Visual Impact Assessment

South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

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July 2021

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1.0 INTRODUCTION

1.1 Purpose of the Investigation

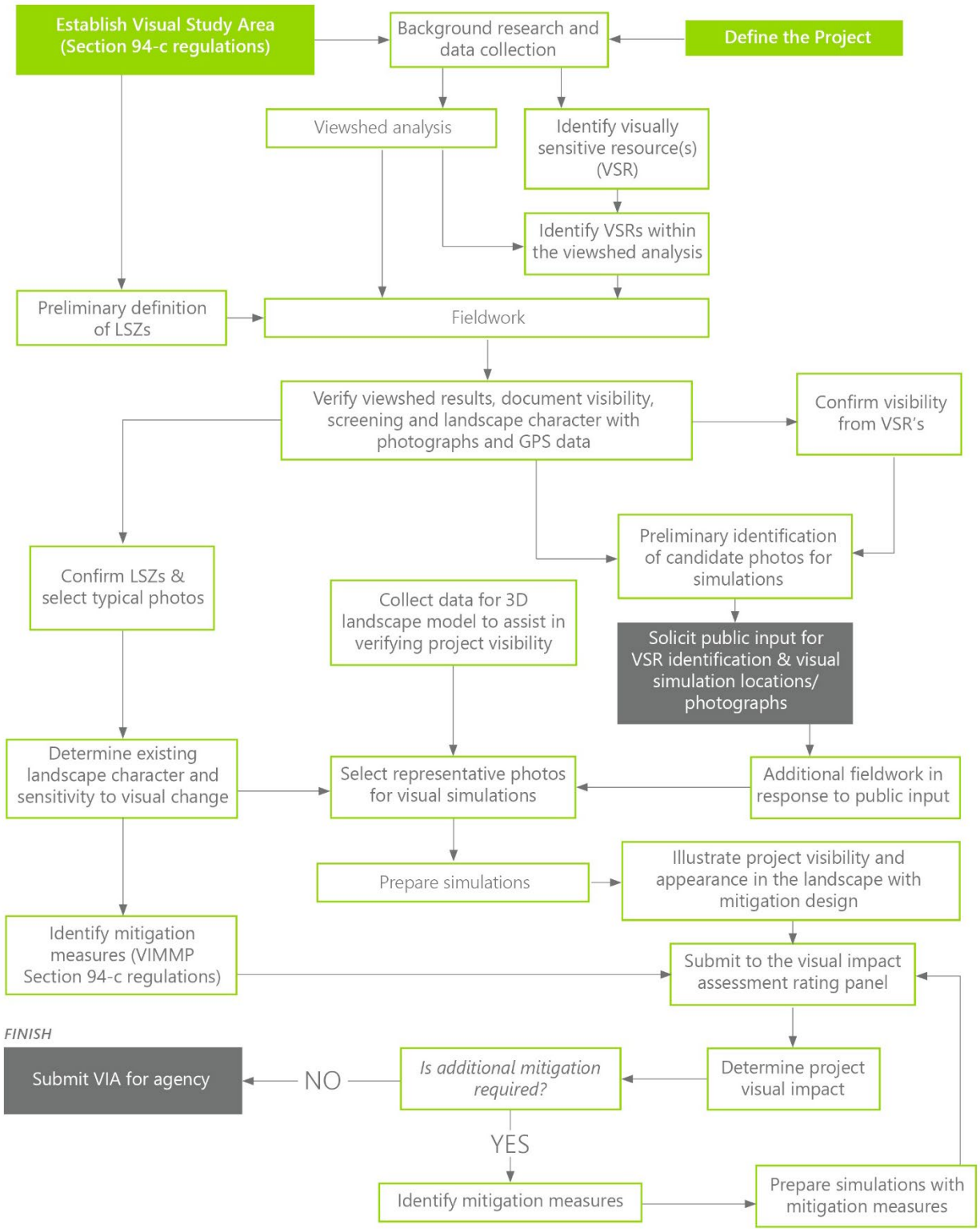
On behalf of ConnectGen Chautauqua County LLC (the Applicant) Environmental Design & Research, D.P.C. (EDR) conducted a Visual Impact Assessment (VIA) for the proposed South Ripley Solar Project (the Facility), located in the Town of Ripley, Chautauqua County, New York. This VIA was prepared in support of the Facility's review under Chapter XVIII, Title 19 of NYCRR Part 900, §900-2.9 (Section 94-c of the New York State Executive Law; hereafter referred to as Section 94-c). It is intended to assist the Office of Renewable Energy Siting (ORES), other state agencies, interested stakeholders, and the public in their review of the proposed Facility in accordance with the requirements of Section 94-c. The purpose of this VIA is to:

- Define the aesthetic character of the visual study area (VSA).
- Inventory and evaluate existing visual resources and viewer groups within the VSA.
- Describe the appearance of the visible components of the proposed Facility.
- Evaluate potential Facility visibility within the VSA, including the visibility of all above-ground infrastructure.
- Identify key views for visual assessment.
- Assess the visual impacts associated with the proposed Facility.
- Determine the need for visual mitigation and propose conceptual mitigation options.

Figure 1.1-1 Regional Facility Location

This VIA was prepared by environmental professionals with educational and career experience in the evaluation of visual impact. As described in more detail in subsequent sections, the VIA methodology and content are consistent with the policies, procedures, and guidelines contained in established visual impact assessment methodologies (see Literature Cited/References in Section 7.0 of this report), and was prepared in accordance with the requirements of Section 94-c. The VIA process followed by EDR is outlined in Figure 1.1-2 (below).

Figure 1.1-2 Visual Impact Assessment Process



2.0 FACILITY DESCRIPTION

The proposed Facility is a utility-scale solar generating project located in Chautauqua County, New York with a generating capacity of up to 270 megawatts (MW). The proposed components of the Facility will include approximately 833 acres of photovoltaic (PV) panels and their racking/support systems, located within 62 individual areas containing a total of 90 PV arrays; direct current (DC) and communications cables connecting the panels to multiple inverters located at the perimeter of the solar arrays; control electronics and step-up transformers; underground and overhead collector circuits; fencing and gates around each PV array; access roads; temporary laydown areas; a battery energy storage system (BESS) with up to 20 MW of battery energy storage capacity; equipment storage containers at the BESS site; a collection substation and a point of interconnection (POI) at an existing substation.

The proposed Facility Site and Facility components are described in greater detail in Sections 2.1 and 2.2 below.

2.1 Facility Site

The proposed Facility Site includes approximately 3,382 acres of leased private land in the Town of Ripley, Chautauqua County, New York. The site is bounded by the New York-Pennsylvania border to the west, the Town of Mina to the south, the Town of Westfield to the west, and Twentymile Creek to the north (Figure 2.1-1). The area of ground disturbance associated with the construction and operation of the Facility will be approximately 1,295 acres. The Facility Site is located at the northern edge of the Allegheny Plateau physiographic region, with elevations ranging from approximately 1,139 feet to approximately 1,634 feet above mean sea level (AMSL). This area can generally be characterized as an undulating landscape with moderate slopes, occasionally becoming steep around river valleys and gorges (such as Twentymile Creek). The Facility Site is near the border of the Erie-Ontario Lowlands, so elevations to the north are lower and become higher and more variable to the south. The proposed PV arrays are primarily located on level to gently sloping agricultural and post-agricultural fields. However, some of the PV arrays are also proposed within existing woodlots and within the boundaries of large, contiguous forested areas.

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Figure 2.1-1: Bounding Features of the Facility Site and Facility Layout

- Access Road
- Underground Collection Line
- Overhead Collection Line
- Inverter
- Battery Energy Storage System
- Collection Substation
- Laydown Yard
- PV Panel Area
- Fenceline
- Facility Site
- Town Boundary
- State Boundary

Notes: **1.** Basemap: USDA NAIP "2019 New York 60cm" orthoimagery map service. **2.** This map was generated in ArcMap on July 2, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

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2.2 Proposed Facility

2.2.1 Solar Arrays

The Facility includes 90 separate groups of PV panels (i.e., PV arrays or solar arrays) ranging in size from approximately 0.3 to 45.3 acres. Each solar array is surrounded by security fencing and consists of PV panels mounted on racking and arranged in parallel rows. The preliminary design specifies that the distance between rows of PV panels will be approximately 32 feet on-center. In total, the solar arrays will occupy approximately 833.3 acres within the 3,382-acre Facility Site.

The PV panels will be mounted on a fixed-tilt racking system. Fixed-tilt racking systems consist of a steel frame (piles driven into the ground) that creates a "table" on which the individual PV panels are mounted. The panels are fastened together to create continuous rows. The rows of PV panels will generally follow the existing topography of the Facility Site. However, limited grading could be required for installation in areas where slopes exceed 10%. Rows will be aligned east to west, with the PV panels tilted to the south at a fixed angle of 30 degrees from horizontal. The PV panels will have a maximum height of approximately 13 feet above the ground at their highest point. The PV panels are the major above-ground component of the proposed Facility, and therefore are the focus of this VIA (see Figure 2.2-1).

Above-ground electrical components of the Facility (not including the overhead collection lines) will be fenced for public safety and site security. For the purpose of this VIA, it was assumed that the solar arrays would be surrounded by a 6-foot-tall chain link security fencing with an additional top strand of barbed wire set approximately 1 foot above the chain link panels bringing the total height to 7 feet. The perimeter security fence consists of posts spaced approximately 8 feet apart, 2-inch diamond mesh wire, and lateral support posts (as needed). All fencing materials will be galvanized steel. Entry gates will occur at each of the PV array access points, along Facility access roads. The substation and BESS will also be fenced in accordance with applicable regulations and standards.

The general design criteria for the Facility includes specific setbacks from various types of adjacent uses. Based on the layout used in this VIA the average fence setback from public roads is approximately 80 feet and ranges from 15 feet to 275 feet. Perimeter fence setback from adjacent residential parcels averages approximately 112 feet and from adjacent vacant parcels is approximately 95 feet. See additional discussion of setbacks required by Local Laws and Ordinances in Exhibit 5 and Exhibit 24 of the Section 94-c Application.

All proposed fencing and setbacks are incorporated into the proposed Facility layout and illustrated in the visual simulations included in this VIA. To further protect the public, warning signs will be posted on the gates and/or fences that enclose the solar arrays. Such signs are not considered in the VIA due to their relatively small size and because their design and placement are unknown at this time.

2.2.2 Electrical System

The electricity generated by the PV panels will be delivered to the existing electrical grid via a network of underground and overhead low and medium voltage electric cables. These cables collect electricity generated from each PV Array (PV panels, inverters, and transformers feeds into the collection system) and connect to the collection substation for delivery of generated power onto the high voltage electrical grid through the POI. These electrical system components are described in greater detail below.

Collection System: Within and between each PV array, an approximately 22-mile network of buried electric lines will collect power from the inverters/transformers within each PV array and transmit it to the collection substation. In addition, approximately 4.5 miles of overhead collection lines will be required to facilitate the connection in areas where underground burial is not practicable (based on environmental and engineering constraints). The overhead portion of the collection system generally begins along a small portion of County Route 6 (Northeast Sherman Road) near the intersection with Sinden Road and continues west though a relatively remote, forested section of the Facility Site before crossing County Touring Route 3. After crossing County Touring Route 3 (Miller Road), the overhead collection line continues in a generally northwesterly direction through agricultural and forested land until reaching the proposed collection substation and POI adjacent to County Route 6. In addition, an approximately 665-foot section of overhead line will be required to cross Twentymile Creek between County Route 6 and New York State Route 76 (Sherman Road) in a heavily forested portion of the Facility Site. Where visible, the overhead collection system is illustrated in the visual simulations included in this VIA.

Medium Voltage Inverters/transformers: Each PV array will include one or more medium voltage paired inverter(s) and transformer(s), which resemble small storage containers, and will be installed on metal skids or concrete pads set on the ground surface. The inverters and transformers will be located within or on the edge of the PV arrays, are anticipated to have a maximum height of approximately 8 feet and will be painted off-white to grey. Inverters and transformers are primarily screened from view by the PV panels within each PV array. In the simulations they are only visible in views that feature moderate to substantial grade change. An illustration of the inverter unit is included below in Figure 2.2-2.

Collection Substation: The collection substation will be located at the western edge of the Facility Site on a parcel south of County Road 6 in the Town of Ripley. Components of the station will include standard electrical, control, and protective equipment, including collection line feeders, high-voltage breakers, metering/relaying transformers, disconnect switches, and an equipment enclosure containing power control electronics. This equipment will generally not exceed approximately 28 feet in height. The tallest components of the collection substation are the lightning masts, which are anticipated to be up to 70 feet tall. The area will be surfaced with crushed stone and enclosed within chain-link fencing, occupying an area measuring approximately 350 feet long by 209 feet wide. The collection substation plan and elevation are illustrated in Figure 2.2-3. Lighting associated with the collection substation will be directed downward at a 30-degree tilt angle to minimize off-site light spillage. Additionally, all lighting will be operated manually or placed on an auto-off switch to further minimize the impacts of off-site light spillage. A simulation of the collection substation is included in the VIA. An illustration of the collection substation is included below in Figure 2.2-3.

Battery Energy Storage System: The BESS is proposed to be located adjacent to the collection substation southwest of County Road 6. The BESS site will consist of an area approximately 613 feet long by 152 feet wide and will be surfaced with crushed stone and enclosed within chain-link fencing. The BESS will include 21 steel storage containers, each measuring approximately 55.7 feet long, 10 feet wide, and 10.3 feet high. The units will resemble shipping containers and will be painted a neutral off-white color. Within the fence, the site will be encircled by a gravel access road and outside of the fence a separate access road will provide access to an emergency response water source measuring approximately 400 feet long and 90 feet wide. The site will have full cut-off overhead light fixtures which will be directed downward and only illuminated when the site is being accessed for maintenance. Figure 2.2-4 provides an illustration of the BESS. A simulation of the BESS is included in the VIA.

Two steel storage containers, each approximately 40 feet long and 8 feet wide with a total height of approximately 12 feet, are also proposed to be located along BESS access road for general Facility storage purposes.

The potential visual effects associated with the overhead collection system, collection substation, and BESS, is described in Section 5 of this VIA. Lighting of these Facility components is described in the Lighting Plan included in the Visual Impact Minimization and Mitigation Plan (VIMMP) (see Appendix 8-B of the Section 94-c Application).

Figure 2.2-1 PV Panel Dimensions

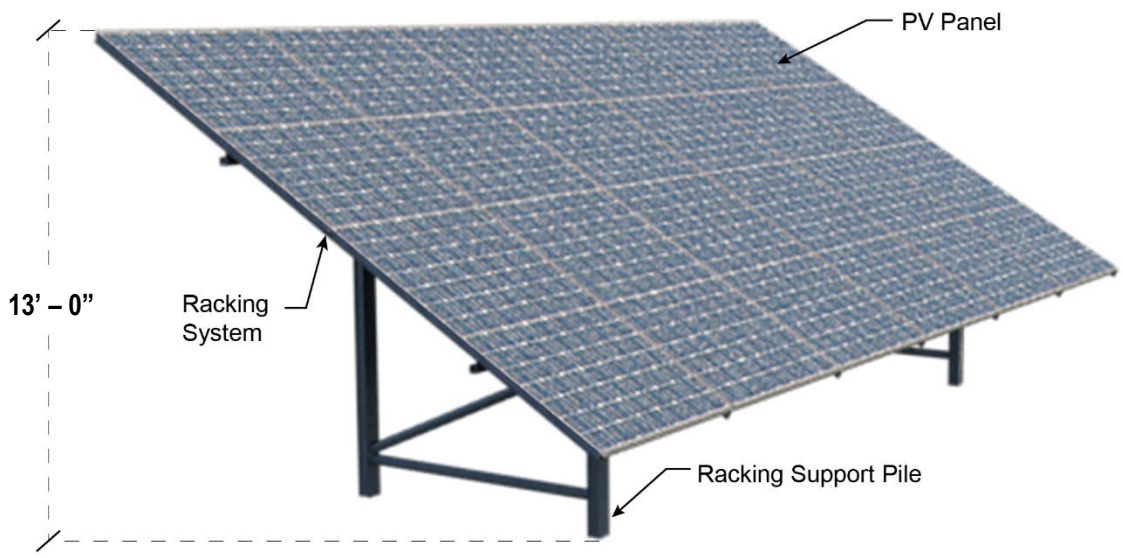


Figure 2.2-2 Inverter Unit Dimensions

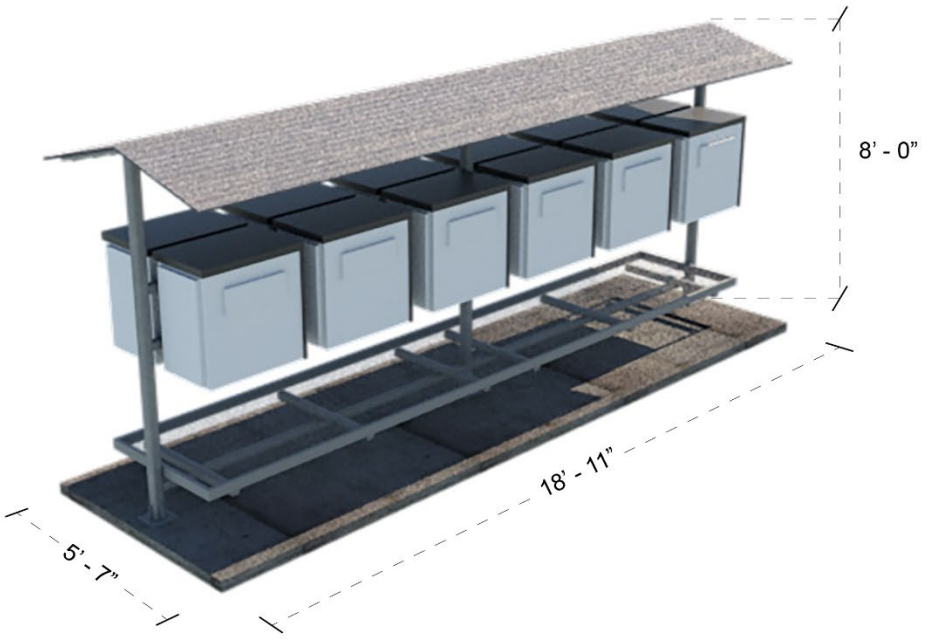


Figure 2.2-3 Collection Substation Dimensions

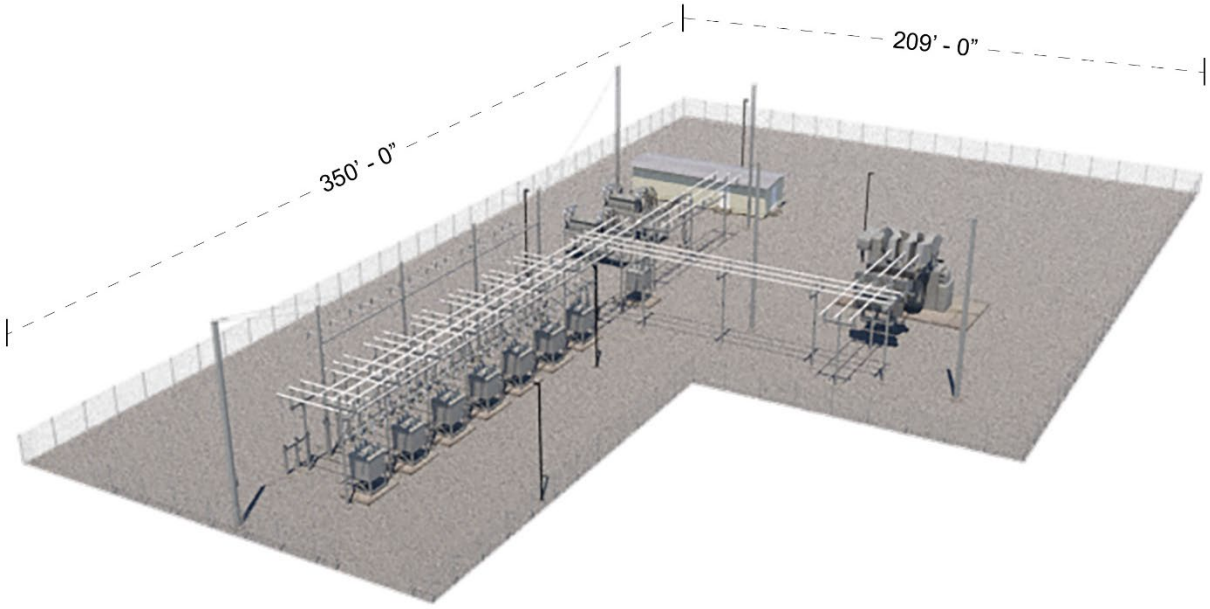
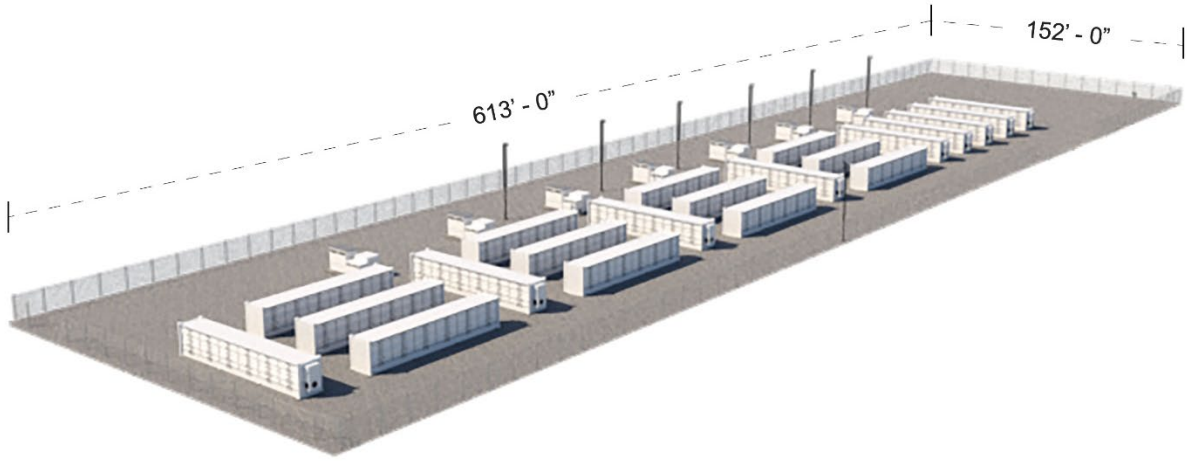


Figure 2.2-4 Battery Energy Storage System Dimensions



2.2.3 Access Roads

The PV arrays will be served by a network of access roads totaling approximately 15.7 miles. These roads will allow for delivery of Facility components during construction and access to the Facility for maintenance purposes during operation. The access roads for the Facility are anticipated to be surfaced with crushed stone or gravel and will be approximately 20 feet wide. The proposed access roads represent relatively minor alterations to the landscape that are rarely visible due to their low profile, unpaved surface, and location primarily within the PV arrays. However, as part of this VIA, access roads are shown in any simulations where they will be visible. A typical access road is depicted in Figure 2.2-5 below. Temporary visual impacts associated with the construction of these facilities are discussed in Section 5.3.5 of this VIA.

Figure 2.2-5 Photograph of a Typical Access Road

2.2.4 Temporary Laydown Areas

Construction of the Facility will require the development of seven temporary laydown areas which will accommodate construction trailers, storage containers, construction materials, and parking for construction workers. The laydown areas will be located north and south of County Highway 6, west of Sinden Road, and east of New York State Route 76 (Sherman Road), in the Town of Ripley, and will range from approximately 2.8 to 5.5 acres in size. The laydown areas are temporary features that will be removed at the end of construction. No permanent fencing, permanent lighting or future use (for the purpose of construction siting) of the laydown areas is proposed. Temporary visual impacts associated with construction of the Facility, including the laydown areas are discussed in Section 5.3.5 of the VIA.

2.2.5 Equipment Storage Containers

No new off-site operations and maintenance (O&M) building is being proposed as part of the Facility; however, a standard trailer-style enclosure will be located within the Collection Substation that will house Facility monitoring, control, and protection systems and a space for on-site technicians to work. Additionally, the Applicant intends to use two storage containers at the BESS site off County Route 6 in the Town of Ripley. Accordingly, an O&M facility is not addressed in this VIA outside of the inclusion within the collection substation as seen in Figure 2.2-3.

2.2.6 Vegetative Screening

The Facility will include perimeter visual mitigation plantings at identified locations to integrate the proposed solar arrays with adjacent vegetation and soften views of the Facility within the surrounding landscape. Proposed vegetative screening following five to seven years of growth is shown in all visual simulations where such plantings are proposed. For more information on the Facility's conceptual mitigation planting plan, see the VIMMP in Appendix 8-B of the Section 94-c Application.

3.0 EXISTING VISUAL CHARACTER

3.1 Definition of Visual Study Area

Section 94-c (§900-2.9 Exhibit 8: Visual Impacts) references a "VIA study area" but does not specifically define the required size of this study area. However, the Section 94-c regulations include the following requirement:

"*Viewshed maps depicting areas of facility visibility within two (2) miles of a solar facility and five (5) miles of a wind facility, as well as any potential visibility from specific significant visual resources beyond the specified study area, shall be prepared…*"

As viewshed maps define a project's area of potential visual impact, the viewshed radius essentially defines the visual study area (VSA). Consequently, the South Ripley Solar Project VSA has been defined as the area within 2-miles of the Facility Site consistent with the viewshed mapping required by the Section 94-c regulations. This VSA was used for all the visual analyses presented herein (i.e., viewshed analysis [for both the PV arrays, collection substation, overhead collection poles, and BESS], field verification, and visual simulations). It should be noted that any visually sensitive resources (VSRs) with federal jurisdiction (e.g., National Register of Historic Places, National Natural Landmarks, National Wildlife Refuges) were identified within 5 miles of the Facility, in accordance with the requirements of Section 94-c (§900-1.2).

The 2-mile radius VSA covers an approximate 44 square mile area and includes portions of the Towns of Ripley, Mina, Westfield, and Sherman, all of which occur within Chautauqua County. The VSA is illustrated in Figure 3.1-1 and a description of the visual setting within the VSA is provided below.

*Please note that the 2-Mile Visual Study Area is defined as a 2-mile radius from the Facility Site, whereas the distance zones are defined by distance to visible Facility Components (PV Panels, Substation, Battery Energy Storage System, Overhead Collection Line).

Middle Ground

Foreground

Near-Foreground

0.5-Mile

1.5 Miles

Pennsylvania

New York

Irish Rd

Sprague Rd

Johnson Rd

Ottoway Rd

Kerr Rd

NE Sherman Rd (RT 6)

S Ripley Rd

Town of Ripley

Town of Westfield

Parker Rd

RT-21

Napper Rd

Jones Rd

Kent Rd

Colton Rd

Miller Rd (RT 3)

Klondyke Rd

Sulphur Springs Rd

Kupta Rd

Camp Rd

Town of Mina

Town of Sherman

Hazen Rd

Sherman-Findley Lake Rd

Southern Tier Expy

Twentymile Creek

West Branch French Creek

76

86

N

W

E

S

0 1,000 2,000 4,000 Feet

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Figure 3.1-1: Visual Study Area

- Distance Zone Transition
- Overhead Collection Line
- Battery Energy Storage System
- Substation
- PV Panel Area
- Facility Site
- 2-Mile Visual Study Area
- Town Boundary
- State Boundary

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. **2.** This map was generated in ArcMap on July 2, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

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3.2 Physiographic/Visual Setting

3.2.1 Landform and Vegetation

The VSA is located within the New York State Low Lime Drift Plain subregion of the Erie Drift Plane Ecoregion which marks the region between the Allegheny Plateau (southern portion of the VSA) and the Erie/Ontario Lake Plain (Bryce, et. al. 2010). This subregion is defined by an irregular plain containing moraines, kames, kettle ponds, and poorly drained depressions. The poorly drained soils historically hosted beech-maple forest with hemlock in better drained areas. Elevations within the VSA range from approximately 766 feet to 1,799 feet AMSL. The VSA is primarily a forested landscape, particularly in the higher and steeper portions of the plateau. These forested areas are interrupted by a patchwork of agricultural fields and pastures which typically have undulating topography and are enclosed by adjacent forest and woodlots.

3.2.2 Land Use

The majority of the VSA consists of mixed deciduous forest vegetation with use generally limited to outdoor recreation and timber harvest. Active land uses within the VSA consist primarily of agricultural and rural residential uses. The majority of the agricultural land within the VSA is actively managed pastureland and hayfields. Development consists primarily of widely scattered rural homes and farms, with a few areas of more regular settlement along County Route 64, Miller Road, State Line Road, and New York State Route 76.

3.2.3 Water Features

The VSA is within the Chautauqua-Conneaut (HUC 04120101) watershed, on the southwestern edge of New York State along Lake Erie. This watershed's northern boundary connects to the southeastern boundary of Lake Erie, which is located over 3 miles to the north of the VSA. National Wetlands Inventory (NWI) mapping indicates the presence of 32 wetland communities within the VSA, consisting primarily of forested/shrub wetlands. Other NWI-mapped communities within the VSA include emergent wetlands, unnamed open water ponds and lakes, and riverine wetlands (USFWS, 2021). Named streams in the vicinity of the VSA include Twentymile Creek, Chautauqua Creek, and West Branch French Creek. Despite numerous small open water bodies scattered throughout the VSA, there are no individually named lakes or ponds.

3.3 Landscape Similarity Zones

In accordance with the requirements set forth in 19 NYCRR § 900.8(b)(1), Landscape Similarity Zones (LSZs) were defined and mapped within the VSA. Defining distinct landscape types within a given study area provides a useful framework for the analysis of a project's potential visual effects. LSZs within the VSA were defined based on the similarity of various landscape characteristics including landform, vegetation, water, and land use patterns, in accordance with established visual assessment methods (notably, USDA Forest Service, 1995; Smardon et al., 1988: USDOT Federal Highway Administration, 1981; USDI Bureau of Land Management, 1984, 1999). Within the VSA, the following four distinct LSZs were identified:

- Forest
- Rural Residential/Agricultural
- River Gorge

- Transportation Corridor

LSZs within the 2-mile study area were mapped using a Geographic Information System (GIS) classification exercise. The LSZ classifications are based on aerial imagery, mapped land cover, and proximity to various landscape or land use features. The mapping of LSZs is a generalization exercise intended for viewing at the macroscopic scale of the entire study area. Therefore, it is possible that field review at a given viewpoint would change the initial GIS-derived LSZ classification based on observed landscape characteristics that are beyond the scale of the GIS analysis. The classification analysis is subtractive, meaning that a given criterion is used to classify a portion of the VSA as a particular LSZ, and then the next criterion is applied to classify portions of the remaining land, and so forth until the entire area is mapped. The classification and mapping of LSZs within the VSA followed the following order of criteria:

- The Transportation Corridor LSZ is identified as areas within 300 feet of the Interstate Route 86 centerline from the New York State Streets dataset published by the New York State GIS Program Office.
- The River Gorge LSZ was identified using topographic data to identify shale cliffs and areas within 150 feet of Twentymile Creek and Belson Creek. Aerial imagery was then used to refine the boundaries of the River Gorge LSZ based on the presence of recognizable cliffs and exposed rock.
- The Forest LSZ is primarily comprised of deciduous forest, evergreen forest, mixed forest, and woody wetlands, (along with small areas of emergent wetland occurring entirely within contiguous forest areas), as defined by the 2016 USGS National Land Cover Dataset (NLCD).
- Finally, The Rural Residential/Agricultural LSZ is comprised of the remaining area which primarily includes Shrub/Scrub, Grassland/Herbaceous, Pasture/Hay, Cultivated Crops, and Developed (including Open Space, Low, Medium, and High) land covers, as identified in the NLCD. Emergent wetlands, as defined by the NLCD, were also included in the Rural Residential/Agricultural LSZ where they occurred adjacent to or within Shrub/Scrub, Grassland/Herbaceous, Pasture/Hay, or Cultivated Crop areas.

The extent of each LSZ within the visual study area is summarized in Table 3.3-1 and depicted in Figure 3.1-2. Descriptions of the visual characteristics of each LSZ, along with representative photographs, are provided in Sections 3.3.1 through 3.3.6, below.

Table 3.3-1 Landscape Similarity Zones

Landscape Similarity Zone	Total Area of LSZ within the Visual Study Area (square miles)	Percent of Total Area[1] within Visual Study Area
Forest	28.6	65.3%
Rural Residential/Agricultural	13.3	30.3%
River Gorge	1.6	3.7%
Transportation Corridor	0.3	0.7%

[1]The visual study area includes approximately 43.8 square miles, or approximately 28,026 acres

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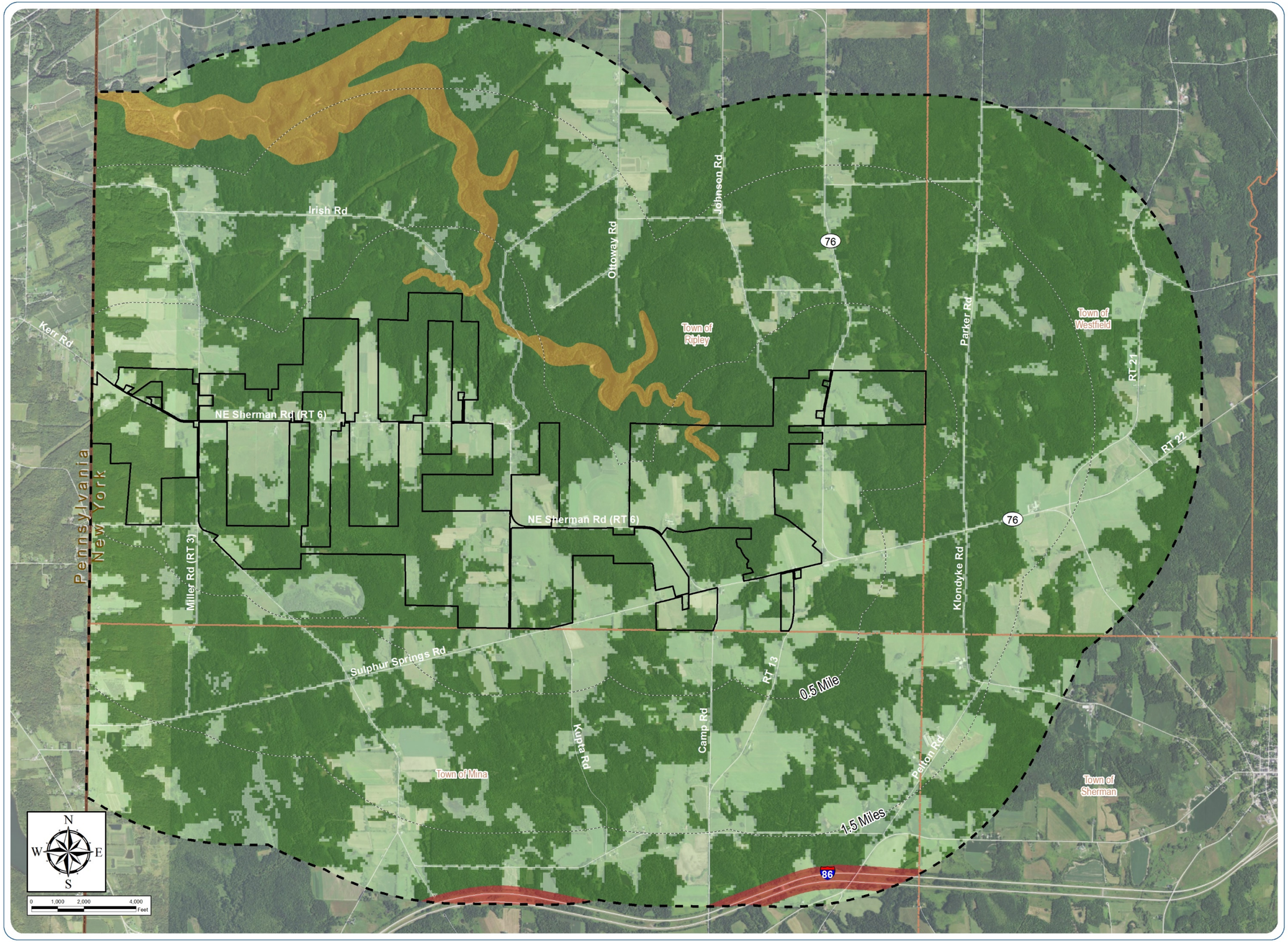
Figure 3.3-1: Landscape Similarity Zones



Landscape Similarity Zone

- Forest
- Gorge
- Rural Residential/Agriculture
- Transportation Corridor
- Distance Zone Transition
- Facility Site
- 2-Mile Visual Study Area
- Town Boundary
- State Boundary

Notes: **1.** Basemap: USDA NAIP "2019 New York 60cm" orthoimagery map service. **2.** This map was generated in ArcMap on July 2, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

3.3.1 Forest

Figure 3.3-1 Representative Photographs of the Forest LSZ

Left: South Ripley Road, Town of Ripley (Viewpoint 18)
Right: Irish Road, Town of Ripley, (Viewpoint 65)

Forested land comprises the largest LSZ, covering approximately 65.3% of the VSA. This LSZ is primarily represented by mixed deciduous forest occurring in large contiguous areas throughout the VSA, with the largest areas found in the northern portion of the VSA. Forest areas are occasionally interrupted by agricultural fields or residential properties occurring within the Rural Residential/Agriculture LSZ, which in concentration, can reduce contiguous forested areas to large woodlots or wide hedgerows. This condition is particularly prevalent in the central and southern portions of the VSA including the Facility Site itself. Typical views within this LSZ are short range and include substantial foreground screening. Where forested areas occur on steep slopes, outward views may be available in areas with sparse vegetative cover and elevated vantage points. This condition is most likely in areas bordering other LSZs with less screening features, such as the Rural Residential/Agricultural or River Gorge LSZs. Users of this LSZ are primarily local residents, drivers on local roadways, and recreational users. While there are limited public recreational amenities within this VSA, private forestlands are often used for recreational activities such as hunting, walking, and the enjoyment of nature.

3.3.2 Rural Residential/Agricultural

Figure 3.3-2 Representative Photographs of the Rural Residential/Agricultural LSZ

Left: County touring Route 3, Town of Ripley (Viewpoint 5).
Right: Northeast Sherman Road, Town of Ripley (Viewpoint 15)

The Rural Residential/Agricultural LSZ is primarily comprised of agricultural fields and low-density residential development. Although this LSZ is found throughout the VSA it is most concentrated in areas south of Twentymile Creek to the southern portion of the VSA. The Rural Residential/Agricultural LSZ can be characterized by relatively small open fields framed or enclosed by large woodlots and forest vegetation. However, where these fields occur in succession, property divisions are often marked by narrow hedgerows composed of deciduous vegetation. The Rural Residential/Agricultural LSZ typically consists of rolling hills with gentle slopes and is conducive to active farming. Often, these agricultural fields have associated homes or farmsteads, which typically occur along the road frontage. This condition is exemplified along County Route 64, Miller Road, and Sinden Road. In these locations residences and farmsteads often occur in small groupings surrounded by landscaped yards with small fields extending to a forest or woodlot. Residential structures range in size, age, and condition, and those associated with farm operations typically include older style farmhouses along with accessory structures such as sheds, barns, and silos. Views from within the Rural Residential/Agricultural LSZ are generally the most open views within the VSA, but typically do not extend beyond the near foreground due to intervening woodlots and forest vegetation. However, topographic highpoints combined with multiple agricultural fields in succession results in some more distant outward views. This condition occurs along portions of County Route 64, where several farms provide opportunities for long-distance, elevated views. User groups within this LSZ are likely limited to local residents and through-travelers (see discussion of viewer groups in Section 3.5).

3.3.3 River Gorge

Figure 3.3-3 Representative Photographs of the River Gorge LSZ

South Ripley Road, Town of Ripley, bridge crossing over Twenty Mile Creek. Photographs were provided by the Town of Ripley.

The River Gorge LSZ occupies approximately 3.7 % of the VSA and includes portions of the Twentymile Creek and Belson Creek valleys along with their forested riparian zones. Within the VSA both Twentymile Creek and Belson Creek are isolated from the surrounding landscape by deep, narrow gorges until they merge to form Gage Gulf in the northwestern portion of the VSA. Views from within the River Gorge LSZ are typically focused inward and oriented upstream and downstream due to the steep, exposed shale walls and abundant vegetation lining the riverbanks. More distant elevated views are generally restricted to areas where small clearings occur at bridge and road crossings (County Route 6 and South Ripley Road). Where longer distance views are available within this zone, they typically provide views across or along the Gorge, and are framed by trees. Users within the River Gorge LSZ typically include local residents and recreational users, particularly fishermen and white-water rafters/kayakers. Official public access

points to the Gorge were not identified in any mapping databases consulted for the development of the VIA, and Twentymile Creek does not appear to have public fishing rights.

3.3.4 Transportation Corridor

Figure 3.3-4 Representative Photographs of the Transportation Corridor LSZ

Southern Tier Expressway (I-86, NY 17). Exported from Google Earth Street View.

The Transportation Corridor LSZ occupies approximately 0.3% of the VSA and consists of areas within 300 feet of Interstate Route 86 (I-86). Views along I-86 are dominated by automobiles, pavement, guard rails, and roadway signage. The roadway is a limited access divided highway with a broad vegetated median and mowed grass shoulders backed by dense forest vegetation, which typically screens visibility of the opposing travel lanes and outward views. Occasional outward views occur along portions of the highway that abut farm fields or open meadows. However, in these instances viewer attention is generally focused on the roadway and associated traffic. Travel is at high speed, and these outward views are peripheral and fleeting in nature. Users within the Transportation Corridor LSZ include residents and through-travelers. Representative views in this LSZ are shown in Inset 3.3.4 above.

3.4 Distance Zones

Distance zones are typically defined in visual studies to divide the VSA into distinct sub-areas based on the various levels of landscape detail available to the viewer. To define these zones, EDR consulted several well-established agency protocols, including those published by the U.S. Forest Service (USFS), BLM, and USDOT, to determine the appropriate area of each distance zone. It is important to note that the distance zones recommended by each of these protocols was considered in the context of this VSA. For example, the BLM (1999) recommends a combined foreground-middle ground zone extending from 0 to 5 miles. While this may be appropriate in a western landscape with frequent, unscreened views over very long distances, it does not translate to northeastern landscapes where views are often contained within 1.0 mile of the viewer. Conversely, the USFS (1995) suggests the foreground be defined as an area extending 0.5 mile from the viewer. Due to the characteristics of the specific landscape being evaluated in this VIA, EDR defined the following four distance zones (as measured from the proposed Facility:

- *Near-Foreground*: 0 to 0.5 mile. At this distance, a viewer is able to perceive details of an object with clarity. Surface textures, small features, and the full intensity and value of color can be seen on foreground objects.

- *Foreground*: 0.5 to 1.5 miles. At this distance, elements in the landscape tend to retain visual prominence, but detailed textures become less distinct. Larger scale landscape elements remain as a series of recognizable and distinguishable landscape patterns, colors, and textures.
- *Middle ground*: 1.5 to 4.0 miles. The middle ground is usually the predominant distance at which landscapes are seen. At these distances a viewer can perceive individual trees and larger built features, but not in great detail. This is the zone where the parts of the landscape start to join together; individual hills become a range, individual trees merge into a forest, and buildings appear as simple geometric forms. Colors will be distinguishable but subdued by a bluish cast and softer tones than those in the foreground. Contrast in texture between landscape elements will also be reduced.
- *Background*: Over 4.0 miles. The background defines the broader regional landscape within which a view occurs. Within this distance zone, the landscape is simplified; only broad landforms are discernable, and atmospheric conditions often render the landscape an overall bluish color. Texture has generally disappeared and color has flattened, but large patterns of vegetation are discernable. Silhouettes of one land mass set against another and/or the skyline are often the dominant visual characteristics in the background. Although outside the VSA, the background contributes to scenic quality by providing a softened backdrop for foreground and middle ground features, an attractive vista, and/or distant focal points.

To better understand the distribution of landscape types within each distance zone a breakdown of the area of each LSZ occurring within each distance zone is summarized in Table 3.4-1. The Forest LSZ is the most dominant cover type in the VSA and makes up over 50% of each of the distance zones, ranging from 59.7% in the near foreground to 72% in the foreground. The Rural Residential/Agricultural LSZ is most prevalent in the near-foreground, making up approximately 5.5 square miles, or 39.1% of that distance zone. This area includes the Facility itself, which will be built primarily within agricultural fields included in this LSZ. The Rural Residential/Agricultural LSZ makes up approximately 24.1% of the foreground zone and 29% of the middle ground zone. The River Gorge LSZ makes up approximately 1.1% of the near-foreground zone and includes the river valley associated with Twentymile Creek. As the river flows north into the foreground distance zone, the River Gorge LSZ broadens, making up approximately 3.7% of this zone and 6.5% of the background zone. The Transportation Corridor LSZ only occurs in the middle ground zone and makes up approximately 2.7% of this zone in the southern portion of the VSA.

Table 3.4-1 Distance Zone by Landscape Similarity Zones

Landscape Similarity Zone	Total Area (square miles) and Percent of LSZ[1]		
	Near-Foreground (0 – 0.5 mile)	Foreground (0.5 – 1.5 miles)	Middle Ground (1.5 – 2.0 miles)
Forest	8.4 (59.7%)	12.8 (72.2%)	7.4 (61.7%)
Rural Residential/Agricultural	5.5 (39.1)	4.3 (24.1%)	3.5 (29%)
River Gorge	0.2 (1.1%)	0.7 (3.7%)	0.8 (6.5%)
Transportation Corridor	0.0 (0.0%)	0.0 (0.0%)	0.3 (2.7%)
Total Distance Zone Area	**14.1**	**17.7**	**12.0**

[1]The calculations used to generate this table were based on unrounded numbers, therefore, the rounded results may not add up precisely.

3.5 Viewer/User Groups

Three categories of viewer/user groups were identified within the VSA. These include the following:

3.5.1 Local Residents

Local residents include those who live and work within the VSA. These individuals generally view the landscape from their yards, homes, local roads, schools, and places of employment. Residents are concentrated along main roads throughout the VSA including County Route 6 and New York State Route 76 (Sherman Road). Except when involved in local travel, residents are likely to be stationary, and have frequent or prolonged views of the landscape. Local residents may view the landscape from ground level or elevated viewpoints (typically upper floors/stories of homes). Residents' sensitivity to visual quality is variable. However, it is assumed that residents may be very sensitive to changes in views from their homes, yards, and local communities.

3.5.2 Through-Travelers

Travelers passing through the area view the landscape from motor vehicles on their way to work or other destinations. These viewers are typically moving, have a relatively narrow field of view, and are destination oriented. Drivers on major roads in the area (e.g., I-86 and County Road 76) will generally be focused on the road and traffic conditions but do have the opportunity to concentrate on roadside scenery. Passengers in moving vehicles will have greater opportunities for prolonged off-road views than will drivers, and accordingly, may have greater perception of changes in the visual environment. Travelers' sensitivity to visual quality is variable. However, it is assumed that local commuters may be sensitive to changes in views of areas that they travel through on a regular basis, while those traveling to and from more distant locations will generally be less aware and less concerned about visual changes to the landscape.

3.5.3 Tourists/Recreational Users

Tourists and recreational users include residents as well as out-of-town visitors involved in recreational activities at local destinations such as the Blueberry Sky Farm Winery, Hazen Manor, Ripley Rod & Gun Club, Chautauqua Gorge State Forest, the Twentymile Creek and Belson Creek gorges, and other undeveloped natural portions of the VSA. These individuals will view the landscape from specific recreational sites within the VSA, as well as from area highways while on their way to these destinations. This group includes hikers, hunters, fishermen, snowmobilers and those involved in more passive recreational activities such as, picnicking, bird watching, and walking. Tourists and recreational users will often have continuous but changing views of landscape features over relatively long periods of

time. Visual quality may or may not be an important part of the recreational activities for these viewers. However, for many, scenery will serve to at least enhance their recreational experience.

3.6 Visually Sensitive Resources

Visually Sensitive Resources (VSRs) within the VSA were identified in accordance with guidance provided by New York State Department of Environmental Conservation (NYSDEC) Program Policy DEP-00-2 *Assessing and Mitigating Visual Impacts* (NYSDEC, 2019), the community and host municipal outreach identified below in Section 3.6.2 and the requirements of Section 94-c. In addition, EDR identified other resources that could be considered visually sensitive based on the type or intensity of use they receive. The categories of VSRs typically addressed in VIAs for projects in New York include the following:

- **Properties of Historic Significance** (National Historic Landmarks, Sites Listed on the State or National Registers of Historic Places [S/NRHP]; Properties Eligible for Listing on the S/NRHP; National or State Historic Sites).

- **Designated Scenic Resources** (Rivers Designated as National or State Wild, Scenic, or Recreational; Adirondack Park Scenic Vistas; Sites, Areas, Lakes, Highways or Overlooks Designated or Eligible for Designation as Scenic; Scenic Areas of Statewide Significance; Other Designated Scenic Resources).

- **Public Lands and Recreational Resources** (National Parks, Recreation Areas, Seashores, and/or Forests; Heritage Areas; State Parks; State Nature and Historic Preserve Areas; State Forest Preserve Lands; Wildlife Management Areas/Wildlife Refuges s; State Forests; Other State Lands; State Boat Launches/Waterway Access Sites; Designated Trails; Palisades Park Lands; Local Parks and Recreation Areas; Publicly Accessible Conservation Lands/Easements; Rivers and Streams with public fishing rights easements; Named Lakes, Ponds, and Reservoirs).

- **High Use Public Areas** (State, U.S., and Interstate Highways, Cities, Villages and Hamlets; Schools;).

- **Locally Identified Resources** (Other resources identified through the agency/public outreach process – see discussion in Section 3.6.2, below)**.**

To identify VSRs within the VSA, EDR consulted a variety of publicly available data sources, including geospatial resources. A complete listing of the resources used in the identification of VSRs is included in the Literature Cited section of this report (see Section 7.0). Review of these data sources resulted in the identification of seven VSRs within the VSA. Other sources of information used to identify additional VSRs are described in Sections 3.6.1 and 3.6.2, below.

3.6.1 Municipal Document Review

A thorough examination of local zoning ordinances and regional planning documents was undertaken to obtain any additional information regarding identified scenic resources within or near the VSA. The following discussion provides an overview of existing local plans and ordinances and the extent to which they identify scenic/visual resources (including open space) within the VSA.

Town of Ripley Zoning Ordinance

Zoning regulations were adopted in the Town of Ripley in 2017. Goals of the Zoning Ordinance (Town of Ripley, New York, 2017) include protection of the integrity of scenic views, ridgelines, steep slopes, agricultural land, existing and potential recreation areas, surface and groundwater supplies, ecological systems, wetlands, wildlife habitat, and natural vegetation, as a means of maintaining property values while preserving the open and rural character of the Town. The Ripley Zoning Ordinance (including Section 620 – Solar and Wind Systems) does not reference specific scenic views or include provisions for the preservation of scenic resources. The Town is in the process of updating the Zoning Ordinance but at the time of writing this VIA, the Town Board had not adopted the proposed update to the Zoning Ordinance. However, based on the draft law provided by the Town for public comment, the proposed Zoning Ordinance states that the standards regarding solar shall:

> *Avoid, or if avoidance is impossible, mitigate the impacts of Solar Energy Systems on environmental resources such as important agricultural lands, forests, wildlife, waterways, unique views and other protected resources;* (See proposed Zoning Ordinance Section 1504(4)).

As in the existing ordinance, the locations of "unique views" are not specifically defined.

Chautauqua 20/20 Comprehensive Plan

The Chautauqua County Comprehensive Plan was adopted in 2011. The Comprehensive Plan (CCDPED, 2011) lists lakes, streams, forests, gorges, scenic farms, and other components of the natural environment as assets to the community. In addition, the comprehensive plan identifies environmental goals, concepts and strategies to protect historic villages, working farms, and scenic landscape, although no locations within the VSA are specifically identified. In the discussion about county-wide agriculture, the comprehensive plan encourages local farms to identify potential renewable energy opportunities.

Chautauqua County Greenway Plan

The Chautauqua County Greenway Plan (Pashek Associates et al., 2012) focuses heavily on connectivity through trail development within the county and neighboring counties. Of the priority trails addressed in the plan, none occur in the VSA, and of the 20 towns named as "Trail Towns", Westfield and Sherman are the only two that occur in the VSA. However, the suggested amenities (main street, food, lodging, and fuel) associated with these "Trail Towns" suggests that these would specifically include villages and hamlet areas, none of which occur within the VSA.

Lake Erie Concord Grape Belt Heritage Area Management Plan

The Lake Erie Concord Grape Belt Heritage Area Management Plan (Peter J. Smith & Company, 2010) focuses on the region's unique grape heritage, and proposes strategies to preserve, interpret, and celebrate related cultural and natural resources. Of the intrinsic and scenic resources identified in the plan, none occur within the VSA. Resources specifically addressed in this management plan are concentrated in the area surrounding Lake Erie and are all contained along the Allegany Plateau Escarpment and within Erie-Ontario Lowlands, which are primarily outside of the VSA.

3.6.2 Agency and Stakeholder Recommendations

Per the requirements set forth in of Section 94-c, the Applicant conducted a systematic program of public outreach to assist in the identification of any additional VSRs. Copies of correspondence sent by the Applicant as part of this

outreach process, and the responses received from state agencies and municipal stakeholders are included as Attachment F of this VIA. In total, 27 locations were identified as VSRs during stakeholder outreach and recommended as viewpoints for evaluation in the VIA. Twenty of these locations were either already included as identified VSRs or are located outside of the VSA. The remaining seven locations, listed below, were added to the VSR analysis and addressed through the preparation of visual simulations (see Section 4.2.1).

- South Ripley Methodist Church
- Ripley Volunteer Fire Department
- Chautauqua County Reforestation Land
- An unnamed pond
- County Touring Route 9 (South Ripley Road) Bridge
- Ripley Rod & Gun Club
- Irish Road Sportsman's Club

See Appendix F for a full overview of the comments received and actions taken as part of the public outreach process.

3.6.3 VSR Summary

A summary of all the VSR types that were identified within the VSA based on document review and public outreach are presented in Table 3.6-1, below. The location of these resources is indicated in Figure 3.6-1.

Table 3.6-1 Summary of Visually Sensitive Resource Types Identified in the VSA

Visually Sensitive Resources	Total Number of Resources within the VSA
Properties of Historic Significance [6 NYCRR 617.4 (b)(9)]	**Total 2**
National Historic Landmarks (NHL)	0
Properties/Districts Listed on National or State Registers of Historic Places (NRHP/SRHP)	0
Properties Eligible for Listing on NRHP or SRHP	2
National/State Historic Sites	0
Designated Scenic Resources	**Total 0**
Rivers Designated as National or State Wild, Scenic or Recreational	0
Adirondack Park Scenic Vistas [Adirondack Park Land Use and Development Map]	0
Sites, Areas, Lakes, Reservoirs or Highways Designated or Eligible for Designation as Scenic ([ECL Article 49Title 1] or equivalent)	0
Scenic Areas of Statewide Significance [Article 42 of Executive Law]	0
Other Designated Scenic Resources (Easements, Roads, Districts, and Overlooks)	0
Public Lands and Recreational Resources	**Total 2**
National Parks, Recreation Areas, Seashores, and/or Forests [16 U.S.C. 1c]	0
National Natural Landmarks [36 CFR Part 62]	0

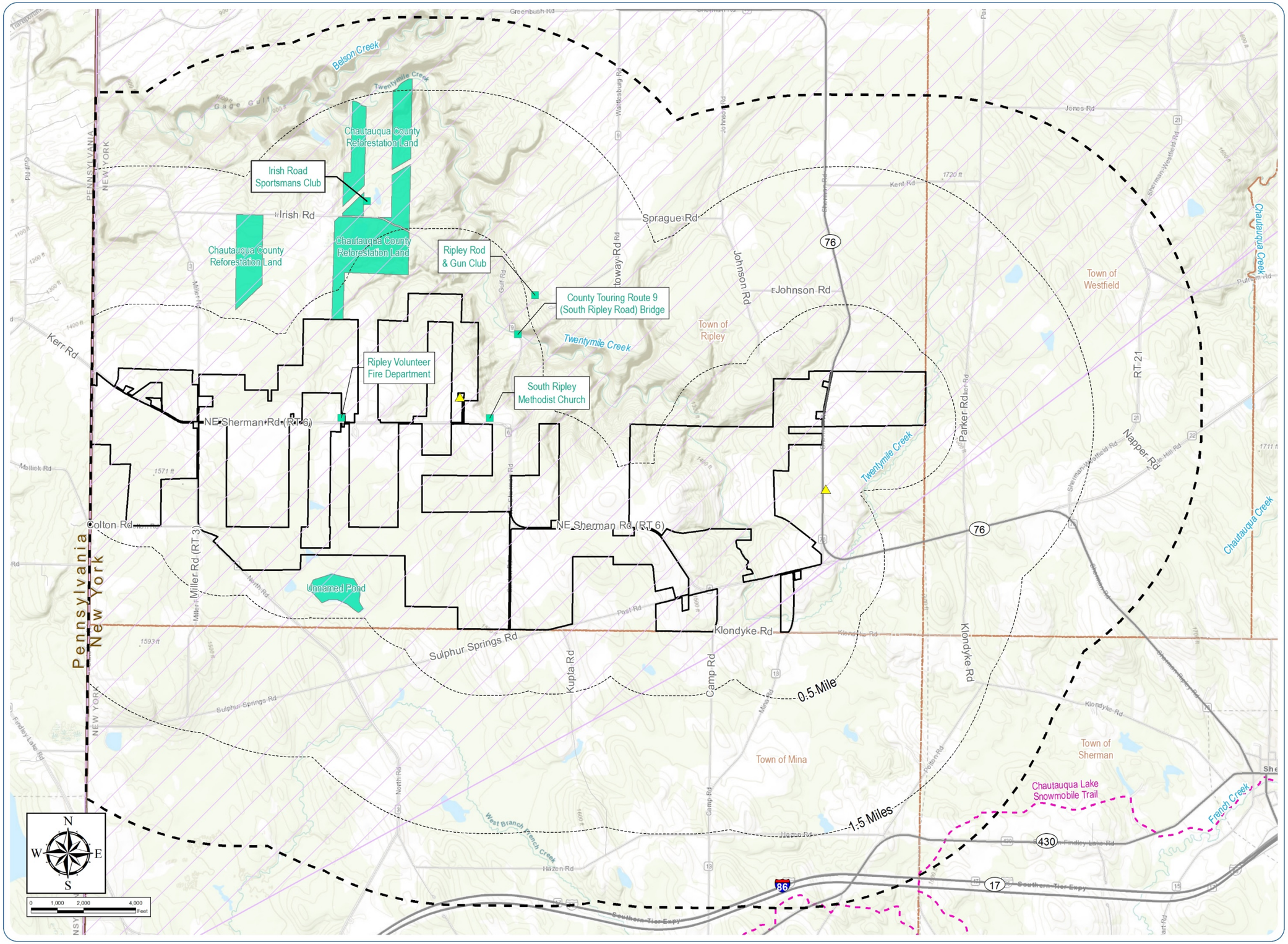
Visually Sensitive Resources	Total Number of Resources within the VSA
National Wildlife Refuges [16 U.S.C. 668dd]	0
Heritage Areas [Parks, Recreation and Historic Preservation Law Section 35.15]	1
State Parks [Parks, Recreation and Historic Preservation Law Section 3.09]	0
State Nature and Historic Preserve Areas [Section 4 of Article XIV of the State Constitution]	0
State Forest Preserve [NYS Constitution Article XIV]	0
Other State Lands	0
Wildlife Management Areas & Game Refuges	0
State Forests	0
State Boat Launches/Waterway Access Sites	0
Designated Trails	1
Palisades Park [Palisades Interstate Park Commission]	0
Local Parks and Recreation Areas	0
Publicly Accessible Conservation Lands/Easements	0
Rivers and Streams with public fishing rights easements	0
Named Lakes, Ponds, and Reservoirs	0
High-Use Public Areas	**Total 3**
State, US, and Interstate Highways	3
Cities, Villages, Hamlets	0
Schools	0
Native American Lands	**Total 0**
Other Resources Identified by Stakeholders	**Total 7**
Total Number of VSRs in the VSA	**14**

South Ripley Solar Project

Town of Ripley, Chautauqua County, New York

Visual Impact Assessment

Figure 3.6-1: Visually Sensitive Resources



- NRHP-Eligible Site
- Snowmobile Trail
- State and Interstate Highway
- Distance Zone Transition
- Resource Identified by Stakeholder
- Concord Grape Belt State Heritage Area
- Facility Site
- 2-Mile Visual Study Area

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic" map service. **2.** This map was generated in ArcMap on July 7, 2021. **3.** This is a color graphic. Reproduction in grayscale may misrepresent the data.

4.0 VISUAL IMPACT ASSESSMENT METHODOLOGY

The visual impact assessment procedures used for this study are consistent with methodologies developed by the BLM (1984 and 1999), USFS (1974), USDOT (1981), U.S. Army Corps of Engineers (Smardon, et al., 1988), and the NYSDEC (2019). These procedures also comply with the requirements of Section 94-C and are widely accepted as standard visual impact methodologies for renewable energy projects (CEIWEP, 2007). The specific techniques used to assess potential Facility visibility and visual impacts are described in the following section.

4.1 Facility Visibility

An analysis of Facility visibility was undertaken to identify those locations within the VSA where there is potential for the proposed PV panels and above-ground electrical components to be seen from ground-level vantage points (i.e., defining the Facility's area of potential effect [APE]). This analysis included identifying potentially visible areas on viewshed maps and verifying potential Facility visibility in the field. The viewshed analysis and field verification methodology are described in greater detail, below.

4.1.1 Viewshed Analysis

PV Panel Array Viewshed Analysis

To identify areas where the proposed PV panel arrays would potentially be visible, a lidar-based digital surface model (DSM) viewshed analysis was conducted. A DSM viewshed analysis evaluates potential Facility visibility considering the screening effects of topography, and existing structures and vegetation. A viewshed analysis based on topography alone is not provided because the results of such an analysis do not accurately represent conditions within the VSA. The DSM viewshed analysis for the proposed PV panel arrays was prepared using: 1) a DSM derived from 2017 New York State Geographic Information System (GIS) Program Office (NYSGPO) lidar data for Chautauqua County; 2) sample points representing PV panel locations placed 300 feet apart in a grid pattern throughout all proposed PV panels; 3) an assumed maximum PV panel height of 13 feet applied to each sample point; 4) an assumed conservative viewer height of 6 feet; and 5) Esri ArcGIS Pro® software with the Spatial Analyst extension.

A few modifications were made to the lidar-derived DSM prior to conducting the analysis. Transmission lines and road-side utility lines that are reflected in the lidar data are generally mis-represented in the DSM as opaque screening features. In order to correct this inaccuracy, DSM elevation values within transmission line corridors and within 50 feet of road centerlines were replaced with bare earth elevation values that provided no additional level of screening. It is important to note that this clearing of the DSM may also eliminate legitimate screening features such as roadside vegetation and structures, which may result in an overstatement of potential Facility visibility along all road corridors within the VSA. Additionally, all areas within the proposed PV array fence lines were cleared of any vegetation to reflect the bare-earth elevation in these locations. This modified DSM was then used as a base layer for the viewshed analysis. Once the viewshed analysis was complete, PV panel visibility was set to zero in locations where the DSM elevation exceeded the bare earth elevation by 6 feet or more, indicating the presence of vegetation or structures that exceed viewer height. This was done for two reasons: 1) in locations where trees or structures are present in the DSM, the viewshed would reflect visibility from the tree-tops or building roofs, which is not the intent of this analysis, and 2) to reflect the fact that ground-level vantage points within buildings or areas of vegetation exceeding 6 feet in height will generally be screened from views of the Facility.

Because it conservatively accounts for the screening provided by topography, vegetation and structures, the DSM viewshed analysis is an accurate representation of potential Facility visibility. However, it is worth noting that because certain characteristics of the Facility and the VSA that may serve to restrict visibility (e.g., color, atmospheric/weather conditions, and distance from viewer) are not taken into consideration in the analysis, being located within the DSM viewshed does not necessarily equate to actual Facility visibility, nor does it indicate that adverse visual impacts will occur within these geographic locations. There is also the possibility of the DSM overstating screening/underestimating visibility in locations where views are available through trees during the dormant season. Potential changes to the landscape since the date of lidar collection (2017) could also lead to minor inaccuracies in the analysis. To minimize the chance of this occurring, any noticeable changes to the landscape observed from the field visits (see Section 4.1.2 Field Verification) and recent aerial imagery were incorporated into the lidar data.

Collection Substation and BESS Viewshed Analysis

A DSM viewshed analysis was also conducted for the proposed collection substation and BESS. The tallest proposed components of the collection substation are narrow lightning masts, with a maximum height of 70 feet. The precise location of these structures was not known at the time of this analysis, so the analysis was run based on representative points in the center and at each corner of the substation footprint, each with an assigned height of 70 feet. The maximum potential height of both the BESS and the Equipment Storage Containers (included as part of the BESS dues to their small size and adjacency to the BESS) is 12 feet and these structures were similarly represented by five sample points at that height within the BESS facility site. Because the POI is located approximately 150 feet southwest of the collection substation viewshed sample points, it is anticipated that the Collection Substation and BESS viewshed analysis will adequately address the potential visibility of this component. All other data sources and assumptions used in this viewshed analysis are as described above for the PV panel array viewshed analysis.

Overhead Collection Line Viewshed Analysis

A DSM viewshed analysis was also conducted for the proposed overhead collection line. The viewshed analysis used pole locations obtained from preliminary design drawings and proposed pole heights ranging from 41 feet for conductors in suspension to 75 feet for dead-end structures. All other data sources and assumptions used in this viewshed analysis are as described above for the PV panel array viewshed analysis.

4.1.2 Field Verification

EDR personnel conducted field review within the VSA on August 2, 2020 and March 15, 2021. During the site visits, EDR staff members travelled public roads, particularly those adjacent to the proposed Facility, such as Miller Road, Sinden Road, County Highway 303, County Route 64, Post Road, County Touring Route 3, and New York State Route 76 (Sherman Road). In addition, EDR personnel visited more distant public vantage points within the VSA to document potential Facility visibility and to confirm the results of the viewshed analysis. The determination of potential Facility visibility was based on the known location and dimensions of the PV panels, the location of screening vegetation and structures, and the visibility of existing identifiable fields and landscape features on and around the Facility Site, which served as location and scale references. In addition, the existing National Grid Ripley Substation provided a visual reference point for the proposed collection substation and BESS. Field personnel also used live maps in ESRI Collector® (Collector) containing Facility components which allowed for the identification of fields, structures, and hedgerows proximate to the proposed Facility location.

During field verification photographs were obtained from 77 representative viewpoints within the VSA. The viewpoints document views from multiple directions toward the Facility Site from the various LSZs, distance zones, VSRs, and areas of high public use throughout the VSA. During the field visits, weather conditions were sunny to partly cloudy, thus representing typical high visibility viewing conditions within the VSA. A representative photograph documenting the general view toward the Facility Site from each viewpoint and an accompanying map is included in Attachment B.

Photographs were taken using digital SLR cameras with a minimum resolution of 24 megapixels. All photos were obtained at lens settings (focal lengths) between 24 and 38 mm (equivalent to between 37 and 58 mm on a 35mm sensor). A 50 mm focal length is the standard typically used in visual studies because it provides an accurate scale perspective. However, when projects are viewed in the near-foreground as solar facilities typically are, 50mm photographs do not provide sufficient context and therefore, do not capture the range of potential visual effects associated with a large, contiguous area of PV panels. To adjust for this, slightly wider-angle photos were taken alongside the standard 50 mm photographs. To assist with viewer orientation and determination of potential Facility visibility in the field, global positioning system (GPS) units were combined with the live mapping unit Collector. The data contained in the Collector unit included the viewshed analysis results, VSR locations, a topographic and aerial base map, and the current user location. At each of the viewpoints, the GPS was used to document the camera location, direction of view, time, and notes for each photo position. Viewpoints photographed during field review generally represented the most open, unobstructed available views toward the proposed Facility Site.

4.2 Facility Visual Impact

Beyond evaluating potential Facility visibility, the VIA also examined the visual impact of the proposed Facility on the LSZs, VSRs, and viewer groups within the VSA. This assessment involved preparing visual simulations of the proposed Facility (including the PV panels, racking, fencing, inverters, collection substation, BESS, and landscape mitigation plantings as applicable) from representative viewpoints. These simulations were evaluated by a rating panel consisting of four registered landscape architects to determine the type and extent of visual impact resulting from installation of the proposed Facility. Further information on rating panel personnel and procedures can be found in Attachment E. Details of the visual impact assessment procedures are described below.

4.2.1 Viewpoint Selection

The Section 94-c regulations require that *"In developing the application, the applicant shall confer with municipal planning representatives, the Office (ORES), and where appropriate, OPRHP and/or APA in its selection of important or representative viewpoints*."[1] As discussed previously, in addition to consultation with the required agencies mentioned above, municipal representatives and local stakeholders were also asked to help identify VSRs and determine an appropriate selection of viewpoints for the development of visual simulations. Copies of correspondence sent to agencies and stakeholders as part of this process, as well as the responses received, are included in Attachment F.

Based on the results of VSR research, field verification, and stakeholder/agency consultation, a total of 14 viewpoints were selected for the development of visual simulations. These viewpoints were selected based upon the following criteria:

[1] The APA is not applicable in this instance due to the Project's location outside the Adirondack Park.

- They provide open views of proposed PV panels or provide representative views of the screening effects of vegetation, topography, or structures from selected areas.
- They illustrate representative Facility visibility from specific VSRs.
- They illustrate typical views from LSZs where open views will be available.
- They illustrate typical views of the proposed Facility that will be available to representative viewer/user groups.
- They illustrate typical views of different amounts of PV panels, from a variety of viewer distances and directions, to illustrate the range of visual change that will occur with the Facility in place.
- The selected photos displayed appropriate composition, lighting, and exposure.

During preparation of the visual simulations one of the 14 viewpoints selected for the production of visual simulations, located 0.3 mi from the nearest Facility component and within the Rural Residential/Agricultural LSZ, turned out to have minimal visibility of the Facility. Rather than include the visual simulation in the visual impact analysis, a wireframe alignment was produced to illustrate the screening elements and lack of potential visual effect from the selected viewpoint. The wireframe alignment methodology is described in section 4.2.2 and the wireframe alignment is presented in Section 5.1.2. Of the remaining 13 simulated viewpoints, 12 are located within the Concord Grape Belt State Heritage Area and the near-foreground distance zone, and 12 viewpoints occur within the Rural Residential/Agricultural LSZ and one occurs within the Forest LSZ. Because of the location of the Facility Site, potential visibility, and the availability of open views from other LSZs and distance zones were either non-existent or substantially screened (see discussion of Field Review in Section 5.1.3). Consequently, the selected viewpoints represent the closest, most unobstructed views available within the VSA.

Location details and the criteria for selection of each visual simulation viewpoint are summarized in Table 4.2-1.

Table 4.2-1. Viewpoints Selected for Visual Simulations and Wireframe Renderings

Viewpoint Number	Location and/or VSR Represented	LSZ Represented[3]	Viewer Group Represented	Viewing Distance[1]	View Orientation[2]
Viewpoints Selected for Visual Simulations					
VP 5	County Route 6 and Miller Road Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	167 feet	SE
VP 15	County Route 6 Concord Grape Belt State Heritage Area, South Ripley Cemetery	Rural Residential/ Agricultural	Local Residents, Through-Travelers	170 feet	SW
VP 16	County Route 6 Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	179 feet	S
VP 20	NYS Route 76 NYS Route 76, Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	84 feet	SE
VP 24	NYS Route 76 NYS Route 76, Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	654 feet	SW
VP 40	County Route 6 Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	118 feet	S
VP 44	Sinden Road Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents	344 feet	W
VP 56	County Route 6 Concord Grape Belt State Heritage Area	Forest	Local Residents, Through-Travelers	139 feet	NE
VP 59	County Route 6 Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	203 feet	S
VP 63S	County Route 6 Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	436 feet	S
VP 63SE	County Route 6 Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	453 feet	SE
VP 69	South Ripley Cemetery off of County Route 6 Concord Grape Belt State Heritage Area, South Ripley Cemetery	Rural Residential/ Agricultural	Local Residents, Tourists/Recreational	417 feet	N
VP 75	County Route 622	Rural Residential/ Agricultural	Local Residents, Through-Travelers	7,450 feet	NE
Viewpoint Selected for Visual Simulation Resulting in Minimal Visibility (wireframe)					
VP 51	County Route 6 Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers	1,836 feet	NE

[1]Distance from viewpoint to nearest visible PV Panel (in feet).

[2]N = North, S = South, E = East, W = West.

[3]The Forest, Gorge, and Transportation Corridor LSZs were considered in the selection of viewpoints but were not included due to lack of Facility visibility.

4.2.2 Visual Simulations

To show anticipated visual changes associated with the proposed Facility, three-dimensional (3D) modeling software was used to create realistic photographic simulations of the proposed Facility from each of the 13 selected viewpoints. The photographic simulations were developed by using Autodesk 3ds Max Design® to create a simulated perspective (camera view) to match the location, bearing, and focal length of each existing conditions photograph. Existing landscape elements in the view were modeled using detailed lidar data representing roads, buildings, vegetation, and topography. Once the camera was roughly aligned to match the photo, minor adjustments were made to the camera and target location, focal length, and camera roll to align all modeled elements with the corresponding elements in the photograph. This assures that any elements introduced to the model space (e.g., the PV panels) will be shown in proper proportion, perspective, and relation to the existing landscape elements in the view. Consequently, the alignment, elevations, dimensions, and locations of the proposed Facility structures in the simulations will be accurate.

Computer models of the proposed PV panels, racking, fencing, inverters, overhead collection line, collection substation, BESS, and access roads were prepared based on specifications and data provided by the Applicant (see Section 2.2.1 for a description of dimensions, materials, and color). Using the camera view as guidance, the visible portions of the modeled Facility components were imported to the landscape model space described above, and set at the proper coordinates. Locations for proposed Facility components were provided to EDR by the Applicant.

Once the proposed Facility was accurately aligned within the camera view, a lighting system was created based on the actual time, date, and location of each photograph in order to accurately represent light reflection, highlights, color casting, and shadows. The rendered Facility was then superimposed over the photograph in Adobe Photoshop®, and portions of the Facility that fell behind vegetation, structures, or topography were masked out. Photoshop was also used to take out any existing vegetation proposed to be removed as part of the Project. Additional information on the extent of vegetation removal is discussed in Exhibit 11 of the Section 94-c Application (Terrestrial Ecology) and illustrated in the site plan drawings included in Exhibit 5 (Design Drawings) as Appendix 5-A. Once the Facility was added to the photograph, any shadows cast on the ground by the proposed structures were included by rendering a separate “shadow pass” over the DEM or lidar model in 3ds Max® and then overlaying the shadows on the simulated view with the proper fall-off and transparency using Photoshop®. A graphic illustration of the simulation process is included in Figure 4.2-1.

Proposed mitigation plantings were also incorporated into the simulations where they would be visible (see Planting Plan in Appendix 8-B of the Section 94-c Application). To accomplish this, 3D plant models representing each of the species proposed were placed into the simulation model at the locations specified in the plan. The models were sized to reflect five to seven years of growth based on region-specific growth rates. The plantings were then rendered to accurately represent shading that would occur on the ground and/or on the proposed Facility components based upon the time of year and day the photos were captured. The visual simulations include both leaf-on and leaf-off conditions of the proposed mitigation plantings.

“Wireframe” Renderings

As mentioned previously, one viewpoint (Viewpoint 51) met a majority of the selection criteria but was located where Facility components were determined to be substantially screened from view which would make a simulation ineffective for impact evaluation purposes. A wireframe alignment was prepared to illustrate the degree of screening provided by existing landscape features within the photograph. In this wireframe alignment, the PV panels (shown in bright green for illustrative purposes), are placed on top of the image at the proper scale and location in which they would appear if