

Wetland Delineation Report

Cassadaga Wind Project

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

Prepared for:

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

Cassadaga Wind, LLC (the Applicant), a wholly owned subsidiary of EverPower Wind Holdings, Inc., is proposing to construct a wind energy generation facility and associated necessary infrastructure (the Facility) in the Towns of Charlotte, Cherry Creek, Arkwright, and Stockton in Chautauqua County, New York (see Figure 1). The Facility site is roughly bounded by Bard Road and State Route 83 to the north, State Route 83 to the east, State Route 64 to the south, and State Route 60 to the west (see Figure 2). The Facility will consist of up to 54 turbines, with a maximum generating capacity of 126 Megawatts. Other proposed components will include: access roads, overhead and underground 34.5 kilovolt (kV) collection lines, an above-ground 115 kV generator lead line, a collection substation, a point of interconnection (POI) substation, two permanent meteorological (met) towers, two temporary staging/laydown yards, and an Operations and Maintenance (O&M) building (see Figure 2). The majority of Facility components will be located in the Towns of Charlotte, Cherry Creek and Arkwright. The only proposed Facility components in the Town of Stockton are a short section of the generator lead line and the POI substation.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) was retained to identify all wetlands and streams within the anticipated limit of disturbance associated with the Facility components described above (hereafter referred to as the "Study Area" - see Figure 3). Specifically, the Study Area includes 1) a 200-foot corridor along proposed access roads, the generator lead line and the collection lines, 2) a 200-foot radius around each turbine and both meteorological towers, and 3) a 200-foot radius around the proposed locations of the substations, laydown yards, and O&M building. Wetland and stream delineations took place within the Study Area during the months of October and November of 2015 and September and October of 2016.

The Cassadaga Wind Project is currently being reviewed under Article 10 of the New York State Public Service Law. On May 27, 2016, EDR submitted a preliminary Wetland Delineation Report as a part of Exhibit 23 of the Article 10 application. This report addressed wetlands that were actually delineated in the field and those that were approximated due to lack of property access. Since the submission of the original report (EDR, 2016), additional property access was obtained and modifications were made to the Facility layout. Certain Facility components have been eliminated or slightly shifted, resulting in the current wetland and stream Study Area. All wetlands and streams within this Study Area were delineated in the field during the 2015 and 2016 growing seasons. Therefore, this updated wetland delineation report is comprehensive and supersedes the preliminary wetland delineation report included with the Article 10 application.

1.2 PURPOSE

The purpose of this study was to delineate and describe all wetlands and streams that may fall under state or federal jurisdiction and could possibly be impacted by construction of the proposed Facility. Specific tasks performed for this study included 1) review of background resource data and mapping, 2) field delineation and flagging of all potential state and federal jurisdictional wetlands and streams, 3) subsequent Global Positioning System (GPS) survey of on-site delineated wetland and stream boundaries, 4) quantification of the area of on-site jurisdictional wetlands and streams within the Study Area, and 5) a description of potentially jurisdictional areas based on hydrology, vegetation, and soils data collected in the field.

This document is intended to provide all of the information necessary to identify and document on-site delineations, facilitate jurisdictional determinations, and support state and federal permit applications.

1.3 RESOURCES

Materials and literature supporting this investigation have been derived from a number of sources including USGS topographic mapping (Cassadaga, Hamlet, and Cherry Creek, NY 7.5 minute quadrangles), United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping (USFWS, 2016), New York State Department of Environmental Conservation (NYSDEC) Freshwater Wetlands and stream classification mapping (NYSDEC, 1999; NYSDEC, 2015), Natural Resources Conservation Service (NRCS) Web Soil Survey (NRCS, 2015), the NRCS List of Hydric Soils of the State of New York (NRCS, 2014), and recent aerial photography.

Vascular plant names follow nomenclature found in the New York Flora Atlas (Weldy et al., 2015), and wetland indicator status for plant species was determined by reference to the National Wetland Plant List (Lichvar et al., 2014). Jurisdictional areas were characterized according to the wetlands and deepwater habitats classification system used in NWI mapping (Cowardin, 1979).

1.4 QUALIFICATIONS

EDR has been conducting wetland delineations for over 25 years. Wetland and stream delineations conducted for this project during 2015 were performed by EDR field ecologists Connor Liddell, Emma Freeland, John Wojcikiewicz, and Russell Farchione. Mr. Liddell and Ms. Freeland have subsequently accepted new positions and no longer work for EDR. Additional delineations conducted during 2016 were performed by EDR Project Manager Michael Kopansky and field ecologists Russell Farchione and Vernon Zoekler.

Mr. Kopansky is an Environmental Project Manager with over eight years of experience in the environmental field. He received a Bachelor of Science Degree in Environmental Science from the State University of New York at Binghamton, as well as a Master of Science Degree in Biology from Towson University in Maryland. Mr. Kopansky holds a Professional Wetland Scientist (PWS) certification from the Society of Wetland Scientists, as well as an Associate Ecologist certification from the Ecological Society of America.

Mr. Wojcikiewicz is an Environmental Analyst/Field Biologist with more than three years of experience in the natural resources field. He received a Bachelor of Science Degree in Biology from Clarkson University and a Master's Degree in Biology from Virginia Commonwealth University. Mr. Wojcikiewicz's experience includes wetland and stream delineations, wetland permitting, ecological surveys, ecological research, invasive species management, environmental impact analysis, and geographic information system (GIS) data analysis.

Mr. Farchione is an Environmental Analyst/Field Biologist with a Bachelor of Science Degree in Biology from the State University of New York at Geneseo. Since joining EDR in 2015, Mr. Farchione has conducted numerous wetland and stream delineations, including surveys for several large-scale wind projects. His experience also includes ecological surveys, invasive plant surveys, environmental research, environmental impact analysis, and GIS data analysis.

Mr. Zoekler is an Environmental Analyst with two years of experience in the environmental field. He received a Bachelor of Science Degree in Environmental Biology from the State University of New York College of Environmental Science and Forestry. Mr. Zoekler's experience includes wetland and stream delineations, rare and invasive plant surveys, GIS data analysis, and environmental compliance monitoring.

2.0 REGULATORY AUTHORITIES AND PERMITS

2.1 WATERS OF THE UNITED STATES

In accordance with the Section 404 of the Clean Water Act, the USACE has regulatory jurisdiction over Waters of the United States (WOUS). As defined by the USACE, WOUS includes all lakes, ponds, streams (intermittent and perennial), and wetlands. Wetlands are defined as “*those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions*” (EPA, 2001). Such areas are indicated by the presence of three criteria: a dominance of hydrophytic vegetation, hydric soils, and evidence of wetland hydrology during the growing season (Environmental Laboratory, 1987).

The jurisdictional status of all on-site waters can only be determined following an official jurisdictional determination provided by the USACE, which typically includes a field visit. However, on June 5, 2007 the United States Environmental Protection Agency (EPA) and the Department of Army issued Clean Water Act jurisdiction guidance regarding the extent of their jurisdiction following the Supreme Court’s decision in *Rapanos and Carabell* (547 U.S., June 29, 2006). A summary of this guidance is as follows:

The USACE will assert jurisdiction over the following waters:

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters;
- Non-navigable tributaries of traditional navigable waters that are relatively permanent where the tributaries typically flow year-round or have continuous flow at least seasonally (e.g., typically three months); and
- Wetlands that directly abut such tributaries.

The USACE will decide jurisdiction over the following waters based on a fact-specific analysis to determine whether they have significant nexus with a traditional navigable water:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to, but that do not directly abut, a relatively permanent non-navigable tributary.

The USACE generally will not assert jurisdiction over the following features:

- Swales or erosional features (e.g., gullies, small washes characterized by low volume, infrequent, or short duration flow); and
- Ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water.

The USACE will apply the significant nexus standard as follows:

- A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by all wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical and biological integrity of downstream traditional navigable waters; and
- Significant nexus includes consideration of hydrologic and ecologic factors.

On August 28, 2015 the EPA released the *Clean Water Rule* (33 CFR Part 328) which provides a clearer and more consistent approach to defining the scope of the Clean Water Act and WOUS. However, on October 9, 2015 the *Clean Water Rule* was stayed by the U.S. Court of Appeals for the Sixth Circuit pending further action of the court. In response to the stay the EPA and the USACE reverted back to the prior regulations defining WOUS.

A Section 404 permit from the USACE is required for activities that result in the placement of dredged or fill materials in WOUS.

In addition to Section 404 of the Clean Water Act, Section 10 of the Rivers and Harbor Act (33 U.S.C. 401 et seq.) requires a permit from the USACE to construct any structure in or over any navigable water of the United States, as well as any proposed action that would alter or disturb (such as excavation/dredging or deposition of materials) these waters. There are no traditional navigable waters mapped within the Study Area.

2.2 NEW YORK STATE FRESHWATER WETLANDS AND PROTECTED STREAMS

The Freshwater Wetlands Act (Article 24 and Title 23 of Article 71 of the Environmental Conservation Law) gives the NYSDEC jurisdiction over state-protected wetlands and adjacent areas (100-foot upland buffer). The Freshwater Wetlands Act requires the NYSDEC to map all state-protected wetlands to allow landowners and other interested parties a means of determining where state jurisdictional wetlands exist. To implement the policy established by this Act, regulations were promulgated by the state under 6 NYCRR Parts 663 and 664. Part 664 of the regulations designates wetlands into four class ratings, with Class I being the highest or best quality wetland and Class IV being the lowest. In general, wetlands regulated by the state are those 12.4 acres in size or larger. Smaller wetlands can also be regulated if they are considered of unusual local importance. A 100-foot adjacent area around the delineated boundary of any state-regulated wetland is also under NYSDEC jurisdiction. The location and approximate boundaries of wetlands regulated by the State of New York under Article 24 are indicated on NYS Freshwater Wetland Maps. An Article 24 permit is required from the NYSDEC for any disturbance to a state-protected wetland or 100-foot adjacent area, including removing vegetation. However, under Article 10, this permitting authority has been delegated to the DPS.

Under Article 15 of the Environmental Conservation Law (Protection of Waters), the NYSDEC has regulatory jurisdiction over any activity that disturbs the bed or banks of protected streams. In addition, small lakes and ponds with a surface area of 10 acres or less, located within the course of a protected stream, are considered to be part of a stream and are subject to regulation under the stream protection category of Article 15. The term “protected stream” means any stream, or particular portion of a stream, that has been assigned by the NYSDEC any of the following classifications or standards: AA, A, B, or C(T) or C(TS) (6 NYCRR Part 701). A classification of AA or A indicates that the best use of the stream is as a source of water supply for drinking, culinary or food processing purposes, primary and secondary contact recreation, and fishing. The best usages of Class B waters are primary and secondary contact recreation and fishing. The best usage of Class C waters is fishing. Streams designated (T) indicate that they support trout, while

those designated (TS) support trout spawning. State water quality classifications of unprotected watercourses include Class C and Class D streams. Waters with a classification of D are suitable for fishing and non-contact recreation. An Article 15 permit is required from the NYSDEC for any disturbance to a stream classified C(T) or higher. However, under Article 10, this permitting authority has been delegated to the DPS.

3.0 PHYSICAL CHARACTERISTICS AND RESOURCES

3.1 PHYSIOGRAPHY AND SOILS

The Study Area is located in the Cattaraugus Hills sub-region within the northwestern edge of the glaciated Allegheny Plateau physiographic region of New York State. This area can be described as flat-topped divides separated by broad glacial valleys and underlain by interbedded shales, siltstones, and soft sandstones. Fine-grained glacial till deposits cover most of the bedrock controlled uplands, while lesser amounts of granular materials are found in the valleys that are entrenched into the rock. Shallow concave depressions scattered throughout the region carry and direct most of the hydrological flows to major streams or rivers. Elevations within the Study Area range from approximately 12,095 feet to approximately 20,100 feet above mean sea level (Figure 4).

The Chautauqua County Soil Survey has mapped general soil associations and soil types within the County (NRCS 2015). The soil survey indicates that 48 soil map units from 29 different soil series are present within the Study Area (Figure 5). Prominent soils within the Study area include Busti, Chautauqua, and Fremont silt loams. Of these, busti silt loam is the most common soil series, occupying 400 acres, or 41.2%, of the Study Area. Soil drainage in the Study Area is variable, with approximately 33% of the mapped soils classified as somewhat poorly drained, 29% classified as well drained, 22% classified as moderately well drained, 8% classified as poorly drained and 6% classified as very poorly drained. Table 1 lists the soil map units within the Study Area and their characteristics. “Hydric” and “Potentially Hydric” designations are based on information obtained from the USDA Web Soil Survey (NRCS, 2015). Although soil series may be generally classified as hydric or potentially hydric, this is for general use and does not supersede specific conditions documented in the field.

Table 1. Study Area Soils

Mapping Unit	Series	Slope (%)	Drainage ¹	Hydric ²	Potentially Hydric ³
Ad	Alden mucky silt loam	--	VPD	Yes	No
As	Ashville silt loam	--	PD	Yes	No
BsA	Busti silt loam	0-3	SPD	No	Yes
BsB	Busti silt loam	3-8	SPD	No	Yes
BsC	Busti silt loam	8-15	SPD	No	Yes
Cb	Canandaigua silt loam, loamy substratum	--	PD	Yes	No
Cc	Canandaigua mucky silt loam	--	VPD	Yes	No
ChC	Chadakoin silt loam	8-15	WD	No	No
ChD	Chadakoin silt loam	15-25	WD	No	No
ChE	Chadakoin silt loam	25-35	WD	No	Yes
ChF	Chadakoin silt loam	35-50	WD	No	Yes
CkB	Chautauqua silt loam	3-8	MWD	No	No
CkC	Chautauqua silt loam	8-15	MWD	No	No
CkD	Chautauqua silt loam	15-25	MWD	No	No
CIA	Chenango silt loam	0-3	MWD	No	No

Mapping Unit	Series	Slope (%)	Drainage ¹	Hydric ²	Potentially Hydric ³
CnB	Chenango gravelly loam	3-8	WD	No	No
CoA	Chenango channery loam, fan	0-3	WD	No	No
CoB	Chenango channery loam, fan	3-8	WD	No	No
DaA	Dalton silt loam	0-3	SPD	No	Yes
ErB	Erie silt loam	3-8	SPD	No	Yes
Fe	Fluvaquents-Udfluvents complex, frequently flooded	--	PD	No	Yes
FmA	Fremont silt loam	0-3	SPD	No	Yes
FmB	Fremont silt loam	3-8	SPD	No	Yes
FmC	Fremont silt loam	8-15	SPD	No	Yes
Ge	Getzville silt loam	--	PD	Yes	No
Ho	Holderton silt loam, occasionally flooded 140	0-3	SPD	No	Yes
La	Lamson silt loam	--	VPD	Yes	No
LnB	Langford silt loam	3-8	WD	No	No
LnC	Langford silt loam	8-15	WD	No	No
MdB	Mardin channery silt loam	3-8	MWD	No	No
Me	Middlebury silt loam	--	MWD	No	Yes
Mn	Minoa fine sandy loam	--	SPD	No	Yes
OrA	Orpark silt loam	0-3	SPD	No	Yes
OrB	Orpark silt loam	3-8	SPD	No	Yes
Po	Pompton silt loam	--	MWD	No	No
Rf	Raynham silt loam, flooded	--	SPD	No	Yes
Rh	Red Hook silt loam	--	SPD	No	Yes
ShB	Schuyler silt loam	3-8	MWD	No	No
ShC	Schuyler silt loam	8-15	MWD	No	No
ShD	Schuyler silt loam	15-25	MWD	No	No
ToC	Towerville silt loam	8-15	MWD	No	No
VaC	Valois gravelly silt loam	8-15	WD	No	No
VaD	Valois gravelly silt loam	15-25	WD	No	No
VaE	Valois gravelly silt loam	25-35	WD	No	Yes
VaF	Valois gravelly silt loam	35-50	WD	No	Yes
VcC	Valois gravelly silt loam, rolling	--	WD	No	No
VoA	Volusia channery silt loam	0-3	SPD	No	Yes
VoB	Volusia channery silt loam	3-8	SPD	No	Yes

¹ Soil drainage is represented by the following abbreviations: "ED" = excessively drained, "SED" = somewhat excessively drained, "WD" = well drained, "MWD" = moderately well drained, "SPD" = somewhat poorly drained, "PD" = poorly drained, and "VPD" = very poorly drained.

² "Yes" indicates this soil is listed as containing 66% or more hydric components within the map unit as listed on the USDA Web Soil Survey.

³"Yes" indicates this soil is listed as containing 1% to 65% hydric components within the map unit as listed on the USDA Web Soil Survey.

3.2 HYDROLOGY

The Facility site is located in the Conewango and the Chautauqua-Conneaut drainage basins (USGS Hydrologic Units 05010002 and 04120101) of the Allegheny River and Niagara River-Lake Erie watersheds (USGS, 2014). The divide

between these two watersheds goes through the northwest section of the Study Area. Portions of the Study Area in the Niagara River-Lake Erie watershed are located between Tarbox Road and Overland Trail, north of Housington Road. The remainder of the Study Area is located in the Alleghany River watershed. The majority of surface hydrology within the Study Area is generated by precipitation and surface water run-off from adjacent land. Total annual precipitation of 45 inches in 2015, and 42 inches in 2016, was documented in the nearby City of Dunkirk, New York (U.S. Climate Data, 2016).

The largest surface water body within the Study Area is Mill Creek, a perennial stream about 20-30 feet wide, located in the center of the Study Area. Mill Creek flows southwest into Cassadaga Creek approximately 4 miles outside of the Study Area. There are several other major streams that occur outside of the Study Area but have tributaries that extend into the Study Area. These include Cherry Creek, the West Branch of Conewango Creek, Clear Creek, Cassadaga Creek, and Canadaway Creek.

Most of the other streams in the Study Area are low-gradient drainage features that meander through wetlands, forests, agricultural fields, hedgerows, and pastures. Most of these are less than 10 feet wide with variable substrates, and vegetative cover characteristics. Some of these streams have well-defined and abrupt banks, while the banks of others transition gradually into adjacent wetland vegetation. There are also a few small farm ponds/open water areas interspersed throughout the area. Generally, these ponds are found in farm settings, adjacent to houses and barns, or within wetlands.

3.3 FEDERAL AND STATE MAPPED WETLANDS AND STREAMS

National Wetland Inventory (NWI) mapping indicates the presence of 10 wetlands and 10 streams within the Study Area (Figure 6). The total acreage of NWI mapped wetlands and streams within the Study Area are 2.48 acres and 2.10 acres, respectively. NWI mapping categorizes wetlands based on their vegetative community. For NWI purposes, a single wetland with two community types is mapped as two different wetlands. NWI mapping indicates that forested/shrub wetlands are the dominant wetland community in the area, totaling approximately 1.63 acres. Other NWI-mapped wetland communities include emergent wetlands (0.42 acre) and freshwater ponds (0.44 acre). As will be discussed in Section 4.0, field investigations indicate that numerous additional wetlands and streams likely to be under federal jurisdiction also occur within the Study Area.

Review of NYSDEC Freshwater Wetlands mapping indicates that there are four state-regulated wetlands that overlap the Study Area (Figure 6). Three of these wetlands are designated as Class II, while the remaining one is a Class III wetland. Table 2 provides a summary of mapped State-regulated wetlands that occur within the Study Area. The actual extent of state jurisdictional wetlands was evaluated in the field with NYSDEC regional staff, and is discussed in Section 5.0.

Table 2. State-Regulated Wetlands Within the Study Area

Wetland	Class ¹	Total Size (Acres)	Size Within Study Area (Acres)
HA-4	II	10.82	0.91
HA-3	III	18.73	4.89 ²
HA-7	II	14.57	0.20
HA-8 ³	II	24.63	--
CS-9	II	17.86	2.28

¹ NYS classification system provides four separate classes that rank wetlands according to their ability to provide functions and values (Class I having the highest rank, descending through Class IV).

²Based on field investigations the actual acreage of HA-3 within the Study Area is significantly less than NYSDEC mapping. Extent of Article 24 jurisdiction to be determine based on site visits with the NYSDEC to be scheduled during the growing season of 2017.

³ NYSDEC Wetland HA-8 does not overlap the current Study Area. This wetland is included in the table because of possible hydrologic connectivity to Wetland EEEE that will be determined with a DEC site visit during the 2017 growing season.

Based on review of NYSDEC classified stream mapping (Figure 7), three protected streams flow through the Study Area, all of which are classified as C(T). These include Mill Creek, an unnamed tributary of Mill Creek, and an unnamed tributary of Cherry Creek. All other NYSDEC-mapped streams within the Study Area are classified as Class C, and are therefore not subject to Protection of Waters regulations. Table 3 provides a summary of all State-mapped streams (protected and unprotected), and their linear distances, within the Study Area.

Table 3. State-Mapped Streams Within the Study Area

Stream Name	NYSDEC Class	Linear Feet Within Study Area
Mill Creek	C(T)	194
Mill Creek (trib)	C(T)	434
Cherry Creek (trib)	C(T)	244
Cherry Creek (trib)	C	110
Cherry Creek (trib)	C	380
Cherry Creek (trib)	C	261
Branch Conewango Creek (trib)	C	1,112
Mill Creek	C	711
Mill Creek (trib)	C	1,536
Mill Creek (trib)	C	214
Mill Creek (trib)	C	686
Mill Creek (trib)	C	272
Canadaway Creek (trib)	C	231
Cassadaga Creek (trib)	C	210

All perennial and intermittent streams in the Study Area will likely be considered jurisdictional by the USACE under Section 404 of the Clean Water Act. There are no streams or other waters regulated by Section 10 of the Rivers and Harbors Act of 1899 (navigable waters) within the Study Area.

4.0 WETLAND AND STREAM IDENTIFICATION

4.1 METHODOLOGY

A preliminary desktop analysis of the Study Area was conducted by EDR prior to performing on-site wetland delineations in 2015. The desktop analysis was performed using NYSDEC Freshwater Wetland mapping, NWI maps, USGS topographic mapping, and recent aerial photography. From these data sources, EDR identified areas likely to contain wetland and stream resources within the Facility Study Area.

The majority of the Study Area was investigated in the field, and most of the wetlands and streams were delineated, during the months of October and November of 2015. A corridor 200-feet wide was examined along all proposed access roads, collection lines and the generator lead line, and a radius of 200-feet was examined around all proposed

turbine sites and meteorological towers. The specific areas where the substations, laydown yards, and O&M building are proposed were also examined. However, due to access restrictions and component relocation, several parcels of land within the current Study Area did not receive a full wetland delineation during the fall of 2015. These areas were delineated during the months of September and October 2016.

The determination of wetland boundaries was made by EDR personnel according to the three-parameter methodology described in the *USACE Wetland Delineation Manual* (Environmental Laboratory, 1987), hereafter referred to as the 1987 Manual. Determination of wetland boundaries was also guided by the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeastern Region* (USACE, 2012), hereafter referred to as the Regional Supplement. Attention was given to the identification of potential hydrologic connections between wetland areas that could influence their jurisdictional status. Delineated wetland boundaries were defined in the field with sequentially numbered pink surveyor's flagging and subsequently recorded using a Trimble Geo Explorer 6000 Series GPS unit, with reported sub-meter accuracy.

Data were collected from one or more sample plots in each delineated wetland (depending on the size and diversity of ecological communities within the delineated area), and recorded on USACE Routine Wetland Determination forms (Appendix B). Data were also collected from adjacent upland sample points. These data included dominant vegetation, hydrology indicators, and soil characteristics. Data collected for streams included information on channel width (mean high water mark), water depth, substrate material, bank condition and gradient.

The vegetative data collection process focused on dominant plant species in four categories: trees (>3" diameter at breast height), saplings/shrubs (<3.0" diameter at breast height and >3.2' tall), herbs (<3.2' tall), and woody vines. Dominance was measured by visually estimating those species having the largest relative basal area (trees), greatest height (saplings/shrubs), greatest number of stems (woody vines), and greatest percentage of aerial coverage (herbaceous) by species. Dominant species for each stratum in the plant community were identified for all delineated wetlands on the site. The dominant species from each category are defined as those plants with the highest ranking which, when cumulatively totaled, exceeds 50 percent of the total dominance measure for that category, plus any additional plant species comprising 20 percent or more of the total dominance measure for the category. The species were rank ordered for each category by decreasing value of dominance.

Soils data at each sampling location were collected from a soil pit dug with a tiling spade. Information concerning soil name, drainage classification, texture, matrix and redoximorphic feature color was obtained by reviewing the Chautauqua County Soil Survey and through field sampling. Soil colors were determined using Munsell Soil Charts (K. I. Corporations, 2000). These data were used to determine whether the soils displayed hydric characteristics. Hydric soils are those that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part of the soil layer. Hydric soils are poorly drained, and their presence indicates the likely occurrence of wetlands (Environmental Laboratory, 1987).

The Regional Supplement lists the following indicators as evidence of wetland hydrology (in order of decreasing reliability): (A1) surface water, (A2) high water table, (A3) saturation, (B1) water marks, (B2) sediment deposits, (B3) drift deposits, (B4) algal mat or crust, (B5) iron deposits, (B7) inundation visible on aerial imagery, (B8) sparsely vegetated concave surface, (B9) water-stained leaves, (B13) aquatic fauna, (B15) marl deposits, (C1) hydrogen sulfide odor, (C3) oxidized rhizospheres on living roots, (C4) presence of reduced iron, (C6) recent iron reduction in tilled soils, and (C7) thick muck surface. Hydrologic characteristics were visually assessed to a depth of 12 inches. The hydrology indicators described above are considered "primary indicators," and any one of these indicators is sufficient evidence that wetland hydrology is present. In addition, "secondary indicators" used by EDR personnel included: (B6) surface soil cracks, (B10) drainage patterns, (B16) moss trim lines, (C2) dry-season water table, (C8) crayfish burrows, (C9) saturation visible on aerial imagery, (D1) saturation visible on aerial imagery, (D2) geomorphic position, (D3) shallow aquitard, (D4) microtopographic relief, and (D5) fac-neutral test. Any two of these secondary indicators also indicate the presence of wetland hydrology. Wetland hydrology, when combined with a dominant hydrophytic plant community and hydric soils, indicate the presence of a wetland.

Photographs were taken of all wetlands and streams delineated within the Study Area. Photographs representative of the delineated wetlands and streams are included in Appendix C.

4.2 RESULTS

EDR delineated 106 wetlands within the Study Area, totaling approximately 48.9 acres. In addition, EDR delineated 57 streams, totaling approximately 17,822 linear feet within the Study Area. Information pertaining to individual delineated wetlands and streams is summarized in Table 4 below. Wetlands and streams were categorized as one or more of the following community types: emergent wetland (PEM), scrub-shrub wetland (PSS), forested wetland (PFO), open water (OW), riverine upper perennial (RUP), riverine intermittent (RIN) and riverine ephemeral (REPH). All delineated wetlands and streams within the Study Area are depicted in Figure 8, and described in Section 4.2.1, below.

Table 4. Delineated Wetlands and Streams

Delineation ID ¹	Wetland Present	Wetland Type ²	Wetland Acreage Within Study Area	Stream Present	Stream Type ³	Linear Feet of Stream Within Study Area ⁴	NYSDEC Stream Class ⁵	Stream Name	Federal Jurisdiction ⁶	State Jurisdiction ⁷	Attach. A, Figure 8, Sheet #
A	Yes	PFO/PSS	2.62	--	--	--	--	--	Yes	Yes	2,3,4,5,6
B	Yes	PEM/Wet Meadow	1.73	--	--	--	--	--	Yes	Yes	1,2,3
C	Yes	PSS	0.07	--	--	--	--	--	Yes	Yes	5,6
D	Yes	PEM	0.02	--	--	--	--	--	Yes	--	6
E	--	--	--	Yes	RIN	217	--	--	Yes	--	7
G	Yes	PSS/PEM	0.12	--	--	--	--	--	Yes	--	8
H	Yes	PEM	0.05	Yes	RIN	58	--	--	Yes	--	8,9
J	Yes	PSS/PEM	0.17	Yes	RIN	--	C	Unnamed Tributary of Mill Creek	Yes	--	25
K	Yes	PFO	0.11	--	--	--	--	--	Yes	--	137
L	--	--	--	Yes	RIN	321	--	--	Yes	--	33
M	Yes	PFO/PSS	0.61	--	--	--	--	--	Yes	--	17,18
N	Yes	PFO/PSS	0.51	--	--	--	--	--	Yes	--	16
O	Yes	PFO/PSS	1.36	--	--	--	--	--	Yes	--	26,27,28
P	Yes	PSS	0.89	--	--	--	--	--	Yes	--	29,30,31
Q	Yes	PSS	0.20	--	--	--	--	--	Yes	--	30,31
R	Yes	PEM	0.13	--	--	--	--	--	Yes	--	29,31
T	--	--	--	Yes	RIN	231	C	Unnamed Tributary of Canadaway Creek	Yes	--	19,20
U	Yes	PEM	2.11	--	--	--	--	--	Yes	--	20,21
V	Yes	PFO	0.02	--	--	--	--	--	Yes	--	136
W	Yes	PEM	0.23	--	--	--	--	--	Yes	--	136,137
X	Yes	PEM	0.04	--	--	--	--	--	Yes	--	136
Y	Yes	PFO	0.13	--	--	--	--	--	Yes	--	133
Z	Yes	PFO	0.18	--	--	--	--	--	Yes	--	133
BB	Yes	PFO	0.04	--	--	--	--	--	Yes	--	132
CC	Yes	PFO	0.04	--	--	--	--	--	Yes	--	132
DD	Yes	PEM	0.003	--	--	--	--	--	Yes	--	132
EE	Yes	PFO	0.14	--	--	--	--	--	Yes	--	131,132
FF	Yes	PFO	0.10	--	--	--	--	--	Yes	--	131,132

Delineation ID ¹	Wetland Present	Wetland Type ²	Wetland Acreage Within Study Area	Stream Present	Stream Type ³	Linear Feet of Stream Within Study Area ⁴	NYSDEC Stream Class ⁵	Stream Name	Federal Jurisdiction ⁶	State Jurisdiction ⁷	Attach. A, Figure 8, Sheet #
HH	Yes	PEM	0.06	--	--	--	--	--	Yes	--	125
II	--	--	--	Yes	RUP	260	C	Unnamed Tributary of Fuller Gulf Creek	Yes	--	130,134
JJ	Yes	PFO	0.03	Yes	RIN	137	--	--	Yes	--	135
KK ⁸	Yes	PEM/PSS	--	Yes	RIN	188	--	--	Yes	--	127,128
NN	Yes	PEM/Wet Meadow	1.14	--	--	--	--	--	Yes	--	124
OO ⁸	Yes	PSS	0.41	Yes	RIN	300	--	--	Yes	--	126
PP	Yes	PSS/OW	0.27	--	--	--	--	--	Yes	--	74
QQ	Yes	PSS/OW	0.35	--	--	--	--	--	Yes	--	44,46
RR	Yes	PFO	0.19	--	--	--	--	--	Yes	--	55,56
SS	--	--	--	Yes	RIN	328	--	--	Yes	--	39
XX	Yes	OW	0.33	--	--	--	--	--	Yes	--	35
YY	Yes	PFO	0.40	--	--	--	--	--	Yes	--	23,24
ZZ	Yes	PFO/PEM/OW	0.59	--	--	--	--	--	Yes	Yes	13,14,15, 22,23
BBB	Yes	PFO/PSS/PEM/OW	1.25	--	--	--	--	--	Yes	Yes	42,43
FFF	Yes	PEM	0.05	--	--	--	--	--	Yes	--	123
GGG	Yes	PSS	0.15	--	--	--	--	--	Yes	--	122
HHH	Yes	PSS/PEM/OW	0.2	Yes	RUP/RIN	312	--	--	Yes	--	101,113, 117,120
JJJ	Yes	PEM	0.03	Yes	RUP/REPH	443	C	Unnamed Tributary of Mill Creek	Yes	--	79,80
KKK	Yes	PFO	0.034	Yes	RUP	230	C	Unnamed Tributary of Cassadaga Creek	Yes	--	78
LLL	Yes	PSS/PEM	0.80	Yes	RUP	495	C	Unnamed Tributary of Mill Creek	Yes	--	60,61,67
MMM	Yes	PEM	0.06	--	--	--	--	--	Yes	--	82
NNN	--	--	--	Yes	RIN	213	--	--	Yes	--	61
OOO	Yes	PSS/PEM	0.60	--	--	--	--	--	Yes	--	48
PPP	Yes	PFO/PEM	0.09	Yes	RUP	467	C	Unnamed Tributary of Mill Creek	Yes	--	49,50
QQQ	Yes	PFO	0.23	--	--	--	--	--	Yes	--	49

Delineation ID ¹	Wetland Present	Wetland Type ²	Wetland Acreage Within Study Area	Stream Present	Stream Type ³	Linear Feet of Stream Within Study Area ⁴	NYSDEC Stream Class ⁵	Stream Name	Federal Jurisdiction ⁶	State Jurisdiction ⁷	Attach. A, Figure 8, Sheet #
RRR	Yes	PEM	0.04	--	--	--	--	--	Yes	--	47
SSS	--	--	--	Yes	RIN	44	--	--	Yes	--	47
TTT	Yes	PSS	0.06	Yes	RUP	686	C	Unnamed Tributary of Mill Creek	Yes	--	64
VVV	--	--	--	Yes	RUP	272	C	Unnamed Tributary of Mill Creek	Yes	--	72
WWW	Yes	PSS	5.23	--	--	--	--	--	Yes	Yes	103,105, 114,115, 116
XXX	Yes	PSS	0.14	--	--	--	--	--	Yes	--	115
YYY	Yes	PSS	3.73	Yes	RIN	265	--	--	Yes	Yes	103,104, 105,115, 116
ZZZ	Yes	PSS	0.62	--	--	--	--	--	Yes	--	106,107
AAAA	Yes	PEM	0.15	--	--	--	--	--	Yes	--	107
BBBB	Yes	PSS	1.53	--	--	--	--	--	Yes	--	107,108, 109
CCCC	Yes	PEM	0.05	Yes	RUP/REPH	539	C	Unnamed Tributary of Mill Creek	Yes	--	72,75
DDDD	Yes	PFO	0.03	Yes	RUP	252	--	--	Yes	--	81
EEEE ⁹	Yes	PFO	1.80	Yes	RUP	224	C(T)	Unnamed Tributary of Mill Creek	Yes	TBD ⁹	92,93,97
FFFF	Yes	PEM	0.09	Yes	REPH	77	--	--	Yes	--	91
GGGG	Yes	PEM	0.10	--	--	--	--	--	Yes	--	89
HHHH	Yes	PFO	0.50	--	--	--	--	--	Yes	--	90
IIII	Yes	PEM	0.11	--	--	--	--	--	Yes	--	88
JJJJ	Yes	PFO/PSS	0.56	Yes	RUP	194	C(T)	Mill Creek	Yes	--	86,87
KKKK	Yes	PSS/PEM	0.29	--	--	--	--	--	Yes	--	85,86
LLLL	Yes	PFO	1.32	Yes	RUP/RIN	434	C(T)	Unnamed Tributary of Mill Creek	Yes	--	83,84
MMMM	Yes	PFO	1.85	Yes	RUP	548	C	Unnamed Tributary of Cassadaga Creek	Yes	--	110,111, 112

Delineation ID ¹	Wetland Present	Wetland Type ²	Wetland Acreage Within Study Area	Stream Present	Stream Type ³	Linear Feet of Stream Within Study Area ⁴	NYSDEC Stream Class ⁵	Stream Name	Federal Jurisdiction ⁶	State Jurisdiction ⁷	Attach. A, Figure 8, Sheet #
NNNN	--	--	--	Yes	RUP	210	C	Unnamed Tributary of Cassadaga Creek	Yes	--	110
OOOO	Yes	PFO/PEM	0.13	Yes	RUP	549	C	Unnamed Tributary of Cherry Creek	Yes	--	55,56
PPPP	--	--	--	Yes	REPH	114	--	--	Yes	--	54
QQQQ	Yes	PFO	0.07	Yes	RUP/RIN	336	C(T)	Unnamed Tributary of Cherry Creek	Yes	--	54
RRRR	Yes	PSS/OW	0.82	Yes	RUP	547	C	Unnamed Tributary of Cherry Creek	Yes	Yes	65,71
SSSS	Yes	PFO	0.28	--	--	--	--	--	Yes	--	70,73
TTTT	Yes	PFO/PSS/PEM	0.92	Yes	RUP	373	C	Unnamed Tributary of Mill Creek	Yes	--	62,63
UUUU	Yes	PFO/PSS/PEM	0.55	Yes	RUP/RIN	1,536	C	Unnamed Tributary of Mill Creek	Yes	--	63,68,69
VVVV	--	--	--	Yes	RUP/REPH	293	C	Unnamed Tributary of Mill Creek	Yes	--	70
WWWW	Yes	PEM	0.14	--	--	--	--	--	Yes	--	76
XXXX	Yes	PEM	0.03	--	--	--	--	--	Yes	--	76,77
YYYY	Yes	PFO/PEM	0.37	--	--	--	--	--	Yes	--	98
5B	Yes	PFO/PSS/PEM	1.18	Yes	RUP	249	C(T)	Unnamed Tributary of Mill Creek	Yes	--	83,96
5C	Yes	PFO/PSS	0.60	Yes	RUP	296	C(T)	Unnamed Tributary of Mill Creek	Yes	--	102
5D	--	--	--	Yes	RUP	244	C(T)	Unnamed Tributary of Cherry Creek	Yes	--	94
5E	Yes	PSS/PEM	0.11	Yes	RIN	48	--	--	Yes	--	66
5F	Yes	PEM	--	Yes	RUP	431	C	Unnamed Tributary of Mill Creek	Yes	--	53,59
5O	--	--	--	Yes	REPH	43	--	--	Yes	--	43
5Q	Yes	PEM	0.17	--	--	--	--	--	Yes	--	52
5R	--	--	--	Yes	RIN	1112	C	Unnamed Tributary of Branch Conewango Creek	Yes	--	57,58
5T	--	--	--	Yes	RIN	210	--	--	Yes	--	34

Delineation ID ¹	Wetland Present	Wetland Type ²	Wetland Acreage Within Study Area	Stream Present	Stream Type ³	Linear Feet of Stream Within Study Area ⁴	NYSDEC Stream Class ⁵	Stream Name	Federal Jurisdiction ⁶	State Jurisdiction ⁷	Attach. A, Figure 8, Sheet #
5V (6Y) ¹⁰	--	--	--	Yes	RUP	711	C	Mill Creek	Yes	--	40,41
5Y (5X) ¹⁰	Yes	PEM	0.06	--	--	--	--	--	Yes	--	83,95
6A	--	--	--	Yes	RIN	110	C	Unnamed Tributary of Cherry Creek	Yes	--	100
6E	Yes	PEM	0.03	--	--	--	--	--	Yes	--	77
6F	Yes	PEM	0.02	Yes	RUP/RIN	460	C	Unnamed Tributary of Mill Creek	Yes	--	38,39
6G ⁸	Yes	PEM	0.01	Yes	RIN	239	--	--	Yes	--	128,129
6H	Yes	PFO/PEM	0.39	--	--	--	--	--	Yes	Yes	129,130, 134,135
6I	Yes	PFO/PEM	1.75	--	--	--	--	--	Yes	Yes	12,13
6J	--	--	--	Yes	RIN	73	--	--	Yes	--	32
6K	Yes	PEM	0.17	Yes	RIN	261	C	Unnamed Tributary of Cherry Creek	Yes	--	32
6L	--	--	--	Yes	RUP	196	C	Unnamed Tributary of Cherry Creek	Yes	--	36
6Q	Yes	PEM	0.14	Yes	RIN	200	--	--	Yes	--	8,9
6R	Yes	PEM	0.46	--	--	--	--	--	Yes	--	10
6S	Yes	PEM	1.09	--	--	--	--	--	Yes	--	10,11
6T	Yes	PEM	0.07	--	--	--	--	--	Yes	--	121
6U	--	--	--	Yes	RIN	214	C	Unnamed Tributary of Mill Creek	Yes	--	118
6X	Yes	PSS	1.15	--	--	--	--	--	Yes	--	37
6Z	Yes	PEM	0.11	--	--	--	--	--	Yes	--	33
7B	Yes	PSS	0.03	Yes	RIN/REPH	175	--	--	Yes	--	26,28
7C	Yes	PSS	0.08	Yes	REPH	60	--	--	Yes	--	28
7E	Yes	PEM	0.06	--	--	--	--	--	Yes	--	133
7F	Yes	PEM	0.09	--	--	--	--	--	Yes	--	131
7G	Yes	PEM	0.03	--	--	--	--	--	Yes	--	2
7G-A	Yes	PEM	0.10	--	--	--	--	--	Yes	--	52
7H (6M) ¹⁰	Yes	PEM	0.06	--	--	--	--	--	Yes	--	51
7I (5W) ¹⁰	--	--	--	Yes	RIN	183	--	--	Yes	--	41,45
7K	Yes	PEM	0.11	--	--	--	--	--	Yes	--	40
7L (5U) ¹⁰	Yes	PEM	0.04	--	--	--	--	--	Yes	--	40

Delineation ID ¹	Wetland Present	Wetland Type ²	Wetland Acreage Within Study Area	Stream Present	Stream Type ³	Linear Feet of Stream Within Study Area ⁴	NYSDEC Stream Class ⁵	Stream Name	Federal Jurisdiction ⁶	State Jurisdiction ⁷	Attach. A, Figure 8, Sheet #
7M	Yes	OW	0.05	--	--	--	--	--	Yes	--	119
7N	Yes	PFO	0.23	--	--	--	--	--	Yes	--	119
7O (6Z) ¹⁰	Yes	PEM	0.03	Yes	RUP	380	C	Unnamed Tributary of Cherry Creek	Yes	--	99
7P (Stream 6I) ¹⁰	--	--	--	Yes	RIN	234	--	--	Yes	--	13
7Q	Yes	PEM	0.06	--	--	--	--	--	Yes	--	37,38
Total Wetlands: 106		Total Streams: 57									

¹ Field ID assigned by EDR. Several wetlands identified in the field are located outside of the Study Area due to facility layout shifts and are not addressed in this report.

² Wetland community types are based upon the Cowardin et al. (1979) classification system: PSS = Palustrine Scrub-Shrub, PEM = Palustrine Emergent, PFO = Palustrine Forested, OW = Open Water.

³ Stream types are based upon the Cowardin et al. (1979) classification system: RIN = Riverine Intermittent Stream, RUP = Riverine Perennial Stream, REPH = Ephemeral Stream.

⁴ Linear feet of stream does not include distance where streams run through culverts.

⁵ Per NYSDEC regulations, perennial streams not appearing on NYSDEC stream maps take on the classification of the streams they flow into.

⁶ Based on visual observation of hydrologic connectivity in the field and review of available spatial data. Final jurisdictional determination to be made by USACE.

⁷ Based on site visit with NYSDEC on December 7, 2016.

⁸ Related to a NYSDEC mapped C(T) stream, however, NYSDEC mapped stream depicted a straight line and was not accurate as to what was seen in the field. Stream was intermittent and did not appear to have C(T) characteristics. Final jurisdiction will be made by the NYSDEC.

⁹ The jurisdictional status of Wetland EEEE is still to be determined.

¹⁰ Wetland or Stream was approximated for the preliminary Wetland Delineation Report (EDR, 2016) and was named differently during the 2016 wetland delineations and this report. Therefore, these wetlands or streams include the Approximate ID that was used in the previous delineation report in parentheses.

4.2.1 Wetlands

Descriptions of each wetland community type delineated within the Study Area are presented below. As indicated in Table 4, many of the delineated wetlands contained more than one community type.

Forested wetland (PFO) – A total of 37 wetlands delineated within the Study Area contained forested wetland communities. These communities are dominated by trees that are 20 feet or taller, but also include an understory of shrubs and herbaceous species. They were typically dominated by red maple (*Acer rubrum*) and green ash (*Fraxinus pennsylvanica*), with occasional American elm (*Ulmus americana*), gray birch (*Betula populifolia*), American hornbeam (*Carpinus caroliniana*), and eastern larch (*Larix laricina*). Understory vegetation typically included saplings of the above-mentioned species, or shrub species such as dogwoods (*Cornus* spp.), willows (*Salix* spp.) and spice bush (*Lindera benzoin*). Herbaceous species in forested wetlands included sedges (*Carex* spp.), sensitive fern (*Onoclea sensibilis*), manna grasses (*Glyceria* spp.), spotted jewelweed (*Impatiens capensis*), cinnamon fern (*Osmunda cinnamomea*), and true forget-me-not (*Myosotis scorpioides*). Evidence of wetland hydrology in the forested wetlands within the Study Area included water-stained leaves, water marks, moss trim lines, drainage patterns, surface water, a high water table, saturated soils, microtopographic relief, and saturation visible on aerial imagery (see Photos 1-10 in Appendix C).

Scrub-shrub wetlands (PSS) – A total of 35 wetlands delineated within the Study Area were found to contain scrub-shrub vegetation. Scrub-shrub wetlands within the Study Area were characterized by dense stands of shrub species less than 20 feet tall, including willows (*Salix* spp.), viburnums (*Viburnum* spp.), and dogwoods. Herbaceous vegetation in these areas included sensitive fern, spotted jewelweed, tearthumb (*Polygonum sagittatum*), field horsetail (*Equisetum arvense*), reed canary grass (*Phalaris arundinacea*), willowherb (*Epilobium* spp.), and various sedges. Evidence of wetland hydrology in the scrub-shrub wetlands identified within the Study Area included water-stained leaves, saturated soils, and microtopographic relief (see Photos 11-17 in Appendix C).

Emergent wetlands (PEM) – A total of 60 wetlands within the Study Area contained emergent wetland communities. These wetlands are dominated by herbaceous vegetation, and generally characterized by soils that remain saturated or inundated throughout the year. Although the Cowardin classification was used to classify wetlands, some of the emergent wetlands in this category could be best described as wet meadow (Reschke, 1990). Wet meadow wetlands are usually found in poorly drained, low-lying depressional areas. Wet meadow wetlands may resemble grasslands and are typically drier than emergent marshes, except during periods of seasonal high water. They generally lack standing water for most of the year, though snow melt, storm water runoff, and/or a high water table allows the soil to remain saturated for a significant portion of the growing season.

Emergent wetlands and wet meadows identified in the Study Area were typically dominated by plants such as broadleaf cattail (*Typha latifolia*), sedges, rushes (*Juncus* spp.), green bulrush (*Scirpus atrovirens*), reed canary grass, late goldenrod (*Solidago gigantea*), wool grass (*Scirpus cyperinus*), spotted Joe-pye weed (*Eutrochium maculatum*), rice cutgrass (*Leersia oryzoides*), willowherb, and boneset (*Eupatorium perfoliatum*). Evidence of wetland hydrology in the emergent wetlands identified within the Study Area included inundation, drainage patterns, a high water table, saturated soils, microtopographic relief, and saturation visible on aerial imagery (see Photos 18-28 in Appendix C).

Open Water (OW) – Eight open water areas were delineated in the Study Area; usually adjacent to other wetland community types. They included small farm ponds, man-made impoundments, beaver ponds or naturally occurring ponds. These ponds occurred in a variety of settings, including open fields, scrub-shrub, and forested environments, and typically have well-defined banks and a fringe of emergent wetland vegetation. Although not verified, water depths of such ponds are typically a minimum of 4 feet deep (see Photos 29-32 in Appendix C).

Streams – A total of 57 streams were delineated within the Study Area. These streams are mostly located within forests, and generally have a gentle to moderate gradient (0-5%). Identified streams appeared to be evenly split between perennial and intermittent, and were generally characterized by a rocky substrate and well-defined banks. Water depths within channels with stream flow averaged 2-10 inches (see Photos 33-40 in Appendix C).

4.2.2 Wetland Functions and Values

A functions and values assessment was conducted following the general methodology described in the *Wetlands Functions and Values: Descriptive Approach* described in the September 1999 supplement to *The Highway Methodology Workbook* (Supplement) by the New England Division of the USACE (USACE, 1995).

Wetland functions are ecosystem properties that result from the biologic, geologic, hydrologic, chemical and/or physical processes that take place within a wetland. These functions include:

1. Groundwater Recharge/Discharge
2. Floodflow Alteration
3. Fish and Shellfish Habitat
4. Sediment/Pollutant Retention
5. Nutrient Removal/Retention/Transformation
6. Production (Nutrient) Export
7. Sediment/Shoreline Stabilization
8. Wildlife Habitat

Wetland values are the perceived benefits for society that can be derived from the ecosystem functions and/or other characteristics of a wetland. Values attributed to wetlands in the Supplement include the following:

1. Recreation
2. Education/Scientific Value
3. Uniqueness/Heritage
4. Visual Quality/Aesthetics
5. Threatened or Endangered Species Habitat

Wetlands functions and values recognized under Article 24 of the Environmental Conservation Law and Regulations are similar to those listed above, and include:

1. Flood and storm control by the hydrologic absorption and storage capacity of wetlands;
2. Breeding, nesting and feeding habitat for many forms of wildlife, including migratory wildfowl and rare species such as the bald eagle and osprey;
3. Protection of subsurface water resources and recharge of ground water supplies;
4. Recreation by providing areas for hunting, fishing, boating, hiking, bird watching, photography, camping and other uses;
5. Pollution treatment by serving as biological and chemical oxidation basins;
6. Erosion control by serving as filtering basins, absorbing silt and organic matter and protecting channels and harbors;
7. Education and scientific research by providing outdoor bio-physical laboratories, living classrooms and training/education resources;
8. Open space and aesthetic appreciation by providing often the only remaining open areas along crowded river fronts and coastal regions;
9. Sources of nutrients in freshwater food cycles and nursery grounds and sanctuaries for fish.

Based on “Considerations/Qualifiers” outlined in the above-referenced Supplement, EDR developed a spreadsheet that includes several basic considerations that help identify the primary functions and values provided by wetlands. These considerations include observed vegetation conditions, hydrologic conditions, size, adjacent area conditions, and the availability of public access. Specific conditions within each of these consideration areas were also defined to allow each wetland’s functions and values to be evaluated based on data collected during field delineation. Functions and values were evaluated for all 106 wetlands that occurred within the Study Area and wetland characteristics for each were entered into the spreadsheet. Functions and values assessments were based on vegetation, soils and hydrological data that were collected as part of the formal delineation process during the fall of 2015 and 2016. Based on the entered data, the primary functions and values provided by each wetland were determined. Results of this evaluation are presented in the spreadsheet included as Appendix D, and summarized below.

The functions and values assessment indicates that most of the delineated wetlands within the Study Area provide some level of wildlife habitat, groundwater recharge and water quality improvement functions. In most cases these functions are limited by the small size of many of the wetlands. However, 14 of these wetlands were determined to provide a substantial wildlife habitat function. These wetlands are part of sizeable wetland complexes, include a variety of wetland cover types (including forested wetland), and also have forested adjacent areas. The combination of these qualities provides habitat for a diversity of wildlife species. However, other than providing potential summer roosting habitat for northern long-eared bat (*Myotis septentrionalis*), none of the wetlands are considered likely to provide habitat for listed threatened and endangered species. Wetlands noted as having standing water or seasonal pools may provide seasonal breeding habitat for amphibians and waterfowl, and have enhanced water quality and groundwater recharge functions. Lacking the other conditions described above, these wetlands were determined to provide wildlife habitat for a more limited number of species.

Twelve wetlands that are part of sizeable wetland complexes, contain dense vegetation, show evidence of inundation, or border a perennial stream were determined to provide a production export function. Such wetlands have a higher productivity levels and have the potential to yield resources that can be consumed by downstream organisms.

There are 32 wetlands within the Study Area which are associated with perennial or intermittent streams. Those which contain dense vegetation and show evidence of inundation or a variable water level throughout the year were considered to provide a floodflow attenuation function. A combination of these characteristics suggest the ability to slow or disperse waters from flooding events and reduce the potential for damage to lands downstream. Wetlands that contained dense herbaceous vegetation and are bordered by a perennial or intermittent stream were also determined to provide shoreline stabilization functions. Dense herbaceous vegetation surrounding a watercourse serves to stabilize banks and act as a buffer against the erosional forces of flood events. Twenty-one wetlands that are associated with perennial streams were determined to potentially provide enhancement of fish habitat within the stream channels.

Nine wetlands which provide floodflow attenuation and also contain seasonal pools, standing water, or dense vegetation also have the potential to provide a substantial water quality enhancement function. Dense vegetation aids in filtering out sediment and the uptake of nutrients, while standing or slow-moving water in seasonal pools and inundated areas allow for sediment and pollutants to settle out of the water column or be adsorbed.

There are 52 wetlands which are adjacent to active agriculture areas. A majority of these wetlands contained dense herbaceous vegetation, and several also border watercourses or contain seasonal pools or standing water. These areas were determined to likely play an important role in water quality improvement by trapping sediment and absorbing nutrients from agricultural run-off.

Two delineated wetlands are located on public land. Due to their accessibility to the public, they have the potential to provide recreational, educational and scientific values. One wetland (delineated as Wetland RRRR) is associated with NYSDEC freshwater Wetland HA-7, and can be fully viewed from the public road. As such, it provides a visual quality/aesthetic value as well.

The uniqueness/heritage value is applied to wetlands which provide a special value in the context of the overall landscape, contain cultural features, or represent a rare wetland or habitat type within the local area. Two wetlands, Wetlands 5Q and 7G-A, occur in a unique area containing circular depressions surrounded by steep slopes that appear to be the result of sinkholes or collapsed bedrock. Currently, these wetlands are entirely covered with thick mucky mats, contain dense herbaceous vegetation, and appear to have no surface inlets or outlets, similar to the sinkhole wetlands described in *Ecological Communities of New York State* (Edinger, 2014).

5.0 CONCLUSIONS

EDR delineated a total of 106 wetlands within the Study Area. These wetlands were identified based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology, and total approximately 48.88 acres. The delineated areas include ponds and emergent, scrub-shrub, and forested wetlands. EDR also delineated 57 streams within the Study Area. These include a roughly even mix of perennial and intermittent streams, but also include ephemeral channels. A total of approximately 17,822 linear feet of stream channels were delineated within the Study Area. The primary functions provided by wetlands and streams within the Study Area include fish and wildlife habitat, flood flow attenuation, water quality improvement, and sediment/shoreline stabilization. Two wetlands located on public land provide recreation and education/scientific values (Wetlands RRRR and SSSS) and two have uniqueness/aesthetic value (RRRR and 5Q).

All of the delineated wetlands within the Study Area appear to have surface water connections to other WOUS, and therefore are likely to be considered jurisdictional by the USACE under Section 404 of the Clean Water Act. However, final determination of jurisdictional status must be made by the USACE. Seven delineated streams within the Study Area are protected by the NYSDEC under Article 15 of the Environmental Conservation Law.

A site visit with staff from the Region 9 office of the NYSDEC was conducted on December 7, 2016 to review delineated wetland boundaries and determine the extent of state jurisdiction pursuant to Article 24 of the Environmental Conservation Law. After the on-site jurisdictional determination, and subsequent desktop analyses conducted by the NYSDEC and EDR, it was determined that a total of 10 delineated wetlands will fall under state jurisdiction (see Table 5, below and memo to the NYSDEC in Appendix E). The jurisdictional status of one wetland (Wetland EEEE) was left to be determined during the 2017 growing season.

Table 5. NYSDEC Jurisdictional Status of Delineated Wetlands

Delineation ID	Delineation Acreage ¹	NYSDEC Jurisdiction	Currently Mapped NYSDEC Wetland
A	8.33	Yes	No
B	4.05	Yes	No
C	0.14	Yes	No
ZZ	13.71	Yes	No
BBB	3.13	Yes	Yes (HA-4)
WWW	12.36	Yes	Yes (CS-8) ²
YYY	4.06	Yes	Yes (CS-9)
RRRR	1.11	Yes	Yes (HA-7)
6I	2.01	Yes	No
6H ³	3.41	Yes	Yes (HA-3)

¹Only represents total acreage of delineated areas and not the extent of entire wetland outside of the wetland study area.

²The delineated portion of this wetland in the Study Area does not intersect wetland CS-8. However, there is a direct connection just beyond the boundaries of the Study Area.

³Wetland 6H will be visited in the spring of 2017 to review wetland boundaries and the extent of state jurisdiction.

6.0 REFERENCES

Cowardin, L.M., V. Carter, F.C. Goblet and E.T. LaRoae. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service, OBS-79/31, Washington, D.C.

Edinger, G.J., D.J. Evans, S. Gebauer, T.G. Howard, D.M. Hunt, and A.M. Olivero (editors). 2014. *Ecological Communities of New York State*. Second Edition. A revised and expanded edition of Carol Reschke's Ecological Communities of New York State. New York Natural Heritage Program, New York State Department of Environmental Conservation, Albany, NY.

Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) 2016. Cassadaga Wind Project Wetland Delineation Report.

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

K. I. Corporations, (2000). *Munsell soil color charts*. Kollmorgen Instruments Corporation, New Windsor, NY.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2014. *The National Wetland Plant List: 2014 Update of Wetland Ratings*. Phytoneuron 2014-41: 1-42. https://wetland_plants.usace.army.mil. (Accessed January, 2016).
U.S. Climate Data. 2016. *Climate Dunkirk – New York*. Available at <http://www.usclimatedata.com/climate/dunkirk/new-york/united-states/usny2910> (Accessed January 2016).

Natural Resources Conservation Services (NRCS). 2014. *New York Portion of the 2014 National Hydric Soil List*. Available at: <http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/use/hydric/> (Accessed January, 2016).

NRCS. United States Department of Agriculture. 2015. *Web Soil Survey*. Available online at <http://websoilsurvey.nrcs.usda.gov/>. (Accessed January, 2016).

New York State Department of Environmental Conservation (NYSDEC). 1999. *New York State Regulatory Freshwater Wetlands For Chautauqua County (ARC Export: 1999)*. Available at: <http://cugir.mannlib.cornell.edu/datatheme.jsp?id=111>. (Accessed January, 2017).

New York State Department of Environmental Conservation (NYSDEC). 2015. *Water Quality Classifications – NYS*. Available at <https://gis.ny.gov/gisdata/inventories/details.cfm?DSID=1118> (Accessed January, 2017).

NOAA. 2016. *Temperature and Precipitation Summary for Dunkirk, NY, 2000-2016*. NOAA Regional Climate Center. Available at: <http://agacis.rcc-acis.org/?fips=36013> (Accessed November 2016).

Reschke, C. 1990. *Ecological Communities of New York State*. New York Natural Heritage Program, New York State Department of Environmental Conservation, Latham, NY.

United States Army Corps of Engineers (USACE). 1995. *The Highway Methodology Workbook Supplement. Wetland Functions and Values: A Descriptive Approach*. U.S. Army Corps of Engineers, New England Division. NENEP-360-1-30a. 32PP.

United States Army Corps of Engineers (USACE). 2012. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region*. ERDC/EL TR-12-1. Vicksburg, MS: U.S. Army Engineer Research and Development Center.

United States Fish and Wildlife Service (USFWS). 2016. National Wetlands Inventory. Available at: <https://www.fws.gov/wetlands/data/Mapper.html>.

U.S. Geological Survey (USGS). 2014. *Hydrologic Unit Maps*. Available at: <http://water.usgs.gov/GIS/huc.html> (Accessed January, 2016).

United States Environmental Protection Agency (USEPA). 2001. *Interagency Memorandum from Gary S. Guzy (General Counsel for the U.S. Environmental Protection Agency) and Robert M. Anderson (Chief Counsel for the U.S. Army Corps of Engineers)*. Memorandum Subject: Supreme Court Ruling Concerning CWA Jurisdiction over Isolated Waters.

Weldy, T., D. Werier, and A. Nelson. 2015. *New York Flora Atlas*. [S. M. Landry and K. N. Campbell (original application development), USF Water Institute, University of South Florida]. New York Flora Association, Albany, NY. Available at <http://newyork.plantatlas.usf.edu/>. (Accessed January, 2016)