WETLAND DELINEATION REPORT

Cohocton Wind Power Project
Town of Cohocton
Steuben County, New York

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1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

Environmental Design & Research, Landscape Architecture, Environmental Services, Engineering and Surveying, P.C. (EDR) was retained by Canandaigua Power Partners, LLC to identify and delineate all wetlands and streams within or adjacent to the footprint of the Cohocton Wind Power Project (the Project). The Project is a 36 turbine utility-scale wind-powered generating facility. Along with the turbines, the Project includes 8.9 miles of gravel access roads, 16.6 miles of buried electrical cable, a 9.0-mile long 115 kV transmission line, a 0.5-acre collector station, and a 2-acre substation. Its construction will also require widening of certain public road intersections, which were also evaluated in this study. The Project is located on approximately 5,700 acres of leased land (hereafter referred to as the Project Site) in the Towns of Cohocton and Avoca, New York. The Project Site will be located in northern Steuben County approximately 2.2 miles south of the Village of Naples, 6.6 miles east of the Village of Wayland, and 5.1 miles north of the Village of Avoca (as measured from the closest proposed turbine) (Figure 1).

1.2 PURPOSE

This wetland delineation report has been prepared in support of the Environmental Impact Statement (EIS) prepared for the Project by EDR in accordance with the requirements of the New York State Environmental Quality Review Act (SEQRA). Specific tasks performed for this study included a field delineation of all potential state and federal jurisdictional areas proximate to the Project footprint, a subsequent instrument survey of jurisdictional area boundaries utilizing Global Positioning System (GPS) units with sub-meter accuracy, and a detailed description of jurisdictional areas based on hydrology, vegetation, and soils data collected in the field.

This report describes the results of both the delineation and data collection efforts conducted by EDR as well as a description of the wetlands and water bodies that were identified and delineated. This document is intended to provide all the information necessary for an agency jurisdictional determination, and to support a subsequent permit application, which will be submitted to the United States Army Corps of Engineers (USACE or Corps) and the New York State Department of Environmental Conservation (NYSDEC).

1.3 RESOURCES

Existing data supporting this investigation have been derived from a number of sources including United States Geological Survey (USGS) topographic mapping (Naples, Avoca, and Haskinville, NY 7.5 minute quadrangles), United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping, NYSDEC Freshwater Wetlands mapping, Federal Emergency Management Agency (FEMA) 100-year floodplain mapping, United States Department of Agriculture (USDA) Soil Conservation Service (SCS) (currently the Natural Resources Conservation Service [NRCS]) Steuben County Soil Survey (USDA, 1978), the NRCS List of Hydric Soils of the State of New York (NRCS, 2006), the NRCS list of New York Soils with Potential Hydric Inclusions (NRCS, 1989), and recent (2002) panchromatic aerial photography obtained from the NYS GIS Clearinghouse. Vascular plant names follow nomenclature found in Gleason and Cronquist (1991), and wetland indicator status for vegetative species was determined by reference to the "National list of plant species that occur in wetlands: Northeast (Region 1)" (Reed, 1988).

1.4 QUALIFICATIONS

On-site wetland delineations and data inventories were performed by EDR ecologists John Hecklau, Benjamin Brazell, William Trembath, and Brian Schwabenbauer.

Mr. Hecklau serves as principal-in-charge on all of EDR's environmental inventory, management, and permitting projects. He received a bachelor's degree in biology from Middlebury College and a master's degree in wildlife biology from State University of New York (SUNY) College of Environmental Science and Forestry. With over 20 years of experience in the environmental field, professional expertise includes wetland delineations, plant and wildlife identification and community mapping, resource management planning, habitat assessments, and environmental impact analysis.

Mr. Brazell is a project manager with over 5 years of experience in the environmental field. He received a bachelor's degree in natural resources from North Carolina State University. Professional expertise includes wetland delineations, federal and state wetland/stream permitting, plant and wildlife identification, stream restoration, community mapping, SEQRA compliance, and environmental impact analysis.

Mr. Trembath is a project manager with over 18 years experience in the environmental field. He received a bachelor's degree in biology from SUNY, College at Fredonia. Professional

expertise includes environmental impact analyses and monitoring, wetland delineations, federal and state permitting, SEQRA compliance, hazardous waste operations, industrial health and safety, emergency response, and wildlife damage management.

Mr. Schwabenbauer is an environmental analyst with over 4 years of experience in the environmental field. He received a bachelor's degree in environmental studies from Hobart College, and is currently pursuing a master's degree in environmental policy from SUNY College of Environmental Science and Forestry. Professional expertise includes GPS surveying and mapping, geographic information systems (GIS) analysis, and wetland delineations.

2.0 PHYSICAL CHARACTERISTICS AND RESOURCES

2.1 PHYSIOGRAPHY AND SOILS

The Project Site is located within the Southern New York Section of the Appalachian Uplands physiographic province of New York State (USGS, 2003). Topography in the area is consistent with that of a mature, eroded plateau. It is characterized by rolling uplands and flat-topped hills, which are dissected by steep ravines and the broad valley of the Cohocton River. Many ravines in the vicinity of the Project Site are associated with tributaries of the Cohocton River including Kirkwood Creek, Twelve Mile Creek, and Neil Creek. Ravines in the northeast portion of the Project Site are associated with Eelpot Creek and Reservoir Creek, tributaries of the West River. Slopes are generally in the range of 3-20% but in some ravine areas nearly vertical slopes can be found. Elevations in the Project Site range from approximately 1,250 feet above mean sea level (amsl) in the Cohocton River Valley to 2,100 feet amsl on Lent Hill (Figure 2).

The Steuben County Soil Survey indicates that approximately 29 soil types are present within the Project Site. In general the upland areas are characterized by deep soils with a fragipan that formed in glacial till, and the Cohocton River Valley consists of deep soils formed in glacial outwash and recent alluvium. A review of the National Hydric Soil List for New York State indicates that 5 of the 29 on-site soils are listed as hydric in New York State. In addition, 2 soils are listed as having the potential for hydric inclusions (NRCS, 1989). These soils occur primarily in the Cohocton River Valley and along Kirkwood Creek. However, a few areas of hydric soil occur in the uplands, generally in the same locations as NWI-mapped wetlands. Table 1 presents detailed information for all on-site soils.

Table 1. Site Soils[1]

Series	Subgroup	Mapping Unit	Slope (%)	Drainage [2]	Landscape Position	Noted Hydrology	Depth to Seasonal High Water Table (ft)	Hydric Soil [3]
Alden	Mollic Haplaquepts	Aa	0-3	VPD	Depressions and low areas on upland till plains	Surface runoff is negligible to very low	0-0.5	A
Arnot	Lithic Dystrochrepts	ARC	2-20	WD-MWD	Sides of long narrow ridges in the uplands	Available water capacity is low	1-1.5	
Atherton	Aeric Haplaquepts	At	0-3	PD-VPD	Nearly level outwash plains and terraces	Potential for surface runoff is very low	0-0.5	A
Bath	Typic Fragiochrepts	BaB	2-20	WD	Convex side slopes on higher plateau areas	Surface runoff ranges from negligible to very low	2.0	
		BaC	12-20					
		BaD	20-30					
		BBE	steep					
Braceville	Typic Fragiochrepts	BrA	0-3	MWD	Terraces, beaches, fans, and moraines	Surface runoff is low.	0.5-3.0	
Chenango	Typic Dystrochrepts	Ch	0-20	EWD-ED	Outwash plains, alluvial fans, valley terraces	Surface runoff ranges from negligible to very low	3.0-6.0	
Chippewa	Typic Fragiaquepts	Ck	0-8	VPD-PD	Upland areas with depressions	Internal drainage very low, surface runoff potential is low to high.	0-0.5	A
Fluvaquents and Ochhrepts	Fluvaquents and Ochrepts	FL	0-8	WD-VPD	Narrow strips along streams and rivers	Frequently flooded	0-6.0	A
Fremont	Aeric Haplaquepts	FrB	2-8	SPD	Broad hilltops and hillsides	Potential for surface runoff is low to high	0.5-1.5	B
Howard	Glossoboric Hapludalfs	HoA	0-3	SED-WD	Glacial outwash terraces along larger streams	Surface runoff ranges from negligible to very low	>6.0	
		HoB	3-12					

Table 1. Site Soils[1]

Series	Subgroup	Mapping Unit	Slope (%)	Drainage [2]	Landscape Position	Noted Hydrology	Depth to Seasonal High Water Table (ft)	Hydric Soil [3]
Howard-Madrid	Glossoboric Hapludalfs	HrB	3-12	SED-WD	Slopes in valleys with varying levels of steepness	Surface runoff ranges from negligible to very low	>6.0	
		HrC	12-20					
		HrD	20-30					
Lordstown	Typic Dystrochrepts	LoB	3-12	WD	Nearly level to very steep	Surface runoff ranges from negligible to very low	>6.0	
		LoC	12-20					
Lordstown-Arnot	Typic Dystrochrepts - Lithic Dystrochrepts	LRE	20-40	WD	Valley walls throughout the county	Water runs off rapidly, and receives little water from adjacent areas.	1.0-1.5	
		LRF	>40					
Mardin	Typic Fragiochrepts	MdB	2-8	WD	Glaciated uplands, mostly on broad hilltops	Available water capacity is low to moderate	1.5-2.0	
		MdC	8-15					
		MdD	15-25					
Ochrepts and Orthents	Ochrepts and Orthents	OC	steep		Very steep areas that have been dissected by streams		>6.0	
Volusia	Aeric Fragiaquepts	VoB	3-8	SPD	Valley sides and broad divides on uplands	Available water capacity is low to moderate	0.5-1.5	B
		VoC	8-15					
		VoD	15-25					
Wayland	Mollic Fluvaquents	Wn	0-3	VPD -PD	Low areas and flood plains	Available water capacity is high	0-0.5	A

[1]Unless otherwise noted, information derived from the Soil Survey of Steuben County, New York, 1978

[2]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.

[3]"A" indicates this soil is considered hydric in New York State, and "B" has the potential for hydric inclusions in New York State (NRCS, 2006, NRCS, 1989).

2.2 HYDROLOGY

The Project Site includes several perennial and intermittent headwater streams, some small ponds, and the Cohocton River. The Project Site is almost entirely within the Cohocton River watershed, except the extreme northern portion, which is in the West River watershed. Unnamed streams in the extreme northern portion of the Project Site drain north via Reservoir Creek, Eelpot Creek, and Naples Creek to the West River. The western portion of the Site drains to Twelve Mile Creek, which flows into the Cohocton River south of the Project Site. The eastern and southern portions of the Project Site drain into the Cohocton River via Kirkwood Creek, Reynold's Creek, Neil Creek, and several unnamed tributaries.

Streams in the area, both named and unnamed, are highly variable, ranging from dry washes in deeply cut ravines to moderate/steep gradient headwater streams with pools and riffles, to the meandering Cohocton River, which is characteristic of a midreach stream (see Reschke, 1990 for community descriptions). With the exception of the Cohocton River, all of these streams are less than 15 feet wide, and most are intermittent. Substrate ranges from bedrock to silt/mud. Most are characterized by a gravel/cobble substrate with little or no aquatic vegetation. Water depths are typically 2 to 8 inches, with maximum depths of 2 to 3 feet. Most of the streams have well-defined and abrupt banks, although some occur within corridors of floodplains or wetlands. The Cohocton River and Twelve Mile Creek occur in broad, nearly flat-bottomed valleys with portions mapped by FEMA as 100-year floodplains. In areas where the Cohocton River is crossed by the Project transmission line, it is approximately 20-30 feet wide and 2-3 feet deep with a moderate gradient and a cobble and gravel substrate. The river has well-defined banks, but is bordered by several large state and federally protected wetlands.

A variety of wetland communities were observed within the Project Site ranging from small isolated depressions on upland plateaus to large riparian complexes in the Cohocton River Valley. A few farm ponds are also found within the Project Site. Generally, they are found in open field settings or adjacent to houses and barns. Typically, these ponds are excavated or diked, and range in size from 0.2 to 2.6 acres. Shorelines are well-defined and water depths are typically 3 feet or more.

Sources of wetland hydrology on the plateau areas within the Project Site include precipitation, discharge from subsurface tile lines, and surface water runoff during rainfall or

snowmelt events. In the ravines and valleys, these sources are supplemented by groundwater discharges/inflow and/or periodic flooding from nearby surface water bodies.

3.0 JURISDICTIONAL AREA MAPPING

3.1 WATERS OF THE UNITED STATES

As defined by the USACE, Waters of the United States include all lakes, ponds, streams (intermittent and perennial), and wetlands. Jurisdictional 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" (USEPA, 2001). Such areas are indicated by the presence of three criteria: hydrophytic vegetation, hydric soils, and evidence of wetland hydrology during the growing season (Environmental Laboratory, 1987). However, as a result of the *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers* Supreme Court case (No. 99-1178; January 9, 2001), it has been determined that the USACE does not have jurisdictional authority over waters that are "nonnavigable, isolated, and intrastate" (USEPA, 2001). More recently, the Supreme Court decided *U.S. v. Rapanos*, 547 U.S. (June 19, 2006), in which it held in two consolidated cases (the other one was *Carabell*) that the Corps misinterpreted the Clean Water Act (Act) in determining its jurisdiction over wetland protection.

In the first consolidated case, *Rapanos*, the lower court held that the landowners violated the Act by discharging pollutants into jurisdictional wetlands without a permit. In *Rapanos*, the wetlands were near ditches and man-made drains that eventually emptied into a lake approximately twenty miles away. In the second case, *Carabell*, the lower court also held that the Corps had jurisdiction over the wetlands and Carabell was denied a permit to build. The wetlands in *Carabell* were separated from a ditch by a man-made berm which "ordinarily, if not always, blocks surface-water flow from the wetlands into the ditch." This ditch drained into a creek which in turn emptied into Lake St. Clair. Before the Supreme Court, both the Rapanos and Carabells argued that while their properties may have wetlands, these wetlands are not adjacent to navigable waters and are therefore beyond the Act's jurisdiction.

Four members of the Court or a plurality held that the wetlands in question were outside the Corps' jurisdiction. However, many commentators regard Justice Kennedy's concurring opinion as the controlling opinion. While Justice Kennedy's opinion provides broader

wetland protection than the plurality, it still requires that the Corps establish a "significant nexus" on a case-by-case basis when it seeks to regulate wetlands based on adjacency to nonnavigable tributaries." Justice Kennedy also looked to the Corps own definition of a tributary in terms of the regularity of flow to suggest that the Corps was overstepping its jurisdictional boundaries when it regulated wetlands based on adjacency to drains, ditches, and streams remote from any navigable-in-fact water and carrying only minor water-volumes (The long term impact of the Rapanos and Carabells is uncertain). To date, no regulatory guidance has been issued by the Corps regarding these cases. Ultimately, the jurisdictional status of all on-site waters will be determined based on the findings of a field visit by a Buffalo District USACE representative.

Review of National Wetland Inventory (NWI) mapping indicates that there are a number of federally-mapped wetlands located within and adjacent to the Project Site. The federally mapped wetlands are identified in Figure 3. While the majority of these wetlands occur in the floodplain setting associated with the Cohocton River, a few of these mapped wetlands are located within the elevated upland portions of the Project Site. The NWI maps indicate that impoundments with unconsolidated bottoms (PUBHh and PUBFh – farm ponds) are the most common wetland type on the upland plateaus within the Project Site, although emergent (PEM1E and PEM1Fh) and forested evergreen (PFO4E) are also represented (totally approximately 7.5 acres). The dominant wetland type in the valley portion of the Project Site is persistent emergent/deciduous scrub-shrub (PEM1/SS1E) totaling approximately 105 acres. Forested evergreen (PFO4E; 34 acres), deciduous forest (PFO1E; 28 acres), scrub-shrub (PSS1E; 11 acres), scrub-shrub/deciduous forest (PSS1/FO1E; 13 acres), emergent (PEM1E; 4 acres), and one unconsolidated bottom impoundment (PUBHh; 2 acres) are also present in the valley portions of the site. Of the 197 acres of wetland mapped by the NWI within the valley portions of the Project Site, only 26 acres occur within the site boundaries (i.e., within the proposed transmission line ROW).

3.2 NEW YORK STATE FRESHWATER WETLANDS & 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 to determine 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.

Review of NYSDEC freshwater wetlands mapping indicates that there are a number of wetlands located in the valleys within and adjacent to the Project Site that are regulated under Article 24 of the Environmental Conservation Law. The state-regulated wetlands are identified in Figure 4. These wetlands are associated with Twelve Mile Creek (located immediately east of the Project Site) and the Cohocton River. State-regulated wetland AV-1, associated with the Cohocton River is designated as a Class I wetland by the NYSDEC and is the only State regulated wetland that occurs within the Project Site. Wetland AV-1 contains deciduous swamp, shrub swamp and wet meadow cover types. It was assigned a Class I designation pursuant to §664.5(a)(7) because it displayed four or more Class II characteristics (NYSDEC, Unpubl.). According to the NYSDEC wetland inventory form completed in October of 1982, AV-1 was found to display the following five Class II characteristics: two or more structural groups; associated with a C(t) or higher stream; tributary to a body of water that could subject a developed or agricultural area to significant flood damage should the wetland be modified, filled, or drained; it is one of the three largest wetlands within the town; and it is within a publicly owned recreation area. While this wetland totals 407.2 acres in size, only 6.6 acres occur within the Project Site (i.e., within the proposed transmission line ROW).

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 stream, are considered to be part of a stream and are subject to regulation under the stream protection category of Article 15. Protected stream means any stream, or particular portion of a stream, for which has been assigned by the NYSDEC any of the following classifications or standards: AA, AA(t), A, A(t), B, B(t) or C(t) (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, and also include those more specifically designated (ts) which support trout spawning. State water quality classifications of unprotected watercourses include Class C and Class D streams. Classification D waters are suitable for fishing and non-contact recreation.

Some stream segments within the Project Site are protected by the Protection of Waters regulations. The Cohocton River and a tributary of Eelpot Creek are classified as C(t) trout streams, and Kirkwood Creek and an unnamed tributary to the Cohocton River located in the valley portion of the Project Site are classified as a C(ts) trout-spawning streams. Specific locations are indicated in Figure 4, and representative photographs are depicted in Appendix C.

4.0 ON-SITE JURISDICTIONAL AREA DELINEATION

4.1 METHODOLOGY

Identification and delineation of wetlands and streams in areas within or adjacent to the project footprint were performed by EDR personnel during the fall of 2005 and the spring and summer of 2006. EDR performed field surveys only on those wetlands that are adjacent to or may be impacted by proposed project components (including the turbines, turbine workspaces, access roads, transmission line, collector station, substation, and buried electrical interconnect) and along the portions of public roads that may be subject to improvements (i.e., increased turning radius). In general, all areas within 200 feet of all turbines, and 100 feet of all roads, interconnects, and other project components were identified and delineated. The determination of wetland boundaries was made by EDR personnel according to the three parameter methodology described in the USACE Wetland Delineation Manual (hereafter referred to as the 1987 Manual) (Environmental Laboratory, 1987). Attention was also given to the identification of potential hydrologic connections between wetlands areas that could influence their jurisdictional status.

Wetland boundaries were defined in the field with sequentially-numbered pink surveyor's flagging, which was subsequently mapped using a Trimble Pathfinder® Pro GPS unit with reported sub-meter accuracy. Data were collected from one or more sample plots in each delineated wetland (depending on the size of the delineated area), and was recorded on USACE *Routine Wetland Determination* forms (Appendix B). Data collected for each of the wetlands delineated by EDR personnel included vegetation, hydrology indicators, and soils characteristics. This methodology was applied to all wetlands delineated on the Project Site.

The wetland vegetative community 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 wetland delineations on the Project 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 percent cover.

Project Site soils data were collected by EDR personnel using a soil auger. Information concerning soil series, subgroup, drainage classification, texture, and matrix and mottle color was obtained for each delineated wetland. This information was 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 is indicative of the likely occurrence of wetlands (Environmental Laboratory, 1987). Hydric soils were determined in the field through observation of composition, color, and morphology. Soil colors were determined using *Munsell Soil Charts* (Kollmorgen Corp., 2000).

The 1987 Manual lists the following indicators as evidence of wetland hydrology (in order of decreasing reliability): (1) visual observation of inundation, (2) visual observation of soil saturation, (3) water marks, (4) drift lines, (5) sediment deposits, and (6) drainage patterns. Hydrologic characteristics (inundation and soil saturation) 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 when combined with a hydrophytic plant community and hydric soils. In addition, "secondary indicators" used by EDR personnel included: (1) oxidized root channels in the upper 12 inches of soil, (2) water-stained leaves, (3) local soil survey data, and (4) morphological plant adaptations. Any two of these indicates the presence of wetland hydrology.

Photographs were taken of each wetland delineated within the proposed Project Site. Photographs representative of the delineated wetlands are included in Appendix C.

5.0 RESULTS

EDR personnel delineated a total of 32 wetlands/waters within the Project site. These include 12 wetlands, 16 streams/drainages, and four farm ponds. Where a river or stream occurred within a delineated wetland, the open water channel was not separately delineated. The location of these wetlands is indicated in Figure 5. Information pertaining to individual on-site wetlands is summarized in Table 2.

Table 2. Delineated Wetlands and Streams

Wetland/ Stream ID	Community Type[1]	Federal Jurisdiction (Yes/No/ Undetermined)[2]	State Jurisdiction (Yes/No) [3]	Potential Impact (Yes/No)[4]	Figure 5 Reference Sheet #
I15A	Stream	Yes	No	Yes	5
I15B	Stream (dry) drainage	Yes	No	Yes	5
I19A	WM drainage	Yes	No	No	6
I19B	Pond with EM edge	Yes	No	No	6
I29A	Pond with SS/ WM edge	No	No	No	10
I29B	FO	No	No	No	10
ERA	WM/Stream	Yes	No	No	8
LHA	Pond with EM edge	Yes	No	Yes	9
VAA	Stream	Yes	No	Yes	23, 27
VAB	Ditch/ Intermittent Stream	Undetermined	No	Yes	26
WRA	SS/WM	Yes	Yes	Yes	24
R17A	EM	No	No	No	10
R19A	WM	Yes	No	Yes	10
R33A	FO/WM	Yes	No	No	22, 26
R5A	EM/WM	Yes	No	No	1
TLA	WM	Yes	No	Yes	12
TLB	Intermittent Stream	Yes	No	No	12
TLC/TLD	FO/SS/WM/Stream	Yes	Yes	Yes	15, 16, 19, 20
TLE	SS/WM/EM	Yes	Yes	Yes	19, 20
TLF	SS/EM/WM	Yes	Yes	Yes	19, 20
TLG	SS/WM/FO	Yes	Yes	No	20, 24
TLH	FO/SS/Stream	Yes	Yes	Yes	20, 24
TLI	SS/WM/EM	Yes	Yes	No	19, 20
TLJ	EM/WM/SS	Yes	No	No	19
TLQ	FO/EM/SS/Stream	Yes	Yes	Yes	20
TLR	Stream	Yes	No	Yes	23
TLS	WM/Dry drainage	Undetermined	No	No	23

Wetland/ Stream ID	Community Type[1]	Federal Jurisdiction (Yes/No/ Undetermined)[2]	State Jurisdiction (Yes/No) [3]	Potential Impact (Yes/No)[4]	Figure 5 Reference Sheet #
TLT	Pond, WM edge	Yes	No	No	23
TLU	Stream/WM/EM/SS	Yes	No	Yes	23
TLV	Stream/Seep/Ditch	Yes	No	No	23, 27
TLW	SS/Stream	Yes	No	Yes	26, 27
TLX	Stream/Ditch	Undetermined	No	No	26

[1] Wetland community types are represented by the following abbreviations: "EM" = Emergent, "FO" = Forested, "SS" = Scrub-shrub, "WM" = Wet meadow.
[2] Based on existing mapping and visual observation of hydrologic connectivity in the field. Final jurisdictional determination to be made by USACE.
[3]Based on existing NYSDEC mapping of freshwater wetlands and/or protected streams.
[4]Based on preliminary assessment of impact avoidability.

The on-site delineation effort revealed that wetlands within the turbine arrays (Pine Hill, Lent Hill, and Brown Hill) are very limited, and generally consist of isolated depressions and swales, farm ponds, and the intermittent headwaters of stream channels. The most significant wetlands within the Project Site occur along the proposed transmission line route through the Cohocton River Valley and along Fairbrother Road (see Figure 5). Descriptions of each of the wetland types found on the plateau areas where turbines are proposed (Generating Site) and through the valleys where the transmission line is proposed (Transmission Line Route) are presented below.

5.1 GENERATING SITE

The elevated plateau areas where the turbines, access roads, buried interconnect, and substations are proposed are generally well drained and include relatively few wetlands. No NYSDEC mapped wetlands/waters and only 13 small federally mapped wetlands are indicated in this area. A total of 16 wetlands were delineated in the field and are described by general type below.

Isolated Depressions and Swales – In several locations on Pine Hill and Lent Hill small depressional wetlands have formed at the outlet of tile lines or in field corners/low spots that collect surface water run-off. Wetlands TLA, R17A, R5A, and R19A are all small depressional wetlands in upland agricultural settings. Similarly, wetland characteristics have developed in some of the man-made drainage swales that have been created between sloping agricultural fields to capture and divert surface water run-off (i.e. Wetland I19A). Dominant species in these depressions and drainages generally include cattail (*Typha sp*.), sedges (*Carex sp*.), rushes (*Juncus sp*., *Scirpus sp*.), spotted jewelweed (*Impatiens capensis*), and willows (*Salix sp*.). Wetlands R5A and TLA are representative examples of

depressional wetlands. Wetland R5A is located at a drain tile outlet south of Pine Hill Road and north of Turbine 6. This emergent/wet meadow is dominated by sedges, cattail, tussock sedge (*Carex stricta*), and late goldenrod (Solidago gigantea) (Photo 15, Appendix C). Wetland TLA is a depressional wetland that has developed on abandoned agricultural land near the intersection of McLean Road and Rynders Road (Photo 16, Appendix C). Cattail, sedges, late goldenrod, and sensitive fern (*Onoclea sensibilis*) dominate the vegetation in Wetland TLA. The soil is a hydric silt loam as evidenced by the low chroma matrix color (10YR 5/2) and moderately abundant high chroma mottles (10YR 5/6) in the B horizon. Primary indicators of hydrology include saturated soils at the surface with free water at a depth of 5 to 6 inches, and drainage patterns in the wetland.

Although these wetlands offer relatively little in terms of wildlife habitat, and most other wetland functions and values, due to their small size and lack of habitat diversity, they play a role in the protection of downstream water quality by physically filtering sediment and absorbing nutrients out of water running off of agricultural fields. In terms of jurisdictional status, the depressional wetlands generally appear isolated and unlikely to fall under federal jurisdiction whereas the drainage swales typically are hydrologically connected to navigable waters and therefore may be considered jurisdictional by the USACE.

Farm Ponds/Emergent Marsh – A few old farm ponds/emergent marshes were delineated on Pine Hill and Lent Hill, including Wetlands TLT, I19B, I29A, and LHA. These wetlands generally correspond to NWI mapping, and are typically small (<1 acre) open water areas with a shoreline fringe of emergent vegetation dominated by cattails, sedges, reed canary grass (*Phalaris arundinacea*), along with scattered silky dogwood (*Cornus amomum*) and willow shrubs. Wetland LHA, located near the intersection of Stanton Road and Kirkwood-Lent Hill Road, is a representative example of this type of wetland with both open water and emergent marsh components (Photo 8, Appendix C). The open water area is less than 0.2-acre in size with a depth greater than 12 inches in the center, and is densely covered by duckweed. The emergent wetland fringe is dominated by cattail with a few interspersed silky dogwood shrubs. The surface layer of the soil has a sandy texture combined with high organic content and organic streaking. The B horizon of the soil has relatively high clay content with a low chroma matrix color (10YR 5/2) and common high chroma mottles (10YR 5/6). Wetland hydrology is indicated by 2-3 inches of standing water, water marks, sediment deposits, and drainage patterns in the wetland.

Farm ponds within the Project Site, particularly those with a well-established emergent marsh fringe, may provide habitat and breeding grounds for waterfowl and amphibians. These wetlands also make a small contribution to nutrient cycling, stormwater detention, and groundwater recharge, but these functions are limited due to the small size of these wetlands. The jurisdictional status of farm ponds is variable depending on the presence or absence of a stream/outlet or adjacent wetlands that may be connected to navigable waters.

Intermittent Headwaters – The tops of ravines and valleys on Pine Hill and Lent Hill typically include intermittent stream channels such as Streams I15B, TLB, and TLS. All of these channels were dry at the time data were collected (June 22, 2006 and September 8, 2006), but displayed evidence of periodic heavy flows. The channels are typically deeply incised and scoured, with a steep gradient and rocky substrate. Vegetation of any type is typically lacking. Stream TLB provides a good example of a typical intermittent headwater stream on the Project Site. It is located south of Rynders Road near the proposed collection substation. It is a 2 to 3 foot wide dry channel with rocky substrate (Photo 17, Appendix C). The banks are eroded and notably scoured by periodic heavy flows. The only vegetation present at the time of data collection was late goldenrod sparsely scattered throughout the drainage. Another example, Stream I15B is located west of Pine Hill Road at a proposed interconnect crossing. This drainage is approximately five to eight feet wide on average with a rocky substrate and interspersed sediment deposits (Photo 2, Appendix C). A sample taken from the soil adjacent to the main channel displayed hydric characteristics with a low chroma matrix (10YR 5/2) and few high chroma mottles (10YR 5/6). Vegetation was not established within the stream channel however spotted jewelweed was noted along the fringe of the riparian area.

The primary function/value of intermittent headwaters is to convey snowmelt and storm water runoff from upland agricultural areas to larger streams in adjacent ravines, and ultimately to rivers in the valleys. This hydrologic connection with intrastate and navigable waters places intermittent headwaters under federal jurisdiction.

Forested Wetlands – Wetlands I29B and R33A are the only forested wetlands delineated within the Generating Site. Wetland I29B is a small, apparently isolated, wet woodlot located off of Kirkwood - Lent Hill Road, adjacent to an excavated pond (Wetland I29A) (Photo 6, Appendix C). Within Wetland I29B, soils were saturated at the surface with a depth of two to three inches to free water. The vegetative overstory is dominated by mature red maples (*Acer rubrum*) with a dense midstory of spirea (*Spiraea sp*.) and a mix of red maple and

eastern cottonwood (*Populus deltoids*) saplings. Dominant vegetation in the herbaceous layer includes sensitive fern, late goldenrod, and sedges. The many indicators of wetland hydrology included buttressing of tree trunks, water marks, sediment deposits, drainage patterns, and water-stained leaves. Wetland R33A is a small forested wetland with a wet meadow component located within an agricultural field north of Preston Road south of Turbine 33. The tree stratum is composed of green ash and red maple with a few interspersed eastern hemlocks. Other vegetation includes silky dogwood, sedges, late goldenrod, and sensitive fern.

Wetland I29B appears to be isolated and is anticipated to be non-jurisdictional while Wetland R33A likely falls under federal jurisdiction due to the drainage way that flows south through the agricultural field, connecting R33A to jurisdictional waters. Both of these wetlands are limited in terms of functions and values due to their small size. However, as the only forested wetlands delineated in the upland areas, it should be noted that even though small, these wetlands are contributing to wetland and wildlife habitat diversity in the landscape.

Stream Channels – Perennial headwater streams were observed in two locations on Pine Hill and Lent Hill. These include Streams ERA and I15A and are characterized by narrow (<10 feet wide) channels, well-defined banks, and rocky substrate. They are typically moderate gradient streams that have shallow (0 to 6 inch deep) flowing water. Wetland I15A is a four to six foot wide stream channel approximately 1 to 2 inches deep with a moderate flow and gradient (Photo 1, Appendix C).

The delineated stream channels appear to display a “significant nexus” to navigable waters and are therefore are almost certain to fall under federal jurisdiction. These streams provide habitat for fish, amphibians, and other aquatic and terrestrial wildlife species, in addition to maintaining downstream surface water flows and water quality.

5.2 TRANSMISSION LINE ROUTE

The majority of wetlands and streams, and certainly the largest/most significant of these resources, occur in the valley areas along the proposed transmission line route. These include the Cohocton River Valley wetland complex, the Fairbrother Road wetland complex, and perennial streams, all of which are described below.

Cohocton River Valley Wetland Complex – Wetlands that border the Cohocton River are primarily scrub-shrub communities dominated by speckled alder (*Alnus rugosa*), silky dogwood, and willows. This wetland community also has some emergent and forested components, which include species such as reed canary grass, sensitive fern, late goldenrod, sedges, eastern cottonwood, green ash (*Fraxinus pennsylvanica*), and red maple. These areas are characterized by periodic inundation/saturation (due to river flooding, surface runoff, beaver activity, and seasonal high groundwater) and deep alluvial soils. They correspond with the major mapped NWI and NYSDEC (AV-1) wetlands described previously, and are the largest/most significant wetlands in the Project Site. Delineated wetlands in this area include TLC/TLD, TLE, TLF, TLG, TLH, TLI, TLJ, TLQ, and WRA. The overhead transmission line route crosses this wetland complex, first entering Wetland TLC/TLD in a dense stand of common reed (*Phragmites australis*) near the toe of the valley wall slope (Figure 5, Sheet 20). As the transmission line route proceeds further into the wetland complex, a mix of primarily scrub-shrub communities with interspersed patches of emergent wetland and forested cover are encountered (Photo 18, Appendix C). Near the first proposed transmission line crossing of the Cohocton River, emergent and wet meadow communities occur on both sides of the river channel. As the route crosses Flint Road, scrub shubland and wet meadow communities (wetland TLD and TLE) dominate. Where the transmission line route parallels the railroad tracks it is bordered by Wetlands TLI and TLF on the west and east side of the tracks, respectively. Both of these wetland areas contain a mix of scrub-shrub, emergent, wet meadow, and to a lesser extent forested communities (Photos 23 and 20, Appendix C). Wetland TLI, on the west side of the elevated railroad tracks, includes an area influenced by recent beaver activity that is characterized by areas of shallow emergent marsh and patches of open water. The transmission line route along the railroad crosses the Cohocton River for a second time at a railroad bridge near the south end of Wetlands TLI and TLF. Wetlands TLQ and TLH occur on either side of the Cohocton River near where the transmission line turns sharply to the west, away from the railroad and crosses the river for a third time. These are primarily scrub-shrub wetlands comprised of species such as green ash, silky dogwood, sensitive fern, spotted jewelweed, and ostrich fern (Photos 25 and 22, Appendix C).

The Cohocton River Valley wetland complex is the most significant wetland delineated with the Project Site in terms of its size, as well as the wetland functions and values it provides. Due to its large size and structural diversity this wetland provides habitat to a variety of plant and animal species, as well as making significant contributions to water quality improvement through nutrient cycling and sediment filtration. Being located within the floodplain of the

Cohocton River, this wetland complex also contributes to floodwater abatement and groundwater recharge/discharge. The transmission line follows the elevated Bath and Hammondsport Railroad through much of the Cohocton River Valley thereby minimizing impacts to the wetland functions by following a previously disturbed route. This wetland complex is mapped on both the NWI map and NYS Freshwater Wetland (Wetland AV-1), and therefore falls under the jurisdiction of the NYSDEC and the USACE.

Cohocton River and Tributary Streams – Two streams were delineated along the transmission line route (Stream TLR and the stream delineated as VAA, TLV, and TLW) in addition to several segments of the Cohocton River (within Wetlands TLC/TLD, TLQ, TLH, TLI, and TLF), and an unnamed tributary of the Cohocton River that flows through Wetland TLQ. Stream TLW is located off of Van Aucker Road and Stream TLR is located in between Fairbrother Road and Brown Hill Road. Both streams have a rocky substrate, well-defined banks, and moderate gradient. Stream width ranges from 2 to 12 feet, and water depths range from 2 to 6 inches (Photos 31 and 26, Appendix C). As described previously, the Cohocton River is a 20-30 foot wide, moderate gradient stream with a substrate that includes cobbles, gravel, and silt. Although somewhat variable, the river has similar characteristics at each of the three crossing locations along the transmission line route (Photos 33 and 34, Appendix C). The river is characterized by numerous meanders/oxbows, and is typically lined by wetlands and agricultural fields in the adjacent floodplain. The Cohocton River is classified as a protected C(t) trout stream by the NYSDEC, and the unnamed tributary to the Cohocton River that flows through Wetland TLQ is classified as a C(ts) trout spawning stream.

All of the delineated stream segments described above are anticipated to fall under federal jurisdiction. Additionally, the Cohocton River and its unnamed tributary located within Wetland TLQ are protected waters under Article 15 and therefore are state jurisdictional as well.

Fairbrother Road Wetland Complex – Wetland TLU is a relatively large area of wet meadow and scrub-shrub wetland associated with an unnamed tributary to the Cohocton River. This wetland occurs along the west side of Fairbrother Road (Photo 29, Appendix C). Much of this area is currently an active pasture. It includes two channels of the stream (protions of which are excavated/ditched), shallow depressional areas, and seeps that are dominated by herbaceous species including rushes, sedges, and grasses. Upland herbaceous species, including thistles (*Cirsium sp*.) and common plantain (*Plantago major*), occur in pastured

portions of this community. Areas that are not grazed include areas of dense shrubs, including willows, elderberry (*Sambucus sp*.), and multiflora rose (*Rosa multiflora*), as well as wet meadow and emergent marsh communities. The streams range from one to six feet wide with depths typically in the range of one to five inches. Consistent with other streams described previously, the substrate consists of rocks and gravel and the gradient and flow are gentle to moderate. Also included in this area is wetland TLT, which is a diked man-made impoundment. The transmission line route has been shifted to the adjacent forested uplands in this area in order to minimize impacts to this major wetland complex.

Due to its association/connection with a perennial stream, it appears that this wetland complex is under federal jurisdiction. The functions of this wetland complex are impaired by the physical disturbance and excess nutrient inputs associated with the presence of cattle, and by the channelized nature of the streams that flow through it. However, it still provides terrestrial and aquatic wildlife habitat, water quality improvement, and minor flood attenuation benefits.

Perennial Roadside Drainages – This category of wetlands includes only roadside drainages/ditches that intercept streams or seeps and thereby carry water throughout the year. Delineated roadside drainages include Wetlands VAA, VAB, TLX, and a portion of TLV. These areas are essentially cut channels along roadsides and are characterized by channel widths of one to three feet, rocky substrates, water depths of one to three inches with moderate flow and gradient. The rocky substrate precluded the collection of soil samples in all cases, however dominantly hydrophitic vegetation along the banks (typically spotted jewelweed and late goldenrod) in addition to the presence of flowing water during the time of data collection in September provides sufficient evidence of wetland status.

The jurisdictional status of these roadside drainages is questionable as they are essentially man-made and maintained ditches. However, these drainages intercept or collect groundwater discharge, maintain downstream surface water flows and have a direct connection with a perennial stream that ultimately drains to the Cohocton River. It thus appears that these drainages are likely to be jurisdictional, although they provide little in terms of wetland functions and values.

6.0 CONCLUSIONS

A total of 32 wetlands and streams were delineated by EDR personnel in areas within or immediately adjacent to the Cohocton Wind Power Project footprint. These wetlands were identified based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. Delineated areas within the Generation Site on Pine Hill and Lent Hill include isolated depressions and swales, farm ponds/emergent wetlands, intermittent headwater streams, and forested wetlands. The functions and values of many of the Pine Hill and Lent Hill wetlands are limited due to 1) their small size, 2) location within or adjacent to agricultural fields, 3) lack of structural diversity, and 4) past or on-going physical disturbance (e.g., agriculture). Delineated wetlands/waters in valley settings along the proposed transmission line route include headwater and mid-reach streams, roadside drainages, and large wetland complexes associated with the Cohocton River and an unnamed tributary that runs along Fairbrother Road. The primary functions provided by these streams and wetlands, collectively, appear to include maintaining surface water flows, groundwater recharge/discharge, storm water detention, flood abatement, water quality improvement, fish and wildlife habitat, and nutrient cycling. The large wetland complexes delineated along the transmission line route are portions of even larger systems (such as NYSDEC Wetland AV-1), which have sizable watersheds and provide significant flood storage, fish wildlife habitat, water quality, and groundwater benefits. Additional detail relative to the functions and values of on-site wetlands will be provided in the Joint Application for Permit, which will be submitted to the USACE and NYSDEC subsequent to this report.

As indicated in Table 2, half of the delineated wetlands appear to be avoidable based on current project plans and impact assumptions. Most of the unavoidable impacts will occur along the overhead transmission line route. As previously mentioned, EDR's analysis suggests that three of the 32 wetlands and streams delineated on-site (Wetlands I29A, I29B, and R17A) will not be considered jurisdictional by the USACE due to their lack of adjacency to jurisdictional (non-navigable) waters and/or the lack of a "significant nexus" between these wetlands and adjacent wetlands/waters. The jurisdictional status of an additional three wetlands is uncertain due to their occurrence as man-made ditches (Wetlands VAB and TLX) or their unclear connection with downstream waters (Wetland TLS). The remaining 26 wetlands and streams are assumed to be under federal jurisdiction, with eight of these also being under state jurisdiction pursuant to Article 24 or Article 15 (see Table 2). However, final determination of jurisdictional status must be made by the USACE and NYSDEC.

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APPENDIX A

FIGURES

APPENDIX B

ROUTINE WETLAND DETERMINATION FORMS

APPENDIX C

REPRESENTATIVE WETLAND COMMUNITIES