ConnectGen Chautauqua County LLC

South Ripley Solar Project
Matter No. 21-00750

900-2.9 Exhibit 8

Visual Impacts

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EXHIBIT 8 VISUAL IMPACTS

(a) Visual Impact Assessment

The Applicant engaged Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) to conduct a Visual Impact Assessment (VIA; see Appendix 8-A) that describes the extent and significance of Facility[1] visibility. The VIA includes identification of visually sensitive resources (VSRs), viewshed mapping, results of field review, visual simulations (photographic overlays), and proposed visual impact mitigation. The methodology and results of the VIA are further described in Appendix 8-A and summarized herein.

(1) Character and Visual Quality of the Existing Landscape

Per the requirements set forth in §900-2.9(b), the Visual Study Area (VSA) is defined as the area within 2 miles of the Facility Site. It should be noted that 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 §900-1.2. The VSA is described in Sections 3.1, 3.2, and 3.3 and shown on Figure 3.1-1 of the VIA (see Appendix 8-A).

Within the VSA, four distinct landscape types exist. These Landscape Similarity Zones (LSZs) can provide a useful framework for describing the character and visual quality of the existing landscape and can facilitate the analysis of a project's potential visual effects. In accordance with established visual assessment methods (notably, USDA Forest Service, 1995; Smardon et al., 1988; USDOT Federal Highway Administration, 1981; USDI BLM, 1980), LSZs within the VSA were defined and mapped. These include Forest, Rural Residential/Agricultural, River Gorge, and Transportation Corridor LSZs. The extent of each LSZ within the VSA is depicted on Figure 3.3-2 of the VIA and representative photographs of the LSZs are illustrated in Figures 3.3-1 though Figure 3.3-4 of the VIA (see Appendix 8-A). In addition, VSRs were identified based on consultation with State and local governments and organizations with knowledge of local cultural and historical resources.

(2) Visibility of the Facility

The VIA (Appendix 8-A) includes an analysis of the potential visibility of the Facility and identifies locations within the VSA where it may be possible to view the proposed PV arrays, overhead collection lines, the battery energy

[1] As defined throughout this Application, the Facility collectively refers to PV modules and their rack/support systems; direct current (DC) collection lines and communications cables connecting the modules to inverters; the inverters, and foundations, control electronics, step-up transformers; buried and overhead alternating current (AC) medium voltage collection lines; security fencing and gates around each array of PV modules; gravel access roads; temporary laydown areas; medium voltage-to-transmission voltage collection substation with associated equipment and fenced areas; a short length of transmission voltage line (approximately 200 feet) to connect the Facility to the designated POI; a switching station, to be owned by National Grid, that loops the Erie to Dunkirk 230 kV transmission line through the POI; an operations and maintenance (O&M) facility at the collection substation with off-site storage containers located outside of collection substation fencing; a battery energy storage system; and any other improvements subject to the Office of Renewable Energy Siting (ORES) jurisdiction.

storage system (BESS), and/or the collection substation. PV panels will be installed on a fixed tilt racking system, consisting of a steel frame secured to support piles driven into the ground on which the individual PV modules are mounted. The PV panels are fastened together to create a continuous row on the racking. The PV panels will have a typical height of 13 feet above the ground at their highest point. The methodology used to prepare the viewshed (i.e., visibility) analyses for the Facility is described in Section 4.1.1 of the VIA (Appendix 8-A) and summarized in Section (b)(2) of this Exhibit. Viewshed maps (see Figures 5.1-1 and 5.1-2 in Appendix 8-A) conservatively show areas where the Facility will potentially be visible, and areas where existing topography, vegetation, and structures will screen potential views of the Facility.

As described in Appendix 8-A, EDR personnel conducted a field review of the VSA to verify results of the viewshed analysis. During these site visits, EDR staff members drove public roads and visited public vantage points within the VSA to document locations from which the PV arrays and other Facility components would likely be visible, partially screened, or fully screened. This determination was based on the visibility of distinctive Facility Site ridges/landforms as well as existing built structures (such as silos, barns, and communications towers) on or around the Facility Site, which served as location and scale references. During the field review, photographs were obtained from 77 separate viewpoints to document potential visibility of the Facility from the various LSZs, distance zones, directions, and VSRs throughout the VSA. Results of field review suggest that the viewshed analyses generally provide an accurate indication of Facility visibility within the VSA (see Figures 5.1-1 and 5.1-2 of Appendix 8-A). A photolog, including a representative photograph in the direction of the Facility Site from each viewpoint visited during field review, is included in Attachment B of the VIA. Further information regarding viewpoint selection and photograph details is presented in Sections 4.1.2 and 4.2 of the VIA (Appendix 8-A).

(3) Visibility of Above-ground Interconnections and Roadways

To the extent that they are visible, access roads and the above-ground interconnection components of the Facility are depicted in the visual simulations included as Attachment D in the VIA (see Appendix 8-A). The above-ground electrical and interconnection components include a collection substation, the BESS, and overhead collection lines. Most of the equipment in the collection substation and BESS will remain below a height of 25 feet with the exception of the lightning masts, which will have a maximum height of 70 feet. The equipment within the collection substation and the adjacent BESS will be installed on concrete foundations and enclosed by 7 feet tall chain link fencing topped with barbed wire strands (approximately 1 foot in height above the 6 feet tall chain link fence) per industry safety and security standards and best practices. The overhead collection lines will be approximately 4.5 miles long and will utilize wood or steel pole structures with heights ranging from 41 to 75 feet above ground level. Section 5.1.1 of the VIA report includes a viewshed analysis of the above-ground electrical and interconnection facilities (see VIA Figure 5.1-2 Collection Substation and BESS DSM Viewshed Analysis and Figure 5.1-3 Overhead Collection Line DSM Viewshed Analysis).

(4) Appearance of the Facility Upon Completion

To show anticipated visual changes associated with the proposed Facility, EDR used high-resolution computer-enhanced image processing (Autodesk 3ds Max Design®) to create realistic photographic simulations of the proposed Facility from 13 selected viewpoints. The methodology used to create the simulations is described in Section 4.2.2 of the VIA report (see Appendix 8-A). Photographic simulations were developed to create a simulated perspective (camera view) to match the location, bearing, and focal length of the existing conditions photograph(s) for each viewpoint. Some of the locations chosen for viewpoint simulations were provided through the visual consultation with the municipal representatives (See Exhibit 2 and Appendix 2-B for more details about municipal consultations).

As described in Section 2.2.6 of the VIA (Appendix 8-A), while the Applicant has attempted to avoid and minimize potential visual impacts, there are instances in the Facility Site where potential visual impacts may occur. In response to these potential impacts, the Applicant has developed a conceptual Visual Mitigation Planting Plan (see Appendix 8-B, Attachment 1), using native species and natural arrangements/designs that mimic the character of roadside vegetation, hedgerows and woodlots in the VSA, to minimize and mitigate the Facility's visual effect on the surrounding landscape. Proposed mitigation plantings were incorporated into the series of simulations for each viewpoint, where applicable, showing the existing view, a simulated view prior to installation of plantings, and the view with associated mitigation plantings simulated. To accomplish this, three-dimensional 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 for the selected species. The plantings were then rendered to accurately represent shading that would occur on the ground and 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. Simulations are included in Attachment D of the VIA (see Appendix 8-A).

(5) Lighting

The Applicant has developed a Lighting Plan (included with Appendix 8-B Attachment 2) to describe the security and exterior lighting design of the proposed Facility. No lighting will be installed as part of the PV arrays. The only light sources that are anticipated to be installed for the Facility are safety/security lighting at the collection substation, BESS, and associated O&M buildings and storage containers. All lighting fixtures will utilize full-cut-off light fixtures which will be directed toward the ground to minimize off-site light transmission and sky glow. In these areas, lighting will be kept to the minimum intensity required to assure safety and security. Additionally, all lighting will be operated manually or placed on an auto-off switch to further minimize the impacts of off-site light spillage. All lighting will comply with the requirements of the Section 94-c regulations.

(6) Photographic Overlays

As mentioned previously, high-resolution computer-enhanced image processing was used to create realistic photographic simulations of the completed PV arrays, BESS, and above-ground collection system and interconnection facilities from each of 13 selected viewpoints to show anticipated visual changes associated with the proposed Facility. See Section 4.2.2 of the VIA for discussion of the methodology used to create the simulations. Appendix 8-A describes the viewpoint selection process in further detail. The visual simulations of the Facility are included in Attachment D of the VIA (see Appendix 8-A).

(7) Nature and Degree of Visual Change from Construction

Visual impacts during construction are described in Section 5.3.5 of the VIA (see Appendix 8-A). These impacts will be relatively minor and temporary in nature. Representative photographs of construction activities are included in the VIA. Anticipated visual effects during construction will include soil disturbance, loss of vegetation, and addition of construction workers, equipment, and materials to certain views. Large construction equipment, including dump trucks, concrete trucks, excavators, pile driving equipment, and delivery vehicles will be present on and adjacent to the Facility Site over the course of several months.

(8) Nature and Degree of Visual Change from Operation

The methodology and results of the visual impact evaluation that was conducted as part of the VIA are described in Sections 4.2.2 and 5.3 of the VIA, respectively (see Appendix 8-A). The visual simulations included with the VIA were evaluated by a rating panel consisting of four registered landscape architects with experience in the visual/aesthetics field to determine the type and extent of visual impact likely to result from installation of the proposed Facility. The methodology utilized in this evaluation compared simulations of the completed Facility with photos of existing conditions at each viewpoint and was developed by EDR in 1999 (and subsequently updated) for use on utility-scale renewable energy projects. The methodology involves using a short evaluation form and a simple numerical rating process to: (1) document the basis for conclusions regarding visual impact, (2) allow for independent review and replication of the evaluation, and (3) allow many viewpoints to be evaluated in a reasonable amount of time. The results of this analysis are described in Section 5.3 and Appendices D and E of the VIA (see Appendix 8-A) and summarized below in Section 8(c)(3) of this Exhibit.

(9) Operational Effects of the Facility

Unlike other forms of energy generation, solar projects typically have minimal operational visual effects associated with the process of generating electricity from the sun. For example, the Facility will not generate visible plumes, air emissions, or other obvious visual effects during operation. Similarly, the Facility's operation will not generate shadow flicker and any "shading" form the Facility would be limited to the shading from built Facility components, typically low-profile and unlikely to impact adjacent properties. The potential for glare from PV arrays is the most frequently raised possible visible impact relating to solar projects.

Glare is defined as a continuous source of bright light and is a common phenomenon in existing environments. Both the sun and artificial light sources can cause glare either directly (such as from a sunset when driving westbound) or indirectly (such as from the sun's reflection on a lake or glass window). Glare is raised as a potential concern as, under some conditions, potential impacts can include:

- After-image in a viewer's vision, which can result in temporary reductions in visibility for pilots landing near the Facility or for road users; and
- Distraction, temporary avoidance of a view, or other annoyance impacts.

There is an inverse correlation between light absorption and reflection. PV panels are designed to absorb as much of the solar spectrum as possible to maximize efficiency. Consequently, virtually all PV panels installed in recent years have at least one anti-reflective coating to minimize reflection and maximize absorption. However, the front-facing surfaces of PV modules are smooth, specular surfaces that can reflect sunlight at high incidence angles, much like windows on a building. Therefore, the Applicant conducted a study to assess glare that may be generated by the Facility (see Appendix 8-B, Attachment 3).

Not all glare generated by a Facility has the potential to produce potentially adverse effects. The Applicant engaged EDR to assess the glare produced by the Facility that could potentially be visible to sensitive receptors and be considered an "impact." The 94-c regulations require the Solar Glare Hazard Assessment Tool (SGHAT) model developed by Sandia National Laboratories (Ho et al., 2015) to be used in developing an assessment of glare impacts. In order to focus on the glare that may cause a potential impact, glare was analyzed for all non-participating residences and public roadways located within 1,500 feet of the Facility. The Solar Glare Assessment prepared by EDR used ForgeSolar's GlareGauge tool, an industry standard commercial software that is based on the SGHAT model. The SGHAT model was initially developed for use by the Federal Aviation Administration (FAA) in evaluating safety impacts to pilots while landing aircraft (Ho et al., 2015). Although the SGHAT model provides the option to model glare at residences and along roadways, this tool is a conceptual model with limited accuracy in quantifying potential glare impacts for ground-based receptors in locations such as the Facility where terrestrial and atmospheric obstructions that limit the production of glare are common.

The SGHAT model does not consider atmospheric conditions that scatter incoming solar radiation, terrestrial obstructions (e.g., structures, trees, or topography) that visually block the receipt of glare by an observer, or site-specific variability in panel spacing and design. Accordingly, SGHAT outputs reflect a scenario which is unlikely to exist in real-world conditions: (1) visual receptors with full visibility in all directions and with the ability to see through any PV panels within the Facility that may be obstructing their view,[2] (2) no cloud cover during daylight hours over the course of the year, (3) no vegetation or structures anywhere within, or adjacent to, the Facility Site or the receptor, and (4) full coverage of each PV array area by PV panels, with no gaps between rows.

The Solar Glare Assessment prepared for the Facility factored in these limitations and utilized the SGHAT model as a baseline tool in identifying receptors within, and adjacent to, the Facility Site that are likely to have potentially higher incidences of glare than other receptors, in order to identify appropriate avoidance, minimization, and mitigation techniques.

Based on the SGHAT model, in total, eight of the 72 non-participating residences within 1,500 feet of the Facility (11%) and portions of three public roadways may receive some glare from the Facility over the course of a year. Timing and duration of glare for both residences and roadways vary depending on the position and proximity of the receptor relative to the PV panels potentially producing glare. In general, glare is not anticipated during the fall and winter and would not be received after 7:00 AM or before 5:00 PM. Typically, residences with higher modelled glare levels receive glare somewhat evenly throughout the spring and summer months, whereas residences with lower modelled glare levels receive glare generally around either the summer equinox or the vernal and autumnal equinoxes. Appendix 8-B provides a detailed breakdown of the results for each receptor evaluated.

The potential glare impacts to the residences and roadways identified above are anticipated to be generally minimal or minimal to moderate. To mitigate potential glare impacts, the Applicant is proposing a comprehensive vegetation screening program, is considering other mitigation options, and is committed to working with members of the community to proactively resolve concerns. These measures will be sufficient to ensure solar glare impacts are avoided or minimized, and will not result in complaints, impede traffic movements, or create safety hazards.

[2] The PV panels are taller than many road users and residents and can therefore limit a receptor's view to just the panels on the edges of an array.

Additionally, please see Appendix 7-B for a Draft Complaint Management Plan that outlines the Applicant's commitments regarding the resolution of complaints form local stakeholders.

(10) Description of Visual Resources to be Affected

As described in Sections 3.6, 5.2, and Attachment C of the VIA (see Appendix 8-A), 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) and the requirements of Section 94-c, as described in Chapter XVIII, Title 19 of NYCRR Part 900, §900-2.9(b)(4). In addition, EDR identified other resources that could be considered visually sensitive based on their type or intensity of use and input from public outreach efforts and stakeholder consultations. The categories of VSRs that would be typically required for consideration in VIAs include the following:

- **Properties of Historic Significance,** such as National Historic Landmarks, sites listed on the National or State Registers of Historic Places (NRHP, SRHP), properties eligible for listing on the NRHP or SRHP, or National or State Historic Sites.
- **Designated Scenic Resources,** such as rivers designated as National or State Wild, Scenic, or Recreational, Adirondack Park Scenic Vistas, sites, areas, lakes, reservoirs or highways designated or eligible for designation as Scenic, Scenic Areas of Statewide Significance, or other designated scenic resources.
- **Public Lands and Recreational Resources,** such as National Parks, Recreation Areas, Seashores, and/or Forests, National Natural Landmarks, National Wildlife Refuges, Heritage Areas, State Parks, State Nature and Historic Preserve Areas, State Forest Preserves, other State lands, Wildlife Management Areas & Game Refuges, State Forests, State Boat Launches/Waterway Access sites, State or Nationally designated trails, publicly accessible conservation lands/easements, rivers and streams with Public Fishing Rights Easements, or named lakes, ponds, and reservoirs.
- **High Use Public Areas,** such as State, US, and Interstate Highways, Schools, Cities, Villages and Hamlets.
- **Locally Identified Resources,** such as local parks and recreation areas.
- **Locations Identified by Municipal Planning Representatives**, that may represent an area with local importance or are otherwise not addressed by the public databases and other available information on potential resources.

Further information regarding how VSRs in the VSA were identified is presented in Section 3.6 of the VIA (Appendix 8-A). In addition, in accordance with the requirements set forth in §900-2.9(b)(4), the Applicant has conferred with municipal planning representatives, the Office of Renewable Energy Siting (ORES or the Office), and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) in its identification of VSRs. These consultations resulted in the identification of seven additional, unique VSRs identified by the Ripley Town Board and Ripley Planning Board. Copies of the correspondence sent by the Applicant, as well as responses received from stakeholders, are included as Attachment F in the VIA (see Appendix 8-A).

As a result of database review and outreach efforts, a total of 14 VSRs were identified within the VSA. The locations of inventoried VSRs are included on Figure 3.6-1 of the VIA, and VSRs within potential views of the proposed Facility (as determined through viewshed analysis) are described in Section 5.2 of the VIA (see Appendix 8-A). Viewpoints selected for the development of visual simulations, including those that illustrate Facility visibility from specific VSRs, are described in Attachment D of the VIA (see Appendix 8-A).

(b) Viewshed Analysis

The VIA includes viewshed analyses to identify locations within the VSA where it may be possible to view the proposed PV arrays and above-ground electrical components 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 methodology employed in these analyses is summarized below and described in Section 4.1.1 of the VIA (Appendix 8-A).

(1) Viewshed Maps

The VIA includes viewshed maps (Figures 5.1-1 and 5.1-2), which define the maximum area from which the completed Facility could potentially be seen within the VSA.

Line-of-Sight cross sections (LOS) were also prepared to demonstrate potential Facility visibility and sources of screening from precise locations (typically including VSRs) along a single line "cut" through the landscape. The Line-of-Sight cross sections are shown in Section 5.2.3 of the VIA (Appendix 8-A).

(2) Viewshed Methodology

The methodology used to prepare viewshed analyses for the Facility are described in Section 4.0 of the VIA (see Appendix 8-A) and summarized below.

Digital surface model (DSM) viewshed analyses were conducted for the proposed PV arrays and above-ground electrical equipment and interconnection facilities to evaluate potential visibility considering the screening effects of topography, structures, and vegetation. Viewshed analyses based on topography alone were not provided because the results of such analyses do not accurately represent conditions within the VSA.

The DSM viewshed analysis for the proposed PV arrays was prepared using: 1) a DSM derived from 2019 New York State Geographic Information System (GIS) Program Office (NYSGPO) and 2014 Federal Emergency Management Agency (FEMA) lidar datasets; 2) sample points representing PV array locations placed 300 feet apart in a grid pattern throughout all proposed PV arrays; 3) a conservative maximum PV array height of 13 feet applied to each sample point; 4) an assumed 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 analysis. Transmission lines and road-side utility lines that are reflected in the lidar data are 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. It is important to note that this clearing of the DSM may also eliminate legitimate screening features such as roadside vegetation and structures, which likely results in an overstatement of potential Facility visibility along road corridors within the VSA. Additionally, all areas within the 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 array 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 treetops 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 accounts for the screening provided by topography, vegetation and structures, the DSM viewshed analysis is an accurate representation of potential PV array 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. As indicated in the VIA, vegetation and structures, in combination with topography, will serve to block views of the PV arrays from approximately 88.6% of the 2-mile VSA (i.e. 11.4% of the VSA is indicated as having potential PV array visibility). The position of the

PV arrays on generally flat topography, and the presence of abundant vegetative screening in the surrounding area, serves to contain the majority of potential Facility visibility to within 1 mile of the proposed PV arrays.

In addition, a DSM viewshed analysis was conducted for the proposed collection substation and BESS. 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 the POI. Additionally, this component, where visible is included in the visual simulations. 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 the analysis was performed, so the viewshed 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 this height within the BESS facility site. All other data sources and assumptions used in this viewshed analysis are as described above for the PV array viewshed analysis. As indicated in the VIA, the viewshed analysis suggests that vegetation, in combination with topography and structures will serve to block views of the proposed collection substation and BESS from approximately 99.5% of the 2-mile VSA (i.e., 0.5% of the study area is indicated as having potential visibility of the substation and BESS).

A DSM viewshed analysis was also conducted for the proposed overhead collection lines. The viewshed analysis used pole locations obtained from preliminary design drawings and proposed pole heights ranging from 41 feet for to 75 feet (matching pole types and placement as defined in design drawings (See Appendix 5-C)). All other data sources and assumptions used in this viewshed analysis are as described above for the PV panel array viewshed analysis. As indicated in the VIA, the viewshed analysis suggests that vegetation, in combination with topography and structures will serve to block views of the proposed overhead collection lines from approximately 94.3% of the 2-mile study area (i.e., 5.7% of the study area is indicated as having potential visibility of the overhead collection lines).

Per the requirements set forth in §900-2.9(a), the potential cumulative visual effect of the Facility as well as other energy projects built or proposed in the surrounding region was considered. The VIA addresses the potential cumulative visual impacts that may arise from interactions between the South Ripley Solar Project and the proposed Empire Solar Project (identified within the 5-mile regional Study Area). Given that the closest other proposed solar project equipment is located over 2 miles from the nearest South Ripley panel array (i.e., approximately 2.7 miles), the opportunity for cumulative visibility of these projects from any given viewpoint will be minimal. Section 5.3.7 of the VIA (Appendix 8-A) includes additional details on the potential cumulative visual effect of the Facility.

(3) Sensitive Viewing Areas

As described above in Section 8(a)(10) of this Exhibit and in Sections 3.6 and 5.2 of the VIA (Appendix 8-A), to identify VSRs within the VSA, the Applicant consulted a variety of data sources including digital geospatial data (summarized in the VIA report) and local planning documents. The Applicant also conducted a systematic program of public outreach to assist in the identification of VSRs. Copies of the correspondence sent by the Applicant as part of this process, as well as responses received from stakeholders, are included as Attachment F to the VIA.

As indicated in Section 5.2 of the VIA (Appendix 8-A), a total of 14 VSRs were identified within the VSA, with 11 of those showing potential Facility visibility according to the viewshed analysis (i.e., occurring within the Facility APE). These include two resources classified as Public Lands and Recreation Resources, two properties of historic significance, three high use public areas, and four resources identified through stakeholder outreach. However, field review indicated that Facility visibility at the VSRs will generally be more limited than suggested by viewshed analysis due to effects of distance, atmospheric diminishment, and the low height or narrow profile of the proposed components (e.g., PV panels, lightning masts, and collection line). Additional discussion regarding potential visibility of the Facility from VSRs within the VSA is included in Section 5.2 and Attachments A and C of the VIA (see Appendix 8-A).

(4) Viewpoint Selection

Based on the results of VSR research, field verification, and stakeholder/agency consultation, a total of 13 viewpoints were selected for the development of visual simulations. These viewpoints were selected based upon the following criteria:

- 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.

- Some of the locations were identified by the Town of Ripley.

As described in Section 4.2.1 and Attachment F of the VIA (Appendix 8-A), agencies, municipal representatives, and local stakeholders were also asked to help identify VSRs and determine an appropriate set of viewpoints for the development of visual simulations. Copies of correspondence sent by EDR as part of this process, as well as the responses received, are included as Attachment F of the VIA.

A total of 13 viewpoints were ultimately selected for the development of visual simulations. The visual simulations included as Attachment D in the VIA (Appendix 8-A) provide representative depictions of the appearance of the built Facility, including views that represent typical views from identified VSRs, adjacent roads and residences. A summary of the selected viewpoint locations is presented in Table 8-1, below.

Table 8-1. Viewpoints Selected for Production of Visual Simulations

Viewpoint Number	Location and/or Visually Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance	View Orientation[2]
VP 5	County Route 6 and Miller Road Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers/Commuters	167 feet	SE
VP 15	County Route 6 Concord Grape Belt State Heritage Area, South Ripley Cemetery	Rural Residential/ Agricultural	Local Residents, Through-Travelers/Commuters	170 feet	SW
VP 16	County Route 6 Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers/Commuters	179 feet	S
VP 20	NYS Route 76 NYS Route 76, Concord Grape Belt State Heritage Area	Rural Residential/ Agricultural	Local Residents, Through-Travelers/Commuters	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, Through-Travelers	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

Viewpoint Number	Location and/or Visually Sensitive Resource	LSZ Represented	Viewer Group Represented	Viewing Distance	View Orientation[2]
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, Through-Travelers	417 feet	N
VP 75	County Route 622	Rural Residential/ Agricultural	Local Residents, Through-Travelers	7,450 feet	NE

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

(c) Visual Contrast Evaluation

(1) Photographic Simulations

As described above in Section 8(a)(4) of this Exhibit, EDR used high-resolution computer-enhanced image processing to create realistic photographic simulations of the proposed Facility from each of the 13 selected viewpoints. The methodology to create the simulations is described in Section 4.2.2 of the VIA. The photographic simulations are included as Appendix D of the VIA (see Appendix 8-A).

(2) Additional Simulations Illustrating Mitigation

As described above in Section 8(a)(4) of this Exhibit and Section 2.2.6 of the VIA, the Applicant has developed a conceptual Visual Mitigation Planting Plan (Appendix 8-B, Attachment 1) to minimize and mitigate the Facility's visual effect on the surrounding landscape. Simulations incorporating the Planting Plan were prepared to demonstrate and allow for evaluation of the efficacy of the proposed plantings in minimizing visual impacts. Simulations showing the plantings following five to seven years of growth, and during the leaf-off and leaf-on seasons are included in Attachment D of the VIA (see Appendix 8-A).

(3) Simulation Comparison

As described above in Section 8(a)(8) of this Exhibit, as well as Section 4.2.3 and Attachment E of the VIA (Appendix 8-A), a panel of four registered landscape architects with experience in the visual/aesthetics field evaluated the visual impact of the proposed Facility as depicted in each of the 13 visual simulations. The rating panel members reviewed the existing and proposed views, evaluated the contrast/compatibility of the Facility with various components of the landscape (landform, vegetation, land use, water, sky, and viewer activity), and assigned quantitative visual contrast ratings on a scale of 0 (insignificant) to 4 (strong). The average contrast score assigned by each rating panel member was calculated for each viewpoint, and a composite average score for each viewpoint was determined. The results of this evaluation process are summarized below in Table 8-2. Additional discussion regarding the results of rating panel evaluation is included in Sections 5.3.1, 5.3.2, and 5.3.4 and Appendix D of the VIA, and copies of the completed rating forms are included in Attachment E of the VIA (see Appendix D).

Table 8-2. Summary of Rating Panel Results

Viewpoint Number	Distance to Nearest Visible PV Panel	Distance Zone	Landscape Similarity Zone	Viewer Groups			Contrast Rating Scores[1]					
				Local Residents	Through Travelers/ Commuter	Tourists/ Recreation	#1	#2	#3	#4	Average	Contrast Rating Result
Visual Simulations That Depict Facility Components (No Mitigation)												
5	167 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.9	2.8	3.8	2.7	2.8	Appreciable
15	170 ft	Near-Foreground	Rural Residential/Agricultural	•	•		0.9	1.4	0.9	0.5	0.9	Minimal
16	179 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.8	2.5	3.2	2.2	2.4	Moderate/Appreciable
20	84 ft	Near-Foreground	Rural Residential/Agricultural	•	•		2.4	2.8	3.4	2.7	2.8	Appreciable
24	654 ft	Near-Foreground	Rural Residential/Agricultural	•	•		0.9	1.9	1.5	1.0	1.3	Minimal/Moderate
40	118 ft	Near-Foreground	Rural Residential/Agricultural	•	•		2.2	3.3	3.6	2.8	3.0	Appreciable
44	344 ft	Near-Foreground	Rural Residential/Agricultural	•	•		3.3	3.5	3.2	2.2	2.9	Appreciable
56	139 ft	Near-Foreground	Forest	•	•		2.9	2.9	3.3	3.0	3.0	Appreciable
59	203 ft	Near-Foreground	Rural Residential/Agricultural	•	•		2.0	3.7	3.0	2.4	2.8	Appreciable
63S	436 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.0	2.3	1.2	1.9	1.6	Minimal/Moderate
63SE	453 ft	Near-Foreground	Rural Residential/Agricultural	•	•		2.0	1.8	1.5	2.0	1.8	Moderate
69	417 ft	Near-Foreground	Rural Residential/Agricultural	•	•		3.2	3.0	2.8	2.5	2.9	Appreciable
75	4,450 ft	Foreground	Rural Residential/Agricultural	•	•		0.7	0.3	0.2	0.8	0.4	Insignificant/Minimal
Total average rating for the visual simulations that depict Facility components (No Mitigation)											2.2	Moderate
Visual Simulations That Depict More Mature Mitigation Plantings (5-7 years post-installation)												

Viewpoint Number	Distance to Nearest Visible PV Panel	Distance Zone	Landscape Similarity Zone	Viewer Groups			Contrast Rating Scores[1]					
				Local Residents	Through Travelers/ Commuter	Tourists/ Recreation	#1	#2	#3	#4	Average	Contrast Rating Result
5	167 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.4	1.5	2.7	2.6	2.1	Moderate
15	170 ft	Near-Foreground	Rural Residential/Agricultural	•	•		0.4	1.1	0.3	0.6	0.6	Insignificant/Minimal
16	179 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.6	1.4	2.9	2.4	2.1	Moderate
20	84 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.3	1.6	1.9	2.7	1.9	Moderate
24	654 ft	Near-Foreground	Rural Residential/Agricultural	•	•		0.9	1.8	1.3	1.0	1.3	Minimal/Moderate
40	118 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.9	2.5	3.6	2.8	2.7	Moderate/Appreciable
44	344 ft	Near-Foreground	Rural Residential/Agricultural	•	•		2.1	2.3	1.6	2.0	2.0	Moderate
56	139 ft	Near-Foreground	Forest	•	•		2.2	2.1	3.2	3.3	2.7	Moderate/Appreciable
59	203 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.5	3.1	2.8	2.4	2.5	Moderate/Appreciable
63S	436 ft	Near-Foreground	Rural Residential/Agricultural	•	•		0.4	1.4	0.7	1.7	1.1	Minimal
63SE	453 ft	Near-Foreground	Rural Residential/Agricultural	•	•		1.0	0.6	1.1	1.9	1.2	Minimal
69	417 ft	Near-Foreground	Rural Residential/Agricultural	•	•		2.9	2.8	2.7	2.5	2.7	Moderate/Appreciable
Total average rating for the simulations that depict plantings at 5-7 years post-installation											1.9	Moderate

Contrast Rating Scale: : 0.0 - 0.2 (Insignificant), 0.3 – 0.7 (Insignificant/Minimal), 0.8 – 1.2 (Minimal), 1.3 – 1.7 (Minimal/Moderate), 1.8 - 2.2 (Moderate), 2.3 – 2.7 (Moderate/Appreciable), 2.8 – 3.2 (Appreciable), 3.3 – 3.7 (Appreciable/Strong), 3.8 – 4.0 (Strong).

The average composite contrast ratings for the 13 visual simulations ranged from 0.4 to 3.0 without the mitigation plantings in place. The viewpoint that received the highest composite contrast rating was Viewpoint 56, which was distinguished by its open expansive views of distant background features which were interrupted by the PV arrays. The lowest composite rating score was received by Viewpoint 75 on County Route 622, approximately 1.41 miles from the Facility. Distance from the Facility in combination with abundant intervening screening resulted in insignificant to minimal contrast. Generally, beyond the near-foreground distance zone (0-0.5 mile) vegetation, topography, and structures combined with the low profile of the PV arrays will result in minimal or insignificant visibility and visual impact. Additional information on the individual contrast ratings is available in Attachment D and Attachment E of the VIA (Appendix 8-A).

For the 12 viewpoints where mitigation plantings were also illustrated, composite contrast scores ranged from 0.6 to 2.7 with plantings in place after five to seven years of growth. This represents an average 0.5-point reduction in contrast when compared to the simulations without the plantings. Additional detail regarding the results of this evaluation are summarized below.

Rating panel results suggest that immediately following installation, the Facility will result in moderate visual contrast with the existing landscape when viewed from the foreground and near foreground distances, as indicated by the overall average contrast score of 2.2. With the established five-to-seven-year post-installation mitigation plantings in place, the total average contrast score across all viewpoints dropped to 1.9, indicating that visual contrast remains moderate. This suggests that the proposed mitigation, although useful in screening/softening views of the PV arrays will not eliminate the overall visual contrast presented by the Facility. However, a selection of individual viewpoints and identified resources that received the proposed mitigation treatment showed a significant reduction in the potential visual contrast resulting from the Facility. These include viewpoints 5, 20, and 44. Each of these received a reduction of 0.7 to 0.9 and resulted in moderate visual contrast with mitigation in place, which was reduced from an appreciable visual contrast without mitigation. Viewpoints 15, 16, 40, 56,63, and 69 received contrast score that were between 0.2 to 0.6 lower with mitigation when compared to the simulations without mitigation. These variable results are typically influenced by the viewer position, existing scenic quality, and the portion of the Facility visible. In most cases, increasing the intensity of mitigation would not successfully reduce the visual contrast further.

However, review of individual viewpoint scores illustrates that the effectiveness of the mitigation will vary by viewpoint. For example, Viewpoints 5, 20, and 44 were noted as having the greatest reduction in visual contrast as a result of the mitigation plantings. Viewpoint 5 received a contrast rating of 2.8 (appreciable visual contrast), but with the mitigation plantings in place after five to seven years, the average contrast score was reduced to 2.1

(moderate visual contrast). Viewpoint 20 received an average contrast score of 2.9 (appreciable visual contrast) without mitigation and 1.9 (moderate visual contrast) with the mitigation in place. Similarly, Viewpoint 44 decreased from a rating of 2.9 (appreciable visual contrast) to 2.0 (moderate visual contrast). In all three of these circumstances the plant material provided effective screening of the Facility and introduced a new aesthetic feature into the view that provided visual interest. By contrast, Viewpoint 24 received a score of 1.3 (minimal to moderate visual contrast) considering the Facility both with and without mitigation. In this instance, the effectiveness of the mitigation plantings is minimized due to the viewer distance from the PV arrays and an angle of the view in which the top edges of PV arrays remain visible above the plantings.

(d) Visual Impacts Minimization and Mitigation Plan

The Applicant has developed a Visual Impacts Minimization and Mitigation Plan (VIMMP) to describe minimization and mitigation strategies taken to decrease the visual impact of the proposed Facility. The VIMMP contains a description of various potential mitigation strategies, including screening (landscaping), architectural design, visual offsets, relocation or rearranging Facility components, reduction of Facility component profiles, alternative technologies, Facility color and design, and lighting options. The minimization and mitigation measures of the VIMMP are further described in Appendix 8-B and summarized below.

(1) Advertisements

Advertisements, conspicuous lettering, or logos identifying the Facility owner, solar panel manufacturer, or any other supplier entity (other than warning and safety signs), will not be displayed at the Facility Site (see Appendix 8-B).

(2) Electrical Collection System

The electrical collection system has been sited underground, to the extent practicable; however, the Facility will include approximately 4.5 miles of overhead collection lines where underground installation is not feasible due to engineering and environmental constraints. Measures to minimize and mitigate potential visual impacts from the overhead collection lines are addressed in the VIMMP (see Appendix 8-B).

(3) Transmission Facilities

A short segment of overhead transmission line (approximately 200 feet) is proposed to connect the Facility to the point of interconnection (POI); that segment will utilize steel pole structures which are self-weathering or otherwise have a non-glare finish consistent with state and utility requirements (see Appendix 8-B).

(4) Conductors

The Facility's limited overhead transmission segment will utilize non-specular conductors (see Appendix 8-B).

(5) Wind Facilities Equipment

The proposed Facility is not a wind facility and therefore, the requirements of §900-2.9(d)(5) are not applicable.

(6) Shadow Flicker for Wind Facilities

The proposed Facility is not a wind facility and therefore, the requirements of §900-2.9(d)(6) are not applicable.

(7) Glare for Solar Facilities

As discussed in Section (a)(9) above, a Solar Glare Assessment (Appendix 8-B, Attachment 3) was prepared to evaluate the potential for glare from the Facility. As part of this assessment, the Applicant utilized the Solar Glare Hazard Assessment Tool (SGHAT) in establishing a baseline of the glare likely to be produced by the Facility. The Solar Glare Assessment found that while there is the potential for glare to be received by eight non-participating residential receptors and portions of three public roadways, solar glare exposure in these locations will limited and will be minimized and mitigated through the installation of the proposed vegetation screening and other mitigation measures. As a result of design of the Facility and the mitigation measures proposed by the Applicant, it is anticipated that any glare produced by the Facility would not result in complaints, impede traffic movements, or create safety hazards. See Appendix 8-B, Attachment 3 for a full discussion of the Facility's potential glare impacts and associated mitigation measures.

(8) Planting Plans

The Applicant has developed a conceptual Visual Mitigation Planting Plan intended to block or soften views of the PV arrays, collection substation, and BESS from surrounding areas per 94-c regulations and existing Town of Ripley Zoning. The Planting Plan uses native species and natural arrangements of plant material that mimics the character of natural vegetation within the VSA, to minimize and mitigate the Facility's visual effect on the surrounding landscape. This conceptual Planting Plan was developed as a site-specific solution appropriate to the scale of the Facility and visual character of its setting. While the Planting Plan was not designed to completely screen views of the proposed Facility, the introduction of native tree and shrub mixes interspersed with pollinator plants along the roadsides adjacent to the Facility will provide a visual buffer of natural vegetation between the Facility and the viewer. These natural forms and colors are intended to substantially screen and soften views of the modern materials and inorganic forms of the PV arrays. See the Planting Plan (Appendix 8-B, Attachment 1) for further details.

In accordance with Section 900-6.4(l)(3), the Applicant will retain a qualified landscape architect, arborist, or ecologist to inspect the visual screening plant modules for up to two years following installation. The inspector will identify plants that require replacement (e.g., dead, unhealthy, or in otherwise poor conditions) and will remove and install replacement plantings within two years of initial installation.

(9) Lighting Plan

As described in Section (a)(5) above, the Applicant has developed a Lighting Plan (Appendix 8-B Attachment 2), including a description of the security and exterior lighting design of the proposed Facility during operation. No lighting will be installed as part of the PV arrays. The only light sources that are anticipated to be installed for the Facility are safety/security lighting at the collection substation and BESS. This lighting will comply with all the relevant requirements outlined in the Section 94-c regulations. During construction and operation, lighting will be kept to a minimum and will prevent light trespass to the extent practicable. See the Lighting Plan (Appendix 8-B, Attachment 2) for further details.

The implementation of mitigation strategies for the Facility including, reduction in the number of proposed PV arrays, the low profile of the individual panels, use of non-specular materials, minimal required site lighting, minimal use of signage where necessary, and the development of a comprehensive vegetative mitigation plan provides a means by which the Applicant has significantly reduced and minimized the potential visual impacts associated with the installation and operation of the Facility. As demonstrated in the rating panel results and illustrated in the visual simulations (Appendix 8-A), the proposed mitigation plan significantly reduced the potential visual impacts from individual viewpoints. For three viewpoints the visual effects were reduced from appreciable to moderate visual contrast. The mitigation had a limited to no effect on more distant viewpoints (greater than 500 feet) in which the Facility already resulted in minimal visual contrast.

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