WETLAND AND STREAM DELINEATION REPORT
WATKINS GLEN SOLAR ENERGY CENTER, LLC PROJECT

TOWN OF DIX
SCHUYLER COUNTY, NEW YORK

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1.0 INTRODUCTION

1.1 Project Description and Purpose

Watkins Glen Solar Energy Center, LLC, (Watkins Glen Solar Energy Center) a wholly-owned indirect subsidiary of NextEra Energy Resources, LLC (NEER), is proposing construction of the Watkins Glen Solar Energy Center (the Project) in the Town of Dix, Schuyler County, New York (see Appendix A: Figure 1). The Project Area consists of approximately 774 acres within the Town of Dix, of which approximately 682 acres were delineated for streams and wetlands (see Appendix A: Figure 4) and approximately 350 acres of land will be used for the solar energy center. The proposed Project will consist of a 50 megawatt (MW) solar energy center located on land leased from a private property owner. Proposed components include commercial-scale solar arrays, access roads, buried (and possibly overhead) electric collection lines, and electrical interconnection facilities. The final solar array specification, as well as locations of arrays, will be finalized as part of ongoing environmental studies and engineering efforts. The Project Area consists predominantly of active and non-active agricultural land, and some forested lots.

1.2 Report Purpose

TRC Companies, Inc. (TRC) conducted a wetland and stream delineation of the Project Area on behalf of Watkins Glen Solar Energy Center on June 6 through June 8, 2017 and April 22 through April 26, 2019.This report details the wetlands and surface waters (including rivers, streams, ponds, and lakes) within the Project Area, regardless of jurisdictional status. However, this report's description of potential jurisdictional areas to regulatory agencies lends itself toward assessing regulated buffers and implementing setbacks (both required by State and Watkins Glen Solar Energy Center's internal process) during Project planning, to the extent practical.

Delineation efforts included the following tasks:

1. A desktop review of existing, publicly available federal and state agency resources;
2. A field delineation of all aquatic features within the Project Area using a handheld Global Positioning System (GPS) with reported sub-meter accuracy; and,
3. Documentation of the delineated aquatic features including the assumed agency jurisdiction for each resource based on hydrology, vegetation, and hydric soils data collected in the field.

Conclusions proposed herein provide information necessary to support a permit application to the United States Army Corps of Engineers (USACE) and the New York State Board on Electric Generation Siting and the Environment (Siting Board).

2.0 REGULATORY AUTHORITY

2.1 United States Army Corps of Engineers

In accordance with Section 404 of the Clean Water Act, the USACE asserts jurisdiction over Waters of the United States (WOTUS). WOTUS are defined as wetlands, streams, and other aquatic resources under the regulatory authority of Title 33 Code of Federal Regulations (CFR) Part 328 and the United States Environmental Protection Agency (EPA), per Title 40 CFR Part 230.3(s). 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*" (33 CFR 328.3[c]).

2.1.1 Historical Context

On June 6, 2007, the EPA and the Department of Army issued a memorandum outlining jurisdictional guidance on WOTUS. The document outlined major key points resulting from the United States Supreme Court decision in the matter of *Solid Waste Agency of Northern Cook County v. Army Corps of Engineers* (531 U.S. 159, January 9, 2001) and *Rapanos v. United States* (547 U.S. 715, June 19, 2006). Following receipt of public comment and based on these agencies' experience in implementing the Rapanos decision, EPA and USACE issued a revised memorandum on December 2, 2008 providing guidance to EPA regions and USACE districts. This document defined the following:

The USACE will assert jurisdiction over the following waters:

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

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

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and

- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

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

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

The USACE will apply the significant nexus standard as follows:

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

2.1.2 Current Status

On August 28, 2015, the EPA released the Clean Water Rule (33 CFR Part 328) intending to clarify the scope of the Clean Water Act (CWA), WOTUS, and definitions of significant nexus. However, on October 9, 2015, implementation of the Clean Water Rule was stayed by the Sixth Circuit Court of Appeals pending further action of the court. On August 16, 2018, the U.S. District Court for the District of South Carolina enjoined the delay of the Clean Water Rule. Therefore, the Clean Water Rule became in effect in 22 states, including New York.

Repeal of the 2015 CWR

On October 23, 2019, the 2015 CWR was repealed, pending a required 60-day public notification period. This repeal is step one of a two-step rule-making process intended to (re)define the scope of waters of the United States that are regulated under the Clean Water Act. The repeal of the CWR becomes effective on December 23, 2019, at which time WOTUS shall be defined as described above under the historical context of the pre-2015 timeframe, (AKA the “Rapanos Approach”). The Rapanos Approach is a temporary replacement, expected to be replaced with yet a new Rule and WOTUS definition, currently under review by federal agencies. This anticipated final replacement Rule awaits the completion of a review of comments submitted on the draft version published in the Federal Register on February 14, 2019.

2.2 New York State Department of Environmental Conservation

The Freshwater Wetlands Act (Article 24 and Title 23 of Article 71 of the Environmental Conservation Law [ECL]) extends NYS jurisdiction over state-protected wetlands and adjacent areas, typically extending 100 feet from the wetland perimeter. To implement this Act, regulations were promulgated by the State under 6NYCRR Parts 663 and 664. Part 664 designates wetlands into four class ratings, with Class I being the highest or best quality wetland and Class IV being the lowest. Wetlands regulated by the State are those 12.4 acres (5 hectares) in size or larger, as well as those smaller than 12.4 acres, deemed to be of "unusual local importance." The Freshwater Wetlands Act requires the NYSDEC to map all state-protected wetlands. This allows landowners and other interested parties a means of determining where state jurisdictional wetlands exist, although the maps are legally only approximations—thus the need for on-site delineations. Outside the context of Article 10 of the NYS Public Service Law, under Part 663, approval under an Article 24 permit is required from the NYSDEC prior to most disturbances to a state-protected wetland or its protected adjacent area, including the removal of vegetation. For Article 10 applications, the Siting Board adopts certificate conditions implementing the applicable provisions of the Article 24 regulations.

Outside the context of Article 10, of the NYS Public Service Law, Article 15 of the ECL (Protection of Waters), and its implementing regulations under 6 NYCRR Part 608, provides the NYSDEC with regulatory jurisdiction over activities disturbing the bed or banks of protected streams, including small lakes and ponds with a surface area of 10 acres or less, located within the course of a protected stream. This law and regulation also provide NYSDEC jurisdiction over navigable waters of the State, including contiguous marshes, estuaries, tidal marshes and wetlands that are inundated at mean high water level or tide, A protected stream is defined in the ECL as any stream, or particular portion of a stream, that has been assigned by the NYSDEC any of the following classifications or standards: AA, A, B, C(T), or C(TS) (6 NYCRR Part 701). State water quality classifications of unprotected watercourses include Class C and Class D streams. The classifications are defined below.

- A classification of AA or A indicates that the best use of the stream is as a source of water supply for drinking, culinary or food processing purposes, primary and secondary contact recreation, and fishing.
- The best usages of Class B waters are primary and secondary contact recreation and fishing.
- The best usage of Class C waters is fishing. Streams designated (T) indicate that they support trout, while those designated (TS) support trout spawning.
- Waters with a classification of D are generally suitable for fishing and non-contact recreation.

It should be noted, per 6 NYCRR Chapter X, Subchapter B, "*All streams or other bodies of water which are not shown on the reference maps herein shall be assigned to Class D, as set forth in Part 701, supra, except that any continuous flowing natural stream which is not shown on the reference maps shall have the same classification and assigned standards as the waters to which it is directly tributary.*

For Article 10 Applications, the Siting Board adopts certificate conditions to implement the applicable provisions of the Article 15 regulations.

3.0 PROJECT AREA CHARACTERISTICS

3.1 Resources

The following publicly available resources were used in the investigation, delineation, and report preparation:

- United States Geological Survey (USGS) Beaver Dams New York 7.5 minute quadrangle;
- United States Department of Agriculture (USDA) Ecoregion Maps;
- NYSDEC Ecozone Mapping;
- USGS National Hydrography Dataset;
- USGS Hydrologic Unit Maps;
- Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panels 3607460005A effective 10/29/1982
- United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) mapping;
- NYSDEC Environmental Resource Mapper (ERM);
- NYSDEC Freshwater Wetlands Mapping;
- USDA Natural Resources Conservation Service (NRCS) Web Soil Survey; and
- Recent aerial orthoimagery.

3.2 Vegetation and Ecological Communities

The Project Area resides in the Laurentian Mixed Forest Province and The Northern Allegheny Plateau Section ecoregions of the United States as defined by the USDA Forest Service (Bailey et al., 1995). Ecoregions are ecosystems of regional extent. The USDA identifies ecoregions by ecosystem characteristics into the following classifications:

- Domains: the largest ecosystem, which are groups of related climates and are differentiated based on precipitation and temperature.
- Divisions: represent the climates within domains and are differentiated based on precipitation levels and patterns, as well as temperature.
- Provinces: Subdivisions of divisions, which are differentiated based on vegetation or other natural land covers.
- Sections: Subdivisions of provinces based on terrain features, sections are the finest level of detail described for each subregion.
- Mountainous Areas: Mountainous regions that exhibit different ecological zones based on elevation.

The Laurentian Mixed Forest Province climate is characterized by long and somewhat severe winters and a short growing season, with average annual temperatures ranging from 35 to 50 degrees Fahrenheit. Altitudes range from sea level to 2,400 feet above mean sea level (AMSL). The vegetation is transitional between the boreal forest and broadleaf deciduous forest zones. Forest vegetation consists of mixed stands of coniferous species (e.g., eastern white pine [*Pinus strobus*], eastern hemlock [*Tsuga canadensis*], and eastern redcedar [*Juniperus virginiana*]) and deciduous species (e.g., yellow birch [*Betula alleghenensis*], sugar maple [*Acer saccharum*], and American beech [*Fagus grandifolia*]), and a mosaic of pure deciduous forest and pure coniferous forest depending on the quality of soil (Bailey, 1995).

The Northern Glaciated Allegheny Plateau is characterized by irregular topographic features such as broadly rolling hills and steep valleys. Elevation ranges from 650 to 1,970 feet AMSL. Forest communities include northern hardwoods and Appalachian oak forest. Regionally important forest communities include Appalachian oak-hickory forest, Appalachian oak-pine forest, beech-maple forest, and hemlock-northern hardwood forest (McNab and Avers, 1994).

Similarly, the NYSDEC has divided New York State into specific ecological regions (Ecozones). Boundaries of the Ecozones of New York State were derived from Will et al. (1982) and Dickinson (1983) and then further modified by the NYSDEC. The Ecozones of New York State have been classified into Major and Minor Zones. The Project Area is located within the Appalachian Plateau—Major Zone A and more specifically the Finger Lakes Highlands.

The Appalachian Plateau—Major Zone A's topography has a general plateau structure with horizontal rock formations. Elevation in most of this zone is well over 1,000 feet. AMSL. Soils are generally medium textured, acid, developed on glacial till, and tend to be shallow and moderately well or poorly drained. Natural vegetation in the Appalachian Plateau is oak-northern hardwoods and northern hardwoods. (Will et al., 1982 and Dickinson, 1983).

The Finger Lakes Highlands Minor Zone's elevation begins at 1,000 feet in most of the zone, except in lower valleys. Vegetation includes an abundance of oak, with white pine, hemlock-hardwood, and pure northern hardwoods. Agriculture is the dominant economic activity in this zone (Will et al., 1982 and Dickinson, 1983).

Recent aerial orthoimagery of the Project Area and surrounding vicinity, obtained from Google Earth (V7.3.2.5776) (July 19, 2019) and other resources (July 19, 2019), indicates that the Project Area is covered by agricultural land and upland forest. Agricultural fields, secondary roads, paved roads and unimproved farm roads are evident. Streams, drainage ditches, and undeveloped forest are depicted throughout the Project Area. The following ecological communities, as defined by *Ecological Communities of New York State* (Edinger et al., 2014), were identified on the Project Area at the time of the delineation:

- Appalachian oak-hickory forest
- Beech-maple mesic forest
- Cropland/field crops
- Cropland/row crops
- Deep emergent marsh
- Ditch/artificial intermittent stream
- Farm ponds/artificial pond
- Hemlock-northern hardwood forest
- Intermittent stream
- Mowed lawn
- Mowed roadside/pathway
- Pastureland
- Pastureland
- Paved road/path
- Red maple-hardwood swamp
- Shallow emergent marsh
- Shrub swamp
- Successional northern hardwoods
- Successional old-field
- Successional shrubland
- Unpaved road/path
- Vernal pool

3.3 Hydrology

3.3.1 Hydrologic Mapping

The USGS has divided and sub-divided the country into hydrologic units based primarily on drainage basins and watershed boundaries. The main hydrologic unit levels are regions, sub-regions, basins, sub-basins, watersheds, and sub-watersheds. The hydrologic units are nested within each other, from the largest geographic area (regions) to the smallest geographic area (sub-watersheds). Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to twelve digits based on the six levels of classification in the hydrologic unit system. In addition to the hydrologic unit codes, each hydrologic unit is assigned a name corresponding to the unit's principal hydrologic feature, or to a cultural or political feature within the unit.

The region hydrologic unit level contains either the drainage area of a major river or the combined drainage areas of a series of rivers. Regions receive a two-digit code. The following hydrologic unit levels are designated by the addition of another two digits with each level. Each sub-region includes the area drained by a river system, a reach of a river and its tributaries in that reach, a closed basin or basins, or a group of streams forming a coastal drainage area.

The Project Area is located within the USGS defined Seneca River sub-basin (HUC 04140201). At the watershed level, the Project Area is located within the Seneca Lake Inlet watershed (HUC 0414020106), and the Seneca Big Stream Watershed (HUC 0414020108). At the sub-watershed level, the Project Area is located within the Sleeper Creek-Catherine Creek Watershed HUC 041402010602; However, HUC boundary mapping at this fine of a scale may be inaccurate.

The NYSDEC also classifies watersheds more generally within the State of New York. Unlike mapping efforts outlined by the USGS above, the NYSDEC uses the definitions of watersheds and drainage basins interchangeably. New York's waters (e.g., lakes, rivers, wetlands, and streams) fall within one of seventeen major drainage basins as defined by the NYSDEC. The NYSDEC defines these drainage basins or watersheds as an area of land that drains water into a specific body of water within or adjacent to New York State and includes networks of rivers, streams, lakes, and the surrounding lands. The NYSDEC-classified watersheds are separated by high elevation geographic features (e.g., mountains, hills, and ridges). Each major drainage basin corresponds to one or more USGS sub-basins (USGS HUC 8-digit codes).

The Project Area is located within the Seneca major drainage basin of New York. This major drainage basin drains an area of 2,214,746 acres and ranges in elevation from 358 to 2,286 feet above sea level, making this the largest watershed in New York State (NRCS, 2010). Schuyler County comprises 6 percent of the Seneca River sub-basin, a total of 141,267 acres. Average annual precipitation is between 34 to 36 inches and an average annual temperature ranges from 55.4 to 45.36 Fahrenheit. Wetlands and open water constitute 6 percent of the sub-basin (USDA

NRCS, 2010). Within this major drainage basin, the Project is located in the Seneca River Sub-basin (HUC 04140201) as previously mentioned.

3.3.2 Hydrologic Character

The predominant surface waterbody within close proximity to the Project Area is Seneca Lake, located approximately 4.6 miles distant. The Project Area has two dominant surface waterbodies: a tributary of Glen Creek and Vanzandt Hollow, and a tributary of Shequaga Creek, all of which flow to Seneca Lake. Three NWI mapped ponds exist within the Project Area. Most aquatic features within the Project Area act primarily as drainages to Glen Creek and Shequaga Creek.

The Project Area receives, on average, 37.41 inches of rainfall annually based on information from the City of Burdett, New York, located 10.8 miles from the Project Area (U.S. Climate Data, 2017).

The Project Area wetlands drain relatively to the north east, with the majority of the identified streams flowing to the north.

On-site hydrological conditions observed during the 2017 delineation were normal, while precipitation events were higher than average immediately preceding the 2019 delineation.

3.3.3 FEMA Flood Zone Mapping

FEMA maintains materials developed to support flood hazard mapping for the National Flood Insurance Program (NFIP). According to FIRM panel 36074600005A, effective October 29, 1982. the Project Area is located within a flood zone designated Zone C, an area of minimal flooding. (see Figure 3).

3.4 Federal and State Mapped Wetlands and Streams

The USFWS is the principal US federal agency tasked with providing information to the public on the status and trends of wetlands on a national scale. The USFWS NWI is a publicly available resource that provides detailed information on the abundance, characteristics, and distribution of nationwide wetlands (where mapped). NWI mapping data is offered in an effort to promote the understanding, conservation, and restoration of wetlands. Note, unlike NYSDEC wetland maps, NWI wetland maps do not denote federal jurisdiction with their mapped boundaries. NWI wetlands are used as a reference guide by TRC field biologists to conduct a more informed site survey in the demarcation or delineation of wetlands and streams, which could be subject to federal jurisdiction under the CWA within the target Project Area.

Review of the NWI mapping during the preliminary desktop analysis indicated 12 federally mapped features within the Project Area, totaling approximately 5.45 acres (see Figure 3). NWI mapping data indicates that Freshwater Pond (PUBHh) aquatic features are the dominant NWI features present within the Project Area (2.47 acres). Other common cover types include

Freshwater Emergent Wetlands (PEM1E) (2.22 acres), and Freshwater Shrub-Scrub Wetlands (PSS1E) (0.76 acre).

The number of field-delineated aquatic features within the Project Area is greater than the number of features represented by the NWI mapping for the Project Area. Moreover, a number of field-delineated NWI mapped features are significantly larger than their mapped depictions and have more specific sinuosity to their boundaries. A total of seven NWI features identified by the NWI maps were confirmed during delineation efforts to not occur on the Project Area. Several NWI features within the eastern parcel were found to be misclassified.

Review of the NYSDEC ERM indicated no NYSDEC-regulated freshwater wetlands or their 100-foot adjacent areas mapped within the Project Area which are regulated under Article 24 of the ECL (Figure 3 of Appendix A). Based on available NYSDEC stream classification mapping, two mapped streams are within the Project Area. State-protected streams are protected under Article 15 of the ECL (see Section 2.2). Table 1 below provides a detailed summary of the NYSDEC-classified (protected and unprotected) streams within the Project Area.

Table 1. NYSDEC-Mapped Streams within the Project Area

NYSDEC Stream Name and Regulatory ID Number	NYS Major Drainage Basin	USGS Sub-basin HUC 8 and Name	NYSDEC Classification[1] and Standard[2]	Cumulative Linear Feet within the Project Area
Trib of Glen Creek and Vanzandt Hollow (898-450)	Seneca River	04140201 (Seneca River)	C	4,428
Trib of Shequaga Creek (898-448.2)	Seneca River	04140201 (Seneca River)	C	3,540

[1]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. Waters with a classification of D are generally suitable for fishing and non-contact recreation.
[2] Streams designated (T) indicate that they support trout, while those designated (TS) support trout spawning.

3.5 Physiography and Soil Characteristics

3.5.1 Physiography and Topography

The Project Area is located within the Glaciated Allegheny Plateau Physiographic Province of New York State (New York State Department of Transportation, 2013). This Physiographic

Province is defined by a plateau with rugged relief from ancient erosion by water and ice. This severe dissection from erosion created numerous steep valley streams and troughs sometimes containing lakes, such as the Finger Lakes.

The landforms of the Project Area are hills and irregular plains. As shown on the USGS Beaver Dams NY 7.5-minute quadrangle, (USGS, 2016), the Project Area is characterized by a rolling landscape. Baker Hill is located within the Project Area. Here the terrain gains elevation from the northern lowest portion by Old Joe Road at approximately 1,500 feet above sea level, moving south towards one of the highest elevation points of approximately 1,700 feet above sea level. The south eastern corner of the Project Area is approximately 1,700 feet above sea level as well. Despite Baker Hill's steep incline from the north, the average slop of the Project Area is six percent.

3.5.2 Site Soils

The USDA NRCS Web Soil Survey is an online resource mapping tool that provides soil data and information for the vast majority of the nation. This information is produced by the National Cooperative Soil Survey (NCSS), in partnership with federal, regional, state, and local agencies, and private entities and institutions.

A total of 14 soil map units were identified within the Project Area. Soil map units represent a type of soil, a combination of soils, or miscellaneous land types. Soil map units are usually named for the predominant soil series or land types within the map unit. Due to limitations imposed by the small scale of the soil survey mapping, it is not uncommon to identify wetlands within areas not mapped as hydric soil, while areas mapped as hydric often do not support wetlands. This concept is emphasized by the NRCS:

"*Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.*"

Soil drainage in the Project Area is variable, with approximately 77.6 percent somewhat poorly drained, 0.3 percent classified as poorly drained, 5.1 percent classified as well drained, and 17 percent classified as moderately well drained. Also, soils within the Project Area have been listed mostly as farmland of statewide importance (89.8 percent), prime farmland (2.1 percent), and not prime farmland (7.2 percent).

The 14 soil map units identified within the Project Area by the NRCS are briefly described below and outlined in Table 3. Refer to Figure 2 for graphically depicted soil map units of the Project Area.

<u>Soil Descriptions</u>

Burdett silt loam, 3 to 8 percent slopes (BuB) –

Consists of somewhat poorly drained soils that occur on drumlinoid ridges, hills, and till plains. These soils are derived from a thin mantle overlying till that is strongly influenced by shale. Its typical profile is 0 to 64 inches thick.

Chippewa silt loam, 0 to 3 percent slopes (Cp) –

Consists of poorly drained soils that occur on toeslopes and base slopes of depressions. These soils are developed in loamy till dominated by siltstone, sandstone, and shale fragments, and its typical profile is 0 to 72 inches thick.

Fremont silt loam, 3 to 8 percent slopes (FrB) –

Consists of somewhat poorly drained soils that occur on footslopes, summits, backslopes, and interfluve of hills. These soils are developed in till with a typical profile of 0 to 72 inches thick.

Lordstown channery silt loam, 8 to 15 percent slopes (LoC) –

Consists of loamy till derived from sandstone and siltstone that are well drained. These soils are commonly found on shoulders, backslopes, mountaintops, rests, and nose slopes of hills and mountains. Its typical profile is 0 to 40 inches thick.

Mardin channery silt loam, 3 to 8 percent slopes (MrB) –

These soils consist of loamy till which is moderately well drained. These soils are commonly found on summits and shoulders of mountains and hills. Its typical profile is 0 to 72 inches thick.

Mardin channery silt loam, 8 to 15 percent slopes (MrC) –

These soils consist of loamy till which is moderately well drained. These soils are commonly found on shoulders and backslopes of mountains and hills. Its typical profile is 0 to 72 inches thick.

Mardin channery silt loam, 15 to 25 percent slopes (MrD) –

These soils consist of loamy till which is moderately well drained. These soils are commonly found on backslopes and side slopes of mountains and hills. Its typical profile is 0 to 72 inches thick.

Tuller channery silt loam, 3 to 8 percent slopes (TuB) –

Consists of somewhat poorly drained soils that occur on hills, ridges, and benches. These soils form from loamy till derived mainly from acid sandstone, siltstone, and shale, and its typical profile is 0 to 22 inches thick.

Tuller channery silt loam, 8 to 15 percent slopes (TuC) –

Consists of somewhat poorly drained soils that occur on hills, ridges, and benches. These soils form from loamy till derived mainly from acid sandstone, siltstone, and shale, and its typical profile is 0 to 22 inches thick.

Valois gravelly silt loam, 3 to 8 percent slopes (VaB) –

Consists of well-drained soils that occur on summits and crests of end moraines, valley sides, and lateral moraines. These soils are developed in loamy till derived mainly from sandstone, siltstone, and shale, and its typical profile is 0 to 60 inches thick.

Valois gravelly silt loam, 15 to 25 percent slopes (VaD) –

Consists of well-drained soils that occur on the backslopes and sideslopes of end moraines, valley sides, and lateral moraines. These soils are developed in loamy till derived mainly from sandstone, siltstone, and shale, and its typical profile is 0 to 60 inches thick.

Volusia channery silt loam, 3 to 8 percent slopes (VoB) –

Consists of somewhat poorly drained soils that occur on footslopes and base slopes of hills or mountains. These soils are developed in loamy till derived from interbedded sedimentary rock, and its typical profile is 0 to 72 inches thick.

Volusia channery silt loam, 8 to 15 percent slopes (VoC) –

Consists of somewhat poorly drained soils that occur on footslopes and side slopes of hills or mountains. These soils are developed in loamy till derived from interbedded sedimentary rock, and its typical profile is 0 to 72 inches thick.

Volusia channery silt loam, 15 to 25 percent slopes (VoD) –

Consists of somewhat poorly drained soils that occur on backslopes, footslopes, and side slopes of hills or mountains. These soils are developed in loamy till derived from interbedded sedimentary rock, and its typical profile is 0 to 72 inches thick.

Hydric Soil

The Web Soil Survey of the Project Area was consulted prior to conducting the delineation to determine the extent of soils meeting hydric criteria as defined by the NRCS. The NRCS definition of a hydric soil is a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part. The *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratories, 1987) (1987 Manual) is compatible, defining a hydric soil as "*a soil that in its undrained condition, is saturated, flooded or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation.*"

Of the Project soils, one of the soils mapped within the Project Area contain higher percentages (33 percent or more) of mapping units with hydric soil inclusions. This is the Chippewa silt loam (Cp) map unit, which comprises less than one percent of the Project Area (see Table 3 and Figure 2). These higher rating percentages indicate the potential presence of a wetland feature on site. Hydric Soil Rating indicates the percentage of map units that meet the criteria for hydric soils. Map units are composed of one or more map unit components or soil types, each of which is rated as hydric or not hydric. Map units that are made up dominantly of hydric soils may have small areas of minor non-hydric components in the higher positions on the landform, and map units that are made up dominantly of non-hydric soils may have small areas of minor hydric components in the lower positions on the landform. As such, each map unit is rated based on its respective components and the percentage of each component within the map unit. Although a soil series will be given a general hydric soil rating on the Web Soil Survey, this rating is for reference only and does not supersede site-specific conditions documented in the field that constitute hydric soil presence in located wetlands.

Table 2. Mapped Soils within the Project Area

Map Unit Symbol	Map Unit Name	Slope (%)	Drainage Class	Hydric Rating (%)	Acres in Project Area	Percent of Project Area
BuB	Burdett silt loam	3 to 8	Somewhat poorly drained	5	6.6	0.9
Cp	Chippewa silt loam	0 to 3	Poorly drained	95	2.1	0.3
FrB	Fredmon silt loam	3 to 8	Somewhat poorly drained	5	10	1.3
LoC	Lordstown channery silt loam	8 to 15	Well drained	0	20	2.6
MrB	Mardin channery silt loam	3 to 8	Moderately well drained	0	38.9	5.0
MrC	Mardin channery silt loam	8 to 15	Moderately well drained	0	67.5	8.7
MrD	Mardin channery silt loam	15 to 25	Moderately well drained	0	25.4	3.3
TuB	Tuller channery silt loam	3 to 8	Somewhat poorly drained	5	1.7	0.2
TuC	Tuller channery silt loam	8 to 15	Somewhat poorly drained	5	6.2	0.8

Table 2. Mapped Soils within the Project Area

Map Unit Symbol	Map Unit Name	Slope (%)	Drainage Class	Hydric Rating (%)	Acres in Project Area	Percent of Project Area
VaB	Volusia channery silt loam	3 to 8	Well drained	0	16.6	2.1
VaD	Valois	15 to 25	Well drained	0	3.1	0.4
VoB	Volusia channery silt loam	3 to 8	Well drained	5	283.3	36.6
VoC	Volusia channery silt loam	8 to 15	Well drained	4	271.4	35.1
VoD	Volusia channery silt loam	15 to 25	Well drained	3	21.3	2.7

4.0 WETLAND AND STREAM DELINEATION METHODOLOGY

Prior to initiating field investigations, TRC conducted a desktop review of publicly available data to determine the potential presence of federal and state mapped wetlands and streams within the Project Area. TRC field biologists subsequently performed field investigations to identify aquatic features within the Project Area. Delineations for wetlands and streams were performed in accordance with criteria set forth in the 1987 Manual (Environmental Laboratory, 1987) and the 2012 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0) (USACE, 2012) (Supplement). Data was collected from sample plots at each delineated wetland. Depending on the size of the delineated area and any change in cover type, multiple sample plots of the delineated wetland may have been taken. Delineation data was recorded on USACE Routine Wetland Determination Forms (Appendix C).

4.1 Hydrology

The presence of wetland hydrology is determined based on primary and secondary indicators established by the USACE. The 1987 Manual defines the presence of wetland hydrology when at least one primary indicator or two secondary indicators are identified. One primary indicator is sufficient to determine if hydrology is present; however, if primary indicators are absent, two or more secondary indicators are required to determine the presence of wetland hydrology. If other probable wetland hydrology evidence was found on-site, then such characteristics were documented on the USACE Routine Wetland Determination Form. Wetland hydrology indicators are grouped into 18 primary and 11 secondary indicators as presented in the Supplement.

Wetland hydrology may influence the characteristics of vegetation and soils due to anaerobic and reducing conditions (Environmental Laboratory, 1987). This influence is dependent on the frequency and duration of soil inundation or saturation which, in turn, is dependent on a variety of factors including topography, soil stratigraphy, and soil permeability, in conjunction with precipitation, runoff, and stormwater and groundwater influence.

4.2 Vegetation

Hydrophytic vegetation is defined in the 1987 Manual as:

"*…the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present.*"

Plants are categorized according to their frequency of occurrence in wetlands. Scientific names and wetland indicator statuses for vegetation are those listed in *The National Wetland Plant List: 2016 Wetland Ratings* (Lichvar et al., 2016) (NWPL). Due to regional differences in wetland vegetation, among other characteristics, the USACE divided the United States into regions to improve the accuracy and efficiency of wetland delineations. The indicator statuses specific to the

"Northcentral and Northeast Region," as defined by the USACE, apply to the Project Area. The official short definitions for wetland indicator statuses are as follows:

- Obligate Wetland (OBL): Almost always occur in wetlands.
- Facultative Wetland (FACW): Usually occur in wetlands but may occur in non-wetlands.
- Facultative (FAC): Occur in wetlands and non-wetlands.
- Facultative Upland (FACU): Usually occur in non-wetlands but may occur in wetlands.
- Upland (UPL): Almost never occur in wetlands.

For species with no indicator status in the Project Area's region, the indicator status assigned to the species in the nearest adjacent region is applied. Plants that are not included on the NWPL within the Project Area's region, nor an adjacent region, are given no indicator status, and are not included in dominance calculations. Plants that are not listed in any region on the NWPL are considered as UPL on USACE Routine Wetland Determination Forms.

Vegetation in both upland and wetland communities was characterized using areal methods for instituting plot measurement. In accordance with USACE methodology, a plot radius of 30 feet around the soil sample location was applied to tree species and vines, a 15-foot radius for saplings/shrubs, and a 5-foot radius was utilized for herbaceous plants. After the measurement of percent coverage was determined for each species, an application of the 50/20 rule of dominance determination was utilized to determine hydrophytic dominance at sample plots. In using the 50/20 rule, the plants that comprise each stratum are ranked from highest to lowest in percent cover. The species that cumulatively equal or exceed 50 percent of the total percent cover for each stratum are dominant species, and any additional species that individually provides 20 percent or more percent cover are also considered dominant species of its respective strata. The total cover for each stratum, and subsequently the plot as a whole, could exceed 100 percent due to vegetation overlap.

It should be noted that where the wetland boundary results of this approach differ meaningfully from the approach outlined within the *New York State Freshwater Wetland Delineation Manual* (Browne et al., 1995), the difference is described within this report if needed to address NYSDEC Article 24 jurisdiction. Though not common, two wetland boundaries, a state and a federal boundary, may arise from subtle differences in the definition of vegetative strata, sampling technique, and wetland indicators between the USACE and the NYSDEC. See Section 5.0 for more detail.

Cover types are also assigned to each wetland. The delineated resources were classified in accordance with the system presented in *The Classification of Wetlands and Deepwater Habitats of the United States, Second Edition* (Federal Geographic Data Committee [FGDC], 2013). Field biologists assign cover types to wetlands based on this classification standard and utilize this document. TRC biologists used the definitions for perennial and intermittent streams found in *The*

Classification of Wetlands and Deepwater Habitats of the United States, Second Edition (FGDC, 2013) when classifying delineated streams. Ephemeral streams have flowing water primarily from rainfall runoff and are above the water table.

4.3 Soils

Hydric soil indicators were determined utilizing the Supplement with added provision from the *Field Indicators of Hydric Soils in the United States: A Guide for Identifying and Delineating Hydric Soils*, Version 8.2 (USDA NRCS, 2018). Soil characteristics were documented, such as color, texture, layer depth, presence of organic-layers, and evidence of redoximorphic features, which may include indicators such as reduction, oxidation, gleyed matrices, manganese features. Soil test pits were dug using a spade shovel to a depth of approximately 20 inches. If refusal of a soil sample to 20 inches occurred due to the presence of hardpan layer, rock, or hard fill materials, this occurrence was documented. Soil color was described using the *Munsell Soil Color Book* (Munsell Color, 2015). Texture was determined using the USDA feel method (Thien, 1979).

Hydric soil indicators applicable to the Project Area were determined using the *Land Resource Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin* (NRCS, 2006) (MLRA Handbook). Per the MLRA Handbook, the Project Area is within Major Land Resource Area 144A (New England and Eastern New York Upland, Southern Part) of Land Resource Region (LRR) R (Northeastern Forage and Forest Region). Hydric soil indicators that do not apply to this MLRA were not considered.

4.4 Streams

Streams and other non-wetland aquatic features (e.g., lakes and ponds) within the Project Area were identified by the presence of an OHWM, which is the line established by the fluctuations of water (33 CFR 328.3). The OHWM, where not established and available by public record, is indicated by physical characteristics such as a clear, natural line impressed on the bank; shelving; changes in the character of soil; destruction of terrestrial vegetation; the presence of litter and debris; or other characteristics of the surrounding areas.

The streams were delineated with blue flagging. Points of the delineated boundaries were located with a handheld GPS unit set for sub-meter accuracy. In streams less than six feet wide, sub-meter GPS point capture and post-processing (differential correction) may yield imprecise stream bank measurements due to the narrow nature of the stream. In these circumstances, centerline delineations are applied to maintain accurate representation of stream sinuosity for planning and impact calculation purposes. Streams six feet wide and wider were delineated from bank to bank. Stream attributes including width, bank height, and water depth are measured and documented on TRC Stream Inventory Data Forms (Appendix C).

5.0 RESULTS

5.1 General Overview

The Project Area contains primarily agricultural land and upland forest. The Project Area also contains several tree lines between agricultural fields and riparian corridors. The estimated average diameter at breast height (DBH) of the trees ranged from 12 to 24 inches. Wetland vegetation at the Project Area included, red maple *(acer rubrum*), giant goldenrod (*Solidago gigantea*), common cattail (*Typha latifolia*), reed canary grass (*Phalaris arundinacea*), fowl blue grass (*Poa palustris*), black willow (*Salix nigra*), and sensitive fern (*Onoclea sensibilis*). Dominant vegetation within the uplands included, red maple sugar maple (*Acer saccharum*), white ash *(Fraxinus americana*), northern red oak (*Quercus rubra*), quaking aspen (*Populus tremuloides*), European buckthorn (*Rhamnus cathartica),* eastern white pine (*Pinus strobus*), black cherry (*Prunus serotina*), nannyberry (*Viburnum lentago*), cock-spur hawthorn (*Crataegus crus-galli*), Japanese honeysuckle (*Lonicera japonica*), Kentucky bluegrass (*Poa pratensis*), and narrowleaf plantain (*Plantago lanceolate*).

An approximately 92 acre section in the southeastern corner of the Project Area is outside of the delineation limits as it is not sited for devolvement or Project components. See Appendix A: Figure 4 for further detail.

Weather conditions were normal in 2017, however there was higher than average precipitation events immediately preceding the 2019 delineation.

TRC identified and delineated 34 wetlands and 25 streams within the delineated Project Area on June 6 through June 8, 2017 as well as April 22 through April 26, 2019 (see Figure 4 and Figure 5). Some of these wetlands have multiple cover types, as described in Table 4. Approximately 3.03 percent (20.71 acres) of the approximately 682-acre delineated Project Area is wetland. Tables 4 and 5 below detail the wetlands and streams delineated at the Project Area.

Representative photographs taken of each delineated wetland community and stream within the Project Area are provided in Appendix B. Completed USACE Routine Wetland Determination Forms and TRC Stream Inventory Data Forms are provided in Appendix C.

5.2 Delineated Wetlands

Palustrine Emergent wetlands (PEM) – A total of 22 wetlands delineated within the Project Area contain characteristics representative of the emergent wetland classification. PEM wetlands are dominated by an herbaceous layer of hydrophytic (water-tolerant) plant species. PEM wetlands typically contain deep, nutrient rich soils that remain heavily saturated or even inundated throughout the year. Emergent wetlands encountered in the Project Area were typically dominated by reed canary grass, fowl blue grass, black willow, and sensitive fern. Evidence of wetland hydrology for these wetlands included surface water, saturation, a high water table, drainage patterns, geomorphic position, microtopographic relief, and passing, the FAC-neutral test. Although hydric soils indications were variable, emergent wetlands within the Project Area typically displayed (10YR 4/2 – 10YR 4/4) silty loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3), Redox Dark Surface (F6), and Depleted Below Dark Surface (A11) hydric soil indicators.

Palustrine Scrub/Shrub (PSS) – A total of six wetlands delineated within the Project Area contain characteristics representative of the scrub/shrub wetland classification. Scrub-shrub wetlands are dominated by woody shrub vegetation that stand less than 20 feet tall. Shrub species dominating the wetland could include true shrubs, a mixture of young trees and shrubs, or trees that are small or stunted due to stressors from explicit environmental conditions.

Scrub-shrub wetlands encountered in the Project Area were typically dominated in the understory by buckthorn, Japanese honeysuckle, silky dogwood (*Cornus amomum*), nannyberry, grey alder (*Alnus incana*), and elderberry. Herbaceous species included sensitive fern, giant goldenrod, common cattail, cinnamon fern (*Osmundastrum cinnamomeum*), red raspberry (*Rubus idaeus*) and curly dock (*Rumex crispus*). Evidence of hydrology for these wetlands included saturation, high water table, surface water, saturation visible on aerial imagery, geomorphic position, and FAC-neutral test. Although hydric soils indications were variable, scrub-shrub wetlands within the Project Area typically displayed (2.5Y 4/1 – 10YR 5/2) silty clay loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3) and Depleted Below Dark Surface (A11) hydric soil indicators.

Palustrine Forested Wetland (PFO) – A total of six wetlands delineated within the Project Area contain characteristics representative of the forested wetland classification. Forested wetlands are sometimes referred to as swamps and are dominated by tree species 20 feet or taller, typically with an understory of shrub and herbaceous species. Understory vegetation presence readily varies, as the upper canopy of tree species may block sufficient light for extensive vegetative growth in the understory. Coniferous swamps, lowland hardwood swamps, and floodplain forests are common types of forested wetlands. Soils in forested wetlands are typically inundated or saturated early spring into summer. Some forested wetlands may dry up entirely, which reveal water stain marks along the trunks of exposed tree species and also shallow, buttressed root systems indicative of periods of heavy inundation events.

Forested wetlands encountered in the Project Area were typically dominated by black willow, red maple, northern red oak, green ash (*Fraxinus pennsylvanica*), American elm (*Ulmus americana*). Understory vegetation typically included saplings including Japanese honey suckle (*Lonicera japonica*), European buckthorn, and American hornbeam (*Carpinus caroliniana*). Herbaceous species included multiflora rose (*Rosa multiflora*), and tussock sedge (*Carex stricta*). Evidence of hydrology for these wetlands included saturation, a high water table, drainage patterns, and geomorphic position. Although hydric soils indications were variable, forested wetlands within the Project Area typically displayed (2.5Y 3/1 – 12.5Y 5/1) clay loam soils. Variations of characteristics in the soil matrices generally demonstrated Depleted Matrix (F3) and Depleted Below Dark Surface (A11) hydric soil indicators.

Palustrine Unconsolidated Bottom (PUB) – A total of five wetlands delineated within the Project Area contain characteristics representative of unconsolidated bottom wetlands. Unconsolidated bottom wetlands are characterized by surface water and have less than 30 percent vegetative cover and at least 25 percent cover of particles less than stones. As these are bodies of standing water, evidence of wetland hydrology was decisively present with standing water ranging from approximately 2–4 feet in depth. Evidence of wetland hydrology included surface water, high water table, saturation, algal mat or crust, inundation visible on aerial imagery, aquatic fauna, geomorphic position, and FAC-neutral test. Dominant herbaceous species included sensitive fern, common boneset (*Eupatorium perfoliatum*), soft rush (*Juncus effusus*), late goldenrod, blackbent (*Agrostis gigantea*), lake sedge (*Carex lacustris*), yellowfruit sedge (*Carex annectens*), reed canary grass (*Phalaris arundinacea*), great bulrush (*Schoenoplectus tabernaemontani*), joe pye-weed (*Eutrochium maculatum*), water horehound (*Lycopus americanus*), pickerelweed (*Pontederia cordata*) and tussock sedge.

Table 3. Delineated Wetlands within the Project Area

Wetland Field Designation	Cover Type Classification[1] and Acreage				Total Wetland Acreage within Project Are	NWI Cover Type[2]	NYSDEC Wetland ID/ Class[3]	Potential Jurisdiction Under Rapanos	Associated Buffer	Latitude of Centroid	Longitude of Centroid
	PEM	PSS	PFO	PUB							
W-DL-1	2.22	-	-	-	2.22	-	-	USACE	None	42.33088728	-76.95331943
W-DL-2	0.53	-	0.18	-	0.71	-	-	Isolated	None	42.33235516	-76.95320509
W-DL-3	1.04	-	-	-	1.04	-	-	Isolated	None	42.33363635	-76.95345986
W-DL-4	0.19	-	-	-	0.19	-	-	USACE	None	42.33038382	-76.94992675
W-DL-5	-	-	0.34	-	0.34	-	-	USACE	None	42.34058701	-76.95049353
W-TC-1	0.08	-	0.48	-	0.56	-	-	Isolated	None	42.33500776	-76.94355780
W-TC-2	0.08	-	-	0.31	0.39	PUBHh	-	Isolated	None	42.33600229	-76.94378737
W-TC-3	-	-	-	0.51	0.51	PUBHh	-	Isolated	None	42.33077203	-76.94531579
W-TC-4	-	-	-	0.31	0.31	PUBHh	-	Isolated	None	42.33325478	-76.94043534
W-TC-5	0.02	-	-	-	0.02	-	-	Isolated	None	42.33835907	-76.94693831
W-TC-6	0.67	0.30	-	-	0.97	-	-	USACE	None	42.33836419	-76.94635340
W-TC-7	0.05	-	-	-	0.05	-	-	Isolated	None	42.33779885	-76.94429454
W-TC-8	0.21	-	-	-	0.21	-	-	Isolated	None	42.33279754	-76.94693375
W-TC-9	0.06	-	-	-	0.06	-	-	Isolated	None	42.32738933	-76.93226536
W-TC-10	0.28	-	-	-	0.28	-	-	Isolated	None	42.32728840	-76.93047647
W-TC-11	0.05	-	-	-	0.05	-	-	Isolated	None	42.32728840	-76.95444649
W-TC-12	0.36	-	-	-	0.36	-	-	Isolated	None	42.33896084	-76.95499795
W-TC-13	0.25	-	-	-	0.25	PUBHh	-	Isolated	None	42.34089525	-76.95568920
W-JJB-1	-	0.37	-	-	0.37	-	-	USACE	None	42.33246177	-76.93427944

Wetland Field Designation	Cover Type Classification[1] and Acreage				Total Wetland Acreage within Project Are	NWI Cover Type[2]	NYSDEC Wetland ID/ Class[3]	Potential Jurisdiction Under Rapanos	Associated Buffer	Latitude of Centroid	Longitude of Centroid
	PEM	PSS	PFO	PUB							
W-JJB-2	0.22	-	-	-	0.22	-	-	USACE	None	42.33045362	-76.93351524
W-JJB-3	0.18	-	2.68	-	2.86	-	-	USACE	None	42.32968112	-76.93402128
W-JJB-4	-	0.02	-	-	0.02	-	-	USACE	None	42.33317942	-76.93036318
W-JJB-5	0.21	-	-	-	0.21	-	-	Isolated	None	42.33461507	-76.93429388
W-JJB-6	0.05	-	-	-	0.05	PEM1E	-	Isolated	None	42.34073696	-76.93389260
W-JJB-7	-	1.10	-	-	1.10	-	-	USACE	None	42.33645843	-76.93586795
W-JJB-8	0.10	-	-	-	0.10	-	-	USACE	None	42.33950994	-76.93643668
W-JJB-9	-	-	-	0.38	0.38	PUBHh	-	Isolated	None	42.34129725	-76.93486314
W-JJB-10	0.27	-	-	-	0.27	-	-	USACE	None	42.33246177	-76.93427944
W-JJB-11	0.82	-	-	-	0.82	-	-	USACE	None	42.34053322	-76.93512613
W-JJB-12	-	-	1.65	-	1.65	-	-	USACE	None	42.33915517	-76.93723386
W-JJB-13	0.10	-	-	-	0.10	-	-	USACE	None	42.34205849	-76.93735796
W-JJB-14	-	0.91	-	-	0.91	PSS1E	-	Isolated	None	42.34173390	-76.93836774
W-JJB-15	-	-	1.55	-	1.55	-	-	Isolated	None	42.34054250	-76.93844746
W-JJB-16	-	1.58	-	-	1.58	-	-	USACE	None	42.34568274	-76.93525831
Total Wetland Acreage Delineated:					**20.71**						

1PEM – palustrine emergent; PSS – palustrine scrub-shrub; PFO – palustrine forested; PUB – palustrine unconsolidated bottom
2PUBHh – Palustrine Unconsolidated Bottom Permanently Flooded Diked/Impounded; PEM1E – Palustrine Emergent Persistent Seasonally Flooded/Saturated; PSS1E – Palustrine Scrub-Shrub Broad-Leaved Deciduous Seasonally Flooded/Saturated

5.3 Delineated Streams

Streams (RUP, RIN, REPH) – A total of 25 streams were delineated within the Project Area. Classification of streams were dependent on a temporal description of their usual level of flow regimes. Perennial streams (RUP) tend to flow all year, except during severe drought conditions. Perennial streams can flow below the water table and receive groundwater flow sources from springs or groundwater seepages on slopes. Intermittent streams (RIN) flow only during certain times of the year from alternating springs, snow melts, or from runoff from seasonal precipitation events. Intermittent streams can flow above or below the water table. Ephemeral streams (REPH) flow sporadically and are entirely dependent on transient precipitation from storm events or from periodic snow melts. These streams tend to flow above the water table and are often found as drainage features adjacent to, or within, the headwaters of a more major stream system.

Streams encountered on the Project Area were mostly intermittent in nature along moderate gradients (4 to 10 percent). Stream widths ranged from 1 to 12 feet. They generally contained channel substrates of silt, clay, cobble, and gravel with probed stream depths in the range of 0 to 6 inches. Most streams were determined to lack substantial features to permit the prevalence of aquatic ecologies. Only a small number of streams within the Project Area were determined to contain significant aquatic habitat to establish and support fish and wildlife populations. Most of the stream systems supporting aquatic habitats were found to be perennial in nature, as an annual flow regime allows for a more readily established life cycle.

Table 4. Delineated Streams within the Project Area

Stream Field Designation	Flow Regime Classification	Linear Feet within Project Area	NYSDEC Stream Name and Regulatory ID Number	NYSDEC Classification[1] and Standard[2]	Potential Jurisdiction Under Rapanos	Associated Buffer	Latitude of Centroid	Longitude of Centroid
S-DL-1	Intermittent	352	-	-	USACE	None	42.33031483	-76.95483912
S-DL-2	Intermittent	350	-	-	USACE	None	42.33072192	-76.95487583
S-DL-3	Intermittent	568	-	-	USACE	None	42.33032465	-76.95121878
S-DL-4	Intermittent	183	-	-	USACE	None	42.33026719	-76.95248907
S-DL-5	Intermittent	194	-	-	USACE	None	42.33019337	-76.95276308
S-DL-6	Intermittent	1,746	-	-	USACE	None	42.33099022	-76.94956255
S-DL-7	Perennial	4,319	898-450	Class C	USACE	None	42.33731114	-76.95002977
S-DL-8	Intermittent	488	-	-	USACE	None	42.33404134	-76.94988511
S-DL-9	Intermittent	769	-	-	USACE	None	42.33717539	-76.94887459
S-TC-1	Intermittent	456	-	-	USACE	None	42.33732604	-76.94406799
S-TC-2	Intermittent	320	-	-	USACE	None	42.33932216	-76.94609817
S-TC-3	Perennial and Intermittent	2,142	898-448.2	Class C	USACE	None	42.32706211	-76.93168139
S-JJB-2	Intermittent	875	-	-	USACE	None	42.33158256	-76.93581506
S-JJB-3	Intermittent	151	898-448.2	Class C	USACE	None	42.32812184	-76.93231991
S-JJB-4	Intermittent	1,066	-	-	USACE	None	42.33398149	-76.93181125
S-JJB-5	Intermittent	841	-	-	USACE	None	42.33773719	-76.93543340
S-JJB-6	Intermittent	2,327	898-450	C	USACE	None	42.34149678	-76.93647589
S-JJB-7	Intermittent	1,175	-	-	USACE	None	42.34355811	-76.93587079
S-JJB-8	Intermittent	396	-	-	USACE	None	42.33999751	-76.93387328

Stream Field Designation	Flow Regime Classification	Linear Feet within Project Area	NYSDEC Stream Name and Regulatory ID Number	NYSDEC Classification[1] and Standard[2]	Potential Jurisdiction Under Rapanos	Associated Buffer	Latitude of Centroid	Longitude of Centroid
S-JJB-9	Intermittent	316	898-450	C	USACE	None	42.34103751	-76.93591854
S-JJB-10	Intermittent	694	-	-	USACE	None	42.33881965	-76.93679908
S-JJB-11	Intermittent	662	-	-	USACE	None	42.34112078	-76.93749537
S-JJB-12	Intermittent	405	-	-	Isolated	None	42.34086873	-76.93792731
S-JJB-13	Ephemeral	74	-	-	Isolated	None	42.34144236	-76.93876189
S-JJB-14	Intermittent	192	-	-	USACE	None	42.34624863	-76.93542951
Total Stream Length Delineated:		**21,061**						

[1]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. Waters with a classification of D are generally suitable for fishing and non-contact recreation.
[2] Streams designated (T) indicate that they support trout, while those designated (TS) support trout spawning.

6.0 CONCLUSIONS

TRC identified and delineated a total of 34 wetlands (20.66 acres) in the delineated Project Area, including 22 wetlands with PEM characteristics (8.04 acres), six wetlands with PSS characteristics (4.28 acres), six wetlands with PFO characteristics (6.88 acres) and five wetlands with PUB characteristics (1.76). TRC assumes that 19 wetlands would likely be considered isolated by the USACE under the Rapanos approach. There are no buffers or setbacks associated with USACE-regulated wetlands. No wetlands are considered NYSDEC freshwater wetlands nor are there any mapped DEC wetlands within the Project Area.

TRC identified and delineated a total of 25 streams in the delineated Project Area, including 23 streams with intermittent flow regimes, one ephemeral stream, two perennial streams, and one that exhibited both perennial and intermittent characteristics at different points within the stream. TRC assumes that 23 are likely to be considered USACE jurisdictional under the Rapanos approach as they appear to be hydrologically connected to Waters of the United States. Two of the delineated streams do not have a direct physical connection to WOTUS and are likely not jurisdictional under the Rapanos. Five delineated streams coincide with NYSDEC Class C streams and are not protected waters per Article 15 of the ECL (Protection of Waters).

7.0 REFERENCES

Bailey, R.G. 1995. Description of the ecoregions of the United States. Miscellaneous Publication No. 1391. Second edition, revised. Washington, DC: USDA Forest Service.

Browne, S. et al. 1995. New York State Freshwater Wetlands Delineation Manual. New York State Department of Environmental Conservation, Division of Fish and Wildlife, Bureau of Habitat, Albany, NY.

Bryce, S.A., Griffith, G.E., Omernik, J.M., Edinger, G., Indick, S., Vargas, O., and Carlson, D. 2010. Ecoregions of New York (color poster with map descriptive text, summary tables, and photographs): Reston, Virginia, U.S. geological Survey, map scale 1:1,250,000.

Cowardin, L.M., et al. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C. 131 pp.

Definition of Waters of the United States 33 CFR Part 328 (1986).

Dickinson, N.R. 1983. A division of southern and western New York State into ecological zones. Unpubl. Report for NYSDEC, Wildlife Resources Center, Delmar, NY.

Edinger, G.J., et al. 2014. Ecological Communities of New York State, Second Edition. New York Heritage Program, NYS Department of Environmental Conservation, Albany, NY, 160 pp.

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

Federal Geographic Data Committee. 2013. The Classification of Wetlands and Deepwater Habitats of the United States, Second Edition.

Lichvar, R.W., M. Butterwick, N.C. Melvin, and W.N. Kirchner. 2016. The National Wetland Plant List: 2016 Update of Wetland Ratings. https://wetland_plants.usace.army.mil. (Accessed June, 2017).

Munsell Color. 2015. Munsell Soil Color Book. X-Rite Corporation, Grand Rapids, MI.

National Wetlands Inventory Wetlands, Electronic Vector Quad Maps of New York, United States Geological Survey.

New York State Department of Environmental Conservation (NYSDEC) Hydrography Network and Water bodies, NYS Hydrologic Units.

NYSDEC website, (http://www.dec.state.ny.us/).

NYSDEC (n.d.a). Seneca River Watershed. http://www.dec.ny.gov/lands/48373.html. July 19, 2019.

New York State Department of Transportation. 2013. Geotechnical Design Manual. Office of Technical Services, Geotechnical Engineering Bureau.

National Oceanic and Atmospheric Administration (NOAA). 2017. Anthony Arguez, Imke Durre, Scott Applequist, Mike Squires, Russell Vose, Xungang Yin, and Rocky Bilotta (2010). NOAA's U.S. Climate Normals (1981-2010). NOAA National Centers for Environmental Information. DOI:10.7289/V5PN93JP [January 2017].

Seaber, Paul R.; Kapinos, F. Paul; Knapp, George L. "*Hydrologic Unit Maps, U.S. Geological Survey Water-Supply Paper 2294*" (PDF). United States Geological Survey. Retrieved July 22, 2019.

Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. (http://websoilsurvey.nrcs.usda.gov/). Accessed July 22, 2019.

Thien, S.J. 1979. A flow diagram for teaching texture by feel analysis. Journal of Agronomic Education. 8:54-55.

United States Army Corps of Engineers (USACE). 2012. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0). U.S. Army Engineer Research and Development Center, Vicksburg, MS, 162 pp.

U.S. Climate Data. 2019. Burdett, New York. Available at: https://www.usclimatedata.com/climate/burdett/new-york/united-states/usny2858. Accessed July 19, 2019.

USDA NRCS. 2006. Land Resources Regions and Major Land Resource Areas of the United States, the Caribbean, and the Pacific Basin. USDA Handbook 296.

USDA NRCS. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

United States Department of the Interior, Geological Survey (USGS). National Hydrography Dataset. https://nhd.usgs.gov/ Modified February 16, 2017.

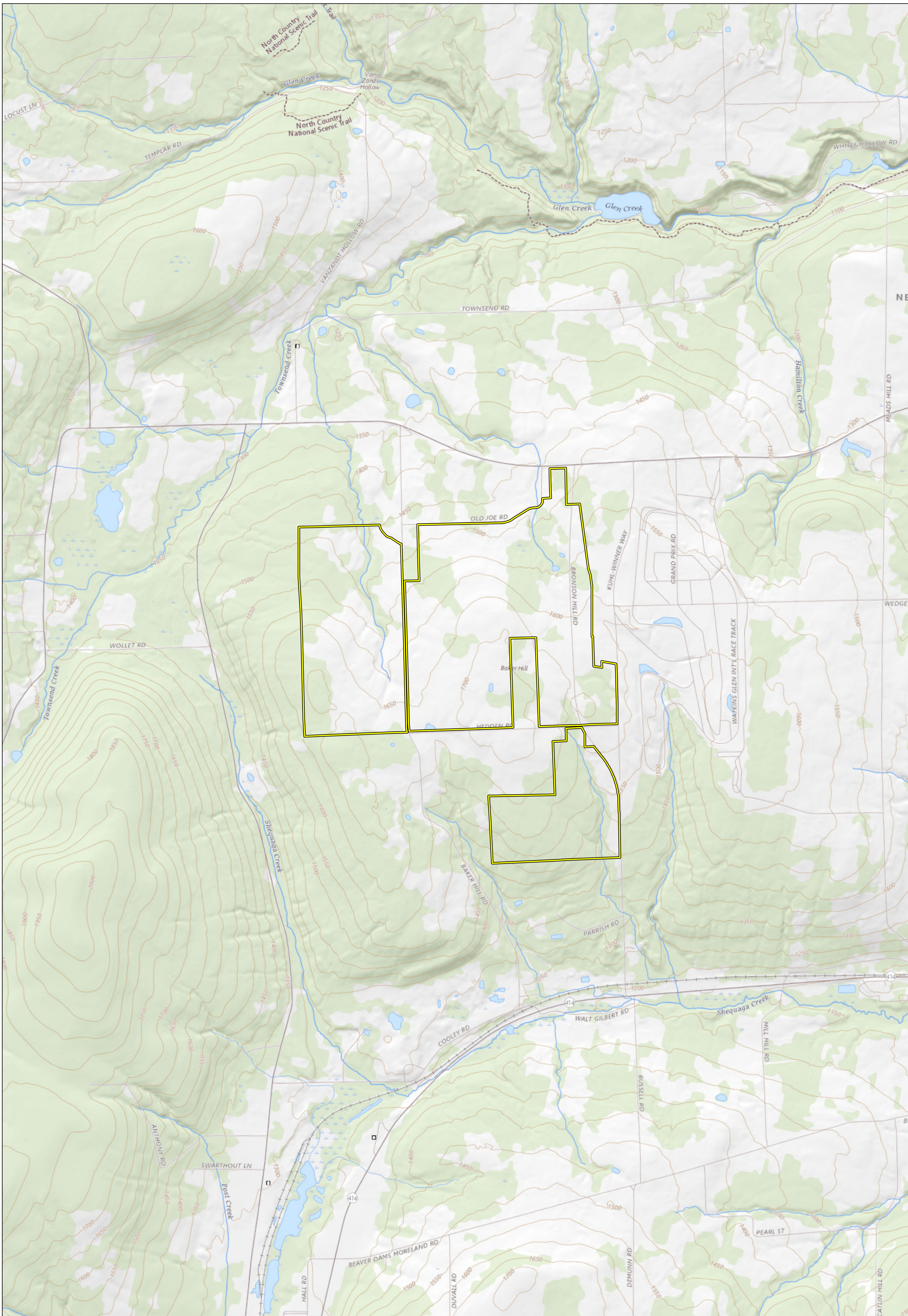
USGS. 2016. Beaver Dams, New York – Schuyler County. 7.5 Minute Series (Topographic).

USGS. 2014. Hydrologic Unit Maps. Available at: http://water.usgs.gov/GIS/huc.html Accessed July 2019.

USGS and USDA NRCS. 2013. Federal Standards and Procedures for the National Watershed Boundary Dataset (WBD) (4 ed.): U.S. Geological Survey Techniques and Methods 11–A3, 63 p. http://pubs.usgs.gov/tm/tm11a3/. Accessed July 22, 2019.

Will, G.B. et al. 1982. The ecological zones of northern New York. Unpubl. report for NYSDEC, Albany, New York.

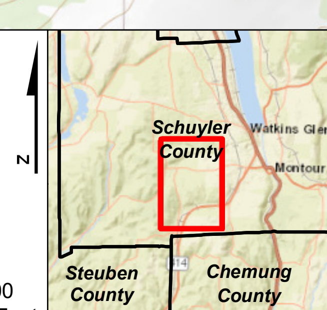
APPENDIX A
Figures



Project Area

Base Map: USGS/The National Map

0 1,000 2,000
Feet



NEXTera ENERGY

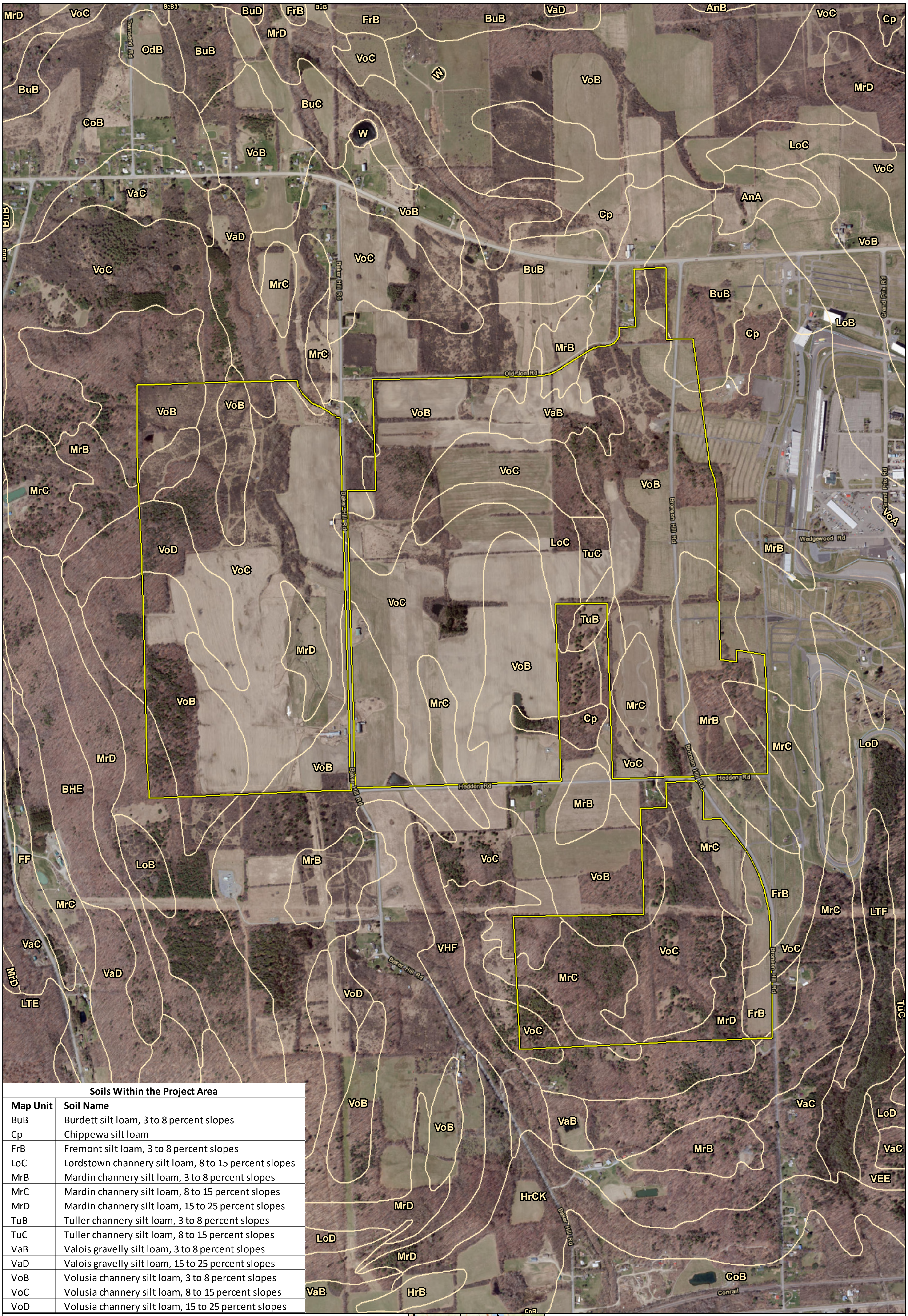
SITE LOCATION MAP

WATKINS GLEN SOLAR ENERGY CENTER, LLC

TOWN OF DIX, NY

FIGURE 1	JANUARY 2020

Map Produced by TRC



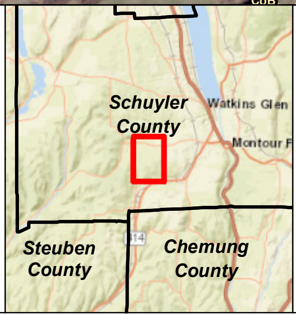
Soils Within the Project Area

Map Unit	Soil Name
BuB	Burdett silt loam, 3 to 8 percent slopes
Cp	Chippewa silt loam
FrB	Fremont silt loam, 3 to 8 percent slopes
LoC	Lordstown channery silt loam, 8 to 15 percent slopes
MrB	Mardin channery silt loam, 3 to 8 percent slopes
MrC	Mardin channery silt loam, 8 to 15 percent slopes
MrD	Mardin channery silt loam, 15 to 25 percent slopes
TuB	Tuller channery silt loam, 3 to 8 percent slopes
TuC	Tuller channery silt loam, 8 to 15 percent slopes
VaB	Valois gravelly silt loam, 3 to 8 percent slopes
VaD	Valois gravelly silt loam, 15 to 25 percent slopes
VoB	Volusia channery silt loam, 3 to 8 percent slopes
VoC	Volusia channery silt loam, 8 to 15 percent slopes
VoD	Volusia channery silt loam, 15 to 25 percent slopes

Project Area
Mapped Soils

Data: USDA-NRCS, 2018
Base Map: Esri and its contributors

0 500 1,000
Feet



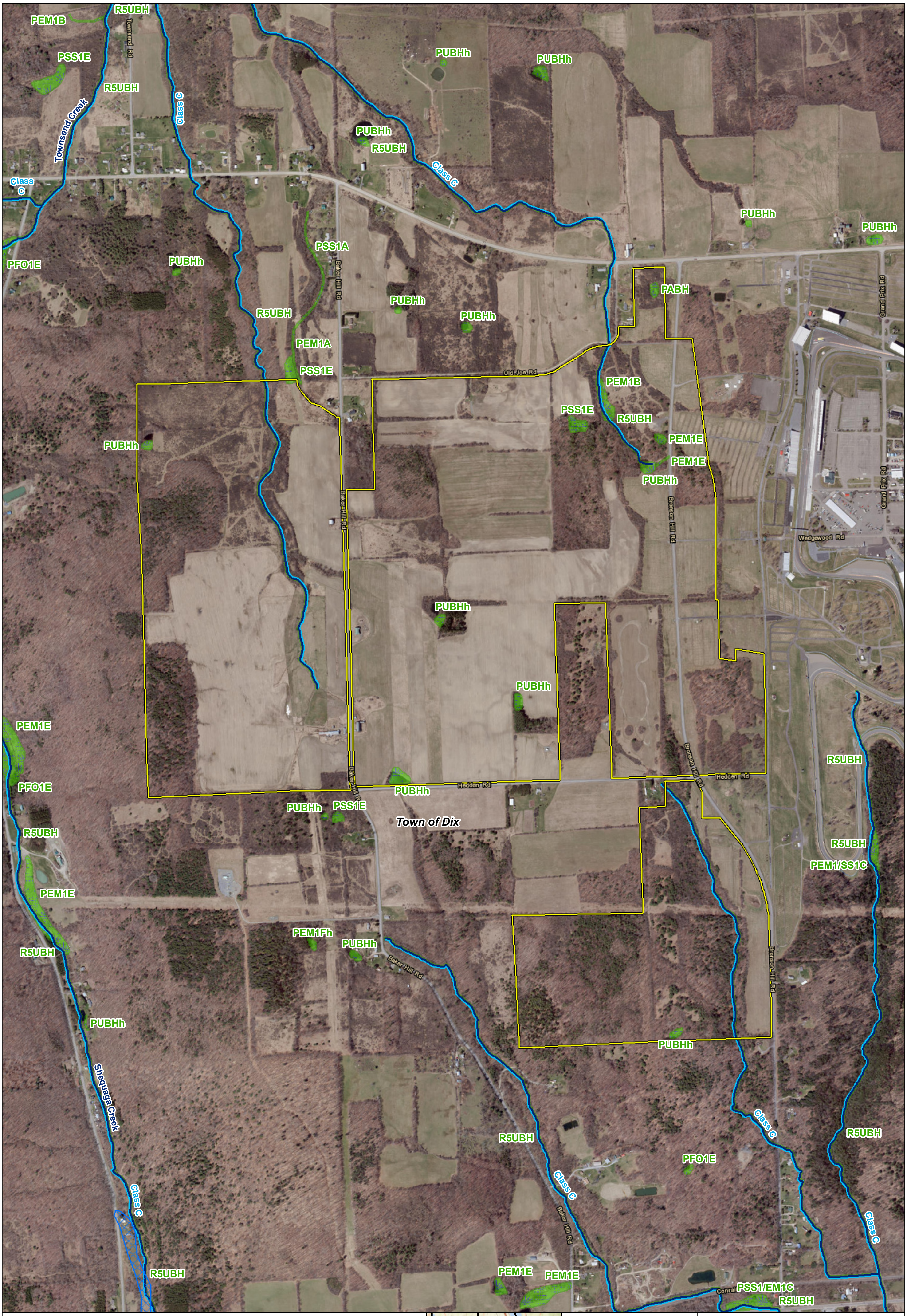
NEXTera ENERGY

SOILS MAP

WATKINS GLEN SOLAR ENERGY CENTER, LLC
TOWN OF DIX, NY

FIGURE 2 | JANUARY 2020

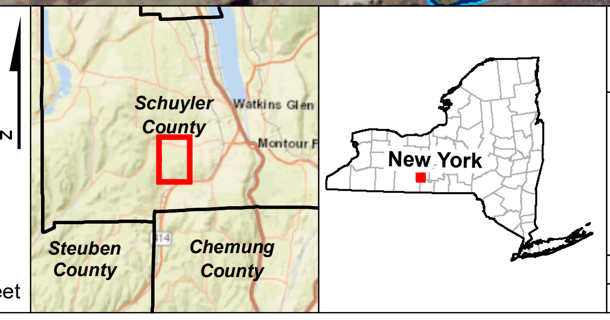
Map Produced by TRC



- Project Area
- NWI Wetland
- NHD Stream
- NYSDEC Classified Stream
- Special Flood Hazard Area

Data: NYSDEC, USFWS NWI, USGS NHD, FEMA
Base Map: Esri and its contributors

0 500 1,000
Feet



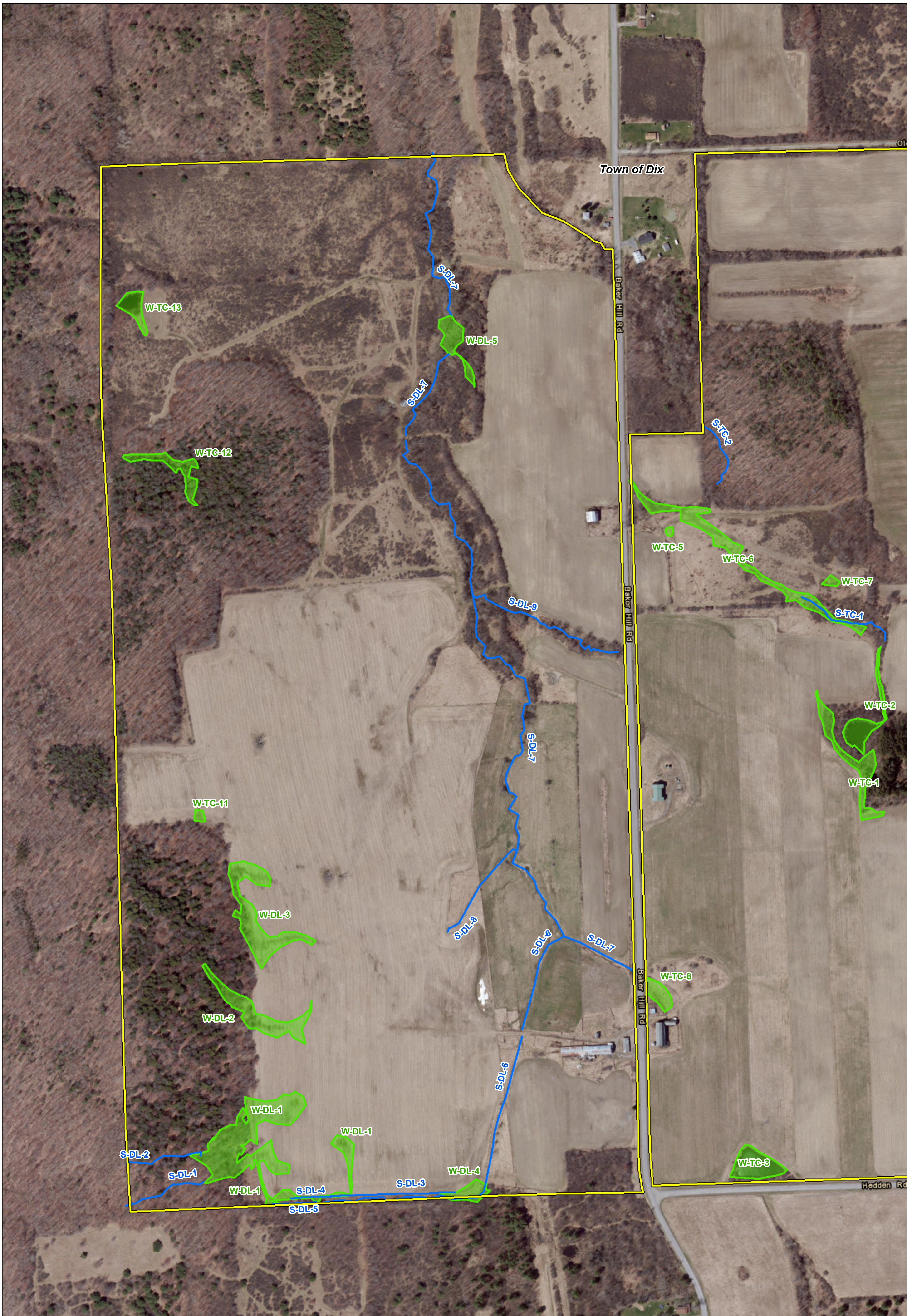
NEXTera ENERGY

FEDERAL AND STATE WETLAND, WATERBODY, AND FLOODPLAIN MAPPING

WATKINS GLEN SOLAR ENERGY CENTER, LLC
TOWN OF DIX, NY

FIGURE 3	JANUARY 2020

Map Produced by TRC



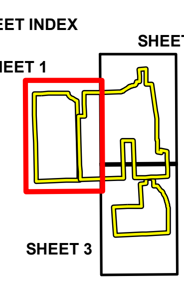
- Project Area
- Culvert
- Delineated Stream
- Delineated Drainage
- Delineated Wetland Line
- Delineated Wetland
- Delineated Vernal Pool
- Delineated Stream Top of Bank

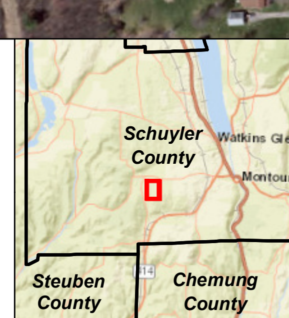
N

0 200 400 Feet

Data: TRC 2017/2019
Base Map: Esri and its contributors

SHEET INDEX





NEXTera ENERGY RESOURCES

DELINEATED RESOURCES
WATKINS GLEN SOLAR ENERGY CENTER, LLC
TOWN OF DIX, NY

FIGURE 4	SHEET 1 OF 3	JANUARY 2020

Map Produced by TRC

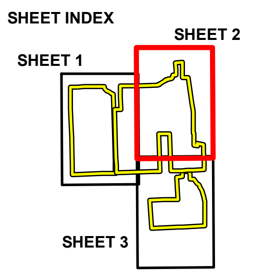
Project Area
Culvert
Delineated Stream
Delineated Drainage
Delineated Wetland Line
Delineated Wetland
Delineated Vernal Pool
Delineated Stream Top of Bank

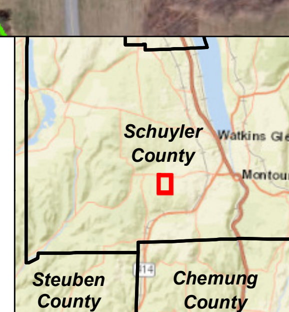
N

Data: TRC 2017/2019
Base Map: Esri and its contributors

0 200 400 Feet

SHEET INDEX





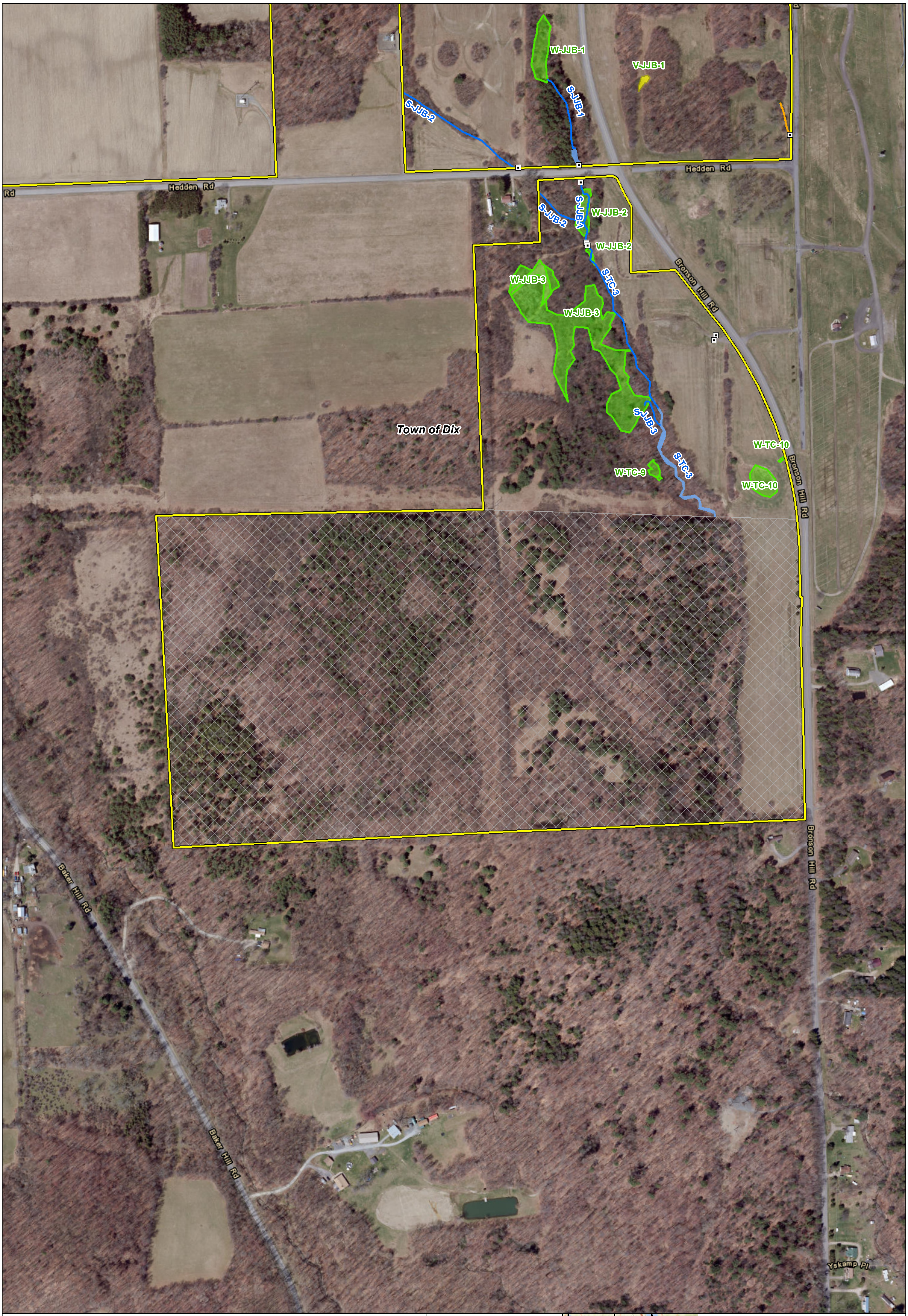
NEXTera ENERGY RESOURCES

DELINEATED RESOURCES

WATKINS GLEN SOLAR ENERGY CENTER, LLC
TOWN OF DIX, NY

FIGURE 4	SHEET 2 OF 3	JANUARY 2020

Map Produced by TRC



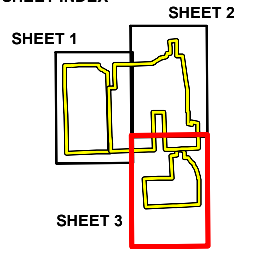
- Project Area
- Culvert
- Delineated Stream
- Delineated Drainage
- Delineated Wetland Line
- Delineated Wetland
- Delineated Vernal Pool
- Delineated Stream Top of Bank
- Outside of Delineation Limits

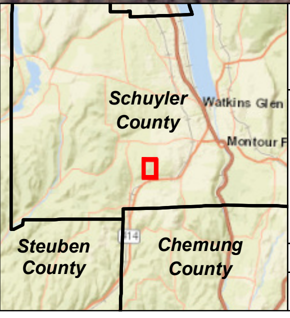
Data: TRC 2017/2019
Base Map: Esri and its contributors

0 200 400
Feet

N

SHEET INDEX





NEXTera ENERGY RESOURCES

DELINEATED RESOURCES

WATKINS GLEN SOLAR ENERGY CENTER, LLC
TOWN OF DIX, NY

FIGURE 4	SHEET 3 OF 3	JANUARY 2020

Map Produced by TRC

APPENDIX B
Photograph Log

Photograph 1: Palustrine Emergent wetland (PEM) W-DL-1, looking south. Taken on 6/7/2017

Photograph 2: PEM wetland W-DL-2, looking north. Taken on 6/7/2017

Photograph 3: PEM wetland W-DL-3, looking northwest. Photo taken on 6/7/2017.

Photograph 4: PEM wetland W-DL-4, looking south. Photo taken on 6/7/2017.

Photograph 5: PFO wetland W-DL-5, looking northeast. Photo taken on 6/7/2017.

Photograph 6: PEM portion of wetland W-TC-1, looking south. Photo taken on 6/7/2017.

Photograph 7: Palustrine unconsolidated bottom (PUB) portion of wetland W-TC-2, looking northwest. Photo taken on 6/7/2017.

Photograph 8: PEM portion of wetland W-TC-2, looking south. Photo taken on 6/7/2017.

Photograph 9: PUB wetland W-TC-3, looking east. Photo taken on 6/7/2017.

Photograph 10: PUB wetland W-TC-4, looking east. Photo taken on 6/7/2017.

Photograph 11: PEM wetland W-TC-5, looking east. Photo taken on 6/7/2017.

Photograph 12: PEM portion of wetland W-TC-6, looking northeast. Photo taken on 6/7/2017.

Photograph 13: PEM wetland W-TC-7 looking southeast. Photo taken on 6/7/2017.

Photograph 14: PEM wetland W-TC-8, looking southeast. Photo taken on 6/7/2017.

Photograph 15: PFO wetland W-TC-9, looking east near stream S-TC-3. Photo taken on 6/7/2017.

Photograph 16: PEM wetland W-TC-10, looking southwest. Photo taken on 6/7/2017.

Photograph 17: PEM wetland W-TC-11, looking north. Photo taken on 6/8/2017.

Photograph 18: PEM wetland W-TC-12. Looking west. Photo taken on 6/8/2017.

Photograph 19: PEM wetland W-TC-13, looking north. Photo taken on 6/8/2017.

Photograph 20: PSS wetland W-JJB-1, facing southwest. Photo taken on 4/22/2019.

Photograph 21: PEM wetland W-JJB-2 and intermittent section of stream S-TC-3, facing southeast. Photo taken on 4/22/2019.

Photograph 22: PSS wetland W-JJB-4, facing southwest. Photo taken on 4/23/2019.

Photograph 23: PEM wetland W-JJB-5, facing northeast. Photo taken on 4/23/2019.

Photograph 24: PEM wetland W-JJB-6, facing west. Photo taken on 4/23/2019.

Photograph 25: PSS wetland W-JJB-7, facing south. Photo taken on 4/23/2019.

Photograph 26: PUB wetland W-JJB-9, facing northwest. Photo taken on 4/24/2019.

Photograph 27: PEM wetland W-JJB-10, facing east. Photo taken on 4/24/2019.

Photograph 28: PEM wetland W-JJB-11, facing east. Photo taken on 4/25/2019.

Photograph 29: PFO wetland W-JJB-12, facing west. Photo taken on 4/25/2019.

Photograph 30: PEM wetland W-JJB-13, facing east. Photo taken on 4/25/2019.

Photograph 31: PSS wetland W-JJB-14, facing southwest. Photo taken on 4/25/2019.

Photograph 32: PFO wetland W-JJB-15, facing northwest. Photo taken on 4/25/2019.

Photograph 33: PFO wetland W-JJB-15, facing northwest. Photo taken on 4/25/2019.

Photograph 34: Intermittent stream S-DL-1, looking west downstream. Photo taken on 6/6/2017.

Photograph 35: Intermittent stream S-DL-2, looking west downstream. Photo taken on 6/6/2017.

Photograph 36: Intermittent stream S-DL-3, looking east toward W-DL-4. Photo taken on 6/6/2017.

Photograph 37: Intermittent stream S-DL-4, looking west toward W-DL-1. Photo taken on 6/7/2017.

Photograph 38: Intermittent stream S-DL-5, looking west toward W-DL-1. Photo taken on 6/7/2017.

Photograph 39: Intermittent stream S-DL-6, looking east toward W-DL-4. Photo taken on 6/7/2017.

Photograph 40: Perennial stream S-DL-7, looking north downstream. Photo taken on 6/7/2017.

Photograph 41: Intermittent stream S-DL-8, looking northeast downstream. Photo taken on 6/7/2017.

Photograph 42: Intermittent stream S-DL-9, looking west downstream. Photo taken on 6/8/2017.

Photograph 43: Intermittent stream S-TC-1, looking northwest downstream. Photo taken on 6/6/2017.

Photograph 44: Intermittent stream S-TC-2, looking north downstream. Photo taken on 6/7/2017.

Photograph 45: Perennial section of stream S-TC-3, looking north downstream. Photo taken on 6/7/2017.

Photograph 46: Intermittent section of stream S-TC-3, looking south downstream. Photo taken on 4/23/2019.

Photograph 47: Intermittent stream S-JJB-2, looking northwest upstream. Photo taken on 4/23/2019.

Photograph 48: Intermittent stream S-JJB-3, looking northwest upstream. Photo taken on 4/23/2019.

Photograph 49: Intermittent stream S-JJB-4, looking southeast downstream. Photo taken on 4/23/2019.

Photograph 50: Intermittent stream S-JJB-5, looking south downstream. Photo taken on 4/23/2019.

Photograph 51: Intermittent stream S-JJB-6, looking southeast downstream. Photo taken on 4/24/2019.

Photograph 52: Intermittent stream S-JJB-7, looking north upstream. Photo taken on 4/24/2019.

Photograph 53: Intermittent stream S-JJB-8, looking north downstream. Photo taken on 4/25/2019.

Photograph 54: Intermittent stream S-JJB-10, looking south upstream. Photo taken on 4/25/2019.

Photograph 55: Intermittent stream S-JJB-11, looking south upstream. Photo taken on 4/25/2019.

Photograph 56: Intermittent stream S-JJB-12, looking north downstream. Photo taken on 4/25/2019.

Photograph 57: Intermittent stream S-JJB-14, looking north downstream. Photo taken on 4/26/2019.

APPENDIX C
USACE Routine Wetland Determination Forms
&
TRC's Stream Inventory Data Forms
(Can be provided under separate cover)