Visual Impact Minimization and Mitigation Plan

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.
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.

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

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
		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, 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.
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

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
		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.
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. The Facility has been sited on open agricultural land in windy locations to take advantage of the energy production 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 Exhibit 2 for additional information on environmental and landowner constraints). Small changes to a turbine's position will only result in significant visual changes directly adjacent to the agricultural fields within which these turbines are sited, and minor shifts will not significantly alter the visual impact of any given turbine. Therefore, options to relocate/rearrange individual Facility components are unlikely to significantly reduce the overall visual impacts of the Facility.
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 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, pricing, and deliverability near the time of construction.

[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.

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
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 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. Weathering steel or chemically dulled galvanized steel are often proposed as an alternative to specular galvanized steel to reduce visual contrast. This is a fairly common practice for certain substation components, lattice towers, and pole structures that are likely to result in significant visual contrast with the existing environment. However, it is often considered unnecessary because natural oxidation and weathering will reduce the specular profile of the material over time. It is also worth noting that the dark color of weathering steel can result in heightened 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. Therefore, alternative color and design to reduce visual impacts of these components is not currently proposed.
Facility 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.

Potential Visual Mitigation Measure[1]	Proposed (Y/N)	Notes/Discussion
		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 interconnection facility. Photometric plans that indicate the proposed fixture locations and include a luminaire schedule, elevation drawings with light locations are included in Exhibit 5. As indicated in the lighting plans in this attachment, light fixtures will be mounted to the static mast poles, dead-end gantry structures, at elevations of 30 feet, and wall-pack light fixtures will be mounted to the control building exterior at elevations of 9 feet. Lighting at the substations will utilize full cut-off light fixtures with no drop-down optical elements. In these areas, lighting will be kept to the minimum intensity required to assure safety and security. Additionally, all lighting will be operated manually or placed on an auto-off switch to further minimize the impacts of off-site light 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. 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 minutes 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 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

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

Attachment A:

Shadow Flicker Analysis Report

Attachment B:

Conceptual Landscape Mitigation Planting Plan