Hoffman Falls Wind Project

Case No. 23-00038

900-2.9 Exhibit 8

Visual Impacts

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EXHIBIT 8 VISUAL IMPACTS

(a) Visual Impact Assessment

On behalf of Hoffman Falls Wind LLC, a wholly owned subsidiary of Liberty Renewables Inc. (the Applicant or Hoffman Falls Wind), 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 Hoffman Falls Wind Project (the Facility). The VIA and VIMMP were prepared in support of the Facility's review under Title 19 of New York Code, Rules and Regulations (19 NYCRR) §900-2.9 and Section 94-c of the New York State Executive Law, hereafter referred to as Section 94-c. It is intended to assist the Office of Renewable Energy Siting (ORES), other state agencies, interested stakeholders, and the public in their review of the proposed Facility in accordance with the requirements of Section 94-c. The purpose of the VIA and VIMMP are to describe the appearance of the visible components of the proposed Facility, define the aesthetic character of the visual study area, inventory and evaluate existing visual resources and viewer groups within the 5-mile visual study area (VSA), evaluate potential Facility visibility within the VSA, identify representative views for the visual assessment, assess the visual impacts associated with the proposed Facility, and discuss measures that have been proposed or considered to minimize or mitigate visual impacts.

(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 details on the physiographic/visual setting, distance zones, landscape similarity zones, viewer/user groups, and visually sensitive resources within the VSA.

Landform in the VSA is consistent with the Glaciated Low Allegheny Plateau in which a mosaic of farmland and woodlots occur on low, rolling hills that have been glacially smoothed, with flattened hilltops and wide stream valleys. The rounded tops of the dissected plateaus are generally cleared for agriculture while the steeper slopes remain forested. Land use within the VSA is characterized by agricultural, forest, and low-density residential land uses, interspersed with small villages and hamlets. Water features within the VSA that contribute most heavily to the aesthetic character of the region predominantly occur along the western edge VSA, and include Chittenango Falls and Cazenovia Lake. Significant water features in the southern portion of the VSA include Tuscarora Lake, Leland Pond, Hatch Pond, Eaton Reservoir, and Stoney Pond. Water features closest to the Facility Site are primarily creeks, smaller waterways, and unnamed ponds. For additional information on landform, land use, and water features in the VSA, see Section 3.2 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 project detail available to the viewer. Due to the characteristics of the landscape and project being evaluated, EDR defined the following distance zones: near-foreground (0 to 300 feet), foreground (300 feet to 0.5 mile), middle ground (0.5 to 4.0 miles), and background (over 5.0 miles). For additional information on distance zones, see Section 3.1.1 of the VIA.

Landscape similarity zones (LSZs) provide a useful framework for the analysis of a project's potential visual effect and 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: Village, Hamlet, Water, Forest, and Agricultural/Rural Residential. Descriptions of these LSZs and additional information on data sources used for delineation and locations within the VSA are included in Section 3.4 of the VIA. Attachment A of the VIA includes figures showing the extent of each LSZ overlaid with viewpoint locations and the viewshed analysis results at 1:24,000 map scale.

Visually sensitive resources within the VSA are discussed in Section (a)(10) herein.

(2) Visibility of the Facility

A description of all visible components of the proposed Facility is included in Section 2.2 of the VIA. These components include the wind turbines, Aircraft Detection Lighting System (ADLS) tower, meteorological (MET) tower, interconnection facility (collection substation, point of interconnection [POI] switchyard, and point of interconnection to the existing grid), operations and maintenance (O&M) facility, and access roads. See Section (b) for information regarding the methodology and results of the viewshed analyses conducted for Facility components and Sections (a)(5) and (a)(9) for information regarding shadow flicker and aviation obstruction warning lights.

(3) Visibility of all Above-Ground Interconnections and Roadways

See Section (b) for information regarding the methodology and results of the viewshed analysis conducted for the interconnection facility.

As discussed in Section 2.2.6 of the VIA, the proposed Facility includes a network of new or improved access roads to allow for delivery of Facility components during construction and access to the Facility for maintenance purposes during operation. The access roads are anticipated to be surfaced with crushed stone or gravel and will be approximately 16 feet wide. Permanent access roads and the interconnection facility are shown in the photosimulations where they will be visible (see Attachment D in the VIA).

(4) Appearance of Facility upon Completion

Representative elevations of Facility components with dimensions are included in Section 2.2 of the VIA. As described in Section (a)(6) and Section 4.2.2 of the VIA, three-dimensional modeling software was used to create realistic photographic simulations to illustrate the appearance of the Facility upon completion.

(5) Proposed Facility Lighting

As described in Section 2.2 and 5.2.3 of the VIA, wind turbine lighting will operate as required by the Federal Aviation Administration (FAA). It is assumed that each of the wind turbine nacelles and the MET

tower will be equipped with two medium intensity (FAA-L-864) aviation obstruction warning lights (also referred to as FAA lights), which will flash in unison at night. If approved by the FAA and feasible for the Facility, an ADLS tower will be installed to reduce and minimize the potential visual impacts associated with the FAA lights on the wind turbines at nighttime. The ADLS tower will detect aircraft within the 3 nautical mile (3.5 mile) airspace surrounding the wind turbines. Once an aircraft is detected within the airspace, the FAA lights will synchronously activate. The lights will remain active for 30 minutes or until the aircraft has exited the airspace, at which time the lights will switch off. The system can also be remotely activated for planned aerial operations within the region. See Section (b) for information regarding the potential visibility of the FAA lights at nighttime.

Other permanent light sources anticipated at the Facility are safety/security lighting to be installed at the site of the collection substation and POI switchyard. Lighting will use the lowest intensity required to assure safety and security. The O&M building will also require full-time lighting, not dissimilar to typical residential security lights and full-cutoff fixtures will be utilized. Permanent lighting at these Facility components is discussed in greater detail in the VIMMP, and photometric plans with information on proposed light fixture mounting heights and manufacturer cut sheets are included in Appendix 5-C.

(6) Representative Views (Photographic Overlays) of the Facility

To show anticipated visual changes associated with the operational Facility, three-dimensional (3D) modeling software was used to create realistic photographic simulations (photosimulations) of the proposed Facility from 17 viewpoints. The model creation and camera alignment process is described in Section 4.2.2 of the VIA. As described in this section of the VIA, 22 viewpoints were initially selected for photosimulation development, but it was determined that Facility components would be substantially screened from five of these viewpoints. For these five viewpoints, wireframe renderings were prepared to illustrate the degree of screening provided by existing landscape features. The photosimulations and wireframe renderings are included in Attachment D of the VIA. The viewpoint selection criteria used to determine which viewpoints were selected for photosimulation and wireframe rendering development is discussed in Section 4.2.1 of the VIA and in Section (b)(4).

(7) Visual Change Resulting from Construction of the Facility and Above-Ground Interconnections

Temporary visual impacts associated with the construction of the Facility are described and illustrated with representative photographs in Section 5.2.4 of the VIA. These impacts will be relatively minor and temporary in nature. Anticipated visual effects during construction will include a temporary increase in traffic, gravel-surfaced temporary laydown areas, temporary erosion control measures, temporary soil disturbance, and addition of construction workers, equipment, and materials to certain views. Large construction equipment, including cranes, a temporary concrete batch plant, dump trucks, concrete trucks, excavators, and delivery vehicles will be present over the course of several months. All temporary site disturbance resulting from Facility construction will be restored and revegetated after construction activity is complete.

(8) Visual Change Resulting from Operation of the Facility and Above-Ground Interconnections

To evaluate anticipated visual change associated with the Facility, photosimulations of the operational Facility were compared to photos of existing conditions by a rating panel of visual professionals. The rating process is described in greater detail in Section (c)(3) and Section 4.2.3 of the VIA.

The potential cumulative visual effect of the Hoffman Falls Wind Project with other renewable energy projects currently operating or proposed in the surrounding region are evaluated in Section 5.2.5 of the VIA.

(9) Analysis of Related Operational Effects of the Facility

A shadow flicker analysis, including a full year of hourly potential receptor-specific predicted shadow flicker based on sunshine probabilities, site-specific wind speed and direction data, and Facility design, is included in Attachment A of the VIMMP. Based on the conservative assumptions used in the shadow flicker model, and considering the most impactful scenario, up to 27 non-participating year-round residences could receive over 30 hours of shadow flicker per year (see Attachment A of the VIMMP [Appendix 8-B]).

(10) Visually Sensitive Resources

Visually Sensitive Resources (VSRs) within the VSA were identified in accordance with guidance provided by New York State Department of Environmental Conservation (NYSDEC) Program Policy *DEP-00-2 Assessing and Mitigating Visual Impacts* and the requirements of Section 94-c. The categories of VSRs identified and evaluated in the VIA include properties of historic significance, designated scenic resources, public lands and recreational resources, high-use public areas, and other resources identified by stakeholders. Sources consulted to identify resources include publicly available geospatial databases, the Historic Resources Survey Report prepared for the Facility (Appendix 8-D of the 94-c Application), local and regional planning documents, and agency and stakeholder outreach. A total of 279 VSRs were identified in the VSA: 128 properties of historic significance, 3 designated scenic resources, 82 public lands and recreational resources, 28 high-use public areas, and 38 other resources identified by stakeholders. See Appendix G for a full overview of the comments received and actions taken as part of the visual stakeholder outreach process. The VSR identification process is described in greater detail in Section 3.5 of the VIA.

Photosimulations were developed to illustrate the visual change that would occur with the Facility in place as summarized in Section 4.2.1 of the VIA. Line-of-sight cross section analysis was performed to demonstrate the extent of visibility of the nearest visible wind turbine for resources of statewide significance as described in Section 4.1.2 of the VIA, and an additional viewshed-based analysis was conducted to provide specific information on potential wind turbine visibility from VSRs as described in Section 5.2.2 of the VIA. The potential visibility and visual effects associated with the Facility are summarized in Section 5.2.2 of the VIA.

(b) Viewshed Analysis

(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 5.1 of the VIA. Potential visibility of the wind turbines blade tips, wind turbine FAA lights, and interconnection facility for each VSR is also indicated in tabular format in Attachment C of the VIA. As described in Section 4.1.1 and 5.1.4 of the VIA, field review largely confirmed the accuracy of the viewshed analysis results. However, it was observed during field review that visibility was overstated from some locations due to the removal of landscape features in roadway and transmission line corridors that are misinterpreted in the digital surface model as described in the viewshed analysis methodology (Section 4.1.1 of the VIA).

As described in Section 3.5.4 of the VIA, significant visual resources beyond the 5-mile VSA were identified within a 10-mile study area. Potential visibility and visual effects associated with the Facility from these resources are discussed in Section 5.2.2 of the VIA.

(2) Viewshed Methodology

The viewshed analysis methodology is described in Section 4.1 of the VIA. Digital Surface Model (DSM) based viewshed analyses, which consider the screening effects of topography, structures, and vegetation, were conducted to identify areas where the wind turbines, FAA lights, interconnection facility, and the MET and ADLS towers would potentially be visible. Because DSM viewshed analyses account for screening provided by topography, vegetation, and structures, they provide an accurate representation of potential Facility visibility. A viewshed analysis based on a bare earth Digital Elevation Model (DEM) considering topography alone is not provided because the results of such an analysis do not accurately represent areas of potential Facility visibility within the VSA. The analyses were prepared using DEM and DSM data derived from publicly available light detection and ranging system (LIDAR) data, an assumed viewer height of six feet, sample points representing the Facility components based upon location and height data provided by the Applicant, and Environmental Systems Research Institute (ESRI) ArcGIS Pro® software with the Spatial Analyst extension.

(3) Viewshed Mapping and Viewpoint Selection

As described in Section (b)(4) and Section 4.2.1 of the VIA, potential visibility of the Facility based on the results of the viewshed analysis were one of many factors considered in the selection of viewpoints for the development of photosimulations and subsequent evaluation by a rating panel of visual professionals. 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 4.2.1 of the VIA photosimulations were developed from 17 viewpoints based upon the following criteria:

- They provide open views of the proposed wind turbines, interconnection facility, ADLS tower, or MET tower, or they provide representative views of the screening effects of vegetation, topography, or structures from selected areas.
- They illustrate views from significant locations, including, but not limited to:
    - Specific VSRs.
    - LSZs where open views will be available.
    - Locations with a high level of exposure for representative viewer/user groups, such as densely populated areas or highly trafficked roadways.
    - Locations recommended by state agencies, municipal representatives, and/or local stakeholders.
- They illustrate different numbers of visible wind turbines from a variety of viewing distances and directions to illustrate the range of visual change that will occur with the Facility in place.
- They illustrate views of the Facility from locations representative of existing and future land uses and/or zoning districts within the VSA.
- They illustrate conditions both consistent with, and inconsistent with, the requirements of adopted local laws or ordinances for host communities.
- They illustrate views where there is potential for cumulative impacts with other existing or proposed renewable energy facilities.

The viewpoints selected for photosimulation development and subsequent rating panel assessment are listed in Table 4.2-1 of the VIA. The visual outreach process, including an overview of the recommendations received from stakeholders for locations suitable for the development of photosimulations, is included in Attachment G of the VIA.

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

As discussed in Section 4.2.1 and Section 4.2.2 of the VIA, photograph(s) selected for photosimulation development provided the most open and unobstructed views available toward the Facility from each location.

(ii) Significance of Viewpoint and Designated Scenic Resources

As discussed above, VSRs were one criterion considered during the viewpoint selection process, which is described in Section 4.2.1 of the VIA. Table 4.2-1 of the VIA identifies if the viewpoint is

representative of views that are available from identified VSRs. Additional contextual information is also included in the cover sheets for each viewpoint that is included in Attachment D of the VIA.

(iii) Level of Viewer Exposure

Viewer/user groups identified in the VSA are described in Section 3.4 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. Viewer/user groups include local residents, through-travelers, and tourists and recreational users. A building density analysis was conducted to determine where viewer exposure is highest for local residents. This analysis indicates that viewer exposure for local residents will be highest in the Villages of Cazenovia, Morrisville, and to a lesser extent, the Village of Munnsville and the various hamlets in the VSA. To determine where viewer exposure would be highest for through-travelers, the New York State Department of Transportation average daily traffic count data was consulted. This data suggests that viewer exposure will be highest for travelers on US Scenic Route 20 and State Routes occurring in the Village of Cazenovia, and to a lesser extent, in proximity to the Village of Hamilton. Tourist and recreational users within the VSA are assumed to be concentrated in publicly accessible recreation areas, which are identified as VSRs. Locations with high viewer exposure (highways, villages and hamlets, and VSRs) and potential Facility visibility were considered during the viewpoint selection as summarized in Table 4.2-1 in the VIA.

(iv) Proposed Land Uses

As discussed in Section 3.2.4 of the VIA, EDR consulted town planning and zoning documents to define future land use areas for towns within the VSA. Future land use areas and zoning districts with a primary use of agriculture/rural residential are the predominant future land uses anticipated within the VSA. Due to the location of the Facility on agricultural land, potential Facility visibility is anticipated to be concentrated to agriculture/rural residential future land use areas. Consequently, the majority of the viewpoints that were selected for the development of photosimulations fall within these areas as indicated in Table 4.2-1 in the VIA.

(v) Local Laws and Ordinances

As discussed in Section 4.2.4 of the VIA, relevant local laws and ordinances of host communities potentially pertaining to the visual environment were considered in the viewpoint selection process. To address visual assessment standards for wind energy generation facilities outlined in the various town land use and zoning laws two photosimulations and one wireframe rendering was developed from viewpoint locations within the Town of Eaton and three photosimulations were developed from viewpoint locations within the Town of Smithfield. Three photosimulations and two wireframe renderings were developed from viewpoint locations within the Town of Nelson. Of which two photosimulations and one wireframe rendering view the Facility at distance less than 3.0 miles. Additionally, one photosimulation from a publicly dedicated scenic roadway was developed within 3.0 miles of Wind Turbine #13 (the only turbine sited in the Town of Nelson). However, this viewpoint

occurs within the Town of Eaton. Within the Town of Fenner, six viewpoint locations were selected for photosimulation, four of which are within 3.0 miles of the wind turbines and two of which represent the interconnection facility and the O&M facility.

(c) Visual Contrast Evaluation

As described in Section (b)(4) and Section 4.2.2 of the VIA, 3D modeling software was used to create realistic photosimulations from 17 viewpoints and wireframe renderings from five viewpoints. The rating panel evaluation process and results are described in Sections 4.2.3 and 5.2.1 of the VIA and summarized in Section (c)(3).

(1) Photographic Simulations of the Facility and Vegetation Screening

As described in Section (b)(4), photograph(s) selected for photosimulation development from each viewpoint illustrate the most direct and unobstructed view available towards the Facility Site. It should be noted that some of the baseline photography was taken during leaf-on conditions. However, existing vegetation in these photographs would have minimal to negligible effects to Facility visibility, and leaf-off photographs from these vantage points are not expected to affect the results of the VIA.

(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 additional information on mitigation measures proposed for the Facility.

(3) Photographic Simulations Visual Impact Rating

To evaluate anticipated visual change associated with the Facility, the visual simulations of the operational Facility were compared to photos of existing conditions at each of the 17 selected viewpoints. These "before" and "after" photographs, identical in every respect except for the Facility components and vegetative clearing shown in the simulated views, were provided to a rating panel of visual professionals.

The results of the rating panel evaluation indicate that the Facility will result in moderate visual contrast with the existing landscape in the views that were assessed. Based on the contrast rating scores and comments, visual contrast is strongly correlated with viewing distance, existing scenic quality, existing wind turbines in the view, the number of proposed turbines visible, and the degree of screening of the turbines in views. Greater levels of visual contrast can generally be anticipated where views of multiple turbines appear in the foreground of views, which heightens their contrast with existing landscape features in terms of line, form, and color. Conversely, contrast is reduced when the wind turbines and other Facility components are partially screened or viewed at greater distances and when existing wind turbines are included in the view.

The methodology and results of the visual contrast evaluation conducted for the Facility are discussed in greater detail in Sections 4.2.3 and 5.2 of the VIA. The rating panel instructions along with the completed rating forms and resumes of the rating panel members are included in Attachment F of the VIA. Attachment D of the VIA includes the photosimulations, contextual information sheets, written summaries of the existing and proposed views, and tables summarizing the rating panel scores.

(d) Visual Impact Minimization and Mitigation Plan

The VIMMP outlines the various measures proposed or considered by the Applicant to avoid, minimize, and mitigate potential adverse visual impacts associated with the Facility. The mitigation measures required for consideration in §900-2.9(d) are listed in tabular format and discussed. Studies and plans that provide information on shadow flicker and conceptual plan are included as Attachment A and B to the VIMMP, respectively.