NORTH SIDE ENERGY CENTER

Case No. 17-F-0598

1001.24 Exhibit 24

Visual Impacts

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Exhibit 24: Visual Impacts

24(a) Visual Impact Assessment

This Exhibit will track the requirements of Stipulation 24, dated February 10, 2021, and therefore, the requirements of 16 New York Codes, Rules and Regulations (NYCRR) §1001.24.

In order to determine the extent and assess the significance of the visibility of the Project, a Visual Impact Assessment (VIA) has been conducted (see Appendix 24-1). The VIA includes both quantitative and qualitative identification of visually sensitive resources, viewshed mapping, confirmatory visual assessment fieldwork, visual simulations (photographic overlays), and proposed visual impact mitigation. Exhibit 24 provides an abbreviated version of the VIA and addresses the issues presented herein. Please refer to the full VIA in Appendix 24-1 of the Article 10 Application for greater detail.

The North Side Energy Center (the Project) will have a generating capacity of 180 megawatts (MW). The Project will be located on land leased or purchased from owners of private property in the Towns of Massena, Brasher, and Norfolk in St. Lawrence County, New York. Proposed Project Components include commercial-scale solar arrays, access roads, inverters, fencing, buried electric collection lines, and electrical interconnection facilities.

The interconnection facilities will consist of a new collection substation and point of interconnection (POI) switchyard which will be transferred to the New York Power Authority (NYPA) to own and operate. The proposed collection substation, switchyard and interconnection facilities will be located on land within the Project Area, adjacent to NYPA's Massena–Moses 230 kilovolt (kV) transmission line. Figure C.101 in Attachment 1 shows the site plan and Figure 1 in Attachment 2 shows the site location on an aerial photo.

Solar Arrays: The Project proposes to install a tracker racking system. As the technology is rapidly evolving for solar panel technology, and market conditions at the time procurement decisions need to be made are unknown at this time, the Applicant is proposing in the Article 10 Application to evaluate both tracking and fixed racking systems, with the final decision to be made and detailed in a compliance filing.

However, for the purposes of assessing visual impacts, the VIA analyses and discussion focuses on the tracker layout, which has the higher aboveground height of the two systems and evaluates

the worst-case scenario. The tracker system in all analyses is set at 13 feet above ground surface (height at maximum tilt).

The tracking system to be utilized would be similar to the Gamechange Solar Genius Tracker™, specification sheets of which have been included in Appendix 2-1 of Exhibit 2 of the Application. Regardless of the type of array racking system ultimately selected for the Project, the Applicant intends to utilize a solar module similar to the Jinko Solar Eagle 72HM G2 380-400 Watt Mono Perc Diamond Cell. Specification sheets for this module as well as the tracker system have been included in Appendix 2-1 of the Application.

As noted above, with the rapid pace at which solar panel technology is evolving and due to the current uncertainty of future procurement decisions to be made for a project with a commercial operation date of late 2023, the exact solar panels and racking systems to be installed are unknown at this time. In the event tracker technology is ultimately utilized for the Project, future design trends are indicating that the panels may reach a maximum height of up to 18 feet when at full-tilt with a dual-portrait solar panel orientation. The evolution of the dual-portrait panel orientation is a more efficient, yet slightly taller configuration compared to a single-portrait panel orientation. The maximum height of a tracker system, however, is only sustained for a short period during daylight hours as the racking makes continuous angle adjustments to follow the sun. For example, tracker systems lay flat near mid-day when the sun is directly overhead resulting in a panel height considerably lower than the maximum height of 18 feet during mid-day. As a result, for the majority of the time when the panels will be visible, the tracker system will be less than 18 feet in height. Although the panels may exceed the 13 feet maximum height assessed in this VIA, this will likely only occur for short durations in the morning and evening or overnight, when the panels are likely not even visible, if the panels are stored at full-tilt. By constructing the arrays with a dual-portrait solar panel presentation, and thus at a height slightly above the current 13-feet assessed in this VIA, the Applicant may be able to minimize the overall Project footprint even further. Regardless, the difference between the maximum height assessed in this VIA and the potentially slightly taller 18-foot maximum height is not anticipated to significantly increase Project visibility or the viewshed assessment results given the height of existing vegetation and structures that screen visibility from further distances.

Project Collection Substation: The 34.5-kV collection lines within the Project Area will gather power from the solar arrays and transport it to a new collection substation that will step up the voltage to 230 kV. The proposed collection substation and interconnection facilities will be located

on land adjacent to NYPA's Massena–Moses 230 kilovolt (kV) transmission line. Please see Appendix 11-1 of the Application for plan and profile drawings associated with the collection substation.

(1) Character and Visual Quality of the Existing Landscape

The Project is in the Towns of Brasher, Massena, and Norfolk, New York. The VSA is a 5-mile radius and primarily includes St. Lawrence County with approximately 85 acres in Franklin County. The definition of the VSA is 5 miles around the fence line of the proposed solar arrays. As a result of the larger Study Area under consideration, a number of additional towns are included over that of the Project location.

Distance Zones are assigned within the VSA as required by Article 10. Currently, Distance Zones of 0.5 miles, 2 miles, and 5 miles are proposed. The towns within the VSA include:

- *Towns that fall within 0.5 miles:* Brasher, Massena, and Norfolk
- *Towns that fall between 0.5 and 2.0 miles:* Brasher, Louisville, Massena, and Norfolk.
- *Towns that fall between 2 and 5 miles:* Brasher, Louisville, Massena, Norfolk, Bombay, and Stockholm.

The Project is approximately 6 miles south of the Canadian border. The VSA is rural and primarily consists of mixed forest groups, wooded wetlands and open land that also includes hay/pasture and cultivated crops as well as rural residential land. The more densely populated center of the Village of Massena lies approximately 1 mile north of the site. The main portion of the village is comprised of low to high intensity urban development. The Massena International Airport is 0.6 miles north of the site. Brasher State Forest lies to the south and is heavily wooded.

Physiographically, the site is approximately 4.2 miles south of the St. Lawrence River within the St. Lawrence Lowlands physiographic province. This Physiographic Province as a whole is defined by smooth plains bordered by the Adirondack Mountains, extending north past the Canadian border. The low relief of this Province was caused by proglacial lake or marine waters. The vegetation is transitional between the boreal forest and broadleaf deciduous forest zones. Forest communities include northern hardwoods and beech-maple forest. Regionally important forest communities include transition hardwood-white pine-hemlock, northern hemlock-elm-red maple, northern hardwoods, aspen-gray birch-paper birch, and pitch pine-heath barrens.

The St. Lawrence Lowlands in the vicinity of the Project is characterized by wet and dry flats mixed in with gently rolling hills. Elevations within the VSA range from 154 to 402 feet above mean sea level (AMSL). Elevations in the general vicinity of the site within a couple miles of the Project range from 162 to 322 feet AMSL not varying much more than 160 feet AMSL save for a low elevation land feature called Maple Ridge, nearing 280 feet AMSL south of the site. The Project site itself is relatively flat with elevations ranging 180 to 273 AMSL, not varying more than 93 feet.

Residential development, aside from the Village of Massena, consists of rural residential houses along roadways scattered throughout the VSA in addition to small developed residential groupings in low population hamlets such as Massena Springs, Massena Center, Brasher Center, and Grantville.

The large Moses Saunders Power Dam and the two adjacent hydroelectric power generating stations, the United States' 912 MW St. Lawrence-Franklin D. Roosevelt Power Project and Canada's 1,045 MW R.H. Saunders Generating Station are 5.7 miles northwest of the Project. Because of the proximity of the dam and power stations, several large and small transmission rights-of-way corridors cross through the VSA.

In addition to the St. Lawrence River, three large rivers flow through the VSA near the Project. The Raquette River is 0.6 miles north of the site. The Grass River is approximately 2.3 miles to the north and the St. Regis River is 1.9 miles to the southeast.

Roadways in a Project vicinity ultimately are important to understand since they are one of several viewer groups that may receive Project visibility. This viewer group could consist of local community, commuter, or tourist constituency on a daily or infrequent basis. To help describe the rural nature of the area and thus provide an understanding of the quantity of viewers by road travel, annual average daily traffic (AADT) counts are provided in the listing of roadways in the area in Table 1 of Appendix 24-1. AADT is a measure used primarily in transportation planning and transportation engineering. Traditionally, it is the total volume of vehicle traffic of a highway or road for a year divided by 365 days. For perspective, highways such as Interstate 90 (I-90) have an AADT of 40,041, while Project roadways such as NY Route 420, has an AADT of 3,083. Other Project local roads such as CR 37 and Small Road, have AADTs of 532 and 307, respectively.

Landscape Similarity Zones

Landscape Similarity Zones (LSZs) are areas of similar landscape and aesthetic character based on patterns of landform, vegetation, water resources, land use, and user activity. These zones provide additional context for evaluating viewer circumstances and visual experiences. Land cover classification datasets from the 2016 United States Geological Survey (USGS) National Land Cover Dataset (NLCD) is available for GIS analysis and was used for an initial establishment of LSZs as they provide distinct and usable landscape categories. These NLCD land cover groupings were then refined based on aerial photo interpretation and general field review. This effort resulted in the definition of five final LSZs within the VSA as depicted in Table 2 and on Figure 2, Attachment 2 and include the following:

Zone 1: Agricultural – This zone includes cultivated land and that which is used for row crops, hay or pasture.

Zone 2: Forested – This zone includes mature deciduous and coniferous tree groups either in uplands or wetlands.

Zone 3: Developed – This zone includes villages, towns, cities, rural residential abutting roadways, and transportation corridors.

Zone 4: Open – This zone includes miscellaneous other open parcels that may have minor development with less visually obstructive features as well as other open lands with few visual obstructions such as minor expanses of barren land or land with short scrub-shrub vegetation.

Zone 5: Open Water – This zone is primarily restricted to the St. Lawrence, Raquette and Grass Rivers in the northern part of the VSA as well as the St. Regis River located southeast of the Project. Other smaller unnamed water bodies, as well as open water of emergent wetlands, are included.

Table 24-1 shows the distribution of LSZs at various distances within the VSA: Distance Zone 1 (0-0.5 miles), Distance Zone 2 (0.5-2.0 miles), and Distance Zone 3 (2.0-5.0 miles).

Table 24-1. Percentage of LSZs within 5-Mile VSA

LSZ	Distance Zone 1 0.5 Miles		Distance Zone 2 0.5-2.0 Miles		Distance Zone 3 2.0-5.0 Miles			
	Square Miles	% of LSZ w/in VSA	Square Miles	% of LSZ w/in VSA	Square Miles	% of LSZ w/in VSA	Total Square Miles of LSZ	Total Percent of LSZ in VSA
Zone 1 Agricultural	2.36	1.76%	4.97	3.71%	14.55	10.86%	21.88	**16.33%**
Zone 2 Forested	5.67	4.23%	17.94	13.39%	65.05	48.54%	88.65	**66.16%**
Zone 3 Developed	0.37	0.28%	3.22	2.40%	8.10	6.04%	11.69	**8.72%**
Zone 4 Open	0.75	0.56%	1.01	0.76%	3.38	2.52%	5.14	**3.84%**
Zone 5 Water	0.03	0.03%	0.69	0.52%	5.92	4.42%	6.65	**4.96%**
Totals	**9.18**	**6.85%**	**27.84**	**20.77%**	**96.99**	**72.38%**	**134.01**	**100.00%**

LSZ 2 Forested is the dominant LSZ found within the 5-mile VSA comprising 66.2% of the land area and appears as the greatest percentages in all three Distance Zones. Zone 1 Agricultural accounts for the next highest acreage resulting in 16.3% of the land area. Zone 3 Developed comprises 8.7% of the land area in the VSA. Zone 4 Open is land with few visual obstructions such as minor expanses of barren land, land with short scrub-shrub vegetation, and emergent wetlands occurs in the least amount and comprises 3.8% of the VSA. Zone 5 Water (St. Lawrence, Raquette, Grass, and the St. Regis Rivers) accounts for 5% of the VSA.

Distance Zones

Distance Zones are based on Project distances to an observer. Three distance zones are applied to the Project: foreground, middleground, and background. Each of these areas will determine the level of detail and acuity of objects. Distance Zones are often identified by the definitions in *The US Forest Service Landscape Aesthetics – A Handbook for Scenery Management* (US Forest Service Handbook) (1995). The effects of distance highly depend on the characteristics of the landscape. However, size, level of visibility perceived for this particular type of project (solar panels), and panel position in the landscape should also be considered in determining zones.

Distance Zones for this Project have been reasonably modified from the US Forest Service Handbook to accommodate the VSA radius, limitations of human vision and perceptible detail of the low profile of the Project components, and how much of the Project can actually be seen. Solar panels are not wind turbines or tall buildings. They are of a different character with a low vertical height profile (13 feet high for tracker arrays) in comparison to other larger objects found in the landscape such as houses, barns, and trees, in addition to the rolling topography in the area that could easily visually obstruct farther locations. Solar projects typically have lateral breadth but the visibility of solar projects in the northeast, because of frequent and highly vegetated narrow ridges and valleys and dense forest areas surrounding agricultural lands, often do not offer substantial far-reaching vistas of many miles. Distance Zones for this project are as follows:

- Distance Zone 1: Foreground (up to 0.5 miles from the viewer). This is the closest distance at which details of the landscape and the solar panels can be seen. Individual landscape forms are typically dominant and individual panel strings and racking system detail may be seen. The concentration of predicted visible areas lies within this zone.

- Distance Zone 2: Middleground (0.5 to 2 miles from the viewer). At this distance, individual tree forms and building detail can still be distinguished at, for example, 1 mile. The outer boundary of this distance zone, however, is defined as the point where the texture and form of individual plants are no longer visibly acute in the landscape. In some areas, atmospheric conditions can reduce visibility and shorten the distance normally covered by each zone. Solar panels lose their level of detail and are seen as a continuous mass of form and/or color.

- Distance Zone 3: Background (2 to 5 miles from the viewer to the horizon). At the extent of background distances, texture disappears, and color flattens but large light and dark patterns of vegetation or open land due to shape or color are distinguishable and ridgelines and horizon lines are the dominant visual characteristics. Landscapes are simplified and are viewed in groups or patterns. Solar panels can be detected as a distant form and color change but are not as discernible.

Further discussion on the percentages of visibility for each Distance Zone can be found in Appendix 24-1 and in Exhibit 24(a)(2) below.

(2) Visibility of the Project

To understand the locations from which the Project may be visible, viewshed maps were developed (see description of methodology in Exhibit 24(b)(2)). Two viewshed analyses were performed, one with bare earth topography only and one with vegetation included with solar panel heights set at 13 feet above ground surface. Results from a topography-only viewshed analysis is not considered representative of the surrounding landscape as trees and buildings are not included. However, the analysis illustrates the effects of the surrounding terrain and determines if landform is responsible for obscuring some of the views. Maps can be found in Attachment 2 of Appendix 24-1.

Viewshed Results– Topography Only

As described a viewshed analysis with bare earth topography without trees is recognized as not being a realistic representation of potential visibility. However, the analysis was performed as it is a useful tool in understanding the influence that terrain has on blocking views to the Project. It was also performed to assist in performance criteria required for Exhibit 20 Cultural Resources.

The bare earth topography-only viewshed analysis results show that without the presence of existing vegetation the Project is visible in nearly the entire VSA and is predominant within 2 miles. However unrealistic this result may be, it indicates that topography is generally quite level at least within 2 miles and there are minimal areas where the terrain is high enough to block views. The topography-only results must also not be fully interpreted as representing visibility during leaf-off conditions, since even leaf-off bare branched tree groups act as a solid mass where lines of sight to objects can be screened. Under some circumstances, there may possibly be visibility through bare-branched trees only if the trees are sparse, that this sparse tree row is the only existing vegetation between the viewer and the site, and that the viewer is in fairly close proximity to the Project.

Some topographic-only screening does occur and is present in select areas between 2 and 5 miles. Refer to Figure 3 in Attachment 2 of Appendix 24-1. There are areas to the north in Louisville and Massena where there are views obstructed by topography, as well as isolated areas to the south in Norfolk, Stockholm and Brasher.

Viewshed Results –Trees Included

The viewshed analysis results (Figures 3 and 4, Attachment 2 of Appendix 24-1) show areas of expected visibility.

When vegetation is included to present a more realistic depiction of the landscape, potential visibility decreases substantially. The viewshed analysis results in the Appendix 24-1 Attachment 2 maps show limited visibility is expected. The general vicinity surrounding the Project and preliminary buildable area is well-forested, as illustrated in Figure 1 Site Location and Figure 2 Landscape Similarity Zone maps in Attachment 2 of Appendix 24-1. The majority of visibility that is expected occurs mostly in a focused location inside of the 0.5-mile Distance Zone 1 within the Project parcels themselves and in a few roadways, open fields, and nearby properties within and outside of the Project vicinity. Although the panels are sited in open land within forested areas, the low-profile panels set against existing tree buffers, hedgerows, and tree groups that frame the panel locations is enough to obscure many outward views. Because of a low profile 13-foot panel maximum height in relation to the mature vegetation, there are minimal far-reaching views outside of the general array locations. Outside of Distance Zone 1, visibility is expected to be minimal to non-existent.

Several viewpoint location photographs depicting regions outside of Distance Zone 1 can be seen in the Attachment 4 Project Photolog. For example, VP3, VP14, VP21, VP23, and VP29 show existing views and character of the area between 0.5 and 5 miles and helps illustrate why there is little visibility farther out from the Project.

From the results of the viewshed analysis with vegetation, the percent visibility of the land area located in the 5-mile VSA is shown in Table 24-2 and discussed below.

Table 24-2. Percent Visibility of the 5-Mile VSA*

Distance Zone	Total Area Comprising Distance Zone (Square Miles)	Visibility Within Distance Zone (Square Miles)	% Visibility Within Distance Zone	% Visibility Within Full VSA
Zone 1 0-0.5 Miles	9.18	3.40	37.03%	**2.54%**
Zone 2 0.5-2.0 Miles	27.84	0.15	0.55%	**0.11%**

Table 24-2. Percent Visibility of the 5-Mile VSA*

Distance Zone	Total Area Comprising Distance Zone (Square Miles)	Visibility Within Distance Zone (Square Miles)	% Visibility Within Distance Zone	% Visibility Within Full VSA
Zone 3 2.0-5.0 Miles	96.99	0.00	0.00%	**0.00%**
Total VSA	**134.01**	**3.55**	**2.65%**	**2.65%**

* Results are from visibility analysis with vegetation

Table 24-2 shows that when considering between Distance Zones, the highest amount of visibility occurs within the 0.5-mile radius of Zone 1, comprising 37.0% of the Zone 1 land area. This is because there is a concentrated amount of visibility in proximity to the Project within the 0.5-mile radius, much of it within the solar array parcels themselves in open land. There is an abrupt difference once outside of the 0.5-mile radius. Visibility within Distance Zone 2 trends downward to 0.6% between 0.5 to 2.0 miles. Percentages of visibility in Distance Zone 3 outside 2.0 miles drops to 0%. There is approximately 3.6 square miles of total visibility within the entire 134.01 square miles that comprises the VSA. Therefore, only 2.7% of the VSA is predicted to experience partial, close, intermittent, or distant views of the Project.

The Project has been strategically sited away from population centers and other sensitive visual receptors. The effect that this siting strategy has on potential visibility for visual resources is apparent in Table 24-3 shown in Exhibit 24(b)(4). Visual change with respect to the visual resources listed in Table 24-3 is not expected.

Article 10 Resources

The viewshed visibility results, and as summarized in Table 24-3 of Exhibit 24(b)(4), indicate that no federal, state, or county Article 10 sensitive visual receptors will have views of the Project.

Local Scenic Resources

Article 10 locally listed visual resources are those locations that are officially designated in an adopted comprehensive plan or through zoning. Those local resources that have been recognized by document research and/or were received as a response from the outreach program described in Exhibit 24(b)(9) are listed in Table 24-3. Local resources listed in Table 24-3 will not have views of the Project.

However, not classed specifically as agency listed scenic resources, it is recognized that local town residents and local roadway traffic will experience views of the Project in varying locations. Several locations of roadways with nearby residences are represented in the Project photosimulations.

(3) Visibility of Above-Ground Interconnections and Roadways

Due to the placement and road offset and surrounding forested area, the collection substation and switchyard will not be visible from most areas in the vicinity as well as within the overall VSA. There may be a few areas where a portion of the upper part of a surge arrester or small diameter lightning mast may be visible. However, the collection substation and switchyard will also be integrated within compatible infrastructure. The station will be adjacent to the existing NYPA's Massena-Moses 230-kV transmission line that consists of large 130 and 140-foot-tall lattice towers, while the tallest vertical proposed heights of substation components will only be 60 feet. Lower station components will range from 25 to 27 feet high and include transformers, bus equipment, and breakers. Views to lower station components are expected to be non-existent in nearly all instances because of the mature forest surrounding the site.

LOS profiles in Attachment 3 of Appendix 24-1 illustrate the anticipated minimal visibility of the collection station. L1 LOS is located on County Road 46 at the nearest resident north of the station approximately 0.43 miles away. LOS L1 profile shows the various component profile against substantial forested areas between L1 and the station. The profile shows there will not be visibility of the collection substation and switchyard from LOS L1. L2 LOS is located at an open farm field behind a nearby residence south of the collection station and switchyard on County Road 37, approximately 0.53 miles from the Project. The existing 230 kV line and lattice tower structures present in the right-of-way are located between the viewpoint L2 and the substation, as the substation will be behind and north of the transmission line. At this viewpoint, the profile shows there is existing forested areas that will prevent views of both the lower and upper portions of the collection substation and switchyard. L3 LOS is located at a residence south of the collection station and switchyard on County Road 37 approximately 0.51 miles from the Project. The existing 230 kV line and lattice tower structures present in the right-of-way are located between the viewpoint L3 viewer and the substation, as the substation will be behind and north of the transmission line. The profile shows there will not be visibility of the collection substation and switchyard from LOS L3. There is proposed vegetative landscaping along the Project fence line in the area near L3 and it is expected that this mitigation will screen views not only to the

arrays but also to the lower and upper station components. While L3 shows heights of mitigation may reach 5 to 15 feet in 5 years, fully mature heights of the year-round coniferous species may reach up to 40 feet tall.

Roads used to access solar arrays will follow existing farm roads and trails where practicable in order to minimize the need for new roads. The same access roads used during construction will be used during operation of the Facility and will be gravel surfaced.

(4) Appearance of the Facility Upon Completion

Site visits were made to obtain photos during leaf-off conditions in order to depict worst-case scenario. See the Project Photolog in Attachment 4. Photographs were taken during leaf-off conditions in 2018 that attempt to provide the most unobstructed views possible at north, south, east, and west positions and/or in areas where the viewshed maps represent potential visibility. Simulations are presented in Attachment 3. In October 2020, all photo views at their corresponding viewpoint locations were field checked and verified to ensure that viewpoint site conditions remained the same and were not altered since 2018.

High resolution digital cameras were used to obtain Project photographs. Coordinates of camera locations intended for simulations as well as other reference points within the view were collected using survey grade sub-meter accuracy Trimble global-positioning system units. Reference locations were noted and were later used to refine the placement of the facility within the simulation photographs.

To create visual simulations, Autodesk 3DS MAX 2020 visualization software was used to correctly dimension the Project 3D model onto the digital photographic image from each viewpoint location. TRC created the 3D model of the solar layout by using engineering specifications obtained from Westwood, the design engineers for the Project. The terrain elevation data (z value) needed to place the panels correctly on the surface of the earth was derived from Light Detection and Ranging (LiDAR) .las point cloud data. LiDAR files were acquired from the 2016-2017 FEMA Franklin/St. Lawrence LiDAR dataset and obtained from the New York State GIS Program website. Using the engineering site plan and LiDAR terrain surface data in GIS, each x, y, z coordinate location of each proposed solar array was obtained and imported into Autodesk 3DS MAX visualization software including the terrain surface itself. A 3D model of every proposed individual solar array was then physically constructed according to the proposed panel specifications and tilt angle along with the proposed racking system. The proposed tracker arrays

were built as double-portrait panels with a height of 13 feet above ground surface with array axis oriented north-south. Since tracker arrays track and follow the maximum sun angle, they can be facing east, west, or up depending on the time of day. The tracker panel orientations depicted in the simulations and which way they might face was based on the time of day the photo was taken to determine if they faced east or west, but then were depicted at their maximum tilt angle to show worst case. In most cases closer to noon, the tracker panels would actually be more horizontal and parallel to the ground in order to face noontime sun angles. The simulation model was further developed to position the viewer at the selected vantage point. For a given vantage point, the visualization software is capable of providing and adjusting a camera view that matches that of the actual photograph. From the field effort, the documented camera coordinate (x, y, z) positions were entered into the model along with other camera information. Reference locations, which are existing visible objects in the photograph, such as light posts, building corners, placed stakes, gate posts, or utility poles, were used to assist with refined placement of the proposed Project within the photograph as well as other standard terrain-matching methodologies. For the landscaping simulations, a CAD version of the proposed landscaping plan obtained directly from the Landscape Architect was imported into the MAX modeling environment where, subsequently, each proposed tree and shrub species was then translated and built into 3D, growth heights set and placed in with the Project along the fence line according to the landscape plan. The day and time of the photographs were also recorded and typically exist as electronic information embedded in the respective digital photograph files. This information was used to adjust for the sun angle in the simulation software in order to represent lighting conditions for the time of day and year.

(5) Lighting

Lighting is only proposed at the Project interconnection facilities and is only for security, safety, and maintenance purposes. No lighting is proposed within the solar arrays. Details regarding the Project's Lighting Plan are included in the Preliminary Design Drawings in Appendix 11-1 of Exhibit 11. Manually operated security lighting is proposed at the collection substation and switchyard. A lighting plan for the collection substation and switchyard is included with the Exhibit 11 drawings. This plan was developed to minimize fugitive light while meeting lighting standards established by the National Electric Safety Code (NESC). The collection substation and switchyard will primarily remain unoccupied. All lighting will be activated manually and turned on by a switch. Lighting will be installed facing downward to minimize potential impacts to the surrounding public. Lighting has been designed to provide a 3.0 foot-candle average to eliminate

unnecessary light trespass beyond the collection substation and switchyard. Lighting will be attached to equipment or pole structure mounted and will not be illuminated during unoccupied periods. The collection substation and switchyard will use full cut-off fixtures and task lighting wherever feasible, as specified in the Lighting Plan. Drop-down optics will not be utilized for the Project.

(6) Photographic Overlays and LOS

In order to simulate the visual changes that are anticipated from introducing the built facilities into the Project Area, high-resolution computer-enhanced image render processing was used to create realistic photographic simulations of the proposed Components from selected viewpoints.

The Project proposes to install tracker racking systems as noted in Section 24(a). The tracker system in all analyses is set at 13 feet above ground surface (the height at maximum tilt).

The following is a summary of the potential visibility to viewers at simulation locations. The complete visual simulations for the Project are provided in Attachment 3 Appendix 24-1.

VP6 County Road 37, View Southwest – Massena (LSZ 1,3; Distance 135 feet)

The viewer is on County Road 37 looking to the southwest approximately 135 feet from the Project fence line. This viewpoint was chosen to represent a close unobstructed view of arrays from a principal arterial road that is also in the vicinity of several residences. County Road 37, a non-interstate, is a part of a rural network of continuous routes with corridor movement indicative of statewide travel. The viewpoint location is reflective of what a rural part of the community would experience at the northeastern portion of the Project. Existing conditions show an open field occupying the view with a forested area far in the distance with low-growing roadside vegetation that allows a clear line of sight. Visually, the existing photo shows large horizontal forms of field in the view. From this location, the sight lines in the simulation show clear views of solar panels due to proximity of the Project in the open field. The overall form and line of the arrays is seen as a horizontal shape sweeping across the view. New form, line, and color contrasts are introduced and have contiguous lateral breadth that also interrupt the horizon line. Features such as the fence, panels, and racking system have discernible detail due to proximity, and combined with a repetitive pattern, provide some texture contrast. Project contrasts overall are rated moderately strong. Viewer groups affected are local motorists and approximately four residences near the viewpoint.

The Applicant is proposing vegetative screening in this area for houses that are near this viewpoint, as depicted on the Landscape Plan drawings included in Appendix 11-1. However, proposed mitigation is not occurring for this specific simulation vantage point as no non-participating landowners have direct views at this portion of the arrays.

VP11a Daly Road (CR 19), View Northwest – Brasher (LSZ 3; Distance 317 feet)

The photo was taken to represent a view of the Project in the vicinity of residences on Daly Road within the eastern portion of the site. Daly Road is a local road with light vehicular traffic.

The view at VP11a is looking northwest with a residential property partially in the view. The viewer is approximately 317 feet from the Project. Existing conditions show large horizontal shapes of sky and a level field with a horizontal band of trees in the background on the opposing end of the field. Proposed conditions show a partial view of the Project at fairly close range providing some, but minor levels of visual acuity and discernible detail. Although there are differences in color and visual changes in the view, the solar arrays are somewhat visually absorbed by the background trees. The size and scale of the Project have a low-profile appearance with no interruption of the horizon line and have a similar horizontal shape as the background landscape. Project contrasts overall are rated weakly moderate. Viewer groups affected are motorists and approximately five residences nearby to the viewpoint.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. Accordingly, it is expected that there will be partial views as the proposed landscaping grows to maturity as demonstrated in the simulation with mitigation at 5 years. With the inclusion of vegetative mitigation, views are softened and moderated as the trees and shrubs are more congruous with the existing environment and the Project color and value contrasts are reduced. Views of the mitigation for motorists will be intermittent and of short duration while longer duration views of the vegetative buffer will be obtained by residences.

VP11b Daly Road (CR 19), View Southwest – Brasher (LSZ 1,3; Distance 103 feet)

VP11b is in the same location as VP11a but with a view looking southwest. The Project is approximately 103 feet away from the viewer where the view overlooks a large agricultural field. Existing conditions show field and sky as large dominant horizontal shapes in the view. Trees are present in the far background running parallel with the field and presents as a small darker horizontal band. Proposed conditions show the that the overall form and line of the array field

mimics the horizontal aspects of ground elevation and terrain. However, the Project is apparent and contrasts with the existing landscape due to proximity and presence of discernible detail such as the fence, solar panels, and racking system. Color and contrasts are rated as moderate/moderately strong. Viewer groups affected are motorists and approximately five nearby residences.

The Applicant is proposing vegetative screening in this area as depicted on the Landscape Plan drawings included in Appendix 11-1. Accordingly, it is expected that there will be partial views as the proposed landscaping grows to maturity as demonstrated in the simulation with mitigation at 5 years. With the inclusion of vegetative mitigation, views are softened and moderated as the trees and shrubs are more congruous with the existing environment and the Project color and value contrasts are reduced. Views of the mitigation for motorists will be intermittent and of short duration while longer duration views of the vegetative buffer will be obtained by residences.

VP12 Small Road, View Southwest – Brasher (LSZ 1,3; Distance 836 feet)

VP12 is approximately 836 feet north of the Project located on Small Road which is classed as a local road with an AADT of 307 indicating its low travel frequency. There are portions of this road that are undeveloped. However, the photo was taken to represent views for a cluster of approximately four nearby residences. VP12 is located in the central part of the Project. Existing conditions show horizontal shapes consisting of field and sky that occur in the view with a narrow tree line band in the far background on the opposing side of the field. The simulation shows the effectiveness of the 836-foot road offset. The solar array size and scale are diminished and are somewhat visually absorbed by the vegetation because the color values are similar to that of the background trees. There are no horizon line interruptions and the arrays appear well below the tree line. Overall average Project contrasts are rated weakly moderate. Viewer groups affected are local motorists and several residences. There is estimated to be a low number of viewers because of the rural location and approximately four residences in the vicinity.

As noted above, the large setback provided from the arrays to the roadway (and nearby residences) reduces visibility of the arrays. Additionally, the Applicant is proposing vegetative screening at select locations (where it would not impact underground collection lines) in this area to further screen visibility of the Project as depicted on the Landscape Plan drawings included in Appendix 11-1. Accordingly, it is expected that there will be partial views as the proposed landscaping grows to maturity as demonstrated in the simulation with mitigation at 5 years. With

the inclusion of vegetative mitigation, Project views are made more congruous with the existing environment and the Project color and value contrasts of the arrays are reduced. Views of the mitigation for motorists will be intermittent and of short duration while longer duration views will be obtained by residences.

VP15 Hopson Road, View Northwest – Brasher (LSZ 1,2; Distance 1,049 feet)

VP15 is located at the south-central portion of the site on Hopson Road approximately 1,049 feet from the Project in the vicinity of a resident that is off to the left and out of view of the photo. The view looks to the northwest. This VP was chosen because it is representative of Project views that are located south of the Project. Existing conditions show some minor roadside vegetation with a sky and middleground field seen as large dominant horizontal shapes in the view, with a narrow horizontal tree row in the far distance. In the proposed conditions simulations, there is some distant tree clearing observed, however, much of this distant tree row will remain uncleared to provide screening for the arrays that are proposed on the opposite side (north). Proposed conditions also show there is an extremely minimal and fragmented view of a few arrays seen through gaps in the far tree row at the end of the field. However, the arrays are not very discernible as the vegetation along the existing tree row serves to block views. Project contrasts are rated very weak due to distance from the viewer and the amount of existing vegetation that remains to serve as screening.

The Applicant is proposing vegetative screening behind portions of the distant tree line where trees are sparse, as depicted on the Landscape Plan drawings in Appendix 11-1. Most of these plantings in the simulation appear behind roadside vegetation that is in the right part of the photo. As the simulation shows, there will be minimal to no visibility of the arrays from this location. And as noted, the Applicant will also be utilizing the existing far tree row as mitigation as well.

VP18 Hopson Road, View Southeast – Brasher (LSZ 3; Distance 267 feet)

VP18 is located at the north central portion of the site on Hopson Road near a residence. The viewer is looking to the southeast and is approximately 267 feet from the Project. Existing conditions show the driveway and an outbuilding on a portion of a residential property. The remaining area beyond is open field. Proposed conditions in the simulation show a partial view of the arrays in the adjoining field. Due to the proximal distance, the Project remains apparent where discernible detail is obtained, and the horizon line is interrupted. The arrays are dominant in the view from the viewing location. Overall average Project contrasts are rated moderately

strong. Viewer groups affected are local motorists and several residences. There are expected to be a low number of viewers because of the rural location and approximately five residences that are nearby.

The Applicant is proposing vegetative screening in this area as depicted on the Landscaping Plan drawings included in Appendix 11-1. Accordingly, it is expected that there will be partial views because the proposed landscaping grows to maturity as demonstrated in the simulation with mitigation at 5 years. With the inclusion of vegetative mitigation, views are softened and moderated as the trees and shrubs are more congruous with the existing environment and the Project color and value contrasts are reduced. Views of the mitigation for motorists will be intermittent and of short duration while longer duration views of the vegetative buffer will be obtained by residences.

VP27 NY State Route 420, View East – Norfolk (LSZ 2,3; Distance 884 feet)

VP27 is at the western side of the site on NY Route 420 located west of the Project with approximately three residences nearby. The structure in view is not a residence but a commercial business called Seaway Valley Dent-Tec. The residences are on the opposite side of the road of the commercial property and behind the viewer. The existing view shows a light-colored scrub field against a forested background with the existing commercial garage in the foreground. There is generally good tree cover along this road. However, this viewpoint was taken where there is an open area along the road that would afford a direct line of sight view. At this location, the proposed panel arrays are offset from the road and approximately 884 feet from the viewpoint which significantly diminishes visibility. The Project provides a new distant lateral breadth of color change from light to dark. Overall average Project contrasts are rated as moderate mostly due to the visible effects of tree clearing noted in the view. Viewer groups affected are local motorists and several residences. There are expected to be a low number of viewers because of the rural location and approximately three residences that might experience visual change.

Given the large road offset that will result in moderate views of the Project, the Applicant is not proposing vegetative screening in this area.

LOS

LOS profiles were performed for the collection substation. LOS analyses are able to provide the viewer with information that assists in examining the reasons why objects such as substation components may have impeded views or no views. The underlying topography of a sight line in addition to vegetative obstructions can be produced as well as an estimated amount of visibility of the upper portion of an object if it is visible.

LiDAR data obtained for the Project was used for an elevation source. ArcGIS Environmental System Research Institute (ESRI) 3D Analyst was used to produce elevation samples across select sight lines for bare earth topography and for vegetation. Please refer to the profiles in Attachment 3 of Appendix 24-1.

L1 – County Road 46 to Collection Substation (LSZ 1,3; Distance 0.43 miles)

The proposed collection substation and switchyard is embedded within a mature forested area, as can be seen in Figure 1, Attachment 1, as well as the inset aerial photo on each Line of Sight. The trees surrounding the proposed station are expected to provide substantial screening to nearby residences.

L1 LOS is located on County Road 46 at the nearest resident north of the station approximately 0.43 miles away. The collection substation and interconnection facilities will be located on land adjacent to NYPA's Massena-Moses 230-kV transmission line and immediately adjacent to the existing Massena substation. However, while the existing lattice towers in the vicinity range between 130 and 140 feet high, the tallest vertical proposed heights of substation components will be lower in height. The tallest components at the collection substation will include two 60-foot tall surge arrestors and one 50-foot lightning mast within the fence line. Other station components with less vertical height include transformers, bus equipment, and breakers ranging from 25 to 27 feet tall. A control building is proposed that will be 12.5 feet tall.

LOS L1 in Attachment 3 shows the various component profile against substantial forested areas between L1 and the station. The profile shows there will not be visibility of the collection substation and switchyard from LOS L1.

L2 – County Road 37 to Collection Substation (LSZ 1,3; Distance 0.53 miles)

L2 LOS is located at an open farm field behind a nearby residence south of the collection station and switchyard on County Road 37, approximately 0.53 miles from the Project. As noted in Section 10.2.2.1, the highest components will be surge arrestors 60 feet tall, a static lightning mast 50 feet tall and other low components that range from 25 to 27 feet tall and are much lower than existing utility lattice towers in the area. The existing 230 kV line and lattice tower structures present in the right-of-way are located between the viewpoint L2 and the substation, as the substation will be behind and north of the transmission line. At this viewpoint, the profile shows there is existing forested areas that will prevent views of both the lower and upper portions of the collection substation and switchyard.

L3 – County Road 37 to Collection Substation (LSZ 1,3; Distance 0.51 miles)

L3 LOS is located at a residence south of the collection station and switchyard on County Road 37 approximately 0.51 miles from the Project. As noted in Section 10.2.2.1, the highest components will be surge arrestors 60 feet tall, a static lightning mast 50 feet tall and other low components that range from 25 to 27 feet tall and are much lower than existing utility lattice towers in the area. The existing 230 kV line and lattice tower structures present in the right-of-way are located between the viewpoint L3 viewer and the substation, as the substation will be behind and north of the transmission line. The profile shows there will not be visibility of the collection substation and switchyard from LOS L3.

There is proposed vegetative landscaping along the Project fence line in this area and it is expected that this mitigation will screen views not only to the arrays but also to the lower and upper station components. While L3 shows heights of mitigation may reach 5 to 15 feet in 5 years, fully mature heights of the year-round coniferous species may reach up to 40 feet tall.

(7) Nature and Degree of Visual Change from Construction

Potential visibility during construction is anticipated to be minor and temporary in nature. Construction activities for a solar facility are site and project dependent. However, construction of a typical facility would normally involve the following major actions with potential visibility: building/upgrading roads; constructing laydown areas; removing some vegetation from areas of construction; transporting components and other materials and equipment related to the solar site; assembling the solar panels; constructing ancillary structures (e.g., collection substation, fences) and installing power-conducting cables (typically buried). Potential visual contrasts that

could result from construction activities include contrasts in form, line, color, and texture resulting from road upgrading; construction and use of staging and laydown areas; vehicular, equipment, and worker presence and activity; dust; and emissions. These elements are quite typical of many major construction projects.

Construction visual contrasts would vary in frequency and duration throughout the course of construction. There may be periods of intense activity followed by periods with less activity and associated visibility would vary in accordance with construction activity levels. Construction schedules are project dependent.

(8) Nature and Degree of Visual Change from Operation

The information in the VIA (Appendix 24-1) can provide a more complete understanding of the visual relationship between the Project and its surrounding context. In-depth compilation of computerized analysis results and corresponding discussion is provided in Section 10.0 of Appendix 24-1. The viewshed analysis results show that there is minimal expected visibility (2.7%) within the overall VSA and there would be limited areas from which the Project would be visible but, in contrast, a multitude of areas from which it would not be seen. A majority of the overall visibility will occur within 0.5 miles of the arrays (2.5%) although there are several tree groups surrounding the Project that will block views. There are also attributes of the design of this solar project and its relationship to its particular surroundings that would minimize the Project's visibility as discussed in Exhibit 24(a)(10).

There are no Article 10 listed visual resources outlined in Exhibit 24(b)(4) that will have views of the Project. It is expected that the number of static viewers able to see the Project is low due to the rural nature of the Project location. However, there will be residences with views, but vegetative mitigation is proposed to screen residences views of the Project. The Applicant has provided mitigation to the maximum extent practicable by using siting and vegetative screening. The general visual appearance of the low-profile panels as a group contribute to a homogenous form with low discernible detail at distance which consists of a new horizontal pattern similar in color, shape, and size to the background forested areas and field edges found in many views. Color differences between the Project and the landscape may provide contrast but will vary throughout the seasons.

Overall Project contrast, described in Exhibit 24(b)(7), and the overall visual effect will vary depending on the extent of panel visibility (partial or full), distance of the arrays from the viewer,

and if the panels are seen in the context of other existing noticeable modifications to the local natural landscape**.** As noted in the visual contrast discussion in Exhibit 24(b)(7), two out of the seven simulation viewpoints resulted in (Part 1) visual contrasts that were determined to be moderately strong, mostly due to close proximity to the Project. The remaining five simulations resulted in very weak to moderate Part 1 Project contrasts. The Applicant is proposing to install landscaping along portions of the Project to provide nearby residences with screened views towards the Project. Landscaping will consist of a variety of evergreen trees and shrubs that will provide year-round screening. Visual Project contrast from solar panels is anticipated to be avoided or minimized in areas where landscaping is proposed. All Part 2 Viewer Sensitivity contrasts were rated as weak due to the low populated rural nature of the area in addition to the fact there are no simulation locations that are within an Article 10 listed resource. Simulations within Article 10 resources were not chosen to show representative Project views since none will have a view of the solar arrays.

Due to the placement and road offset and surrounding forested area, the collection substation and switchyard will not be visible from most areas in the vicinity as well as within the overall VSA. There may be a few areas where a portion of the upper part of a surge arrester or small diameter lightning mast may be visible. However, the collection substation and switchyard will also be integrated within compatible infrastructure. The station will be adjacent to the existing NYPA's Massena-Moses 230-kV transmission line that consists of large 130 and 140-foot-tall lattice towers, while the highest vertical proposed heights of substation components will only be 60 feet. Lower station components will range from 25 to 27 feet high and include transformers, bus equipment, and breakers. Views to lower station components are expected to be non-existent in nearly all instances because of the mature forest surrounding the site. LOS profiles in Attachment 3 illustrate the anticipated minimal visibility of the collection station.

Other factors assessing the degree of visual change other than percentages of visibility expected (Table 24-2) as a result of the Project can be considered:

- Aside from the Village of Massena, the towns that fall within the 5-mile VSA are rural with some agricultural farming.

- Project Facilities are set back from property lines and/or behind forested areas to both reduce visibility and to not disturb surrounding agricultural activities on adjacent parcels.

- Through the use of efficient solar panels, the Applicant is able to limit the ground cover required to achieve its objective of 180 MW generating capacity. Additionally, solar facilities typically result in a minimal amount of ground disturbance for the installation of racking and mounting posts thereby preserving the ability to use the land for agricultural purposes in the future following decommissioning.

- The Alternating Current (AC) collection lines will be placed underground for the entirety of their length and installed primarily via direct burial or trenching with some portions to be proposed via HDD in order to avoid wetland resources and roadways.

- While the Project area consists of many pastoral views, landscape features are similar to each other and landscape characteristics are typical of what you would find in a rural area in this part of New York. The Project will not impair these surrounding regional landscape characteristics.

- The Project will not always appear as a dominant feature in a view.

- There will be no interference with the general enjoyment of recreational resources in the area due to the fact that most visual resources are at a distance from the Project with no expected views as well as limited to no long-range visibility overall in the VSA.

- The Applicant has employed reasonable mitigation measures to the maximum extent practicable in the overall design and layout of the proposed Project so that it fits relatively well into the available parcels and landscape.

- Vertical scale is typically not an issue in relation to surrounding features such as trees, hills, and barns. Lateral extent may be an issue if the arrays appear to overwhelm a ridgeline, scenic water body, or cultural feature that appears diminished in prominence. The Project solar arrays, considering their layout, spacing and the topography and resources in the area, do not overwhelm such physical geographic areas.

- Visual clutter often is adversely perceived and commonly results from the combination of human-made elements in close association that are of differing shapes, colors, forms, patterns, or scales. Generally, solar facilities offer simple and uniform or geometrically patterned arrays or groupings that may be more visually consistent than mixed types and sizes of objects.

- Aside from normal low road traffic (see also AADTs in Table 1 of Appendix 24-1), the public areas in the vicinity to the Project Area are not exceedingly high-use destination areas.

- The Project does not have an adverse effect on a known listed scenic vista.

- The Project does not damage or degrade existing scenic resources.

- The Project does not create a new source of substantial light that would adversely affect nighttime views in the area. Potential glare from the solar modules and associated equipment would be negligible because they would consist of a non-reflective coating. In the case of tracker arrays, the face of the solar panel surface is programmed to follow the movement of the sun.

- The Project is not predicted to emit significant glare into the existing environment. Panels are designed to absorb sunlight and will be treated with anti-reflective coatings that will absorb and transmit light rather than reflect it. In general, solar panels are less reflective than window glass or water surfaces and any reflected light from solar panels will have a significantly lower intensity than glare from direct sunlight. In the case of tracker arrays, the face of the solar panel surface is programmed to follow the movement of the sun.

(9) Analysis of Operational Effect

The Project is not predicted to emit glare into the existing environment. Panels are designed to absorb sunlight and will be treated with anti-reflective coatings that will absorb and transmit light rather than reflect it. In general, solar panels are less reflective than window glass or water surfaces (NYSERDA, 2019) and any reflected light from solar panels will have a significantly lower intensity than glare from direct sunlight (Mass. Department of Energy Resources, 2015).

The Applicant prepared a Glint and Glare Analysis, included as Appendix 24-2, to identify any potential glint/glare impacts on nearby residences and roads and the need for any necessary mitigation. The analysis was prepared by Capitol Airspace Group utilizing the Solar Glare Hazard Analysis Tool (SGHAT). The results of the analysis conform to, and are in accordance with, the FAA's interim policy for Solar Energy System Projects on Federally Obligated Airports (78 FR 63271, October 2013), although this policy is only applicable for projects proposing to install solar panels at federally funded airports. SGHAT is a very conservative tool in that:

- Glare analyses do not account for physical obstructions between reflectors and receptors. This includes buildings, tree cover, and geographic obstructions;

- The glare analysis assumes clear, sunny skies for 365 days of the year and does not take into account meteorological conditions that would nullify predicted glare such as clouds, rain or snow; and,

- Although only a portion of a modeled array may have the potential to produce glare, the results are provided as if the receptor has visibility of the entire array.

The results of the analysis indicate there is no predicted glare for the proposed arrays. Based on the results of the analysis, no significant impacts from glare are expected as a result of the Project.

Additionally, the results of the glare analysis predict no glare occurrences for either Runway 05/23 or Runway 09/27 approaches at the nearby Massena International Airport as a result of the Project. Finally, proposed racking systems are anticipated to consist of non-reflective metallic materials that will not result in glare.

Refer to the VIA and Appendix 24-2 for full details on the glint and glare analysis.

(10) Measures to Mitigate for Visual Impacts

Mitigation includes siting and design and vegetative plantings to help moderate visibility.

When a solar facility is decommissioned and removed, the land can be returned to other productive use, including farming. In this way, a solar lease can be a way to preserve land for potential future agricultural use. Large-scale solar projects can be made less visible from roads or other public vantage points. Several approaches for minimizing and mitigating visibility from large-scale solar projects can be made such as keeping facility components at low profile and siting and designing the site to take advantage of natural topographic and vegetative screening; road setbacks; siting against tree lines; and avoiding the use of overhead interconnection lines.

Siting and Design

Current siting is optimized to minimize visibility of the project by placing, orienting, or arranging the arrays in certain ways. Siting against existing vegetation such as tree lines and utilizing sufficient setback distances are effective in reducing visibility.

Siting layout and design considerations that offer mitigation are summarized as follows:

- Use of existing vegetation such as the surrounding woodlands and hedgerows as existing visual barriers as much as possible.
- Panels proposed against background trees to reduce visual contrasts, as color contrasts are absorbed and moderated by the background trees.
- Setbacks and offsets: The Project alignment has been designed to incorporate and abide by most of the minimum property and building setback distance requirements for each of the Towns of Brasher, Massena, and Norfolk. As explained in Exhibit 31, if the Board determines that the Town of Massena's and Norfolk's zoning requirement of a 100-foot setback from "neighbors" refers to property lines rather than residences, then waivers are required. For purposes of the VIA, the minimum distance from a residence to an array is 212 feet in Massena and 177 feet in Norfolk.
- Use of antireflective coatings on solar panels. Solar photovoltaic panels are also designed to absorb light, not reflect light, and therefore, produce minimal, if any, glare.
- Racking systems consist of non-reflective metallic materials.
- When employed, tracker technology keeps panels at a 90-degree angle from the sun reflecting any potential glare back towards the sky.
- General site location placed far from sensitive agency recognized and listed visual receptors.
- The Project has been sited away from the population centers in order to minimize potential visibility by a relatively larger number of viewers.
- The collection substation and switchyard are located proximal to the existing transmission right-of-way for minimally distant new interconnects.
- The collection substation and switchyard are located near similar utility infrastructure.
- The collection station and switchyard for this Project has been embedded within a mature forested area.

- Vegetative buffers: plantings of native/indigenous pollinator-friendly plant species are included in the proposed landscape mitigation plan.

- Collection lines have been placed underground to decrease additional aboveground impacts. This configuration allows continued use of the land within the Project area.

- Minimized vegetation clearing outside of the arrays in order to preserve existing trees and other vegetation for Project screening to the best extent possible.

Vegetative Mitigation

From a scenery point of view, methods and techniques of hiding/screening solar farms can be effective in moderating views. Typically, a landscape planting scheme is developed to provide year-round screening that is sustainable, hearty, and resilient. The vegetative screening will use native/indigenous plant species that primarily consist of a dense bank of evergreen trees with a variety of ornamental, pollinator-friendly, small tree and shrub species incorporated throughout the planting scheme. This approach will provide a more naturalized planting look that is aesthetically pleasing and compliments the surrounding area.

The Landscaping Plan for vegetative mitigation can be found in Appendix 11-1 of Exhibit 11. The following items and concepts were applied to the plan:

- The Towns of Brasher, Massena, and Norfolk Land Use Code and Zoning Laws were reviewed to understand how and where to apply the visual screening efforts.

- Native/indigenous evergreen trees and pollinator-friendly deciduous shrub and small ornamental tree species were selected for the vegetative barriers. The species chosen will need to reach an adequate height and width to provide the appropriate visual screening required while also maintaining minimum mature heights that will not produce shade over the Project in later years. Deciduous and evergreen tree species include: river birch (Betula nigra 'Heritage), northern white cedar (Chamaecyparis thyoides), white spruce (Picea glauca), black spruce (Picea mariana), red spruce (Picea rubens), and downy shadbush (Amelanchier arborea). Shrub species include: red chokeberry (Aronia arbutifolia), red twig dogwood (Cornus sericea), common witch hazel (Hamamelis virginiana), American cranberry (Viburnam triloblum), common winterberry (Ilex verticillata), and highbush blueberry (Vaccinium corymbosum).

- The plantings are proposed along the outside fence line in locations noted on the Landscaping Plan in Appendix 11-1. The deciduous and evergreen vegetative mitigation planting template maintains a proposed planting density and will average approximately 31 evergreens per 300 linear foot of planting to increase year-round visual mitigation. The evergreen species as noted above include northern white cedar, white spruce, black spruce, and red spruce.

- A grass seed mix using native/indigenous warm and cool season grasses was developed especially for the areas under and around the solar array fields and is considered favorable for wildlife habitat and sustainable growth. The seed mix will provide a groundcover that minimizes erosion concerns, does not pose any shading issues, and is manageable year-round. Appendix 11-1 of Exhibit 11 identifies the species that are included in the grass seed mix.

- Expected growth heights (depending on the specific tree or shrub species) are expected to be between 5 to 15 feet at 5 years. However, fully mature heights of the year-round coniferous species may reach up to 40 feet high.

- It is important to note that an annual O&M (Operation and Maintenance) effort will be provided to ensure that proper care and attention is given to the proposed plantings once they have been installed. Annual O&M efforts will include, but not be limited to, selective pruning, mowing, and monitoring of invasive species. Additionally, landscaping notes in the Landscaping Plan will provide further direction, recommendations, insight, and guidelines to ensure a healthy, viable, and sustainable landscape throughout the life cycle of the project to the best extent possible.

- The Applicant has attempted to provide a landscape buffer in most areas where minimum setbacks are provided from arrays to adjacent non-participating landowner's residences who have a direct line of sight of the arrays and no existing vegetation would provide screening. This was successfully accomplished for the majority of the 981-acre Project fence line area with the exception of an approximately 2,500-foot segment of Daly Road, located east of its intersection with Small Road. Approximately four residences are located on the opposite side of Daly Road from the proposed arrays and one on the same side of the road. In this area, given the location of proposed underground collection lines, landscaping cannot be installed. While adequate setbacks from the arrays to these

residences is proposed (varying from approximately 200 to 275 feet), these residences have a direct line of sight of the Project and there is no existing vegetation to screen Project views. If requested, the Applicant is willing to offer to provide landscaping, consistent with what is proposed for other portions of the Project, on those five adjoining landowner's properties with a direct line of sight to Project Components and no existing vegetation exists to screen the Project to provide visual mitigation..

(11) Description of Visual Resources to be Affected

Exhibit 24(b)(4) discusses the visual resources in the 5-mile VSA and includes Table 24-3 that indicates the distance of resources to the Project as well as the potential visibility from each resource. Mapped locations of the resources can be found in Attachment 2 of Appendix 24-1.

24(b) Viewshed Analysis

(1) Viewshed Maps

A viewshed analysis is a computerized GIS analytical technique that illustrates the predicted visibility that may potentially be expected for a project. It allows one to determine if and where objects, such as a solar array, can geographically be seen within a larger regional area. The viewshed model accounts for topography, vegetation, and the height of the solar panels. The results of the viewshed analysis, typically displayed over a USGS topographic map or aerial photo, are combined with other Article 10 listed visual receptors such as historic places, national forests, or state parks, etc. Incorporating GIS integrated data along with a viewshed analysis assists in understanding the potential for Project visibility at sensitive resource locations. Refer to Attachment 2 of Appendix 24-1 for maps depicting the result of the viewshed analysis.

(2) Methodology

Two viewshed analyses have been produced to illustrate predicted visibility within the VSA:

- Topography-Only: Results from a topography-only viewshed analysis are not considered representative of the surrounding landscape. However, the analysis illustrates the effects of the surrounding terrain and determines if landform is responsible for obscuring some of the views. Trees and buildings are not incorporated in this analysis.

As part of Exhibit 20, in order to summarize the nature of probable effects to historic architectural resources, the Office of Parks, Recreation and Historic Preservation (OPRHP) requested the identification of historic resources with positive visibility of the Project, based on bare-earth

topography visibility modeling, within a five-mile radius of the Project. Completion of this task for Exhibit 20 was accomplished with the coordination of the Exhibit 24 topography-only viewshed analysis.

- With Vegetation: A second viewshed analysis with vegetation incorporated accounts for the heights of existing trees also with the inclusion of larger buildings. This contributes to a more realistic representation of landscape conditions over the topography-only analysis and is the analysis that is emphasized in this report with respect to potential visual impacts. It should be noted that this analysis does not account for proposed landscaping that would serve as additional visual mitigation where proposed.

The viewshed analysis results (Attachment 2 in Appendix 24-1), show areas of expected visibility. For the analysis, Light Detection and Ranging (LiDAR) .las point cloud data from the 2016-2017 FEMA Franklin/St. Lawrence LiDAR dataset and obtained from the New York State GIS Program website was used. LiDAR data is the best available elevation data as it includes high resolution accurate ground elevations in addition to building heights and individual tree heights that offer realistic physical visual impediments as they occur in the landscape.

For the analysis, the top of the panels was set at a maximum of 13 feet in height above ground surface to represent tracker arrays and placed within the viewshed modeling environment. The viewshed model was further developed by establishing an observer height of 6 feet and the assumption that the Project would not be visible to a viewer who is standing amongst trees in a forested area for the viewshed analysis that incorporated trees. The final resulting output identified those areas from which viewers would potentially see all or some part of the proposed solar panels. ESRI Spatial and 3D Analyst GIS software were used to develop the viewshed model.

Assumptions and Limitations of the Viewshed Model

The viewshed analysis identifies cells (image pixels) that contain elevation information and computes the differences along the terrain surface between an observer in the landscape and a target (e.g. solar panel). The analysis is a clear line-of-sight and therefore certain factors in the interpretation of results need to be considered:

- The model, because of its computerized aspect, assumes the observer to have perfect vision at all distances. Therefore, a certain amount of reasonable interpretation needs to be considered because of the limitations of human vision at greater distances or those

atmospheric/meteorological conditions that may cause imperfect vision, such as haze or inclement weather. Additionally, an object is naturally smaller and shows much less detail at distances and will have less visual impact. These aspects cannot be conveyed with this analysis.

- Because an area may show visibility, it does not mean the entirety of the Project will be seen. The viewshed analysis depicts areas of visibility over a regional area. It can only predict geographically on a map, areas where some part of the solar panels might be seen. It does not and cannot determine if it is seeing a full-on view or a partial view. Additionally, if visibility is occurring in an area, it may sometimes only be a result of glimpsing a portion of the Project over undulating treetops between gaps of trees, or visibility of the tops of panels and not a full-on view. Likewise, there may be understory tree gaps where there may be visibility of the Project.

- The viewshed model when trees are incorporated, assumes that any vegetation is opaque and therefore represents a leaf-on condition. Transparency predictions through something similar to bare-branched trees under leaf off conditions cannot be made. A topography-only analysis has been included to help understand some of the visual environment in the absence of trees.

- The model was developed with the assumption that a viewer would not see the panels if standing amongst trees in forested areas as it is assumed the tree canopy would preclude outward looking views.

(3) Viewer Groups Overview

Sensitivity levels are a measure of public concern for scenic quality. Visual sensitivity is dependent upon user or viewer attitudes, the amount of use and the types of activities in which people are engaged when viewing an object. Overall, higher degrees of visual sensitivity are correlated with areas where people live and with people who are engaged in recreational outdoor pursuits or participate in scenic driving. Conversely areas of industrial or commercial use are considered to have low to moderate visual sensitivity because the activities conducted are not significantly affected by the quality of the environment.

These concepts are applied when evaluating the visual landscape and assessing the importance of a viewpoint location if it falls in an area of visibility. Viewer groups and associated responses to visual changes are analyzed from a variety of factors including:

Viewer group – Types of viewers will vary by geographic region, as well as by travel route or use areas, such as a developed recreation site, urban area, or back yard. Viewer groups include:

- *local constituency*: - People living in the local area and/or surrounding communities who interpret the significance of where they live and interact with others; these people may include local residents and members of groups to which the local area is important in different ways.

- *commuter constituency*: - People who use or are generally restricted to travel corridors that are destination oriented towards places of employment. These people generally have transient short duration views.

- *visitor or recreational constituency*: Individuals who visit the area to experience its natural appearance, cultural landscape qualities or recreational opportunities. Visitors may be of local, regional, or national origin.

Context of viewer - The viewer group and associated viewer sensitivity is distinguished among viewers in residential, recreational/open space, tourist commercial establishments, and workplace areas, with the first two having relative high sensitivity.

Number of viewers - The number of viewers is established by the amount of people estimated to be exposed to the view. In comparing viewing locations to each other, one can consider if the area is a high public use area or if it is a location that is less frequently visited or more inaccessible where the public is not expected to be present (such as marshes or swamps).

Duration of view - Duration of view is the amount of time a viewer would actually be looking at a particular site. Use areas are locations that receive concentrated public-use viewing with views of long duration such as residential back yards. Recreational long duration views include picnic areas, favorite fishing spots, campsites, or day use in smaller local parks. Comparatively, drivers, hikers, snowmobilers, or canoeists will likely encounter a shorter, more rapid transient experience as a person transitions from one linear segment to the next but will encounter more visually varied experiences.

Viewer activities - Activities can either encourage a viewer to observe the surrounding area more closely (hiking) or discourage close observation (commuting in traffic).

(4) Scenic Resources Inventory

An inventory of publicly available and accessible local, county, state, and federally recognized visual resources out to the 5-mile VSA was compiled under the provision of 16 NYCRR §1001.24 (b)(4)(ii). GIS data, town, county, and agency reports, topographic data, and site visits along with photographic documentation were used as source data. Also, on October 15, 2020 an information request was sent out to the Visual Stakeholders, as defined in 16 NYCRR § 1000.24(b)(4) and Stipulation 24. In this request, a preliminary visual report was provided, indicating the extent and findings of visibility studies at that point in time which included identified visual resources. Opportunity was provided for stakeholders to append additional visual resources of concern to the inventory. Only DPS responded and provided additional visual receptors to include in the inventory. Visual resources within 5 miles of the Project are listed in Table 24-3. Locations of these visual resources can be found in Attachment 2 of Appendix 24-1.

The following have been reviewed for their appearance within the VSA:

1) Landmark landscapes;

2) Wild, scenic or recreational rivers;

3) Forest preserve lands, scenic vistas specifically identified in the Adirondack Park State Land Master Plan, conservation easement lands, scenic byways designated by the federal or state governments;

4) Scenic districts and scenic roads;

5) Scenic Areas of Statewide Significance;

6) State parks or historic sites;

7) Sites listed on National or State Registers of Historic Places;

8) Areas covered by scenic easements, public parks or recreation areas;

9) Locally designated historic or scenic districts and scenic overlooks; and

10) High-use public areas.

Historic resource data is provided as a courtesy from the NY State Historic Preservation Office (SHPO). For historic sites and districts, listed New York historic sites, National Register of Historic Places (NRHP) and eligible historic properties were obtained directly from SHPO as part of a specific request made on October 6, 2020. Refer to Exhibit 20 of the Application for greater detail on the cultural resources investigations and results. Exhibit 20 and associated studies follow SHPO guidelines for solar facility development and address the visual effects with respect to historic resources under those guidelines.

Table 24-3 provides the results of this investigation listing the resources found within the full 5-mile VSA with other information regarding location characteristics such as distances and potential for visibility.

Table 24-3. Inventory of Visual Resources within the Five Mile VSA

Map ID	Resource Name	Town/Village	Distance (miles)	Potential Visibility*
	Local Parks/Recreation			
1	Alcoa Field Recreation Park	Village of Massena	2.1	No
2	NYPA Boat Launch to St. Lawrence River	Massena	4.5	No
3	Bushnell Park	Village of Massena	1.1	No
4	Danforth Place Park	Village of Massena	1.9	No
5	East Orvis Street Park	Massena	1.7	No
6	Fox Hill Golf and Country Club	Massena	1.0	No
7	John Story Trail (1.5-mile walking path)	Village of Massena, Louisville	1.6	No
8	Massena International Kampground	Massena	2.0	No
9	Massena Town Beach	Louisville	4.4	No
10	North Main Street Park	Village of Massena	2.7	No
11	Robert Moses State Park (includes Campground)	Massena	4.3	No
12	Springs Park	Village of Massena	1.2	No
13	Veterans Memorial Park	Village of Massena	2.1	No
14	Massena Country Club	Louisville	5	No

Table 24-3. Inventory of Visual Resources within the Five Mile VSA

Map ID	Resource Name	Town/Village	Distance (miles)	Potential Visibility*
15	Cedar View Golf Club	Massena	2.8	No
16	Raymondville Golf and Country Club	Norfolk	4.9	No
17	Canoe and Kayak Launch St. Regis River	Brasher	2.7	No
	Federal/State/County Recreation Lands			
NA	Brasher State Forest	Brasher, Norfolk	1.1	No
NA	Lost Nation State Forest	Norfolk, Stockholm	2.6	No
NA	Grantville State Forest	Norfolk	2.3	No
NA	Raymondville State Forest	Norfolk	4.5	No
NA	Grass River Blueway Trail (in planning phase)	Consists of the Grass River as it runs through the VSA in Louisville and Massena	1.7	No
NA	St. Lawrence Flatlands Management Unit Detached Forest Preserve Parcel	Louisville	3.7	No
	Scenic Byways			
NA	Seaway Trail	Louisville, Massena, Village of Massena	1.25	No
NA	Military Trail	Massena	4.9	No
	Nationwide Rivers Inventory			
NA	Deer River	Brasher	3.9	No
	Cemeteries			
A	Adath Cemetery	Village of Massena	2.4	No
B	Calvary Cemetery	Village of Massena	2.4	No
C	Carville Cemetery	Brasher	2.5	No
D	Jenkins Cemetery	Stockholm	4.2	No
E	Kent Mill Cemetery	Norfolk	2.6	No
F	Kyle Cemetery	Norfolk	2.2	No
G	Massena Center Cemetery	Massena	2.1	No
H	Nevins Cemetery	Massena	0.3	No
I	Pine Grove Cemetery II	Norfolk	0.9	No
J	Pine Grove Cemetery	Village of Massena	2.2	No

Table 24-3. Inventory of Visual Resources within the Five Mile VSA

Map ID	Resource Name	Town/Village	Distance (miles)	Potential Visibility*
K	Reed Cemetery	Massena	2.1	No
L	Richardson Cemetery	Brasher	4.5	No
M	Saint Peter's Roman Catholic Cemetery	Village of Massena	1.8	No
N	West Orvis Street Cemetery	Village of Massena	2.0	No
	Trails			
NA	St. Lawrence County Snowmobile Association snowmobile trails	Massena	2 - 5	No
NA	Richards Landing Dike Trail	Massena, Louisville	4.6	No

USN	Resource Name	Town/Village	Distance	Potential Visibility*
	National Register Historic Place			
8941.000073	United States Post Office, 100 Main Street	Village of Massena	1.8	No
	Eligible Historic Sites			
8917.000008	153 Kingsley Road	Louisville	3.6	No
8917.000135	14971 Route 37	Louisville	3.7	No
8920.000013	Eisenhower Lock & Power Project, NY 131	Massena	3.7	No
8941.000013	Massena Town Hall, 60 Main Street	Village of Massena	2.0	No
8941.000027	School of Business/3, 24 Main Street	Village of Massena	2.1	No
8941.000036	Evans Residence, 44 Elm Circle	Village of Massena	1.8	No
8941.000038	Wall Residence, 30 Elm Circle	Village of Massena	1.8	No
8941.000052	Old Elementary School, 62 Maple Street	Village of Massena	2.3	No
8941.000056	Edwin Mc Donald House, 2 Elm Circle	Village of Massena	1.8	No
8941.000057	Frank Bradley House, 3 Elm Circle	Village of Massena	1.8	No
8941.000058	Albert P Bero House, 4 Elm Circle	Village of Massena	1.8	No
8941.000059	Leslie Sutton House, 5 Elm Circle	Village of Massena	1.7	No
8941.000060	V A Warren House, 6 Elm Circle	Village of Massena	1.8	No

USN	Resource Name	Town/Village	Distance	Potential Visibility*
8941.000061	George Timmerman House, 7 Elm Circle	Village of Massena	1.8	No
8941.000062	George Matthews House, 19 Elm Street	Village of Massena	1.8	No
8941.000063	David Adams House, 21 Elm Street	Village of Massena	1.8	No
8941.000064	Bernard Cummings House, 26 Elm Street	Village of Massena	1.8	No
8941.000065	Noah Canton House, 30 Bridges Street	Village of Massena	1.9	No
8941.000066	Jesse Walthart House, 19 Bridges Street	Village of Massena	1.8	No
8941.000076	Alcoa Road Bridge Demolished, Alcoa Road	Massena	1.9	No
8941.000077	High School, Highland Avenue	Village of Massena	1.9	No
8941.000152	50 Maple Street	Village of Massena	2.3	No
8941.000176	56 Center Street	Village of Massena	2.1	No
8941.000373	19 Main Street	Village of Massena	2.0	No
8941.000386	1/2 Story Brick Commercial Block W/3 Storefronts, 57 Main Street	Village of Massena	2.0	No
8941.000390	Story Yellow Brick Commercial Building W/Storefront, 69 Main Street	Village of Massena	2.0	No
8941.000395	Non Story Commercial Building, 46 Main Street	Village of Massena	2.0	No
8941.000431	Elm Street Circle Historic District, Elm Street	Village of Massena	1.8	No
8941.000465	65 Main Street	Village of Massena	2.0	No
8953.000104	St. Lawrence Power Historic District	Louisville, Massena	5.1	No
8920.000067	Robert Moses Power Dam, Barnhart Island	Massena	5.1	No
8920.000071	Long Sault Dam, Barnhart Island	Massena	5.1	No
8920.000074	Barnhart Island Bridge, Barnhart Island	Massena	5.1	No
8920.000128	Robert Moses Power Dam Switchyard, Barnhart Island	Massena	5.1	No

* Expected visibility is based on LiDAR-based viewshed analysis results that include trees and buildings.

(5) Viewpoint Selection

Integrating the results of the GIS resources inventory data along with the viewshed analysis results provided desktop reconnaissance for recognizing areas with potential visibility and identifying candidate locations for photosimulations. While focusing on inventoried locations listed

above, an additional objective in the viewpoint selection process is to also choose locations for simulations that represent the various LSZs as well as Distance Zones. Further, site field visits are necessary for ground-truthing and increasing the understanding of the visual environment.

Visibility, as noted by the viewshed results in Appendix 24-1 Attachment 2 mapping, guided the candidate locations for simulations viewpoints. The visibility mapping shows the most prominent visibility is within Distance Zone 1 (0.5 miles) of the Project, with some extremely minor predicted visibility in Distance Zone 2 and no predicted visibility in Distance Zone 3. It is often difficult to obtain representative simulation photos at distance as there are often minimal locations with far reaching views of solar projects in the northeast. Therefore, much of the focus for viewpoint locations are closer to the Project near residences where visibility is predicted.

As noted in Table 24-3, there are no listed visual receptors that will experience views of the Project and in fact, very few resources are even present within 1 mile. Attempts to represent all LSZs are typically made. However, obtaining photo viewpoints from a representative forested area is often moot, since there are not expected to be outward views from within a forested area. Most viewpoints are taken from the most open views along roadways near residences.

16 NYCRR § 1000.24(b)(4) requires consultations with affected agencies and municipalities. “The applicant shall confer with municipal planning representatives, DPS, DEC, OPRHP, and where appropriate, APA in its selection of important or representative viewpoints that may be subject to project visibility.” Per Project stipulations dated February 10, 2021, Stipulation 24(b)(4)(i) states that viewpoint selection will be based on representative or typical views from locations predicted to have direct line-of-sight visibility of facility components, based on results of preliminary viewshed mapping.

As noted above, on October 15, 2020, an information request was sent out to stakeholders. In this request, a preliminary visual report was provided, indicating the extent and findings of visibility studies at that point in time which consisted of identified visual resources as well as the result of the trees-only viewshed analysis. Opportunity was provided for stakeholders, including local municipalities with predicted visibility of the project, to suggest additional and reasonable candidate locations for photosimulations or append additional visual resources of concern to the inventory. This request to stakeholders was specific to locations that were publicly accessible. Only DPS responded. In their November 4, 2020 response letter, DPS suggested viewpoint location photos that should be considered for final simulations as presented in the Appendix 24-

1 Project Photolog. The Applicant, therefore, has produced simulations for this VIA based upon the recommended DPS suggestions. Correspondence is included in Attachment 5 of Appendix 24-1.

Table 24-4 outlines the viewpoints chosen for simulations or lines of sight.

Table 24-4. Summary Table Simulation and LOS Viewpoints

Viewpoint ID	Location	Town	Distance to Project	Landscape Similarity Zone	Comment
6	County Route 37	Massena	135 ft	1,3	County road at interior of Project, northeastern side, near residences.
11a	Daly Rd	Brasher	317 ft	3	Local road, eastern end of Project near residences.
11b	Daly Rd	Brasher	103 ft	1,3	Local road, eastern end of Project near residences.
12	Small Rd	Brasher	836 ft	1,3	Local road, central part of Project near residences.
15	Hopson Rd	Brasher	1,049 ft	1,2	Local road, south of Project near residences.
18	Hopson Rd	Brasher	267 ft	3	Local road, central part of Project near residences.
27	State Route 420	Norfolk	884 ft	2,3	State road, southwestern side of Project, near residences.
L1	County Road 46 to Collection Substation	Massena	0.43 mi	1,3	Line of Sight for proposed collection substation from nearest local road north of station.
L2	County Road 37 to Collection Substation	Massena	0.53 mi	1,3	Line of Sight for proposed collection substation from yard of nearby residence.
L3	County Road 37 to Collection Substation	Massena	0.51 mi	1,3	Line of Sight for proposed collection substation from southerly local road near residence.

(6) Photographic Simulations and LOS

As described previously, photographic simulations were prepared using high-resolution photos with three-dimensional visualization software in order to realistically represent the built facilities from each of the selected viewpoints. The photographic simulations are presented in Attachment 3 of Appendix 24-1 and include locations representative of vantage points at varying distances and compass points. Landscape mitigation for visual screening is proposed for numerous areas of the Project. Both leaf-off and leaf-on mitigation simulations have been provided. The landscaping seen in the simulations were derived directly from the landscape architect. The Landscaping Plan can be found in Appendix 11-1 of Exhibit 11. See Exhibit 24(a)(10) for a

discussion of mitigation strategies that include siting considerations and the discussion of vegetative mitigation to reduce visibility of the Project.

Visibility is not relatively extensive in all LSZs or Distance Zones nor is visibility expected at the listed Table 24-3 visual receptors. Most simulations then are from locations that the community would experience which is within agricultural land and travel roadways, and near developed residential groupings.

LOS analysis was performed for the collection substation. Results are presented in Attachment 3 of Appendix 24-1.

(7) Visual Impact Rating of Project Photo Simulations

TRC has developed a visual impact rating form for use in comparing Project photosimulations. This form is a simplified version of various federal agency visual impact rating systems. It includes concepts and applications sourced from:

- U.S. Bureau of Land Management (BLM), Handbook H-8431: Visual Contrast Rating, January 1986 (USDOI, 1986).
- Visual Resources Assessment Procedure for U.S. Army Corps of Engineers, March 1988 (Smardon, et al., 1988).
- National Park Service (NPS) Visual Resources Inventory View Importance Rating Guide, 2016 (NPS, 2016c).
- USDA Forest Service, Landscape Aesthetics: A Handbook for Scenery Management. USDA Forest Service Agriculture Handbook No. 701, 1995 (USDA, 1995).

Depending on the Project location, a variety of VIA guidance and established procedures exist as noted above that apply to management of federal lands that fall under a specific agency such as the USFS or BLM. These guidance documents vary in regard to agency-specific rating systems or procedures and often begin with the evaluation of existing conditions such as scenic quality or presence of sensitive resource locations.

TRC has developed this form for efficient and streamlined use with projects that undergo state environmental permitting processes. It is assumed that visual resource inventories, terrain analyses, development of LSZs or viewshed analyses have already been performed in the Project VIA according to state regulatory requirements or other visual policy. This form was developed to be used as a numerical rating system for the comparison of Existing Conditions (before) vs. With

Project (after) photosimulations of final selected viewpoint locations and is meant to accompany the Project VIA.

For evaluating visual change there are two parts to the form. Part 1 is the Visual Contrast Rating which rates the Project as it contrasts against compositional visual elements of the viewpoint scene. This includes compositional contrasts against the existing and natural environment such as vegetation, water, sky, landform, or structures. The higher the rating total the higher the contrast. Part 2 is the Viewpoint Sensitivity Rating. This section rates the sensitivity of the viewpoint location which inherently considers the importance of the viewpoint (if it falls within a visual resource area), duration of view, if it is a high use area, or if there is the presence of water. The higher the rating total, the more sensitive the viewpoint is. Part 3 does not rate change but is an overall General Scenic Quality of the View which rates the view of existing conditions only, without the influence of the Project. A more in-depth discussion of how Parts 1-3 were rated can be found in the VIA in Attachment 6 of Appendix 24-1.

Visual Contrast Ratings Results

The VIA in Appendix 24-1 describes the concepts and methodology applied to rating visual change incurred by the proposed Project by evaluating the Project photosimulations. Simulations of the Project and security fence without mitigation were rated to evaluate contrasts under worst-case conditions with the understanding that proposed Attachment.

Descriptions of the moderating effects of mitigation are discussed in Exhibit 24(a)(6) while simulations showing mitigation are presented in Appendix 24-1. Three panelists evaluated and scored the simulations where there were views of the Project. Panelist 1 has been trained in the visual arts with a B.F.A. and a minor in art history as well as having an environmental background with an M.S. in Soil Science. Panelists 2 and 3 are landscape architects. Attachment 6 in Appendix 24-1 provides more detail on panelist qualifications as well as the raw evaluation forms for each simulation viewpoint.

Table 24-5 below summarizes the final scores and averages for Part 1 Visual Contrast, Part 2 Viewpoint Sensitivity and Part 3 Existing Scenic Quality. Here, trends of contrast ratings where those VP locations that are considered to have the highest or lowest visual change in relation to each other can be obtained. Mean deviations are also calculated to gauge the variation between each of the panelists.

Table 24-5. Visual Impact Rating Results Summary

VP	Location	Contrast Rating Panelist 1			Contrast Rating Panelist 2			Contrast Rating Panelist 3			Avg Part 1	Mean Dev* Part 1	Avg Part 2	Mean Dev* Part 2	Avg Part3	Mean Dev* Part 3
		Part 1	Part 2	Part 3	Part 1	Part 2	Part 3	Part 1	Part 2	Part 3						
6	County Route 37	20.5	5.5	1.5	19.5	6.0	1.0	18.0	4.0	2.0	19.3	0.9	5.2	0.8	1.5	0.3
11a	Daly Rd	12.5	5.5	1.5	13.0	9.0	1.0	12.0	6.0	2.0	12.5	0.3	6.8	1.4	1.5	0.3
11b	Daly Rd	16.5	5.5	2.0	18,5	9.0	1.0	19.5	7.0	2.0	18.0	1.5	7.2	1.2	1.7	0.4
12	Small Rd	9.5	6.0	1.5	10.0	9.0	1.5	12.0	8.0	2.0	10.5	1.0	7.7	1.1	1.7	0.2
15	Hopson Rd	1.0	3.5	1.0	1.0	5.5	1.0	1.5	5.0	1.0	1.2	0.2	4.7	0.8	1.0	0.0
18	Hopson Rd	18.5	6.0	1.0	18.0	8.5	1.0	19.0	5.5	2.0	18.5	0.3	6.7	1.2	1.3	0.4
27	State Route 420	12.5	6.0	1.0	14.0	9.5	1.0	17.5	8.5	1.5	14.7	1.9	8.0	1.3	1.2	0.2

Mean Dev = Mean Deviation

Part 1 Project Contrast Rating

Part 1 Contrast methodology is fully described in Attachment 6 of Appendix 24-1. It rates proposed visual change against existing conditions with respect to compositional elements such as newly introduced lines, shapes, colors, project scale, and broken horizon lines. Under Part 1, there are nine categories to rate, where the total rating ranges from 0 to 27. The scale is as follows:

Contrast Rating Scale	
0	None
0 - 4.5	Very Weak
4.5 - 9	Weak
9 - 13.5	Weakly Moderate
13.5 - 18	Moderate
18 - 22.5	Moderately Strong
22.5 - 27	Strong

The viewpoint with the strongest Part 1 Contrast is VP6 on County Road 37 with an average rating of 19.3. This simulation shows the viewer approximately 135 feet from the Project. The Project will not be seen in its entirety as only a portion of the arrays are visible from this location. However, the proposed view results in a moderately strong contrast rating due to new form, color, line, and texture contrasts of discernible detail observed at proximity to the viewer, compared to what is currently there. VP18 on Hopson Road is the only other viewpoint rated as moderately strong with an average rating of 18.5. VP18 shows views perpendicular to the arrays and are also at close proximity.

The next highest contrast groupings, which are rated as moderate, are VP11b (103 feet from the Project) and VP27 (884 feet from Project) with average ratings of 18.0 and 14.7, respectively. VP11b is closer to the viewer at 103 feet to the Project and is rated on the higher side of moderate. However, panelists felt that some of the Project horizontal form and line elements were similar to or mimicked those found under existing conditions such as the background tree line and horizontal aspects of sky and field and helped provide some unification. VP27 is on the lower end of moderate. This simulation has one of the farthest distant views and contrasts are highly diminished due to a larger offset from the road. However, it remains as a moderate rating because the clearing of trees is noticed from this location causing some apparent visual change.

Two viewpoints are assigned a Part 1 contrast rating of weakly moderate. They are VP11a and VP12 where average ratings are 12.5 and 10.5, respectively. While road offsets are 317 and 836 feet, respectively, each of these views has trees in the background that moderate the views where they appear visually absorbed. The arrays have a similar color to the tree groups in the background and are below the horizon line.

Mean deviations were calculated to observe the level of variance between the panelists within each simulation evaluation. Mean deviations ranged between 0.2 and 1.9. It appears panelist opinion varied the most regarding contrast changes when assessing VPs 27 and 11b. VP27 has a mean deviation of 1.9 where two panelists rated contrasts similarly as weakly moderate while one panelist rated the visual change as moderate with an opinion that contrasts appeared higher. VP11b has a mean deviation of 1.5. Two panelists rated the contrast as moderately strong while a third panelist gave the contrast a higher rating of moderate. Mean deviations indicate that there was close agreement for the remaining VPs where the assessment of visual change appeared more straightforward to the panelists.

Part 2 Viewer Sensitivity Rating

There are eight categories under Part 2 to rate where the total rating ranges from 0 to 24. The scale is as follows:

Contrast Rating Scale	
0	None
0 - 4	Very Weak
4 - 8	Weak
8 - 12	Weakly Moderate
12 - 16	Moderate
16 - 20	Moderately Strong
20 - 24	Strong

Part 2 takes into account viewer sensitivity, in particular if the VP falls within or has a view of an existing visual receptor as well as the character of viewer groups such as number of viewers, duration of view, presence of existing development, etc.

Because Table 24-3 indicates there will be no views of the Project from the listed visual receptors, most of the viewer sensitivity issues focus on viewer groups related to the community travelers or residences as opposed to recreational viewers or tourists. All Part 2 Viewer Sensitivity ratings were assigned a weak rating, ranging from 5.2 to 8.0. This is due to the fact that there are no

viewpoints within or with a view of a visual receptor but mainly due to the fact that Project views are located within a very rural area with a low number of nearby local residences as well as roads with low vehicular traffic.

Mean deviations for Part 2 Viewer Sensitivity show variance ranging between 0.8 and 1.4. Generally, Part 2 is less subjective. However, in reviewing the raw data form comments, in some instances there were differences of opinion on how panelists rated duration of view and numbers of viewers based on observations in the view and the location of the viewpoint.

Part 3 Scenic Quality Rating

Part 3 Scenic Quality is a standalone single rating that assesses the overall scenic quality of the VP's existing conditions (see also Attachment 6 in Appendix 24-1). For this rating, there is no evaluation of visual change, only a simple appraisal of the scenic quality of the view. A rating of 1 is weak, 2 is moderate, and 3 is strong.

Scenic quality for the simulation VPs was generally rated as weak to moderate. However, this is not to imply that views are not pretty, restful, or important to the community. Although there are restful, unchaotic and harmonious pastoral views of open fields with little development, panelists felt the views were average and typical of the area and that views did not offer a high degree of visual interest such as landscape diversity, show distinct focal points that enhance scenic quality or offer other types of outstanding views according to criteria in Appendix 24-1. Aside from VP11a and VP27, most views have a similar large horizontal shape to each of the views consisting of level foreground-midground fields in the bottom third of the photo, a band of background trees in the middle and the upper third of the photos showing sky. However, the intent was to provide simulations of the Project from visual resources but to mainly have representative views of what the community would experience from residences and roadways.

Mean deviations for Part 3 are comparatively very low, ranging between 0.0 and 0.4. This suggests the panelist's opinions on scenic quality regarding each viewpoint are very similar.

(8) Visible Effects Created by the Project

As applicable to the proposed Project technology and as part of this Application, the comprehensive VIA examined the overall appearance, operational characteristics, and general visible effects of the Project by means of computerized GIS viewshed and terrain analysis and with the use of specialized 3d visualization software. Viewshed analyses results are mapped for

illustrating geographic locations of predictive visibility as well as having used resultant data to quantify and compare amounts of visibility within varying parameters such as Distance Zones, LSZs, and sensitive receptors. More descriptive and qualitative assessments of the proposed Project was further provided with photo simulations that show comparisons between existing conditions and conditions with the Project.

A Glint and Glare Analysis report has been provided in Appendix 24-2. The findings are briefly summarized in Exhibit 24(a)(9).

The viewshed analysis concludes that 2.7% of the land area within the VSA expects some level of full or partial views of the Project where there would be some areas from which the Project would be in view and, in contrast, a multitude of areas from which it would not be seen. There are many tree groups surrounding the Project that will block views. In addition, where there are potential resident views of the Project, the Applicant has also proposed vegetative mitigation for those nearby residents in order to screen and minimize views of the Project to the maximum extent practicable. There are also attributes of the design of this solar project that would minimize the Project's impacts as discussed in under Exhibit 24(a)(10). Refer to 24(a)(8) for a discussion on the nature and degree of visual change during operation of the Project.

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