	**0.4**
Upland Ridges and Knolls						
No Associated Water	136.5	43.2	33.1	8.1	4.9	**225.8**
Near Wetland/Hydric Soil	31.1	14.4	9.3	2.0	2.2	**59.0**
Near Stream	3.1	0.8	0.3	0	0	**4.2**
Upland Saddles						
No Associated Water	10.2	12.8	11.9	4.3	20.4	**59.6**
Near Wetland/Hydric Soil	7.9	4.6	5.8	4.9	0	**23.2**
Near Stream	1.2	1.1	1.7	0	0	**4.0**
Valley Wall						
No Associated Water	2.1	2.2	1.0	32.9	0	**38.2**
Near Wetland/Hydric Soil	0.8	0.1	0.3	7.3	0	**8.5**
Near Stream	0	0	0.6	1.0	0	**1.6**
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	0	0	**0**
Valley Floor						
No Associated Water	0	0	0	1.3	0	**1.3**
Near Wetland/Hydric Soil	0	0	0	2.8	4.7	**7.5**
Near Stream	0	0	0	2.2	0.3	**2.5**
Total	**193.1**	**79.2**	**64.1**	**66.9**	**32.5**	**435.8**

[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.

As shown in Table 4, approximately 375.8 acres of the APE occurs on uplands, 48.3 acres on valley walls, 11.3 acres on valley floors, and 0.4 acres on steep slopes. A relatively small portion of the Project APE occurs near streams (only 12.3 acres of APE within 328 feet of a mapped stream). Areas of APE near wetlands/hydric soils are fairly common (98.2 acres) but areas with no associated water features dominate (324.9 acres).

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 of 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 Project site generally located proximate to drainages and/or wetlands should be considered as having a relatively higher potential for the presence of prehistoric Native American archaeological resources. In general terms, areas that are not located close to freshwater sources (and associated ecological habitats) are less likely to include pre-contact Native American archaeological sites.

Per the landscape classification model described in Section 4.3 and depicted in Figure 10, areas within the Project 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. and To allow for a cost-effective and efficient archaeological survey for the Project, EDR proposes that within those portions of the Project APE that are identified as "No Associated Water", only 50% of the overall level of effort that would be typically required for the acreage of the APE be sampled (shovel tested) as part of the Phase 1B survey. In other words, approximately 324.9 acres of the archaeological APE are in areas with "No Associated Water". Typically, the total level of shovel testing for these areas would be equivalent to 5,198 shovel tests (at 16 shovel tests/acre). However, because these areas have a relatively lower potential for Native American archaeological sites to be present, EDR proposes excavating 2,599 shovel tests (or 50%) in areas with "No Associated Water" (see Table 5). It is worth noting that cultivated land within these areas that is suitable for pedestrian survey will be surveyed consistent with the methods described in Section 4.1. In addition, any map-documented structures or areas with other indicators of a potential historic-period archaeological site will be investigated without any reduction in effort.

The proposed reduction in sampling in areas with 'No Associated Water' would result in the proposed excavation of up to 3,716 shovel tests, which is generally consistent with the level of effort for previous archaeological surveys for comparable scaled wind energy project in New York. Examples include: Allegany Wind Power Project – 1,455 shovel tests (JMA, 2010); Arkwright Summit (formerly New Grange) Wind Farm – 4,010 shovel tests (Tetra Tech, 2008a, 2009a, 2009b); Copenhagen Wind Farm – 3,425 shovel tests (EDR, 2014); Hardscrabble (formerly Top Notch) Wind Farm – 4,097 shovel tests (PCI, 2006); Howard Wind Farm – 880 shovel tests (JMA, 2006a); Jericho Rise Wind – 3,455 shovel tests (Tetra Tech, 2008); Jordanville Wind Farm – 1,562 shovel tests (JMA 2006b); Marble River Wind Farm – 4,913 shovel tests (JMA, 2007a, 2007b); and the Roaring Brook Wind Farm – 3,068 shovel tests (JMA, 2009). The total level of effort proposed for the archaeological survey for the Cassadaga Wind Farm is expected to generate an adequate testing sample to evaluate the Project's potential effect on archaeological resources.

Table 5. Summary of Archaeological Survey Method by Landscape Class

Landscape Classification	Number of Shovel Tests (Idle Areas)	Surface Survey Acreage (Cultivated Areas)
Steep Slopes (>12%)	n/a	0
Upland Ridges and Knolls		
No Associated Water	1,620 [1]	26.3
Near Wetland/Hydric Soil	825	7.4
Near Stream	68	0
Upland Saddles		
No Associated Water	309 [1]	23.1
Near Wetland/Hydric Soil	358	0.8
Near Stream	64	0
Valley Wall		
No Associated Water	221 [1]	10.5
Near Wetland/Hydric Soil	128	0.5
Near Stream	27	0
Valley Floor Ridges and Knolls		
No Associated Water	0	0
Near Wetland/Hydric Soil	0	0
Near Stream	0	0
Valley Floor		
No Associated Water	9 [1]	0.2
Near Wetland/Hydric Soil	51	0
Near Stream	36	0.2
Total	**3,716**	**69**

[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.

Table 5 provides the research design for the Phase 1B Archaeological Survey. The research design reflects the distribution of various landscape classes according to existing land cover/land use (e.g., agricultural fields, wooded area) and associated archeological survey methods (e.g., pedestrian surface survey, shovel testing), as appropriate. In addition, the research design assumes that 50% reduction in shovel testing for those portions of the archaeological APE located in areas with "No Associated Water".

The locations of areas selected for intensive archaeological sampling within the archaeological APE will be made on a judgmental basis in the field under the direction of a Registered Professional Archeologist. Selection of areas for shovel testing, in accordance with the research design presented in Table 3, will prioritize areas of high sensitivity for historic or prehistoric archaeological sites within or adjacent to proposed Project components. In general, high prehistoric archaeological sensitivity will be assigned to areas with little to no slope, moderate- to well-drained soils, and close proximity to water sources. High historic archaeological sensitivity will be assigned to areas of the APE in close proximity to historical map-documented structures.

4.5 Phase 1B Archaeological Survey Report and Delivery of Electronic Data

Results of the Phase 1B archaeological survey will be summarized in an illustrated report prepared in accordance with the *New York State Historic Preservation Office (SHPO) Phase 1 Archaeological Report Format Requirements* issued in April 2005. NYSOPRHP Archaeological Site Inventory Forms will be prepared for any archaeological sites identified during the survey, if necessary. In accordance with the *SHPO Wind Guidelines*, EDR will also provide accurate location information for any sites identified during the Phase 1B survey. EDR anticipates this data will be provided when uploading site description into NYSOPRHP's On-line CRIS database.

5.0 SUMMARY AND CONCLUSIONS

5.1 Potential Effect on Archaeological Resources

Relative to the potential for archaeological sites to be located in the Project site, the results of the Phase 1A archaeological resources survey for the proposed Cassadaga Wind Project can be summarized as follows:

- There are two previously reported Native American archaeological sites located within the wind generating facility Project site, and more generally there are three additional previously reported Native American archaeological sites located within 1 mile of the Project site. Native American archaeological sites that have been identified in the area typically consist of lithic and ceramic scatters, and villages. In general terms, areas that are not located close to freshwater sources (and associated ecological habitats) are less likely to include pre-contact Native American archaeological sites. Therefore, those portions of the Project site generally located proximate to drainages and/or wetlands should be considered as having a relatively higher potential for the presence of prehistoric Native American archaeological resources.
- One previously reported historic archaeological site is located within the Project site and five previously reported archaeological sites occur within 1 mile of the Project site. Historic maps (see Figures 7-10) identify the locations of farmsteads and other potential historic-period archaeological sites within the Project site; archaeological resources associated with these sites could include foundations, structural remains, artifact scatters, and/or other features. The sensitivity for historic period archaeological remains is considered to be high within close proximity to these MDS and low for the rest of the Project site.

Proposed construction of the Project will include ground disturbing activities that have the potential to impact archaeological resources. The APE for archaeological resources 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 Project site but that are not within the limits of disturbance for proposed Project facilities will not be affected by the Project.

5.2 Summary of Archaeological Survey Work Plan

On behalf of EverPower Wind Holdings, Inc. EDR has prepared a Phase 1A Archaeological Resources Survey and Phase 1B Archaeological Survey Work Plan for the proposed Cassadaga Wind Project, located in the Towns of Charlotte, Cherry Creek, Arkwright and Stockton, Chautauqua County, New York. Per the *SHPO Wind Guidelines*, A project's archaeological APE is defined as those areas where soil disturbance is proposed to occur during construction. (NYSOPRHP, 2006). Based on the current Project design, the Project's archaeological APE is 435 acres in size. Please

note that the Project layout will be reviewed prior to conducting the Phase 1B survey. The Project APE and survey effort will be adjusted in accordance with Project layout modifications consistent with the assumptions and methodology for determining the APE as presented herein.

Based on the current Project design, it is anticipated that the Phase 1B archaeological survey for the Cassadaga Wind Project will include:

- The excavation of approximately 3,716 shovel tests and the pedestrian surface survey of approximately 69 acres archaeological APE located within agricultural fields.
- Preparation of a Phase 1B archaeological survey report, to be submitted to NYSOPRHP via the CRIS website. The report will be prepared in accordance with NYSOPRHP's *Phase 1 Archaeological Report Format Requirements* (NYSOPRHP, 2005) and will also include inventory forms for any archaeological sites recorded during the survey.
- Submission of site information for any identified archaeological sites via the CRIS website.

EDR has provided this work plan to NYSOPRHP in advance of conducting the Phase 1B archaeological survey to confirm the landscape classification model, proposed sampling strategy, and anticipated field methodology for the Project 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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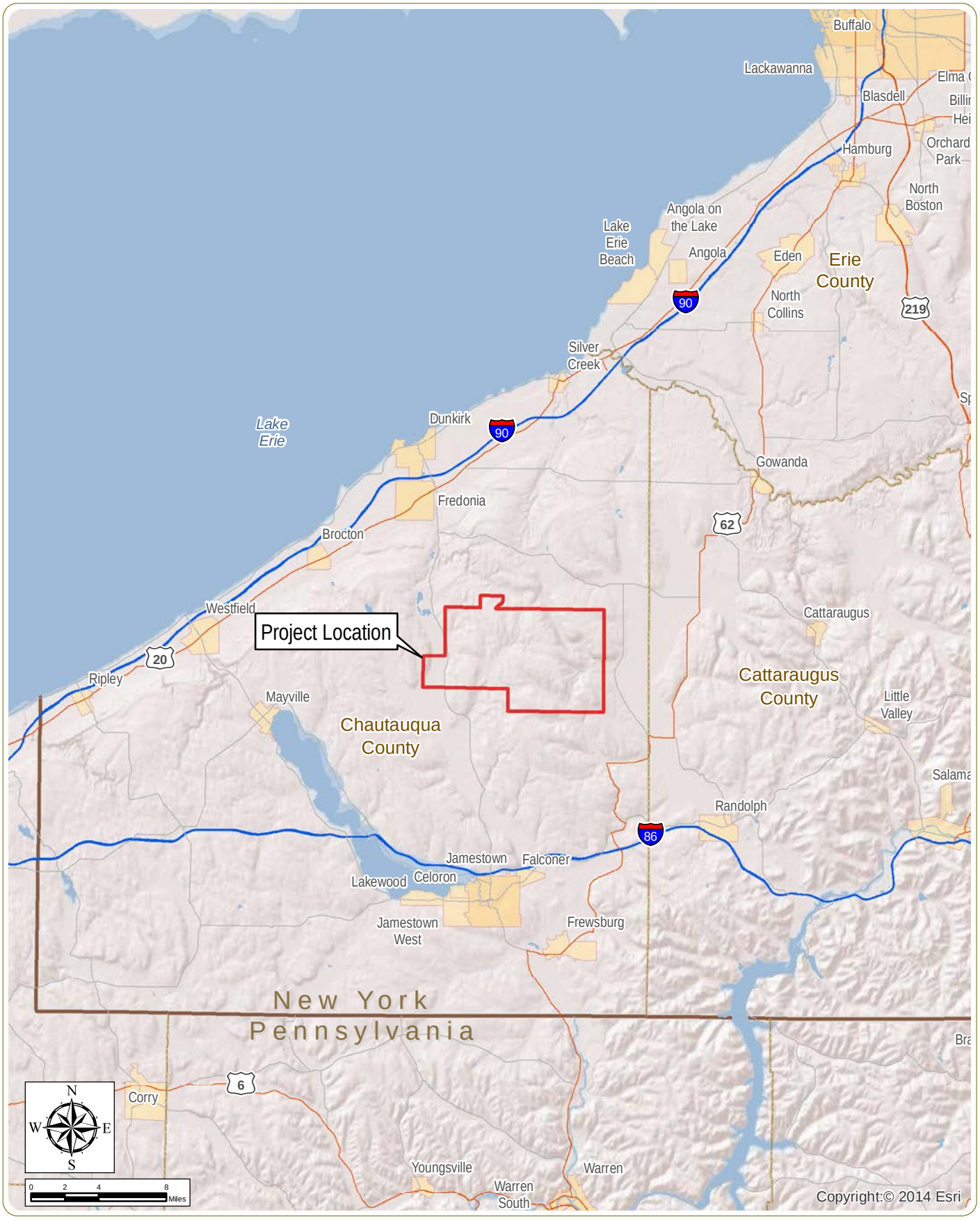
Figures



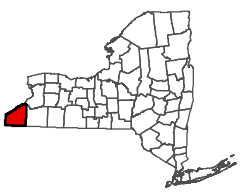
Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 1: Regional Project Location

July 2015

Notes: 1. Basemap: ESRI ArcGIS Online "World Shaded Relief" Map Service and ESRI StreetMap North America, 2008.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.



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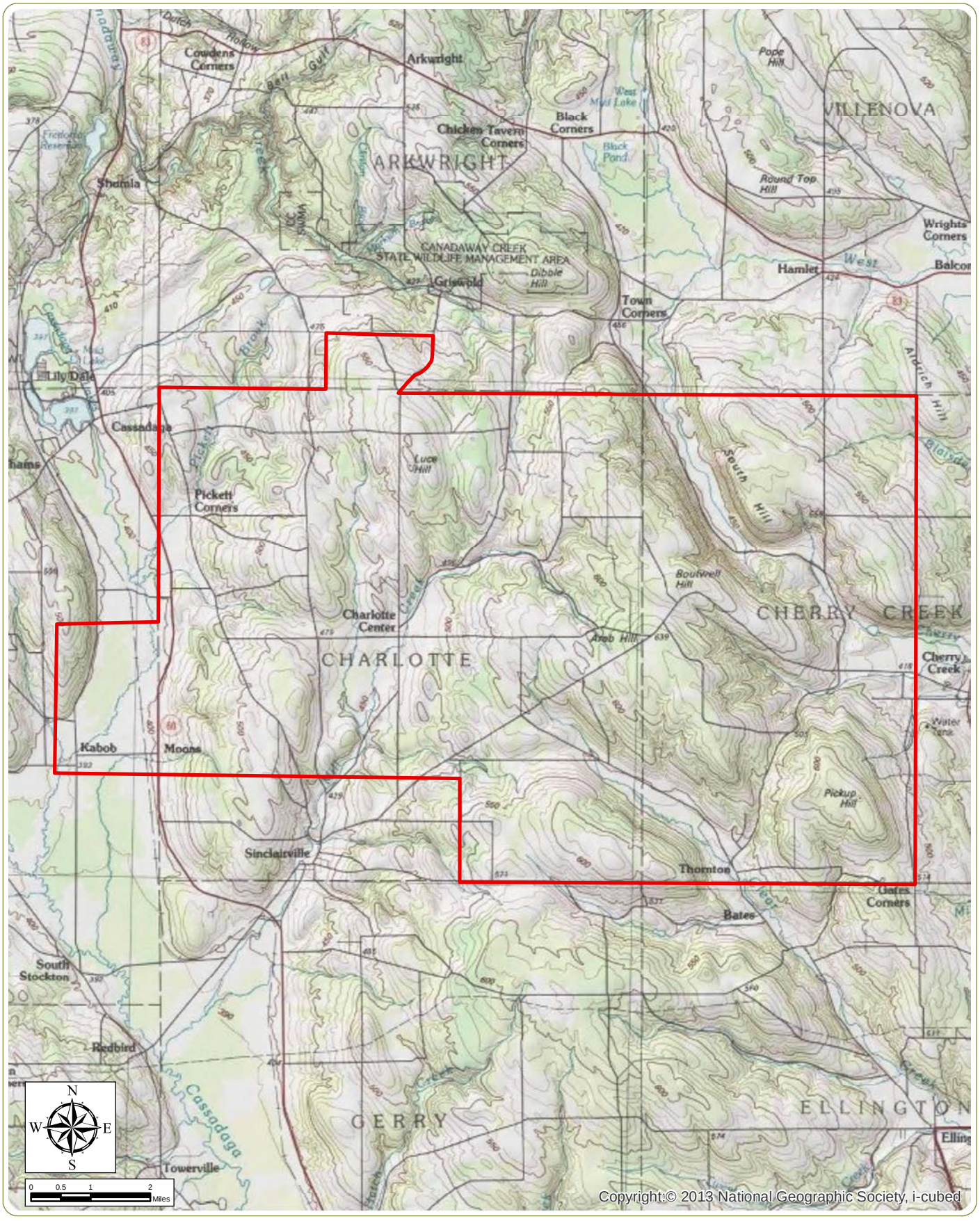

Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 2: Project Site Topography

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Project Site

Notes: 1. Basemap: ESRI ArcGIS Online "USA Topo" Map Service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 3: Project Site Soils

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Project Site

Notes:
1. Basemap: ESRI ArcGIS Online "World Terrain" Map Service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

Alden mucky silt loam
Allard silt loam
Ashville silt loam
Busti silt loam
Canandaigua mucky silt loam
Canandaigua silt loam
Canaseraga silt loam
Carlisle muck
Chadakoin silt loam
Chautauqua silt loam
Chenango channery loam
Chenango gravelly loam
Chenango silt loam
Dalton silt loam
Elnora fine sandy loam
Erie silt loam
Fluvaquents-Udifluvents complex
Fremont silt loam
Getzville silt loam
Halsey mucky silt loam
Hamlin silt loam
Hinesburg fine sandy loam
Holderton silt loam
Lamson silt loam
Langford silt loam
Mardin channery silt loam
Middlebury silt loam
Minoa fine sandy loam
Orpark silt loam
Palms muck
Pits
Pompton silt loam
Raynham silt loam
Red Hook silt loam
Saprists and Aquents
Schuyler silt loam
Scio silt loam
Swormville silt loam
Tioga silt loam
Towerville silt loam
Udorthents
Unadilla silt loam
Valois gravelly silt loam
Volusia channery silt loam
Wakeville silt loam
Water
Wayland soils complex

0 0.5 1 2 Miles

Sources: Esri, DeLorme, USGS, NPS, Sources: Esri, USGS, NOAA

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Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 4:
Previously Identified Archaeological Resources

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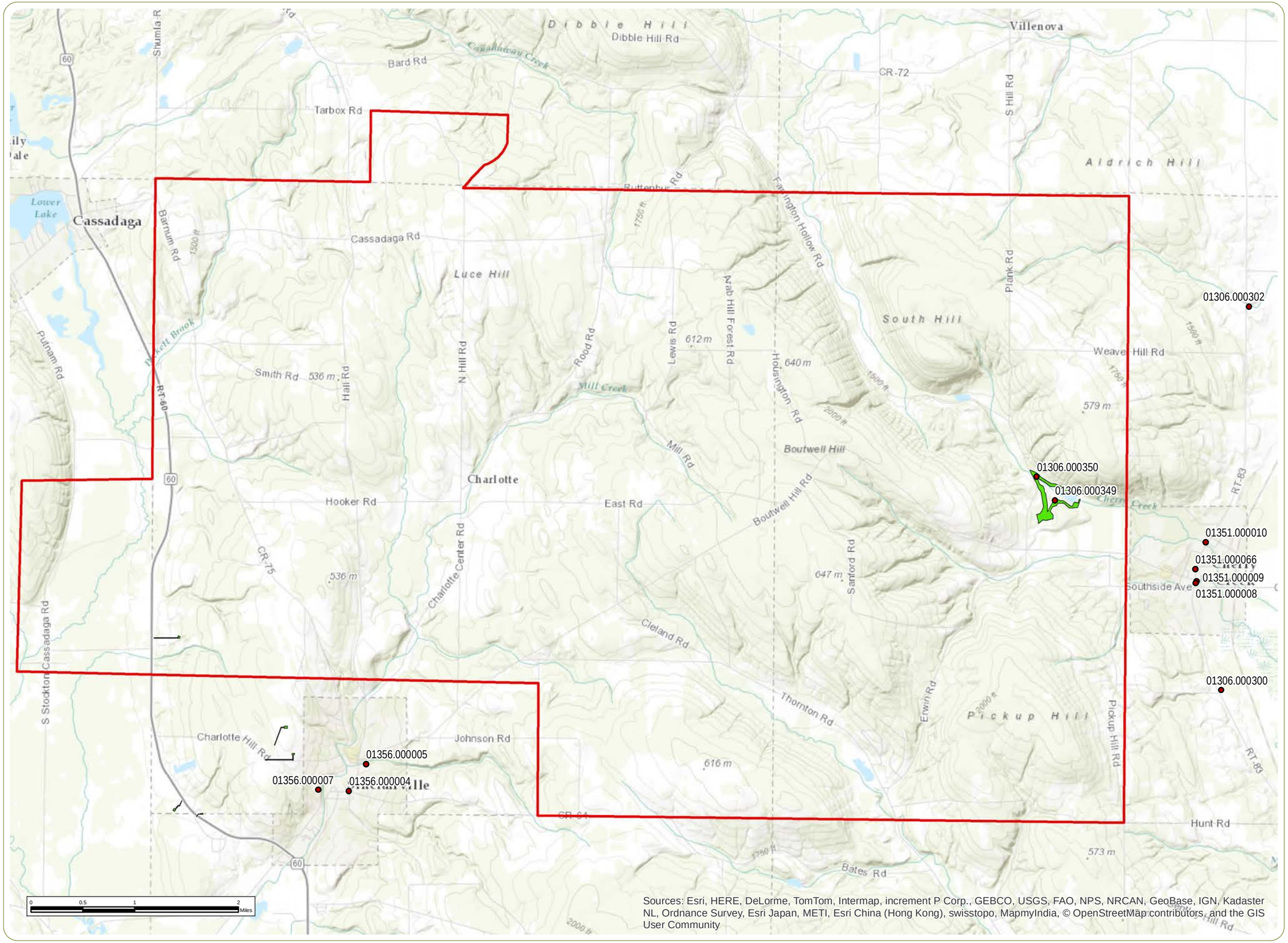

Archaeology Site
Previous Cultural Resource Survey
Project Area

Notes:
1. Basemap: ESRI ArcGIS Online "Topography" Map Service.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

Sources: Esri, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community

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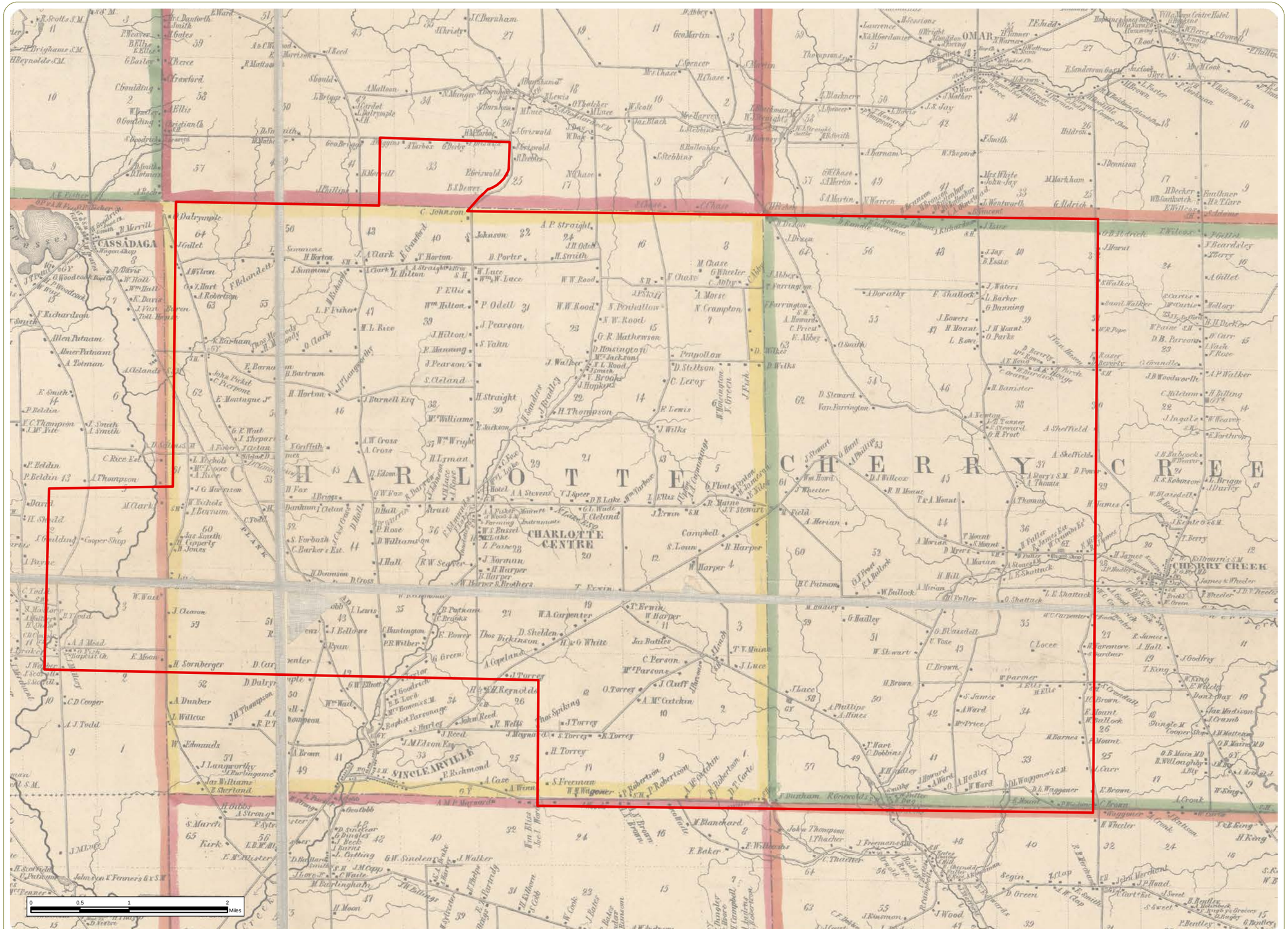
Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 5: 1854 Keeney
Map of Chautauqua County, New York

July 2015



Project Site

Notes:
1. Basemap: 1854 Keeney *Map of Chautauqua County, New York*.
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 is a color graphic. Reproduction in grayscale may misrepresent the data.

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Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 6: 1881 Beers *Atlas of the County of Chautauqua, New York*.

July 2015

Project Site

Notes:
1. Basemap: 1881 F.W. Beers and Co. *Atlas of the County of Chautauqua, New York* .
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 is a color graphic. Reproduction in grayscale may misrepresent the data.

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Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 7:
1900 USGS *Cherry Creek, NY* and *Dunkirk, NY* Topographic Quadrangle Maps

July 2015

Project Site

Notes:
1. Basemap: 1900 USGS *Cherry Creek, NY* and *Dunkirk, NY*Topographic Quadrangle Maps.
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 is a color graphic. Reproduction in grayscale may misrepresent the data.

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Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 8:
1941 USGS *Cherry Creek, NY* and 1943 *Dunkirk, NY* Topographic Quadrangle Maps

July 2015

Project Area

Notes:
1. Basemap: 1941 *Cherry Creek, NY* and 1943 *Dunkirk, NY*Topographic Quadrangle Maps.
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 is a color graphic. Reproduction in grayscale may misrepresent the data.

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Cassadaga Wind Project

Towns of Arkwright, Charlotte, Cherry Creek, and Stockton - Chautauqua County, New York

Figure 9:
Archaeological Survey Landscape Model

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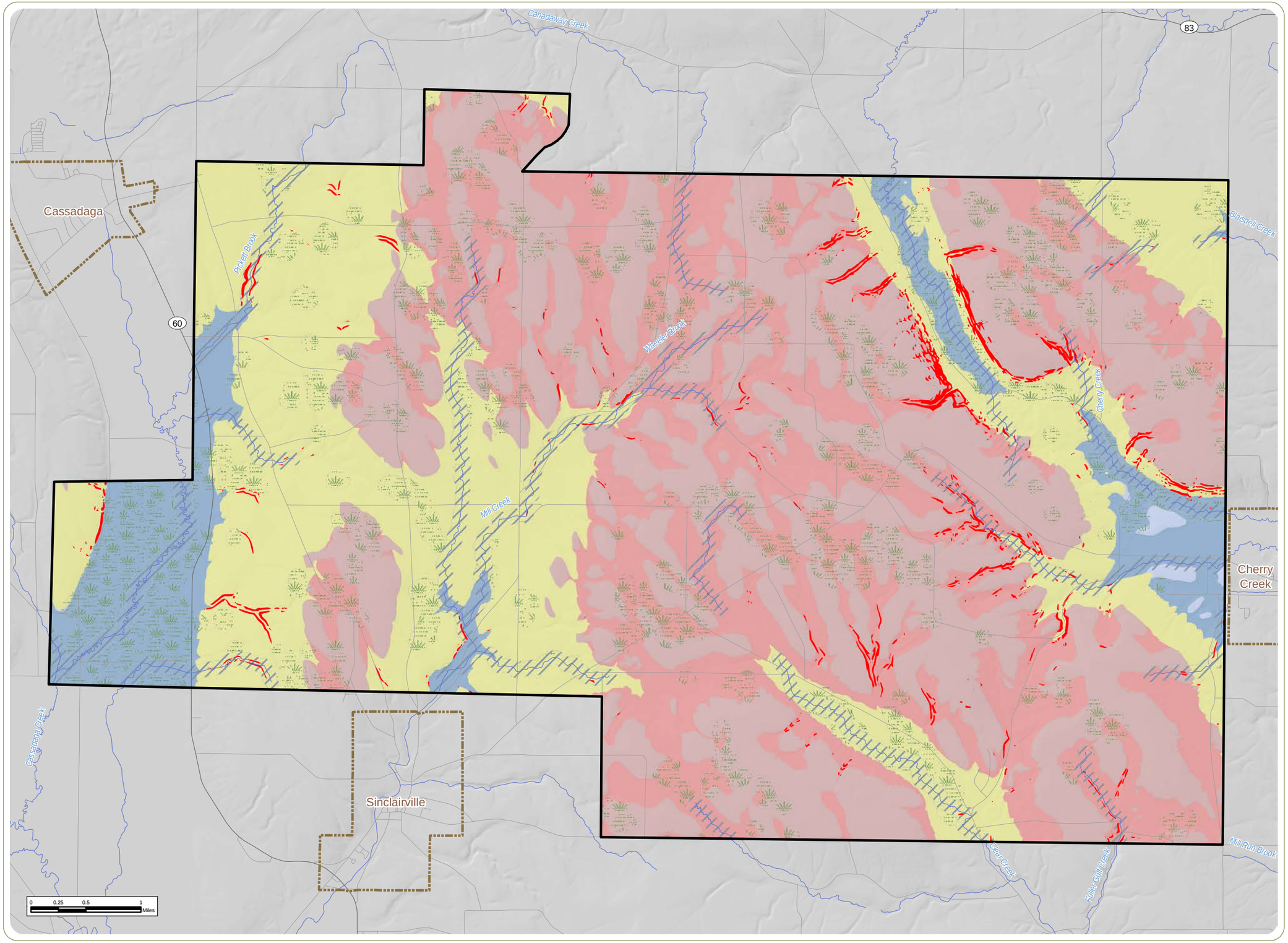

Landscape Model

- Upland Ridge, Near Stream
- Upland Ridge, Near Wetland/Hydric Soil
- Upland Ridge, No Water
- Upland Saddle, Near Stream
- Upland Saddle, Near Wetland/Hydric Soil
- Upland Saddle, No Water
- Valley Wall, Near Stream
- Valley Wall, Near Wetland/Hydric Soil
- Valley Wall, No Water
- Valley Floor Ridge, Near Stream
- Valley Floor Ridge, Near Wetland/Hydric Soil
- Valley Floor Ridge, No Water
- Valley Floor, Near Stream
- Valley Floor, Near Wetland/Hydric Soil
- Valley Floor, No Water
- Steep Slope
- Project Site
- City/Village Boundary

Notes:
1. Basemap: Hillshade derived from USGS 10-meter resolution digital elevation model.
2. This is a color graphic. Reproduction in grayscale may misrepresent the data.

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Appendix A:

NYSOPRHP Correspondence

Close

Project 15PR02730: Cassadaga Wind Project (UJ91NB2J7WBR)

View Project

Please accept the following information below as the consolidated response from NYS SHPO for the above referenced submission.

Review Responses

Reviewer	Review Type	Response
Daria Merwin	Survey and Evaluation	In order for SHPO to complete our evaluation of the historic significance of all buildings/structures/districts within or adjacent to your project area, we need further information. Please review the specific information request(s) below and click the Process button to respond to each request.
Nancy Herter	Archaeology	In order for SHPO to complete our evaluation of the Archaeological sensitivity of your project, we need further information. Please review the specific information request(s) below and click the Process button to respond to each request.

Information Requests

Process	Status	Reviewer	Review Type	Request Type	Request Entity	Request Item	Request Description
	Information Requested	Daria Merwin	Survey and Evaluation	Request a New Attachment, Photo, or Survey for this Consultation Project	Survey	Please submit a Historic Resources Study to address potential visual impacts to properties 50 years or older within a five-mile radius of the APE.	
	Information Requested	Nancy Herter	Archaeology	Request a New Attachment, Photo, or Survey for this Consultation Project	Attachment	The SHPO will be pleased to offer archaeological recommendations once we receive a map of the direct Area of Potential Effects. An attachement token has been provided to facilitate this request.	

Attachments

Attachment	Reviewer	Review Type	Type	Name	Description
No Attachment Records					

Appendix B:
Site Photographs

Photograph 01:

Representative view of agricultural context within Project site.

Photograph 02:

Representative view of agricultural context within Project site.

Photograph 03:

Representative view of agricultural context within Project site.

Photograph 04:

Representative view of agricultural context and farm buildings within Project site.

Photograph 05:

Representative view of forested area within Project site.

Photograph 06:

Representative view of forested area within Project site.