Visual Impact Minimization and Mitigation Plan

Revision 1

Hoffman Falls Wind Project

Towns of Eaton, Fenner, Nelson, and Smithfield, Madison County, New York

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1.0 Introduction

The following Visual Impact Minimization and Mitigation Plan (VIMMP) outlines the measures proposed or considered by Hoffman Falls Wind LLC (the Applicant) to avoid, minimize, and mitigate potential adverse visual impacts associated with the proposed Hoffman Falls Wind Project (the Facility) a utility-scale wind energy generating project located in Madison County, New York with a generating capacity of up to 100 megawatts (MW) including up to 24 wind turbine locations. This report was prepared in support of the Facility's review under Chapter XVIII, Title 19 of New York Codes, Rules, and Regulations (NYCRR) Part 900, §900-2.9 and Section 94-c of the New York State Executive Law (hereafter referred to as Section 94-c). This document is supported by the Visual Impact Assessment (VIA; Appendix 8-A) which assesses the potential visual effects associated with the Facility including the mitigation measures implemented in the Facility design. The mitigation measures required for consideration by §900-2.9(d) of Section 94-c are listed in tabular format below, along with an indication of whether they are being proposed, and a brief discussion regarding each proposed measure. Studies and plans that provide more detail are included as attachments or separate appendices in the 94-c application. These include a Shadow Flicker Analysis Report (Attachment A) and Conceptual Landscape Mitigation Planting Plan (Attachment B).

2.0 Visual Impact Minimization and Mitigation Plan Table

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
Screening/Landscaping	Y	EDR has developed a Conceptual Landscape Mitigation Planting Plan (see Attachment B) to screen and/or soften the appearance of the proposed collection substation, point of interconnection (POI) switchyard (collectively referred to as the interconnection facility in the VIA), and the operations and maintenance (O&M) facility from the surrounding area. The locations of the plantings and planting details are in Attachment B. Proposed mitigation plantings are depicted at installation and after five to seven years of growth during leaf-on and leaf-off conditions in the photosimulations of these Facility components (Viewpoints 69 and 70; see Attachment D of the VIA). To evaluate anticipated visual contrast associated with the proposed Facility, the photosimulations were compared to photographs of existing conditions by a rating panel of visual professionals. The rating panel results suggest the plantings were effective in softening the appearance of the O&M facility after five to seven years of growth but were less effective near the interconnection facility. However, it is likely that the benefits of these plantings will increase over time as plant height and density increases. The Applicant considered other forms of screening to further minimize and mitigate the visual impacts of the interconnection facilities, including screen walls, enclosure, and setbacks. These

[1] As listed in 19 NYCRR §900-2.9 Exhibit 8: Visual Impacts (d).

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		methods were determined to be impractical due to the proximity of the interconnection facilities to Cody Road (see Component Relocation/Rearrangement for a further discussion on the siting process for the interconnection facilities), the topographic position of these facilities relative to Cody Road, and the presence of existing utilities and proposed infrastructure on the north side of Cody Road. However, the Applicant is proposing to utilize black vinyl coated fencing to reduce the specular profile of the fence at the interconnection facilities.
Architectural Design	N	Proposed buildings associated with the Facility are the Operations and Maintenance (O&M) buildings and the control houses within the interconnection facility. The proposed control buildings associated with the substations that were assessed in the VIA are 66 feet long by 34 feet wide and approximately 13 feet tall. The buildings will be clad in standing seam metal siding with a neutral color, which will generally result in low color contrast when viewed against the surrounding vegetation. As described in Section 2.2 of the VIA, the O&M facility is located off South Road in the Town of Fenner and will include an office building and a storage building. The office building assessed in the VIA is approximately 90 feet long by 48 feet wide by 15 feet tall and the O&M storage building will be 60 feet long by 42 feet wide by 18 feet tall. These buildings will be clad in standing seam metal siding with a neutral color (gray), which will generally result in low color contrast when viewed against the surrounding vegetation and are somewhat consistent with existing agricultural structures in the regional landscape. Given the relatively low profile of these buildings, potential visibility and visual effects are anticipated to be limited to adjacent residences and portions of South Road. As discussed above, plantings are proposed along the perimeter of the O&M facility to soften the appearance of the buildings from nearby residences and portions of the roadway. These buildings utilize standard design and materials and would not appear unusual or out of place in views from the surrounding area. Due to the limited extent of visibility and visual effects, they are minor components that do not significantly contribute to the overall visual contrast of the Facility. Therefore, mitigation measures intended to further improve the architectural design of the buildings are not proposed. the O&M Facility has been designed to fit with the existing architectural aesthetic of the area. With a traditional pole-barn pitched roof style, the O&M Facility matches many existing farm buildings in the town of Fenner. In addition, the vegetative mitigation

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
		is similar in style to many residential designs. Similarly, the control houses in the Interconnection Facility utilize a common architectural style and a neutral surface color. These facilities will be lighted minimally and offsite light pollution is not anticipated.
Visual Off-Sets	N	Visual off-set measures are the correction of an existing aesthetic problem to compensate for a project's impacts. An example of a visual-offset measure is the removal of an existing abandoned structure or the protection/restoration of a recreational facility near a proposed project. This mitigation strategy is employed when significant visual impacts remain after other mitigation strategies (landscape mitigation, architectural design improvement, etc.) have been implemented. As described in this report, the Applicant is proposing several mitigation strategies to minimize or mitigate visual contrast of associated with the Facility, including landscape mitigation, undergrounding of electrical collection lines, and Federal Aviation Administration (FAA) lighting. Due to the mitigation and minimization measures that are currently in place, the Applicant is currently not proposing to implement visual-offset measures and potential visual offset measures have not been identified by host municipalities. The Applicant will consider off-sets and other mitigation measures as needed to ensure operation of the Facility does not interfere with or result in significant adverse visual impacts to adjacent land uses. The host municipalities and the Applicant have not identified any specific visual offsets at this time. However, the Applicant is open to discussing this mitigation measure with the towns. NYSHPO has advised that a mitigation plan for adversely affected properties will be required and the Applicant will develop a plan that will endeavor to provide projects and funding to improve aesthetics and provide rehabilitation (where applicable and appropriate). This mitigation plan is currently under development and will be provided to the SHPO at the appropriate time.
Component Relocation/Rearrangement	N	As discussed in the VIA, the Facility is sited in a rural area and visibility and visual impacts to high density areas and significant scenic resources are anticipated to be minimal. Options to relocate/rearrange wind turbines are limited by the constraints discussed in this Application; even if relocation/rearrangement was possible, it would be unlikely to substantively reduce the overall visual impacts of the Facility. The Facility has been sited in open uplands and forests in windy, high elevation locations to take advantage of the energy production

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
		potential. There are a limited number of suitable alternative locations for wind turbines to allow for the energy production goals of the Facility to be met while also accommodating other environmental and design constraints (see Exhibits 2, 7, 9, 10, 11, 12, 13, 14, and 15 for additional information on environmental and landowner constraints). Changes to the position of one or several turbines are unlikely to substantively change the Facility's overall visual impacts; rather, these shifts would result in localized visual changes to areas directly adjacent to the turbines that are shifted. In siting the O&M facility and interconnection facilities, the Applicant carefully considered all possible alternative locations/arrangements to minimize impacts. As discussed elsewhere in this table, the O&M facility generally resembles other agricultural structures found in this area and, in combination with the setbacks and visual screening proposed, is anticipated to have limited visual contrast. Its current location minimizes visual impacts while meeting the needs of the facility. In siting the interconnection facilities, the Applicant was significantly constrained by the buildable area, the topography, adjacent state-regulated wetlands, and transmission owner design requirements. Parcel 79.-1-3 is the only parcel available to the Applicant to site the POI switchyard. The portion of this parcel that is available to the Applicant is the shape of an obtuse triangle and is 8 acres in size. Approximately half of this acreage is occupied by Class II state-regulated wetlands. The remaining acreage contains steep topography and close to Cody Road. The Applicant initially considered siting the collection substation and POI switchyard separately. However, potential alternative locations were limited by the agreements the Applicant has in place with adjacent landowners or other design constraints (e.g., the high slopes found in areas north of T-5 and limited options for transmitting power from a separate collection substation to the POI switchyard). Ultimately, the collection substation and POI switchyard were sited within Parcel 79.-1-3 in the location that minimized impacts to the adjacent Class II wetlands while also placing the facilities as far from the road as is possible. Further rearrangement of the interconnection facilities to minimize potential visual impacts would result in additional impacts to the adjacent Class II wetland.
Reduced Number and Profile (Height) of Facility Components	N	As described in Section 2.2 of the VIA, the visual reports assessed the visibility and visual impact of 24 wind turbines, which is the maximum number of turbines in consideration. The wind turbine model assessed in the VIA is the 5-MW SG145 wind turbine manufactured

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
		by Siemens Gamesa.[2] By assessing the maximum turbine number and maximum height wind turbine model, the conclusions of the visual analysis and report represented the most conservative assessment of potential visibility and visual effect. In reality, if a turbine of this size were utilized, a reduced number of positions would be developed, and development of all positions would only occur if a smaller turbine was utilized. As described in the Bureau of Land Management (BLM) 2013 guidance document "Best Management Practices for Reducing Visual Impacts of Renewable Energy Facility on BLM-Administered Lands," the use of fewer, large turbines generally results in a better visual outcome than a greater number of smaller turbines. The Applicant's final turbine selection(s) for the Facility will be highly dependent on turbine availability, deliverability, energy production capacity, the Applicant's landowner agreements, including good neighbor agreements (GNAs), and the discussions the Applicant has with the wind turbine manufacturers. With respect to other aboveground Facility components, the height of the meteorological and ADLS towers are constrained by engineering requirements, as are the structures proposed at the interconnection. The Applicant considered placing the gen-tie line between the collection substation and POI switchyard underground to minimize visual impacts; however, the transmission owner does not allow gen-tie lines to be brought into a POI switchyard underground. If an underground gen-tie line was proposed by the Applicant, the transmission owner would require the installation of a riser pole outside of the POI switchyard security fence, and the visual impact would be the same as the currently proposed design.
Alternative Technologies	N	Wind energy generation technology and equipment are fairly standard and do not offer variations that would significantly decrease visual impacts. Alternative technologies for power generation, such as solar power or gas-fired generation facilities, would have different, and possibly more significant visual impacts than solar. The Applicant is committed to utilizing the most efficient technology practicable.
Color and Design	N	The proposed white/off white color of wind turbines (as mandated by the FAA to avoid daytime lighting) generally minimizes contrast with the sky under most conditions, as demonstrated by simulations prepared under a variety of sky conditions (see Attachment D of the

[2] The Siemens Gamesa SG145 was the tallest wind turbine under consideration at the time the VIA was being prepared. While this turbine is no longer under consideration it continues to represent a maximum height scenario. Those turbines still under consideration are discussed in Exhibit 5 of the Section 94-c Application.

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		Visual Impact Assessment [Appendix 8A]). The size and movement of the turbines prevents more extensive camouflage or design alterations from being a viable mitigation alternative (i.e., the turbines cannot be made to look like anything else). Other structures, including the meteorological (MET) tower, and Aircraft Detection Lighting System (ADLS) tower, and substation components, have specific engineering requirements related to their design and materials that must be adhered to in order to meet the performance standards of their intended uses. Therefore, there is minimal flexibility in the architectural or industrial design of these components. The majority of these components consist of galvanized steel materials. As required in 19 NYCRR § 900-2.9(d)(3) and as shown in the photo simulations, the dead-end transmission pole structures associated with the interconnection will be constructed of self-weathering steel. However, the Applicant would note that although self-weathering steel is required in the regulations, presumably to reduce visual contrast, in this specific case, the dark color of weathering steel may in fact increase visual impacts compared to galvanized steel in certain lighting conditions and viewing conditions (such as when viewed against the sky [commonly referred to as sky lining]). Additionally, visual impacts associated with these components is expected to be fairly localized and they will not significantly contribute to the overall visual impact of the Facility as discussed in the VIA.
Facility Exterior Lighting	Y	Some temporary lighting (i.e., task lighting) will be utilized in the construction laydown areas and could be required at some work areas during construction. This lighting is designed to maintain a sufficient level of illumination across large areas and, as such, some off-site light trespass is anticipated during the construction period. The impacts associated with this lighting will be short-term, intermittent, and localized to the construction period and location. Task lighting will be limited to the maximum total outdoor lighting output based on the lowest allowable OSHA Limits. The permanent light sources anticipated at the Facility are safety/security lighting to be installed at the site of the O&M facility and interconnection facility. Photometric plans that indicate the proposed fixture locations and include a luminaire schedule, elevation drawings with light locations, and manufacturer

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		specifications are included in Appendix 05-A for the O&M facility lighting and Appendix 05-B for the interconnection facility lighting. At the O&M facility, wall-pack light fixtures will be mounted above the man doors. As indicated in the lighting plans for the interconnection facility, light fixtures will be mounted to the static mast poles, dead-end gantry structures, at heights of 30 feet, and wall-pack light fixtures will be mounted to the control building exterior at elevations of 9 feet. As shown in the manufacturer specification sheets, lighting at the substations and O&M facility will utilize full cut-off light fixtures with no drop-down optical elements. In these areas, task lighting will be utilized to the extent practicable, and lighting will be kept to the minimum intensity required to assure safety and security while complying with OSHA limits. Additionally, all lighting will be operated manually or placed on an auto-off switch to further minimize the impacts of off-site light trespass. The lighting system has been designed to meet applicable state and local standards.
Federal Aviation Administration (FAA) Aviation Hazard Lighting	Y	In order to minimize the nighttime impacts of the Facility associated with the FAA aviation hazard lighting, the Facility will utilize an ADLS tower if approved by the FAA. The applicant filed a Notice for a Marking and Lighting Study of Aircraft Detection Lighting System(s) (ADLS) and dimmable lighting options with the FAA/Department of Defense (DOD) on September 01, 2023. If implemented, the ADLS tower will activate the aviation hazard lighting mounted on each wind turbine only once an aircraft is detected within the airspace of the wind turbine array. The lights will remain active for 30 seconds or until the aircraft has exited the airspace, at which time the lights will switch off. The use of ADLS would substantially reduce the potential time in which the aviation hazard lighting is active. When active, wind turbine lighting will operate as required by the FAA. Medium intensity red strobes will be used at night, rather than white strobes or steady burning red lights. Fixtures with a narrow beam path will be utilized as a means of minimizing the visibility/intensity of FAA warning lights at ground-level vantage points.
Shadow Flicker	N	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

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		design, is included as Attachment A. Based on the conservative assumptions used in the shadow flicker model, up to 27 non-participating year-round residences could receive over 30 hours of shadow flicker per year depending on the wind turbine model ultimately selected for development. The Applicant intends to execute good neighbor agreements with the owners of any non-participating residences that could receive over 30 hours of shadow flicker per year (at which point they would be considered participants) or curtail the turbines as needed to reduce shadow flicker below the 30-hour threshold.[3] Ultimately, the Applicant will ensure that all non-participating residences will experience less than 30 hours of shadow flicker per year by including a shadow flicker detection and prevention system in each Facility wind turbine. The Applicant has been in contact with the landowners of all 27 non-participating receptors, and if necessary, the Applicant can address further concerns of the landowners. Ultimately, the Applicant intends to prepare an updated shadow flicker analysis once the final turbine model has been selected and the turbine layout has been finalized. With curtailment mitigation, the maximum duration of annual shadow flicker will be below 30 hours/year for all non-participating residences across the Project. Therefore, the Hoffman Falls Wind Project will comply with the shadow flicker limit in 19 NYCRR §900-2.9(d)(6).
Prohibit Advertising/Minimize Signage	Y	The placement of any signage (including commercial advertising, conspicuous lettering, or logos identifying the Facility owner, wind turbine module manufacturer, or any other supplier entity), other than those required for public safety and security, will be prohibited at the Facility.
Underground Electrical Collection System	Y	No overhead collection lines are currently proposed. The only overhead conductors will include a short length of overhead transmission (gen-tie) line that will connect to the Facility existing National Grid 115 kV Fenner-Cortland #3 transmission line.

[3] As described in detail in Appendix 08-B, each wind turbine model proposed by the Applicant can be installed with a shadow flicker control module. Although each turbine manufacturer has a proprietary system, they function similarly by measuring the potential for shadow flicker using light intensity sensor(s) installed on the wind turbines. If shadow flicker is possible based on the time of day/time of year and solar/cloud conditions, and the wind turbine is operational, the shadow flicker curtailment software may shut down the respective wind turbine until shadow flicker is no longer possible. Turbine shutdown will not necessarily occur during every possible occurrence of shadow flicker. The shadow flicker curtailment software system will keep a running tally of shadow flicker time such that a total of 30 hours/year will not be exceeded at non-participating receptors modeled to receive over 30 hours of shadow flicker per year.

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
Non-specular Conductor and Non-reflective Finishes	Y	The overhead transmission line will utilize non-specular conductors.