WEB Addison Solar

Matter No. 23-03015

Section 1101-2.8 Exhibit 8: Visual Impacts

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EXHIBIT 8 VISUAL IMPACTS

(a) Visual Impact Assessment

On behalf of WEB Addison Solar, LLC (the Applicant), a subsidiary of WEB Renewable Energy USA, LLC, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR) completed a Visual Impact Assessment (VIA; see Appendix 8-A) and a Visual Impact Minimization and Mitigation Plan (VIMMP; see Appendix 8-B) for the WEB Addison Solar project (the Facility). The VIA and VIMMP were prepared in support of the Facility's review under Article VIII of the New York State Public Service Law (hereafter referred to as Article VIII).

These reports are intended to assist the Office of Renewable Energy Siting and Electric Transmission (ORES), other state agencies, interested stakeholders, and the public in their review of the proposed Facility. The VIA and VIMMP describe the appearance of the visible components of the proposed Facility, define the aesthetic character of the visual study area (VSA), inventory and evaluate existing visual resources and viewer groups within the VSA, evaluate potential Facility visibility within the VSA, assess the visual impacts associated with the proposed Facility, and discuss measures that have been proposed or considered to minimize or mitigate visual impacts. The methodology and results of the VIA and VIMMP are summarized herein.

(1) Character and Visual Quality of the Existing Landscape

The character and visual quality of the existing landscape is described in Section 3 of the VIA. This section of the report provides information on regional setting and distance zones, landscape similarity zones, viewer/user groups, and VSRs within the VSA.

The VSA is located near the border between New York and Pennsylvania within the Glaciated Low Allegheny Plateau ecoregion, which extends across the southern tier of New York. The landscape in this region is characterized by rolling hills and deep valleys in a predominately rural setting where typical land uses include farm fields, forests, and low-density residential development bisected by a network of local and county roadways. Although development mostly occurs as widely scattered homes and farm complexes, areas of higher density are also present in hamlets, villages and cities. For information on the regional setting in which the Facility is located, see Section 3.1 of the VIA.

Distance zones are typically defined in visual studies to divide the VSA into distinct sub-areas based on the various levels of landscape and Facility detail that can be perceived by a viewer. Due to the characteristics of the landscape and project being evaluated in the VIA, EDR defined the following four distance zones (as measured from the nearest proposed photovoltaic [PV] array, overhead collection line, collection substation, and point-of-interconnection [POI] switchyard): near-foreground (0 feet to 300 feet), foreground (300 feet to 0.5 mile), middle ground (0.5 to 4.0 miles), and background (over 4.0 miles). For information on the distance zones, see Section 3.3 of the VIA.

Landscape similarity zones (LSZs) were used to define distinct landscape types within the VSA based on the similarity of various landscape characteristics, including landform, vegetation, water, and land use patterns. Five distinct LSZs were identified within the VSA: Forest, Agricultural/Rural Residential, Hamlet, River/Creek, and Transportation. For descriptions of these LSZs and their locations within the VSA, see Section 3.4 of the VIA.

Visually Sensitive Resources (VSRs) within the VSA are discussed in subsection (a)(9) of this exhibit and Section 3.6 of the VIA.

(2) Visibility of the Facility

See section (b) of this exhibit and Section 4.0 of the VIA for information regarding the visibility analysis techniques conducted to identify locations within the VSA where there is potential for the proposed Facility to be seen from ground-level vantage points. See subsection (a)(8) of this exhibit and Attachment B of the VIMMP for the analysis conducted that determined there would be no potential PV panel glare or glint impacts.

(3) Visibility of Above-ground Interconnection Facility Components and Roadways

See section (b) of this exhibit and Section 4.1.2 of the VIA for information regarding potential visibility of the collection substation, POI switchyard, and overhead collection line (collectively referred to in the VIA as ancillary Facility components).

As discussed in Section 2.2.4 of the VIA, the majority of the proposed access roads represent relatively minor alterations to the landscape that are rarely visible at distance due to their ground-level location, narrow width, and unpaved surface. However, if visible, access roads are illustrated and evaluated in the photosimulations included in this VIA.

(4) Appearance of Facility Upon Completion

The appearance, design, and materials proposed for each of the Facility components, including the PV arrays, security fencing, electrical system, access roads, and mitigation plantings are discussed and illustrated with elevations in Section 2.2 of the VIA.

(5) Proposed Facility Lighting

It is anticipated that the only permanent lighting required for the Facility is safety/security lighting at the collection substation. The substation will utilize inward angled and shielded light fixtures, and all lighting will be operated manually or placed on an auto-off switch to further minimize the nighttime impacts. Information on the permanent lighting proposed at the substation, including a photometric plan and information on the proposed light fixtures, is provided in Attachment B of the VIMMP.

Some temporary lighting (i.e., task lighting) will be utilized in construction laydown yard areas and could be required at work areas throughout the Facility Site during construction. The impacts associated with

this lighting will be short term, intermittent, and localized to the construction period and areas immediately surrounding where work is being performed. Both the proposed substation lighting and temporary task lighting will be kept to the minimum intensity required to assure safety and security while complying with applicable Occupational Safety and Health Administration, state, and local standards.

(6) Representative Views (Photographic Overlays)

As described in subsection (c)(1) of this exhibit and Attachment H of the VIA, three-dimensional (3D) modeling software was used to create realistic photographic simulations (photosimulations) to illustrate the appearance of the Facility upon completion. The photosimulations are included in Attachment D of the VIA. Representative elevations of the Facility components are included in Section 2.2 of the VIA.

(7) Degree of Visual Change from Construction of the Facility

As described in Section 5.6 of the VIA, construction has the potential to result in short-term, intermittent, and transitory adverse visual impacts due to the presence of construction vehicles, personnel, equipment, and temporary disturbance of vegetation and soils in certain locations. However, these short-term/temporary impacts will last only for the duration of construction. Upon completion of construction, construction vehicles and equipment will depart, and disturbed portions of the site will be restored.

(8) Degree of Visual Change from Operation of the Facility

See subsection (b)(4) and section (c) of this exhibit and Section 5.0 of the VIA for information regarding the visual contrast evaluation completed to evaluate anticipated visual change associated with the proposed Facility.

As described in the Solar Glare Analysis Report (Attachment B of the VIMMP), a solar glare analysis was conducted to assess the potential for reflected glare and glint from the proposed PV arrays that would be experienced at receptors (such as residences, commercial buildings), airports, and roadways located near the proposed Facility Site. This analysis was completed using industry standard commercial software based on the Solar Glare Hazard Analysis Tool (SGHAT) that was developed by Sandia National Laboratories on 33 residential receptors and 11 roadway corridors that were determined by viewshed analysis to have potential PV array visibility. The results of this analysis indicate that none of the identified potentially sensitive receptors would receive glare or glint from the primary Facility PV arrays. As further discussed in the Solar Glare Analysis Report, the PV panels have anti-reflective coatings to minimize reflection, and single-axis tracking PV arrays maintain low incidence angles relative to the sun, limiting the amount of solar radiation that is reflected by the arrays in the morning and evening. Therefore, no additional mitigation measures to reduce glint/glare impacts associated with the proposed Facility are anticipated to be necessary.

(9) Visually Sensitive Resources

As described in Section 3.6 of the VIA, VSRs within the VSA were identified in accordance with guidance provided by New York State Department of Environmental Conservation Program Policy *DEP-00-2 Assessing and Mitigating Visual Impacts* and the requirements of Article VIII. In addition, EDR conducted a search for other resources that could be considered visually sensitive based on the type or intensity of use they receive. Sources used to identify VSRs include local and regional planning documents, municipal and county websites, publicly available geospatial databases, the Historic Resources Survey completed for the Facility (see Appendix 9-A and 9-D of the Article VIII Application). In addition, EDR conducted outreach to solicit input from agencies and other stakeholders to assist in the identification of VSRs per the requirements set forth in Article VIII. However, no additional resources were identified in the two responses received during the visual outreach process.

The categories of VSRs identified and evaluated in the VIA include properties of historic significance, designated scenic resources, public lands and recreational resources, and high-use public areas. A total of 21 VSRs were identified in the VSA, which included five properties of historic significance, four designated scenic resources, eight public lands and recreational resources, and four high-use public areas. A list of all VSRs within the VSA, with additional information on potential PV panel, collection substation, POI switchyard, and overhead collection line visibility is included in Attachment C of the VIA. Attachment A of the VIA includes figures with the identified VSRs overlaid with the viewshed results and viewpoint locations. Potential visual effects of the proposed Facility on VSRs based on the results of the viewshed analysis, field review, line-of-sight cross sections, and photosimulation evaluation are discussed in Section 5.4 of the VIA.

A 5-mile radius study area was defined to identify significant visual resources located outside the 2-mile VSA. A total of 19 significant visual resources were identified: 11 resources listed on the State or National Registers of Historic Places, one trail, five state forests, one state park, and one wildlife management area. These resources are mapped in Section 3.6.1 of the VIA. Potential Facility visibility and visual effects are discussed in Sections 4.2.1 and 5.4.1 of the VIA.

(b) Viewshed Analysis

An analysis of Facility visibility was undertaken to identify locations within the VSA where there is potential for the proposed PV panels, collection substation, POI switchyard, and overhead collection to be seen from ground-level vantage points. This analysis included identifying potentially visible areas on viewshed maps and verifying potential Facility visibility in the field. In addition, line-of-sight cross sections were completed to demonstrate potential visibility of the Facility from VSRs within the VSA as required by Article VIII regulations. The results of each of these Facility visibility assessments techniques are described in Section 4.0 of the VIA. Detailed descriptions of the various visibility assessment methodologies are presented in the Technical Memorandum included as Attachment H of the VIA.

(1) Viewshed Mapping

Maps with the viewshed results overlaid with VSRs, viewpoint locations, distance zones, and LSZs are presented at 1:24,000 map scale in Attachment A of the VIA and in Section 4.1 of the VIA. Potential visibility of the PV panels, collection substation, POI switchyard, or overhead collection line for each VSR are also indicated in tabular format in Attachment C of the VIA.

Information on potential PV panel visibility from significant visual resources outside the 2-mile VSA is provided in Section 4.2.1 of the VIA.

(2) Viewshed Methodology

The viewshed analysis methodology is described in Attachment H of the VIA. Digital Surface Model based viewshed analyses, which consider the screening effects of topography, structures, and vegetation, were conducted for the PV panels and interconnection facility. The analyses were prepared using surface models derived from publicly available light detection and ranging system (lidar) data, an assumed viewer height of 6 feet, sample points representing the Facility components based upon location and height data provided by the Applicant, and Environmental Systems Research Institute ArcGIS Pro® software with the Spatial Analyst extension.

As described in Section 4.4 of the VIA, field review largely confirmed the accuracy of the viewshed analysis results. However, it was observed that visibility was more limited in views down roadway corridors than would be expected given the results of the viewshed analyses. This is likely due to the removal of roadside screening features during the viewshed analysis process as described in Attachment H.

(3) Viewshed Mapping and Viewpoint Selection

As described in subsection (b)(4) of this exhibit and Section 4.0 of the VIA, potential Facility visibility from VSRs based on the results of the viewshed analyses was one of many factors considered in the selection of viewpoints for the development of photosimulations and subsequent rating panel evaluation. Maps with the viewshed results overlaid with VSRs, viewpoint locations, distance zones, and LSZs are presented at 1:24,000 map scale in Attachment A of the VIA.

(4) Viewpoint Selection and Stakeholder Outreach

As described in Section 5.1 and Attachment H of the VIA, a total of 12 views from 11 viewpoints were selected for the development of photosimulations based upon the following criteria:

- They could provide open views of the PV arrays or other Facility components.
- They could illustrate the range of Facility visibility from a variety of viewing distances and geographic locations to represent the spectrum of visual change that will occur within the VSA with the Facility in place.
- They could illustrate views from significant locations including

    - VSRs and LSZs where open views will be available
    - Locations with a high degree of visual exposure for viewer/user groups (such as densely populated areas, highly traveled roadways, or high-use recreation areas) where open views will be available
    - Locations recommended by state agencies, municipal representatives, and/or local stakeholders.
- They could illustrate views of the Facility from locations representative of existing and future land uses within the VSA.
- They could illustrate views where there is potential for cumulative impacts with other existing or proposed renewable energy facilities.

Following selection of viewpoints, camera alignments that were completed as part of the photosimulation development process (see methodology discussion in Attachment H of the VIA) revealed that the proposed Facility components were almost completely screened from view from two viewpoints. Therefore, wireframe renderings were completed for Viewpoint 35 from Curtis Coopers Road in the Town of Campbell and Viewpoint 44 from Lewis Road in the Town of Thurston, and the 10 views from the remaining nine viewpoints were used for photosimulation development and subsequent rating panel evaluation.

The selected viewpoints are listed in Table 5.1-1 of the VIA. For information on the visual outreach process, including an overview of the recommendations received from stakeholders on locations suitable for the development of photosimulations, see Attachment F and H of the VIA.

(i) Representative of typical views or direct line-of-sight views

As discussed in Section 5.1 and Section 5.2 of the VIA, the photograph selected for photosimulation development provides the most open and unobstructed views available toward the Facility from each selected viewpoint location.

(ii) Significance of Viewpoint and Designated Scenic Resources

As discussed in section (c) of this exhibit, VSRs were one criterion considered during the viewpoint selection process, which is described in Section 5.1 of the VIA. Table 5.1-1 in the VIA identifies if the selected viewpoint is representative of views from identified VSRs. Additional contextual information is also included in the cover sheets for each simulated viewpoint in Attachment D of the VIA.

(iii) Level of Viewer Exposure

Viewer/user groups identified in the VSA are described in Section 3.7 of the VIA based on activity, duration of views, exposure to the Facility, and sensitivity to visual change that individuals are likely to have in common. In addition, EDR conducted a building density analysis using publicly available national building footprint data and reviewed traffic count data available from the New York State Department of Transportation to determine areas within the VSA that have the highest number of

local residences and through-travelers, and therefore are likely to experience a high level of viewer exposure.

As discussed in Attachment H of the VIA, 10 of the selected viewpoints occur within the Agricultural/Rural Residential LSZ, eight of the viewpoints occur in the near-foreground or foreground distance zones, and five of the viewpoints occur in the agriculture/rural agriculture future land use areas or in agricultural areas without zoning ordinances (where future land uses are not defined but assumed to be consistent with existing use), four of the viewpoints are representative of views that would be available from identified VSRs, and one viewpoint is located in a higher density residential area. This reflects the geographic distribution of potential Facility visibility within the VSA, which is concentrated in these distance zones and agricultural areas where viewer exposure is expected to be low. Areas of high use by residents and through-travelers and resources that are expected to receive high visitation by tourist/recreational users are limited in the VSA and generally not included in the Facility viewshed, or the Facility components were determined to be substantially screened from view in these areas during field review and/or the photosimulation preparation process.

(iv) Proposed Land Uses

As discussed in Section 3.5 of the VIA, EDR reviewed available local zoning ordinances and maps to define future land use areas within the VSA. Ten future land use areas were defined based on similarities in zoning district goals and allowable land uses. As indicated in Table 3.5-1 and Figure 3.5-1 of the VIA, agriculture/rural use is the predominant desired future land use in the VSA. Future land uses are not defined for about half of the VSA because the towns of Addison and Thurston have not adopted zoning regulations. It is assumed that the current land uses, which are predominately agriculture and rural residential development, are the desired future land uses in these areas. Future land use is also undefined for certain areas within the Town of Erwin, including land within the Erwin WMA and the Interstate 86 highway corridor. These lands accommodate forestry/recreational activities and transportation, respectively, and it is safe to assume that these will remain the primary future land uses.

(v) Visual Assessment Requirements of Local Laws and Ordinances

Local laws and ordinances of the host community that pertain to the assessment of visual impacts are identified and discussed in Section 1.2 of the VIA. The visibility and visual impact analyses conducted as part of this VIA comply with the requirements of local ordinances and provide sufficient information for reviewers to identify areas with potential Facility visibility, and understand potential visual impacts associated with the Facility and the mitigation measures that could be implemented to reduce visual impacts.

(c) Visual Contrast Evaluation

A summary of the visual contrast evaluation completed for the proposed Facility is discussed in the following sections. Detailed descriptions of the various photosimulation development and visual contrast evaluation methodologies are presented in the Technical Memorandum included as Attachment H of the VIA.

(1) Photographic Simulations of the Facility and Vegetation Screening

As described in Attachment H of the VIA, 3D modeling software was used to create realistic photosimulations of the proposed Facility from each of the 10 selected views where the Facility would be visible. Proposed mitigation plantings are depicted at installation and after five to seven years of growth during leaf-on and leaf-off conditions in all photosimulations where such plantings are proposed and would be visible. The data and software used in this process assure that the alignment, elevations, dimensions, locations, and appearance of the proposed Facility components and plantings in the simulations are accurate. Information on the proposed mitigation plantings is provided in the Conceptual Landscape Mitigation Plan (Attachment A of the VIMMP). The photosimulations (along with the two wireframe renderings, which were not evaluated by the rating panel) are included in Attachment D of the VIA.

It should be noted that care was taken to avoid existing vegetation in the foreground of the views while documenting viewpoints during leaf-on conditions in order to illustrate the most open, unobstructed view that could be available from each selected location, as described in Section 4.4 of the VIA. During leaf-off conditions, slightly larger portions of some of the portions of the PV arrays could be visible through gaps between foliage and branches in existing deciduous vegetation in the middle ground or background of some of these views. However, this slight increase in visibility would not materially change the overall perceived visual impact at these viewpoints or affect the results of the VIA. Therefore, screening provided by existing vegetation was not relied on for facility mitigation for the visual contrast evaluation.

(2) Additional Revised Simulations Illustrating Mitigation Measures

All proposed minimization and/or mitigation measures that are currently proposed for the Facility, where visible, are illustrated in the photosimulations in Attachment D of the VIA. The VIMMP provides information on mitigation measures proposed for the Facility.

(3) Photographic Simulations Visual Impact Rating

To evaluate anticipated visual change associated with the proposed Facility, photosimulations of the operational Facility at each of the selected viewpoints were compared to photographs of the 10 selected existing views. The simulations that were used in this evaluation illustrate the Facility at the time of installation without any mitigation plantings and following five to seven years of mitigation plant growth. Rating panel personnel and procedures and copies of each panel member's completed rating forms are included in Attachment E of the VIA.

As discussed in Section 5.3 of the VIA, rating panel results suggest that the proposed Facility will result in minimal/moderate visual contrast with the existing landscape following installation without mitigation plantings, as indicated by the overall composite contrast score of 1.6, with the combined average of each panel member's scores for individual viewpoints ranging from 0.2 (insignificant) to 3.1 (appreciable).

The rating panel results suggest that the expansiveness of PV panel visibility and extent of vegetation removal strongly influenced visual impact. Viewpoints 11B, 15, and 17 received the highest composite scores (scores ranging from 3.1 and 2.9) indicating moderate/appreciable to appreciable visual contrast. With the proposed Facility in place, open views are available of multiple PV arrays and overhead collection line conductors and structures which are almost entirely unscreened by existing vegetation or structures are now visible, and existing forested areas and hedgerows that contribute to the rural character of the views have been removed. Due to their proximity to the viewer and/or extent of visibility, the Facility components present significant line, form, and scale contrast, particularly with existing land use, landform, and vegetation. In these views, the Facility components become character-defining features of the landscape and the focus of the view, shifting the character of the landscape from a working agricultural landscape to one primarily of solar energy generation and secondarily continuing agricultural uses.

The three views discussed above represent the most open, unobstructed views of the PV panels and overhead collection line that are anticipated to be available within the VSA. As indicated by the average contrast rating scores for Viewpoints 11A, 21, 23, and 28, which received composite contrast rating scores indicating minimal to moderate visual contrast (scores ranging from 0.9 to 1.6), less visual contrast would occur in the foreground and middle ground distance zones where the PV panels and collection line are set back further from the viewer, less vegetation removal is visible, and/or existing topography and vegetation would provide more substantial screening. Viewpoint 4, which represents the most open, unobstructed view anticipated to be available of the collection substation and POI switchyard, also received a composite contrast rating score of 1.6 (minimal/moderate). Due to the setback of the substation/switchyard from the roadway these Facility components occupy a fairly small portion of the view, which includes existing industrial mining use and utility lines. As such, the Facility results in minimal/moderate visual with the existing landscape in this view.

The remaining viewpoints (Viewpoints 39 and 41) were selected for photosimulation development because they represented the most open, unobstructed views anticipated to be available of the overhead collection line from residential and industrial areas within the Cohocton River valley. At these viewpoints, vegetation clearing for the overhead collection line corridor on the hillside in the background of the views is visible, but individual structures are indistinguishable due to viewing distance, their narrow profiles and neutral colors, and screening provided by the surrounding forest vegetation. Consequently, these views received composite scores of 0.3 and 0.2, indicating insignificant/minimal and insignificant contrast.

The rating panel results suggest that the proposed mitigation was most effective in reducing visual contrast from Viewpoint 11B, where plant materials provided effective screening of the fenceline and lower portions of the PV panels. The mitigation plantings have less effect from Viewpoint 15, where proposed PV arrays remain mostly unscreened due to the elevated viewing position and low heights of the mitigation plantings. Differences among the rating panel members in the perceived effectiveness of the plantings are reflected in the comments, which mention factors including the compatibility of the proposed plantings with existing vegetation in the view and seasonal effectiveness. The composite contrast rating scores indicate that the proposed mitigation plantings had no measurable effect from

Viewpoint 17 due to the inferior viewing position from this viewpoint and the low heights of the mitigation plantings. As discussed further in the VIMMP, environmental and design constraints prevented the placement of plantings in locations along Irish Hill Road (represented by the simulations prepared from Viewpoints 11B, 15, and 17). Additionally, concerns about generation efficacy as well as long-term maintenance prevented the use of larger or taller plant materials that could more effectively screen portions of the PV arrays in views that are available along the roadway.

In instances where the PV arrays are viewed from long distances (Viewpoints 21 and 23 from Mose Road), the proposed plantings are difficult to distinguish from other existing landscape features and provide little to no screening of the Facility or are not visible at all. However, it is important to note that proposed mitigation plantings are not intended or expected to be effective at screening or soften views of the Facility at such viewing distances, and the Facility would result in minimal/moderate visual contrast with the existing visual environmental as currently proposed without mitigation plantings.

(d) Visual Impact Minimization and Mitigation Plan

The VIMMP (Appendix 8-B of the Article VIII application) outlines the various measures proposed or considered by the Applicant to avoid, minimize, and mitigate potential adverse visual impacts associated with the Facility in accordance with the mitigation measures required for consideration in 16 NYCRR Section 1101-2.8(d). Attachments of the VIMMP include the Conceptual Visual Mitigation Report (Attachment A), Solar Glare Analysis Report (Attachment B), and Lighting Plan (Attachment C).