

Appendix 22-7:

Wetland Functions and Values Assessment



EXCELSIOR ENERGY CENTER

Case No. 19-F-0299

Wetland Functions and Values Assessment

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1.0 INTRODUCTION AND PURPOSE

This assessment report has been prepared by TRC Companies, Inc. (TRC) on behalf of Excelsior Energy Center, LLC (a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC [NEER]). The report provides a functional assessment of the freshwater wetland resources that may or may not be impacted by construction and/or operation of a proposed solar-powered wholesale energy generating facility with associated infrastructure located in the Town of Byron, Genesee County, New York (the Project).

Wetlands that are deemed Waters of the United States (WOTUS) are regulated by the United States Army Corps of Engineers (USACE) under the Clean Water Act of 1972 (Section 404, CWA). Originating in 1987, *The Highway Methodology Workbook* (the Workbook), was created by the USACE New England District to integrate highway planning, design, and development with the requirements of USACE permit regulations, the National Environmental Policy Act (NEPA), and the Federal Highway Administration (FHWA) funding approvals (USACE, 1993). A memorandum of agreement between the Environmental Protection Agency (EPA) and USACE, dated February 7, 1990, was appended to the Workbook, recognizing a stepwise process of avoidance, minimization, and compensation of adverse impacts to an established set of wetland functions and values. Subsequently, *Wetlands Functions and Values: A Descriptive Approach*, was created by the USACE New England District as a supplement to the Workbook (the Supplement). Within the Supplement, a “Descriptive Approach” is presented as a method that any project, outside the scope of highway development, could adopt to characterize wetland resources necessary for Section 404 permit requirements.

Efforts to utilize best professional judgment to interpret functions and values are often unorganized, unpredictable, and legally difficult to defend and document (USACE, 1999). In response, the USACE developed a format in the Supplement to collect and display this information, and to describe the functions and values assessment of wetlands in a measurable and un-biased perspective.

In contrast, New York State does not yet have its own wetland functional assessment methodology, nor does it endorse any specific methodology. However, a survey of New York State Department of Environmental Conservation (NYSDEC) wetland biologists reveals the USACE Highway Methodology to be the most commonly used wetland functional assessment

technique for projects requiring NYSDEC permits (Bliss, 2016). Importantly, the functions and values reviewed by the Supplement are compatible with the wetland benefits outlined in the Environmental Conservation Law at Article 24, the Freshwater Wetlands Act. For these reasons, TRC elects to utilize elements of the USACE Highway Methodology outlined in the Supplement as a means of providing a wetlands functions and values assessment.

Excelsior Energy Center, LLC contracted TRC to survey, identify, and document all wetlands within the Project Area. There are approximately 3,418 acres of leased private lands within the Project Area. TRC delineated 60 freshwater wetlands within the Project Area, totaling approximately 176 wetland acres. This Functions and Values Assessment is intended to aid in determining the wetland functions and values that may be impacted and/or altered due to the Project's construction and operation.

The functions and values of wetlands are the roles that a wetland provides to its surrounding environment, often to the benefit of human society. Functions and values are a result of specific biological, chemical, and physical characteristics within the wetland, and many complex relationships between the wetland and its watershed, local environment, and inhabitants and dependents, including the public. The wetland functions and values assessment is used to document wetland features based on their presence and level of significance relative to providing these many roles. Doing so helps to ensure that wetlands receive proper protection through well planned wetland impact avoidance, minimization, and mitigation.

The 13 functions and values that are considered by the USACE Supplement are described below in Sections 3.0 and 4.0. The list includes eight functions and five values. As noted above, these functions and values equate well to the benefits of concern within the applicable New York State Environmental Conservation Law. These functions and values, together with the working suite of USACE Supplement descriptors, have been used to provide an objective representation of the wetland resources associated with the Project.

2.0 ASSESSMENT METHODOLOGY

This wetland functions and values assessment was developed based on the *Wetlands Functions and Values: A Descriptive Approach*, described in the supplement to *The Highway Methodology Workbook* (the Supplement) by the New England Division of the USACE (1999). This method incorporates wetland science and best professional judgement in data collection toward a qualitative description of the physical and biological characteristics of the wetlands. In so doing, it identifies the functions and values exhibited and, very importantly, the bases for associated conclusions. The approach addresses the limitations of wetland assessments based on numerical weightings, rankings, and/or averaging of dissimilar wetland functions (USACE 1999). As part of this method, the evaluator accounted for many predetermined “Qualifiers” that are utilized as indicators or descriptors of functions and values. Based on the descriptions of qualifiers outlined in the Supplement, TRC developed a spreadsheet (Table 1) that displays these qualifiers. When attributed to a wetland, these qualifiers, help to identify the functions and values thought to be provided by the wetland. Considerations included observed vegetation conditions, hydrologic conditions, size, adjacent area conditions, and the availability of public access, among several other documented characteristics strategically defined to allow each wetland’s functions and values to be evaluated.

Functions and values were evaluated for all wetlands were observed during the 2019 growing season. Data on qualifiers of functions and values were documented at each wetland where vegetation, soils, hydrological data, location, and geographic nature were also collected as part of a formal delineation. All 60 wetlands delineated within the Project Area were entered into Table 2 with the various wetland qualifiers identified at each wetland. This was cross-referenced to the predetermined Qualifier Assignment Table (Table 1) and the functions and values provided by each wetland were determined based on the predetermined qualifiers.

Wetlands functions and values recognized under Article 24 of the Environmental Conservation Law and Regulations are similar to those described by the Supplement. The Functions and values as outlined in the Freshwater Wetlands Act are:

1. Flood and storm control by the hydrologic absorption and storage capacity of freshwater wetlands;

2. Wildlife habitat by providing breeding, nesting, and feeding grounds and cover for many forms of wildlife, wildfowl, and shorebirds, including migratory wildfowl and species such as the bald eagle and osprey;
3. Protection of subsurface water resources and provision for valuable watersheds and recharging 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 sedimentation areas and filtering basins, absorbing silt and organic matter, and protecting channels and harbors;
7. Education and scientific research by providing readily accessible outdoor bio-physical laboratories, living classrooms, and vast training and education resources;
8. Open space and aesthetic appreciation by providing often the only remaining open areas along crowded river fronts and coastal Great Lakes regions; and
9. Sources of nutrients in freshwater food cycles and nursery grounds and sanctuaries for freshwater fish.

3.0 WETLAND FUNCTIONS

Wetland functions are the properties or processes of a wetland ecosystem that aid in promoting an equilibrium in the wetland and surrounding environment. Wetland functions relate to the ecological significance of wetland properties without regard to subjective human values. The eight functions attributed to wetlands by the Supplement are defined as follows:

- 1. Flood-flow Alteration** - The effectiveness of the wetland to reduce flood damage by containing and desynchronizing floodwaters for an extended period following heavy precipitation and runoff events. Wetlands that occur higher in a watershed reduce flooding of downstream waterbodies through ponding water and diffusing or diverting flow velocities. Wetlands that occur lower in the watershed may contain the ability to store high volumes of water through direct interactions with the local floodplain or contain large areas of porous surface soils with the ability to become heavily saturated and still maintain integrity during flood-flow events. If a wetland is situated in the riparian zone along a waterbody and contains dense vegetation, it can attenuate the severity of increased flow regimes by dissipating flow velocity during flooding events.
- 2. Groundwater Recharge/Discharge** - The potential for a wetland to act as a source of groundwater recharge and/or discharge. Recharge describes the potential for the wetland to contribute water to an underlying aquifer. Discharge relates to the potential for the wetland to act as a source of groundwater transfer to the surface (i.e., springs and hillside seeps).
- 3. Sediment/Pollutant Retention** - The ability to reduce or prevent the degradation of water quality. It relates to the effectiveness of the wetland as a trap for sediments, toxicants, or pathogens based on its geomorphic position, connectivity, soil thickness, and other physical characteristics. The retention of sediments, toxicants, or pathogens that may be carried by surface water runoff within the watershed reduces or prevents the degradation of water quality and is a function shared by many wetland features.
- 4. Fish and Shellfish Habitat** - The ability to contain or influence suitable habitats for fish and shellfish. For a wetland to contain fish and/or shellfish habitat, the wetland must be associated with a fish/shellfish bearing water. Wetlands providing the fish and shellfish habitat are typically associated with perennial streams or large bodies of standing water. These waterbodies must contain appropriate levels of nutrient production, habitat complexity, and flow regimes to support the lifecycles of various fish and/or shellfish species.

5. **Sediment/Shoreline Stabilization** - The ability to effectively stabilize streambanks and shorelines against erosion.
6. **Production (Nutrient) Export** - The ability to produce food or usable products for all organisms, including humans. To perform this function, a wetland must contain a level of high productivity. Wetlands that exhibit this function have an abundance of wildlife habitat and are ecologically rich. Many trophic levels support a higher level of production within the system and, therefore, an increased level of production export.
7. **Nutrient Removal/Retention/Transformation** - The ability to prevent excess nutrients from entering aquifers or surface waters by trapping nutrients in runoff water from surrounding uplands or contiguous wetlands, and by processing these nutrients into other forms or trophic levels. Wetlands remove excess nutrients carried by sediments through absorbing them into soils with high organic matter or transforming these nutrients through nitrification and denitrification as a result of the alternating oxic and anoxic water conditions caused by wetland hydrology.
8. **Wildlife Habitat** - The effectiveness of the wetland to provide habitat for various types and populations of animals typically associated with wetlands and their periphery. Resident and migrating species are considered along with the potential for any state or federally listed species occurring within the target wetland. The presence of wildlife habitat can be inferred by looking at the characteristics of a wetland including the ecological community present, dominant vegetation, and surrounding habitat availability. Wetlands often support large invertebrate populations which provide a food source for birds, bats, and other wildlife. Inundation and open water found in some wetlands can provide aquatic breeding habitat for amphibians as well. Many plant species commonly found in wetlands may be used by birds and mammals as a food source.

4.0 WETLAND VALUES

Values are the societal benefits resulting from one or more of the functions and the physical characteristics associated with a wetland. The five values defined by the Supplement and adopted for use in this assessment, including short descriptions of each value, are documented below.

1. **Recreation** - The effectiveness of the wetland to provide, or assist in the establishment of, recreational opportunities such as boating, fishing, hunting, and other leisurely pursuits.
2. **Education/Scientific Value** - The effectiveness of the wetland as a site for public education or as a location for scientific research.
3. **Uniqueness/Heritage** - The ability to contain or demonstrate a singular or rare quality. Such qualities may include the presence of archaeological sites; an unusual aesthetic quality; historical events that took place at the wetland; or unique plants, animals, or geologic features located within, or supported by, the wetland.
4. **Visual Quality/Aesthetics** - The ability to provide pleasing or unique visual and aesthetic qualities.
5. **Threatened or Endangered Species Habitat** - The effectiveness of the wetland to specifically support threatened or endangered species.

5.0 RESULTS

The assignment of qualifiers, which when attributed to a given wetland, identified the primary functions and values thought to be provided by the wetlands identified within the Project Area (Table 1). The primary functions and values of each delineated wetland were based on observed qualifiers (Table 2).

5.1 Groundwater Recharge/Discharge

Within the Project Area, all identified wetlands were found to exhibit groundwater recharge/discharge. This conclusion is due in part by the relative fluidity and connectivity of wetlands and waterbodies through surface or groundwater flows and the fundamental interactions that occur between wetlands and aquifers. The wetlands were observed to have characteristics such as being associated with a watercourse, ponded water, signs of springs or seeps, sandy or organic soils, located in a concave depression or contain a gradual gradient, water marks, and deep surface soil layers. These characteristics indicate that the water level changes periodically or seasonally within the wetland due to potential discharge/recharge events, which the wetland assists in the continuance of surface water flows for groundwater recharge, or that physical attributes in the wetland allows for groundwater recharge/discharge to occur on-site at variable rates.

5.2 Flood-flow Alteration

All wetlands within the Project Area were found to function as flood-flow alteration or attenuation. The delineated wetlands were noted to have a combination of features including ponded water, water marks, dense vegetative cover, association with a waterbody, deep surface soil layers, fine-grained or organic soils, large areas relative to other wetlands in the local watershed and occurring in a concave landform or on a gentle gradient. These characteristics contribute to the ability of a wetland to reduce stormwater flow velocities, divert and diffuse stormwater flows, and store excess water.

5.3 Fish and Shellfish Habitat

A total of eight wetlands within the Project Area were designated as having the function of supporting fish/shellfish habitat. These wetlands were associated with perennial streams or large open waterbodies which were determined to function as fish/shellfish habitat. Delineated wetlands were also included as contributing to potential fish/shellfish habitat if they contained

intermittent tributaries and/or ponded wetland areas that were close to a confluence with a perennial waterbody and could provide seasonal fish habitat or potential refugia within confluence areas. Wetlands directly connected and adjacent to predetermined high quality streams or designated trout streams by the NYSDEC were also characterized as containing the function of providing fish/ shellfish habitat.

5.4 Sediment/Toxicant/Pathogen Retention

All wetlands in the Project Area were noted to contain sediment/toxicant/pathogen retention abilities. These wetlands were determined to have some combination of thick layers of organic soils, dense vegetation, occur in concave landforms or on gentle gradients, contain areas of deep open water to trap sediment/toxicant/pathogens and allow them to settle out of the water column. Wetlands that provide flood-flow alteration were also considered to exhibit the function of sediment/toxicant/pathogen retention. Increased flow regimes caused by flooding events carry increased sediment loads. These increased sediment loads are in turn deposited in wetlands that provide the function of flood flow attenuation by disrupting increased flow regimes.

5.5 Nutrient Removal/Retention/Transformation

All wetlands within the Project Area perform a nutrient removal/retention/transformation function. Wetlands within the Project Area that support nutrient removal/retention/transformation contain characteristics such as inundation or deep water habitats, association with a watercourse, occur in concave landforms or gentle gradients, large in size compared to other wetlands in the area, contain thick layers of fine-grained or organic soils, and contained dense vegetative cover. Large portions of the Project Area are active agricultural land. Wetlands that exhibit the nutrient removal/retention/transformation function are important in helping reduce the input of excess nutrients generated by this agriculture to downstream watercourses. Excess nutrients in a watershed are associated with increased productivity levels of aquatic plant life, eutrophication events, and lowered dissolved oxygen levels throughout the water column. Such instances may lower water quality, alter aquatic habitat, and adversely impact fish and other aquatic species.

5.6 Production Export

A total of 38 wetlands within the Project Area exhibit the function of production export. Wetlands in the Project Area with this function contained relatively high ecological richness and a high structural diversity through the presence of multiple vegetative cover types. Wetlands that are

seasonally or perpetually inundated, serve as habitats for amphibians, reptiles, freshwater fish, aquatic invertebrates, and as breeding areas for insects. These species are consumed by higher trophic levels like birds, fish, bats and various mammals.

5.7 Sediment/Shoreline Stabilization

A total of 10 wetlands within the Project Area exhibit the function of sediment/shoreline stabilization. Wetlands in the Project Area were considered to function in stabilizing the sediment and banks of a waterbody if they created a buffer zone adjacent to a waterbody which acts to absorb and/or diffuse high flow velocities during flood events preventing the erosion of shoreline or transport of excess sediment.

5.8 Wildlife Habitat

Within the Project Area, all of the identified wetlands function as wildlife habitat. Wildlife or evidence of wildlife was observed during field surveys in many of the wetlands. White-tailed deer, gray squirrel, various birds, green frogs, salamanders, and several other species of mammals, reptiles, amphibians, and various invertebrates were seen within wetlands located throughout the Project Area during field surveys. Evidence of wildlife observed in wetlands includes tracks, scat, burrows, scrapes, and chews. Wetlands in the Project Area that support wildlife habitat have some combination of characteristics including being associated with a watercourse, dense vegetative coverage, multiple cover types, limited wetland fragmentation, deep open water areas, and ecological richness.

5.9 Recreation

A total of 35 wetlands in the Project Area are considered suitable for recreation. Although they are located on private land without available public access, hunting on private lands is very prevalent within the Project Area as evidenced by deer stands, duck blinds located in wetlands and the surrounding area throughout the Project Area. Additionally, there are several streams and deep open water areas within wetlands in the Project Area that support fishing, another popular recreational activity on private land.

5.10 Educational/Scientific Value

The wetlands in the Project Area do not provide direct educational value, as they are located on private land without available or safe public access, parking, or facilities. However, four wetlands

were deemed to hold significant scientific value due to the presence of a Northern White Cedar Swamp, a large beaver complex and associated wetland community, or large unfragmented wetland habitat.

5.11 Uniqueness/Heritage

Four of the wetlands within the Project Area have been determined to contain a uniqueness/heritage value. Rare wetland habitat including a Northern White Cedar Swamp, a large beaver complex and associated wetland community, and large unfragmented wetland habitat, all of which unusual within the local watershed were observed in these wetlands.

5.12 Visual Quality/Aesthetics

A total of 21 wetlands in the Project Area were found to exhibit visual quality/aesthetics values. Although they lack a primary publicly-accessible viewing location, they are visible to local land owners. Qualifiers within a wetland that support a value of visual quality/aesthetics include an associated watercourse and a sizeable wetland complex.

5.13 Threatened or Endangered Species Habitat

None of the wetlands within the Project Area contain the potential for threatened or endangered species habitat. Correspondence with the NYSDEC and USFWS indicated there was potential for the occurrences of several threatened or endangered species throughout the Project Area including Eastern Massasauga, Bald Eagle, Rainbow Mussel, and Woodland Agrimony. Some of these species use wetlands or waterbodies associated with or running through wetlands as habitat, however none of the wetlands within the Project Area represent ideal habitat for these species.

Table 1. Qualifier Assignment Table

Qualifiers	Wetland Functions								Wetland Values				
	Groundwater Recharge or Discharge	Flood Flow Alteration	Fish or Shellfish Habitat	Sediment, Toxicant, Pathogen Retention	Nutrient Removal, Retention, Transformation	Production Export	Sediment, Shoreline Stabilization	Wildlife Habitat	Recreation	Educational or Scientific Value	Uniqueness and Heritage	Visual Quality and Aesthetics	Threatened or Endangered Species Habitat
Associated with Watercourse	X	X		X	X	X	X	X	X			X	
Signs of Springs/Seeps	X												
Concave Landform or Gentle Gradient		X		X	X								
Deep Surface Soil Layer (16"+)		X		X	X								
Dense Vegetative Coverage		X		X	X	X		X					
Sizeable Wetland		X			X				X			X	
Deep Open Water Area	X	X	X	X	X	X		X	X				
Fish/Shellfish Present			X			X		X	X				
Ecologically Rich					X	X		X					
Fine-grained or Organic Soils Present	X	X		X	X								
No to Low Wetland Fragmentation								X					
Threatened/Endangered Present or Habitat Present								X		X	X		
Multiple Cover Types					X	X		X					

Table 2. Functions and Values of Delineated Wetlands

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
W-JDV-01	Yes	No	Yes	Yes	High	Large	No	No	Yes	Yes	Low	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Recreation; Visual Quality and Aesthetics
W-JDV-02	No	No	Yes	Yes	Medium	Small	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JDV-03	No	No	Yes	Yes	Medium	Medium	Yes	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JDV-04	No	Yes	Yes	No	Medium	Medium	No	No	Yes	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JDV-05	No	No	Yes	Yes	High	Large	No	No	Yes	Yes	Low	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/tra	Recreation; Visual Quality and Aesthetics

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															nsformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	
W-JDV-06	Yes	No	Yes	Yes	Medium	Medium	No	Yes	Yes	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Fish or Shellfish Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Recreation; Visual Quality and Aesthetics
W-JDV-07	Yes	No	Yes	Yes	High	Medium	No	Yes	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Fish or Shellfish Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Recreation; Visual Quality and Aesthetics
W-JDV-08	No	No	Yes	Yes	Low	Small	No	No	No	Yes	Low	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JDV-09	No	No	Yes	Yes	Medium	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment,	

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															Toxicant, Pathogen Retention	
W-JDV-10	No	No	Yes	No	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JDV-11	No	No	Yes	Yes	High	Medium	No	No	Yes	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JDV-12	No	No	Yes	Yes	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JDV-13	Yes	No	Yes	Yes	Medium	Small	No	Yes	Yes	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Fish or Shellfish Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Recreation; Visual Quality and Aesthetics
W-JDV-14	Yes	No	Yes	Yes	High	Large	No	Yes	Yes	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/tra	Recreation; Uniqueness and Heritage; Educational or Scientific Value;

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															nsformation; Wildlife Habitat; Fish or Shellfish Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Visual Quality and Aesthetics
W-JDV-15	No	No	Yes	No	Low	Medium	Yes	No	Yes	No	Low	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JDV-16	No	No	Yes	Yes	High	Small	No	Yes	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	
W-JJB-01	No	No	Yes	Yes	High	Medium	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	
W-JJB-02	No	No	Yes	No	Low	Small	Yes	No	Yes	No	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
W-JJB-03	No	No	Yes	Yes	High	Medium	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	
W-JJB-04	No	Yes	Yes	Yes	High	Medium	No	No	Yes	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JJB-05	No	No	Yes	Yes	Medium	Large	No	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-06	No	Yes	Yes	Yes	High	Large	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-07	No	No	Yes	Yes	Medium	Small	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment,	

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															Toxicant, Pathogen Retention	
W-JJB-08	No	No	Yes	Yes	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-09	No	No	Yes	Yes	Low	Medium	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-10	No	Yes	Yes	Yes	High	Large	No	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-11	Yes	No	Yes	Yes	High	Large	No	Yes	Yes	Yes	Low	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Fish or Shellfish Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-12	No	No	Yes	No	Low	Small	No	No	No	Yes	Low	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/tra	

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															nsformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-13	No	No	Yes	Yes	High	Large	No	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-14	No	Yes	Yes	No	Medium	Medium	No	No	Yes	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation;
W-JJB-15	No	No	Yes	Yes	Medium	Medium	No	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation;
W-JJB-16	No	No	Yes	Yes	Medium	Medium	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-17	No	No	Yes	Yes	High	Large	Yes	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/tra	Recreation; Visual Quality and Aesthetics

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															nsformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	
W-JJB-18	No	No	Yes	No	Low	Small	Yes	No	Yes	No	Low	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation;
W-JJB-19	No	Yes	Yes	Yes	High	Large	No	No	Yes	Yes	Low	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-20	No	No	Yes	Yes	Medium	Medium	No	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Threatened or Endangered Species Habitat
W-JJB-21	Yes	No	Yes	Yes	Medium	Medium	No	Yes	Yes	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Fish or Shellfish Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Recreation; Visual Quality and Aesthetics

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
W-JJB-22	No	No	Yes	Yes	High	Large	Yes	No	Yes	Yes	Low	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Uniqueness and Heritage; Educational or Scientific Value; Visual Quality and Aesthetics
W-JJB-23	No	No	Yes	Yes	Low	Medium	Yes	No	Yes	No	High	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JJB-24	No	No	Yes	Yes	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-25	No	No	Yes	Yes	Medium	Medium	No	No	Yes	Yes	High	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JJB-26	No	No	Yes	No	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
W-JJB-27	No	Yes	Yes	No	Medium	Large	No	No	Yes	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-28	No	No	Yes	No	Low	Medium	Yes	No	Yes	No	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation
W-JJB-29	No	Yes	Yes	Yes	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-30	No	No	Yes	Yes	Low	Small	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-31	Yes	No	Yes	Yes	Medium	Large	Yes	Yes	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Fish or Shellfish Habitat; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention;	Recreation; Uniqueness and Heritage; Educational or Scientific Value; Visual Quality and Aesthetics

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															Sediment, Shoreline Stabilization; Production Export	
W-JJB-32	No	No	Yes	Yes	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-33	No	Yes	Yes	Yes	High	Large	Yes	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-JJB-34	No	No	Yes	Yes	Low	Medium	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-35	No	No	Yes	Yes	Low	Medium	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-JJB-36	Yes	No	Yes	Yes	High	Large	Yes	Yes	Yes	Yes	Low	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Fish or Shellfish Habitat;	Recreation; Uniqueness and Heritage; Educational or Scientific Value; Visual Quality and Aesthetics

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	
W-WSH-01	No	No	Yes	No	Low	Small	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-WSH-02	No	Yes	Yes	Yes	Medium	Medium	No	No	No	Yes	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-WSH-03	No	No	Yes	No	Low	Medium	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-WSH-04	No	Yes	Yes	No	High	Large	No	No	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation; Visual Quality and Aesthetics
W-WSH-05	No	No	Yes	No	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife	

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
															Habitat; Sediment, Toxicant, Pathogen Retention	
W-WSH-06	No	No	Yes	Yes	Low	Small	No	No	No	Yes	High	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention	
W-WSH-07	Yes	Yes	Yes	Yes	High	Large	No	Yes	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Fish or Shellfish Habitat; Sediment, Toxicant, Pathogen Retention; Sediment, Shoreline Stabilization; Production Export	Recreation; Visual Quality and Aesthetics
W-WSH-08	No	No	Yes	No	Low	Small	Yes	No	Yes	No	Medium	No	No	No	Groundwater Recharge/Discharge ; Flood Flow Alteration; Nutrient removal/retention/transformation; Wildlife Habitat; Sediment, Toxicant, Pathogen Retention; Production Export	Recreation

6.0 CONCLUSIONS

Wetlands delineated within the Project Area displayed multiple functions based on their specific characteristics. Each of the wetlands identified within the Project Area were determined to have the ability to provide the functions of groundwater recharge/discharge, flood-flow alteration, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, and wildlife habitat. Other functions displayed within wetlands delineated within the Project Area include:

- Fish and Shellfish Habitat (8 wetlands)
- Sediment/Shoreline Stabilization (10 wetlands)
- Production Export (38 wetlands)

Values were found to occur in most, but not all wetlands within the Project Area based on this assessment. None of the values looked at in this assessment were found to occur within all wetlands in the Project Area. Of the 60 wetlands located in the Project Area the values that were found to occur include:

- Recreation (35 Wetlands)
- Educational or Scientific Value (4 Wetlands)
- Uniqueness and Heritage (4 Wetlands)
- Visual Quality and Aesthetics (21 Wetlands)

Assessing a specific wetland's functions and values is needed to determine the overall effects an impact or alteration may have on a wetland feature. Ultimately, such a measurement aids in establishing the appropriate level of mitigation after impacts to a wetland occur. As such, this functions and values assessment will be utilized during the impact analysis and mitigation planning efforts for the Project.

7.0 REFERENCES

Bliss, Kevin. 2016. NYSWF Wetland Functional Assessment Workshop [PowerPoint Slides]. Retrieved from <http://www.wetlandsforum.org/NYSWFWetlandAssessmentOctober13WorkshopIntro.pdf>

U.S. Army Corps of Engineers (USACE). 1993. *The Highway Methodology Workbook*. U.S. Army Corps of Engineers, New England Division. NEDEP-360-1-30. 30 pp.

USACE. 1999. *The Highway Methodology Workbook Supplement. Wetland Functions and Values: A Descriptive Approach*. U.S. Army Corps of Engineers, New England Division. NAEEP-360-1-30a. 32 pp.

Memorandum

To: Excelsior Energy Center, LLC

From: TRC

Subject: Wetland Functions and Values Assessment – Excelsior Energy Center, LLC.
Excelsior Energy Center Project, Parcel Addition

Date: September 22, 2020

On June 1, 2020, two biologists from TRC visited two tax parcels totaling approximately 36.5 acres (Survey Area) added after the initial delineation effort in 2019 to the proposed Excelsior Energy Center Project (Project Site), located in the Town of Byron, Genesee County, New York. The team documented all wetlands and surface waters (including rivers, streams, ponds, lakes, etc.) regardless of jurisdictional status. This memorandum summarizes the functions and values of the two wetlands that were delineated within the Survey Area.

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1.0 INTRODUCTION AND PURPOSE

This assessment report has been prepared by TRC Companies, Inc. (TRC) on behalf of Excelsior Energy Center, LLC (a wholly-owned, indirect subsidiary of NextEra Energy Resources, LLC [NEER]). The report provides a functional assessment of the freshwater wetland resources that may or may not be impacted by construction and/or operation of a proposed solar-powered wholesale energy generating facility with associated infrastructure located in the Town of Byron, Genesee County, New York (the Project).

Wetlands that are deemed Waters of the United States are regulated by the United States Army Corps of Engineers (USACE) under the Clean Water Act of 1972 (Section 404, CWA). Originating in 1987, *The Highway Methodology Workbook* (the Workbook), was created by the USACE New England District to integrate highway planning, design, and development with the requirements of USACE permit regulations, the National Environmental Policy Act (NEPA), and the Federal Highway Administration (FHWA) funding approvals (USACE, 1993). A memorandum of agreement between the Environmental Protection Agency (EPA) and USACE, dated February 7, 1990, was appended to the Workbook, recognizing a stepwise process of avoidance, minimization, and compensation of adverse impacts to an established set of wetland functions and values. Subsequently, *Wetlands Functions and Values: A Descriptive Approach* (Supplement), was created by the USACE New England District as a supplement to the Workbook. Within the Supplement, a “Descriptive Approach” is presented as a method that any project, outside the scope of highway development, could adopt to characterize wetland resources necessary for Section 404 permit requirements.

New York State does not yet have its own wetland functional assessment methodology, nor does it endorse any specific methodology. However, a survey of New York State Department of Environmental Conservation (NYSDEC) wetland biologists reveals the USACE Highway Methodology to be the most commonly used wetland functional assessment technique for projects requiring NYSDEC permits (Bliss, 2016).

Excelsior Energy Center, LLC hired TRC to survey, identify, and document all wetlands within the 36.5-acre Survey Area. TRC delineated two freshwater wetlands totaling 11.31 acres within the Survey Area. This Functions and Values Assessment is intended to aid in determining the wetland functions and values that may be impacted and/or altered due to the Project’s construction and operation.

2.0 ASSESSMENT METHODOLOGY

This wetland functions and values assessment was developed based on the *Wetlands Functions and Values: A Descriptive Approach*, described in the Supplement by the New England Division of the USACE (1999). This method incorporates wetland science and best professional judgement in data collection toward a qualitative description of the physical and biological characteristics of the wetlands. In so doing, it identifies the functions and values exhibited and, importantly, the bases for associated conclusions. The approach addresses the limitations of wetland assessments based on numerical weightings, rankings, and/or averaging of dissimilar wetland functions (USACE 1999). As part of this method, the evaluator accounted for many predetermined “Qualifiers” that are utilized as indicators or descriptors of functions and values. Based on the descriptions of qualifiers outlined in the Supplement, TRC developed a spreadsheet (Table 1) that displays these qualifiers. When attributed to a wetland, these qualifiers, help to identify the functions and values thought to be provided by the wetland. Considerations included observed vegetation conditions, hydrologic conditions, size, adjacent area conditions, and the availability of public access, among several other documented characteristics strategically defined to allow each wetland’s functions and values to be evaluated.

Functions and values were evaluated for all wetlands were observed during the 2020 growing season. Data on qualifiers of functions and values were documented at each wetland where vegetation, soils, hydrological data, location, and geographic nature were also collected as part of a formal delineation. The two wetlands delineated within the Survey Area were entered into Table 2 with the various wetland qualifiers identified at each wetland. This was cross-referenced to the predetermined Qualifier Assignment Table (Table 1) and the functions and values provided by each wetland were determined based on the predetermined qualifiers.

Wetlands functions and values recognized under Article 24 of the Environmental Conservation Law and Regulations are similar to those described by the Supplement. The functions and values as outlined in the Freshwater Wetlands Act are:

1. Flood and storm control by the hydrologic absorption and storage capacity of freshwater wetlands;
2. Wildlife habitat by providing breeding, nesting, and feeding grounds and cover for many forms of wildlife, wildfowl, and shorebirds, including migratory wildfowl and species such as the bald eagle and osprey;

3. Protection of subsurface water resources and provision for valuable watersheds and recharging 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 sedimentation areas and filtering basins, absorbing silt and organic matter, and protecting channels and harbors;
7. Education and scientific research by providing readily accessible outdoor bio-physical laboratories, living classrooms, and vast training and education resources;
8. Open space and aesthetic appreciation by providing often the only remaining open areas along crowded river fronts and coastal Great Lakes regions; and
9. Sources of nutrients in freshwater food cycles and nursery grounds and sanctuaries for freshwater fish.

3.0 WETLAND FUNCTIONS

Wetland functions are the properties or processes of a wetland ecosystem that aid in promoting an equilibrium in the wetland and surrounding environment. Wetland functions relate to the ecological significance of wetland properties without regard to subjective human values. The eight functions attributed to wetlands by the Supplement are as follows: Flood-flow Alteration, Groundwater Recharge/Discharge, Sediment/Pollutant Retention, Fish and Shellfish Habitat, Sediment/Shoreline Stabilization, Production (Nutrient) Export, Nutrient Removal/Retention/Transformation, and Wildlife Habitat.

4.0 WETLAND VALUES

Values are the societal benefits resulting from one or more of the functions and the physical characteristics associated with a wetland. The five values defined by the Supplement are as follows: Recreation, Education/Scientific Value, Uniqueness/Heritage, Visual Quality/Aesthetics, and Threatened or Endangered Species Habitat.

5.0 RESULTS

The assignment of qualifiers, which when attributed to a given wetland, identified the primary functions and values thought to be provided by the wetlands identified within the Survey Area (Table 1). The primary functions and values of each delineated wetland were based on observed qualifiers (Table 2).

5.1 Groundwater Recharge/Discharge

Both wetlands within the Survey Area were found to exhibit groundwater recharge/discharge. This conclusion is due in part by the relative fluidity and connectivity of wetlands and waterbodies through surface or groundwater flows and the fundamental interactions that occur between wetlands and aquifers. The wetlands were observed to have characteristics such as being associated with a watercourse, sandy or organic soils, and deep surface soil layers. These characteristics indicate that the water level changes periodically or seasonally within the wetland due to potential discharge/recharge events, which the wetland assists in the continuance of surface water flows for groundwater recharge, or that physical attributes in the wetland allows for groundwater recharge/discharge to occur on-site at variable rates.

5.2 Flood-flow Alteration

One wetland within the Survey Area was found to function as flood-flow alteration or attenuation. The delineated wetland was noted to have a combination of features, including ponded water, water marks, dense vegetative cover, association with a waterbody, deep surface soil layers, and fine-grained or organic soils. These characteristics contribute to the ability of a wetland to reduce stormwater flow velocities, divert and diffuse stormwater flows, and store excess water.

5.3 Fish and Shellfish Habitat

Neither wetland within the Survey Area was designated as having the function of supporting fish/shellfish habitat.

5.4 Sediment/Toxicant/Pathogen Retention

Both wetlands in the Survey Area were noted to contain sediment/toxicant/pathogen retention abilities. These wetlands were determined to have some combination of thick layers of fine grained or organic soils, dense vegetation, and provided flood-flow alteration. Increased flow

regimes caused by flooding events carry increased sediment loads. These increased sediment loads are in turn deposited in wetlands that provide the function of flood flow attenuation by disrupting increased flow regimes.

5.5 Nutrient Removal/Retention/Transformation

Both wetlands within the Survey Area perform a nutrient removal/retention/transformation function. These wetlands contain a combination of characteristics such as association with a watercourse, large in size compared to other wetlands in the area, contained thick layers of fine-grained or organic soils, and contained dense vegetative cover. Excess nutrients in a watershed are associated with increased productivity levels of aquatic plant life, eutrophication events, and lowered dissolved oxygen levels throughout the water column. Such instances may lower water quality, alter aquatic habitat, and adversely impact fish and other aquatic species.

5.6 Production Export

One wetland within the Survey Area exhibited the function of production export. This wetland contained relatively high ecological richness and a high structural diversity through the presence of multiple vegetative cover types. Wetlands that are seasonally or perpetually inundated, serve as habitats for amphibians, reptiles, freshwater fish, aquatic invertebrates, and as breeding areas for insects. These species are consumed by higher trophic levels like birds, fish, bats and various mammals.

5.7 Sediment/Shoreline Stabilization

One wetland within the Survey Area exhibited the function of sediment/shoreline stabilization. This wetland was considered to function in stabilizing the sediment and banks of the adjacent waterbody where it created a riparian buffer zone and floodplain adjacent to the perennial stream, which acts to absorb and/or diffuse high flow velocities during flood events preventing the erosion of shoreline or transport of excess sediment.

5.8 Wildlife Habitat

Both wetlands within the Survey Area function as wildlife habitat. Wildlife or evidence of wildlife was observed during field surveys in both of the wetlands. White-tailed deer (*Odocoileus virginianus*), eastern gray squirrel (*Sciurus carolinensis*), various birds (*Aves spp.*), green frogs (*Rana clamitans*), toads (*Bufo bufo*), salamanders (*Urodela spp.*), and various invertebrates were

seen within the wetlands located throughout the Survey Area during field survey. Evidence of wildlife observed in wetlands includes tracks, scat, and scrapes. The wetlands in the Survey Area that support wildlife habitat have some combination of characteristics including being associated with a watercourse, dense vegetative coverage, multiple cover types, limited wetland fragmentation, and ecological richness.

5.9 Recreation

One wetland within the Survey Area is suitable for recreation. Although it is located on private land without available public access, hunting on private lands is prevalent within the Survey Area, as evidenced by deer stands in and directly adjacent to the wetland.

5.10 Educational/Scientific Value

The wetlands within the Survey Area do not provide direct educational value, as they are located on private land without available or safe public access, parking, or facilities.

5.11 Uniqueness/Heritage

The wetlands within the Survey Area do not provide specific uniqueness/heritage.

5.12 Visual Quality/Aesthetics

The wetlands within the Survey Area do not exhibit visual quality/aesthetics values. They lack a primary publicly-accessible viewing location.

5.13 Threatened or Endangered Species Habitat

None of the wetlands within the Survey Area contain the potential for threatened or endangered species habitat. Correspondence with the NYSDEC and USFWS indicated there was potential for the occurrences of several threatened or endangered species throughout the Survey Area including: eastern massasauga (*Sistrurus catenatus*), bald eagle (*Haliaeetus leucocephalus*), rainbow mussel (*Villosa iris*), and woodland agrimony (*Agrimonia rostellata*). Of these species, eastern massasauga, rainbow mussel, and woodland agrimony use wetlands or waterbodies associated with wetlands as habitat. However, none of the wetlands observed within the Survey Area represent ideal habitat for these species. The Northern White Cedar Swamp community was the only potential habitat location identified for the eastern massasauga within the Project Site. This community is not located within the Survey Area indicating that the potential for eastern

massasauga to occur is unlikely. It is also unlikely that there will be impacts to bald eagles, woodland agrimony, or their potential habitat since both the Project Site and Survey Area are predominately located within active agriculture fields. Forested communities, which are the preferred habitat for these species, are being avoided. Rainbow mussels do have the potential to occur within the perennial watercourses that are associated with wetlands W-IBP-01, however the wetland itself does not serve as ideal habitat for the rainbow mussle. Likewise, wetland W-IBP-02 and the associate intermittent watercourse do not offer the appropriate habitat to support rainbow mussle. Additionally, none of these four species were observed by TRC biologists during the survey effort.

Table 1. Qualifier Assignment Table

Qualifiers	Wetland Functions								Wetland Values				
	Groundwater Recharge or Discharge	Flood Flow Alteration	Fish or Shellfish Habitat	Sediment, Toxicant, Pathogen Retention	Nutrient Removal, Retention, Transformation	Production Export	Sediment, Shoreline Stabilization	Wildlife Habitat	Recreation	Educational or Scientific Value	Uniqueness and Heritage	Visual Quality and Aesthetics	Threatened or Endangered Species Habitat
Associated with Watercourse	X	X		X	X	X	X	X	X			X	
Signs of Springs/Seeps	X												
Concave Landform or Gentle Gradient		X		X	X								
Deep Surface Soil Layer (16"+)		X		X	X								
Dense Vegetative Coverage		X		X	X	X		X					
Sizeable Wetland		X			X				X			X	
Deep Open Water Area	X	X	X	X	X	X		X	X				
Fish/Shellfish Present			X			X		X	X				
Ecologically Rich					X	X		X					
Fine-grained or Organic Soils Present	X	X		X	X								
No to Low Wetland Fragmentation								X					
Threatened/Endangered Present or Habitat Present								X		X	X		X
Multiple Cover Types					X	X		X					

Table 2. Functions and Values of Delineated Wetlands

Wetland Name	Associated with Watercourse	Signs of Springs /Seeps	Concave Landform or Gentle Gradient	Deep Surface Soil Layer (16"+)	Vegetative Cover Density (High, Medium, Low)	Wetland Size (Small, Medium, Large)	Deep Open Water Area (3'+)	Fish or Shellfish Present in Associated Stream	Ecologically Rich	Fine-grained or Organic Soils Present	Wetland Fragmentation (High, Medium, Low)	Publicly Accessible	Threatened or Endangered Species Present or Habitat Present	Multiple Cover types	Attributed Functions	Attributed Values
W-IBP-01	Yes	No	No	Yes	High	Medium	No	Yes	Yes	Yes	Medium	No	No	Yes	Groundwater Recharge/ Discharge, Nutrient Removal, Production Export, Sediment/ Shoreline Stabilization, Floodflow Alteration, Sediment/ Toxicant Retention, Wildlife Habitat	Recreation
W-IBP-02	Yes	No	No	Yes	Medium	Small	No	No	No	Yes	Low	No	No	No	Groundwater Recharge/ Discharge, Nutrient Removal, Sediment/ Toxicant Retention, Wildlife Habitat	

6.0 CONCLUSION

Wetlands delineated within the Survey Area displayed multiple functions based on their specific characteristics. Each of the wetlands identified within the Survey Area were determined to have the ability to provide the functions of groundwater recharge/discharge, sediment/toxicant/pathogen retention, nutrient removal/retention/transformation, and wildlife habitat. Wetland W-IBP-01 was found to also exhibit the functions of floodflow alteration, production export, and sediment/shoreline stabilization.

The only wetland value identified within the Survey Area based on this assessment was that of recreation within wetland W-IBP-01.

Assessing a specific wetland's functions and values is needed to determine the overall effects an impact or alteration may have on a wetland feature. Ultimately, such a measurement aids in establishing the appropriate level of mitigation after impacts to a wetland occur. As such, this functions and values assessment will be utilized during the impact analysis and mitigation planning efforts for the Project.

7.0 REFERENCES

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