

5.3 Project Visual Impact

5.3.1 Analysis of Existing and Proposed Views

To illustrate anticipated visual change associated with the proposed Project, photographic simulations of the completed Project from the 15 selected viewpoints indicated in Figure 5.1-3 (see also Table 4.2-1) were prepared. These simulations are included as insets in the following section for the purposes of illustrating Project visibility and appearance. Larger sized copies of the simulations are provided in Appendix D to facilitate more detailed review. Review of these images, along with photos of the existing view, allows for comparison of the aesthetic character of each view with and without the proposed Project in place. Results of this evaluation are presented below.

Viewpoint 1 (see Appendix D – Sheets 1-3)

Inset 5.3-1. Existing view from Interstate Route 88, Town of Bainbridge

Existing View (see Inset 5.3-1)

This viewpoint is located along Interstate Route 88 in the Town of Bainbridge, approximately 11.8 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Transportation Corridor LSZ and the typical viewer would be a through-traveler or commuter. The existing view to the north features a divided two-lane highway separated by a maintained grassy median. The road proceeds away from the viewer to the north, out of sight. To the right of the interstate, the road is bordered by a grassy shoulder and adjacent open fields delineated by irregular, wooded hedgerows and woodlots. In places, the trees in these hedgerows and woodlots extend above the horizon, which is formed by wooded, rolling hills that comprise the visible background. Man-made features along the highway include road signage, mile markers, and associated infrastructure. Overall scenic quality of the existing view is moderate.



Inset 5.3-2. Project simulation from Interstate Route 88, Town of Bainbridge

Proposed Project (see Inset 5.3-2)

With the proposed Project in place, there is little to no change to the existing view. From this location, the turbines are partially screened from view by the background ridge and are indiscernible to the viewer. Any potential views of the turbines will be brief and fleeting as the viewer travels along the interstate. Due to the effects of distance, and visible components of the Project, would represent very minor components of the background landscape, and would not alter the character of the existing view. The overall effect on scenic quality is insignificant.

Viewpoint 5 (see Appendix D – Sheets 4-7)

Inset 5.3-3. Existing view from Sidney Veterans Memorial Park, Town of Bainbridge

Existing View (see Inset 5.3-3)

This viewpoint is located within Sidney Veterans Memorial Park in the Village of Sidney, and also occurs within the Sidney Historic District. It is approximately 6.0 miles from the nearest proposed turbine that would be visible in this view. Despite occurring within the Village limits, this viewpoint is representative of the Rural Residential/Agriculture LSZ and the typical viewer would be a local resident driving down the road, working in the fields, or walking on the nearby recreational trails. The existing view to the north-northwest features a level harvested cornfield, which dominates the foreground of the view. The field is backed by a mature woodlot that continues to, and partially screens, views of a wooded, rolling ridge in the background. The forest and ridgeline form the visible horizon where they meet the light blue, clear sky. The existing view is not particularly dynamic, but is free of man-made structures or infrastructure. Overall scenic quality of the existing view is moderate.



Inset 5.3-4. Project simulation from Sidney Veterans Memorial Park, Town of Bainbridge

Proposed Project (see Inset 5.3-4)

With the proposed Project in place, the turbines are very difficult to discern due to the partial screening provided by background vegetation and topography. It is possible that a viewer may notice blade tip protruding above the horizon, particularly when the turbines are in motion. The selected photo represents high-visibility conditions with clear skies, low atmospheric moisture, and leaf-off conditions. Therefore, it is unlikely that a viewer will be able to detect the presence of the turbines in the background of the view, especially under less ideal weather conditions or under leaf-on conditions. Overall visual impact is insignificant.

Viewpoint 29 (see Appendix D – Sheets 8-10)

Inset 5.3-5. Existing view from Furnace Hill Road, Town of Guilford

Existing View (see Inset 5.3-5)

This viewpoint is located along Furnace Hill Road in the Town of Guilford. It is approximately 1.7 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agricultural LSZ and the typical viewer would be a local resident traveling along the road. The existing view to the north features a rural road traversing gently sloping, mowed fields in the immediate foreground. In the middle ground and background, the fields are backed by mature forest vegetation, which extend to the light blue sky and block views of more distant landscape features. To the northwest (left) of the viewer, the top of a rolling wooded hill is visible in the background above the tree line. Scenic quality of the existing view is considered moderate.



Inset 5.3-6. Project simulation from Furnace Hill Road, Town of Guilford

Proposed Project (see Inset 5.3-6)

With the proposed Project in place, two turbines can now be seen extending above the treetops. While portions of the towers are screened from view by intervening topography and vegetation, the viewer is afforded a full view of the nacelle and blades. At this distance, the turbines appear similar in line and scale to some of the closer trees in the middle ground. However, their man-made character and novel form contrast with the undeveloped nature of the surrounding lands and they are notably taller than the existing forest vegetation. The turbines penetrate the sky and become new focal points in the view, especially the central turbine which coincides with the road terminus. Although the turbines introduce a new land use, they do not conflict with the working agricultural character of the landscape. Overall visual impact is moderate.

Viewpoint 30 (see Appendix D – Sheets 11-13)

Inset 5.3-7. Existing view from Creek Fred Smith Road, Town of Guilford

Existing View (see Inset 5.3-7)

This viewpoint is located along Creek Fred Smith Road in the Town of Guilford, approximately 1.3 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agriculture LSZ and the typical viewer would be a local resident. The existing view to the northeast looks out from the roadside over a gently rolling mowed field in the foreground. In the middle ground, a rural residence with associated vehicles and a shed can be seen atop the crest of a hill on the left, while partially screened sheds and trailers are visible in the center of the view. A mosaic of fields, woodlots, and rural residences with associated barns and silos are visible on a rising hill in the background. The mature forest covering the rolling background hills forms the visible horizon, and creates an abrupt color transition where the hills meet the light blue sky. Although the slightly elevated position of the viewer offers the opportunities for long-distance views, the forest in the background screens views of more distant landscape features. Overall scenic quality of the existing view is low to moderate.



Inset 5.3-8. Project simulation from Creek Fred Smith Road, Town of Guilford

Proposed Project (see Inset 5.3-8)

With the proposed Project in place, portions of three turbines are now clearly visible above the background hilltop. Portions of two of the towers are shielded from view by the rolling topography and mature forest, but the nearest turbine and associated forest clearing at its base is fully visible. The turbines add prominent new vertical elements to the landscape and shift the viewers' focus from the rural residences to the Project components. The turbines present appreciable line, form and scale contrast with the existing vegetation and landform. Their light color contrasts with the dark vegetation masses, but contrast with the sky is softened by the wispy clouds. Although the turbine's scale contrast with the existing buildings in the view is notable, they appear somewhat compatible with the working agricultural landscape that includes a number of existing human elements and alterations. The visual impact of the turbine will also be limited by the low number of drivers along the rural road. However, nearby residents may experience a moderate to appreciable visual impact due to the scale and proximity of the turbines.

Viewpoint 33 (see Appendix D – Sheets 14-16)

Inset 5.3-9. Existing view from State Route 51, Town of Butternuts

Existing View (see Inset 5.3-9)

This viewpoint is located along the State Route 51 bridge over the Unadilla River in the Town of Butternuts. It is approximately 1.3 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the City/Village LSZ and the typical viewer would be a local resident, tourist, or recreational user. The existing view to the west-southwest features an open road and guardrails in the foreground, with residential and commercial structures and roadside utility lines present in the middle ground. To the left of the bridge, mature trees along the river's bank partially shield views of the adjacent residences and background hills. Rising hills covered in forest vegetation form the backdrop to this view and block views of more distant landscape features. The Unadilla River is not visible but is a more prominent feature in views to the west-northwest and southwest from this location. The existing view in this direction is not particularly dynamic, and scenic quality is compromised by the bridge railings and overhead utility lines that dominate the foreground and middle ground. Overall scenic quality of this view is low to moderate.



Inset 5.3-10. Project simulation from State Route 51, Town of Butternuts

Proposed Project (see Inset 5.3-10)

With the proposed Project in place, three turbines can be seen extending above the background ridgeline on the left side of the view. The turbines present moderate contrast with the existing vegetation and landform, and their large size is obvious relative to the height of the forest vegetation on the hilltop. However, the contrast of the turbines' line, form, and scale is lessened by the existing foreground and middle ground trees that extend above the ridgeline as additional vertical features that extend into the sky. The limited number of visible turbines, and their compatibility with man-made elements of the landscape, also serve to limit the Project's impact on land use and scenic quality. The turbines add a new land use that contrasts with the rural character of the view, but is consistent with the extent of development visible in the village center. Although the turbines become new focal points, foreground structures and the adjacent river will remain the dominant features in views from this location. The change in character resulting from the proposed turbines will have little effect on viewer activity at this viewpoint. Overall visual impact is moderate.

Viewpoint 34 (see Appendix D – Sheets 17-25)

Inset 5.3-11. Existing view from Furnace Hill Road, Town of Guilford

Existing View (see Inset 5.3-11)

This viewpoint is located along Furnace Hill Road in the Town of Guilford, approximately 1.1 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agriculture LSZ and includes an open water component as well. The typical viewer would be a local resident traveling along the road or working in the adjacent fields. The existing view to the northeast features a rural road leading down a gentle slope toward a small pond in the center of the view. The road is bordered to the north (left) by a fallow field dissected intermittently by scrubby hedgerows, and to the east (right) by successional shrubland that transitions to broken forest vegetation in the middle ground. An overhead utility line crosses the road in the middle ground, but the poles and overhead conductors blend with the surrounding wooded vegetation. The road forks at the pond, which is surrounded by a mix of herbaceous and wooded vegetation among its shores. The pond is backed by gently rolling hills covered in a mix of woodlots, open fields, hedgerows, and rural residences. The hills culminate in a rolling, wooded ridgeline that forms the visible horizon. Scenic quality of the existing view is considered moderate to high.



Inset 5.3-12. Project simulation from Furnace Hill Road, Town of Guilford

Proposed Project (see Inset 5.3-12)

With the proposed Project in place, multiple turbines rise above the background ridge across the full field of view. Additionally, the collection substation has been added to the background in the center of the view. While the substation is nearly unnoticeable in this view, the turbines are very visible along the horizon due to their number and size. The turbines' line, scale, and form present appreciable contrast with the vegetation, landform and sky in this view, although additional cloud cover would serve to soften the turbines' contrast with the sky. The turbines become prominent new focal points, but the complexity of features and textures in this view compete for the viewer's attention. The turbines introduce a new land use to the view and although they are compatible with the surrounding agricultural lands, they appear inconsistent with the traditional rural land use that characterizes this view. Viewers driving on the road and local residents will focus on the turbines, which alter the character and scenic quality of the view. Overall visual impact is appreciable.

Viewpoint 35 (see Appendix D – Sheets 26-28)

Inset 5.3-13. Existing view from County Road 37, Town of Guilford

Existing View (see Inset 5.3-13)

This viewpoint is located along County Road 37 in the Town of Guilford, approximately 2.8 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agriculture LSZ and the typical viewer would be a local resident. The existing view to the east-southeast features a mowed field along the roadside in the foreground backed by a cluster of residential/farm structures. To the southeast (right) of these structures, an additional home and a small pond surrounded by successional old field can be seen. Overhead utility lines are interspersed among the fields and structures in the foreground and middle ground. Beyond the fields, a thick band of conifers transitions to hardwood forest in the background. The landscape rises into rolling hills that are covered by a mix of woodlots, open fields, and widely scattered rural residences. The horizon is formed where the irregular forested ridgeline meets the light blue sky. Overall scenic quality of the existing view is low to moderate.



Inset 5.3-14. Project simulation from County Road 37, Town of Guilford

Proposed Project (see Inset 5.3-14)

With the proposed Project in place, multiple turbines can be seen rising above the ridgeline in the background of the view. In addition, the proposed O&M facility is now visible among a group of existing structures on the left-hand side of view. The color, size, design, and siting of the O&M facility results in minimal impact on the existing landscape. The turbines, however, are quite noticeable along the ridgeline. The turbines' white color blends well with the light blue sky and thin cloud cover along the horizon. However, their position along the ridgetop accentuates their contrast in scale with other landscape features. Under the lighting/sky conditions represented in this photo, the turbines' scale is less significant than the dark mass of evergreen trees in the middle ground. However, the turbines could appear more prominent when back-lit or under clearer sky conditions. Various man-made features in the foreground compete for viewer attention and remain the most prominent focal points in the view. Viewers will notice the turbines but may not focus on them. Overall visual impact is considered moderate.

Viewpoint 41 (see Appendix D – Sheets 29-31)

Inset 5.3-15. Existing view from North Pond Road, Town of Guilford

Existing View (see Inset 5.3-15)

This viewpoint is located along North Pond Road in the Town of Guilford, approximately 1.0 mile from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agricultural LSZ and the typical viewer would be a local resident or a visitor to Camp Mesorah (a children's summer camp). The existing view looks to the northeast across a successional old field toward the grounds of Camp Mesorah. Small trees and shrubs in the immediate foreground partially screen views of an eclectic mix residence halls and buildings associated with the camp in the middle ground. The buildings are grouped in different arrangements, and in places are separated by mature coniferous trees. The camp area is backed by a band of dense forest, which rises to a low ridgeline that defines the visible horizon and blocks views of more distant landscape features. Although not present in this view, the open waters of North Pond are visible in views to the north. Overall scenic quality of the existing view is low.



Inset 5.3-16. Project simulation from North Pond Road, Town of Guilford

Proposed Project (see Inset 5.3.16)

With the proposed Project in place, four turbines and two additional blade tips are clearly visible above the horizon. Due to their proximity to the viewer and ridgetop location, the turbines appear large, and present appreciable contrast in line, scale, and form with the existing vegetation, landform and sky. Under the lighting/sky conditions illustrated in this photo, the turbines are backlit, and their dark color contrasts with the light blue sky. The turbines are consistent with existing development in the view, and some viewers may consider the turbines to be an added element of interest to an otherwise discordant landscape. However, given their size, movement, and proximity to the viewers, the turbines appear inconsistent with the summer camp land use that defines the character of the existing view. In this context, the turbines could have an adverse impact on both land use and viewer activity. Overall visual impact is appreciable.

Viewpoint 42 (see Appendix D – Sheets 32-38)

Inset 5.3-17. Existing view from County Road 36, Town of Guilford

Existing View (see Inset 5.3-17)

This viewpoint is located along County Road 36 in the Town of Guilford, approximately 0.8 mile from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agriculture LSZ and the typical viewer would be a local resident. The foreground of the view features a two-lane road with a disturbed embankment/ditch along the right shoulder. The road extends to the background, traversing a rolling, agricultural landscape that slopes gently upward toward the horizon. The road is surrounded on either side by fallow agricultural fields, which are separated from one another by hedgerows and fence lines. A cluster of residential and farm structures occurs along the roadside in the middle ground. This cluster of structures, along with a house, barn and silo in the background, are focal points in this view and strengthen its rural agricultural character. Agricultural fields on the east (right) side of the view transition to dense forestland on the west. Overall scenic quality of the existing view is moderate.



Inset 5.3-18. Project simulation from County Road 36, Town of Guilford

Proposed Project (see Inset 5.3-18)

With the proposed Project in place, two turbines and the collection substation have been added to the view. The turbine on the right-hand side of view is more distant from the viewer and partially screened by intervening vegetation. Consequently, it is less conspicuous, and appears comparable in scale with existing features of the landscape. However, because of its proximity and lack of foreground screening, the turbine on the left-hand side of view is a prominent new feature that presents appreciable to strong line, color and scale contrast in the view. The bright white turbine on the left contrasts with the densely forested ridgetop and the blue sky, although sky contrast is somewhat softened by the wispy cloud cover. The substation presents form and land use contrast with the rolling, rural landscape, but is of comparable scale and color to existing features in the view and is consistent with existing vertical elements in the background such as the silo and trees. The new structures alter the perceived land use, but are not incompatible with the working agricultural character of the landscape, and will have limited effect on viewer activities. While the turbine on the left is a prominent new focal point, the complex assortment of structures dominating the center of this view still competes with the turbine for viewer attention. Overall visual impact is moderate to appreciable.

Viewpoint 58 (see Appendix D – Sheets 39-41)

Inset 5.3-19. Existing view from State Route 12, Town of Oxford

Existing View (see Inset 5.3-19)

This viewpoint is located along State Route 12 in the Town of Oxford, approximately 3.9 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agricultural LSZ and the typical viewer would be a local resident or a through-traveler/commuter. The existing view to the east-southeast features a winding road that traverses a rolling, agricultural landscape. An overhead utility pole parallels the road corridor and proceeds away from the viewer out of sight. The road is lined on either side by agricultural fields, including a harvested cornfield to the south (right) that dominates the immediate foreground and extends to the middle ground of the view. The field is intermittently interrupted in the middle ground by a woodlot and scattered shrubs, but otherwise continues unimpeded to the base of forest-covered ridge that extends into the distance and forms the visible background. At the base of this ridge, a few rural residences are visible along the roadside. Overall scenic quality of the existing view is moderate.



Inset 5.3-20. Project simulation from State Route 12, Town of Oxford

Proposed Project (see Inset 5.3-20)

With the proposed Project in place, portions of four turbines are now visible protruding into the sky above the ridgeline. The crest of the forested ridge screens views of the towers, but the blades from two turbines and two full nacelles and rotors are visible. The turbines present contrast with the surrounding vegetation in color, scale, line, and form, but their contrast is muted by front lighting and atmospheric haze along the horizon, which allows the sky to visually absorb views of the turbines. The turbines introduce a noticeable new land use to the view, but due to their distance and lack of contrast with the sky do not dominate or alter the character of the existing working agricultural landscape. Foreground features such as the open fields, road, and other manmade structures remain more prominent than the turbines, and while viewers will notice the turbines, they are unlikely to focus on their presence. Overall visual impact is moderate.

Viewpoint 66 (see Appendix D – Sheets 42-44)

Inset 5.3-21. Existing view from Gibbon Road, Town of Norwich

Existing View (see Inset 5.3-21)

This viewpoint is located along Gibbon Road in the Town of Norwich, approximately 3.2 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agricultural LSZ and the typical viewer would be a local resident traveling along the road or working in the fields. The existing view to the south-southeast features a grassy embankment along the road shoulder, backed by a plowed agricultural field. Due to subordinate viewer position, much of the field is screened from view in the middle ground. The field is backed by a ridgeline that is solidly forested with the exception of one open field that rises up on its flank in the left center of the view. An overhead utility line is visible traveling parallel with the road along the backside of the plowed field. The forested ridgeline screens views of more distant landscape features and forms the visible horizon where it meets the light blue sky. Overall scenic quality of the existing view is moderate.



Inset 5.3-22. Project simulation from Gibbon Road, Town of Norwich

Proposed Project (see Inset 5.3-22)

With the proposed Project in place, portions of multiple turbines are visible projecting above the forested ridgeline. The turbines rise above the mature vegetation and into the sky, but due to the effects of distance, appear similar in size to the existing utility poles in the view. The vertical form of the turbines contrasts with the horizontal line of the landform, but this contrast is somewhat mitigated by the presence of the aforementioned utility structures. The turbines introduce a new land use into a view with few manmade features. However, due to their distance from the viewer and their limited contrast with the sky, addition of the turbines does not overwhelm the existing working agricultural character of the landscape. Turbine visibility may be increased under clearer viewing conditions, but it would also be reduced under more overcast sky conditions. Although the turbines are visible along the horizon, their presence will not be overly distracting or discordant. Overall visual impact is moderate.

Viewpoint 70 (see Appendix D – Sheets 45-47)

Inset 5.3-23. Existing view from Morris Lull Farm (NRHP-listed), East Side Road, Town of Morris

Existing View (see Inset 5.3-23)

This viewpoint is located along East Side Road in the Town of Morris, approximately 9.8 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the Rural Residential/Agricultural LSZ although it has a significant forested component. The typical viewer would be a local resident. The existing view to the southwest features a grassy field associated with the Morris Lull Farm, an NRHP-listed property. The field is backed by a row of mature trees, which partially screen views of a background ridgeline. Beyond the far edge of the field the land drops into a valley before rising as a dark wooded ridge in the background. The ridgeline is undulating and solidly forested, presenting sharp color contrast with the light blue sky. In the foreground of the view, part of an overhead utility cable can be seen above the viewer. With the exception of the utility line, there are no man-made features in the view, although a road and fence occur outside the view to the left (see context photos). Overall scenic quality of the existing view is moderate to high.



Inset 5.3-24. Project simulation from Morris Lull Farm (NRHP-listed), East Side Road, Town of Morris

Proposed Project (see Inset 5.3-24)

With the proposed Project in place, multiple turbines have been added behind the background ridgeline. While some of the turbines are fully screened by intervening topography, portions of others protrude above the horizon line. However, due to the effects of distance, and under the viewing conditions illustrated in this photo, the turbines are indiscernible to the viewer. Although some turbine blades and nacelles may be visible above the horizon, the woody vegetation in the foreground and the effects of distance combine to minimize, if not eliminate, any perceptible visual effect. Given that it is difficult to detect the presence of the turbines under existing leaf-off conditions, it is likely that the turbines will be fully screened from view at this site during the growing season. There is no effect on perceived land use or viewer activity, and overall visual impact is insignificant.

Viewpoint 74 (see Appendix D – Sheets 48-50)

Inset 5.3-25. Existing view from the intersection of State Routes 23 and 8, Town of New Berlin

Existing View (see Inset 5.3-25)

This viewpoint is located at the intersection of State Route 23 and State Route 8 in the Town of New Berlin, approximately 5.2 miles from the nearest proposed turbine that would be visible in this view. The viewpoint is representative of the City/Village LSZ and the typical viewer would be a local resident or through traveler. The existing view to the south-southwest features a well maintained highway passing through a cluster of predominantly residential structures. The road is closely lined on either side by sidewalks, buildings, overhead utility lines, and street trees, signs, and light posts. The view has a classic small town/village character. At the end of the road corridor, the slope of a distant hill can be seen in the background. Although the structures in the view are well organized along the roadway, the number of utility cables and road signage add a degree of visual clutter to the view. Overall scenic quality of the existing view is low to moderate.



Inset 5.3-26. Project simulation from the intersection of State Routes 23 and 8, Town of New Berlin

Proposed Project (see Inset 5.3-26)

With the proposed Project in place, one turbine has been added to the background of the view. The turbine sits high on the distant hillside that is visible at the terminus of the road corridor. Despite its prominent location, due to its distance from the viewer, the turbine's perceived size relative to the adjacent vegetation is small and reduces its contrast with foreground elements. Furthermore, the turbine presents minimal color contrast with the white sky, and atmospheric haze along the horizon renders the turbine nearly imperceptible. Viewers may notice the turbine while traveling along the road, particularly when the turbine is motion, but the abundance of man-made structures and roadside trees in the foreground and middle ground remain the dominant, character-defining elements of this view. The location and relative scale of the turbine at this viewpoint results in only minor impact on perceived land use and viewer activity in the existing developed town center. Overall visual impact is minimal.

Viewpoint 80 (see Appendix D – Sheets 51-53)

Inset 5.3-27. Existing view from State Route 12, Town of Norwich

Existing View (see Inset 5.3-27)

This viewpoint is located adjacent to State Route 12 within St. Paul Cemetery in the Town of Norwich, just outside the limits of the City of Norwich. This location is approximately 7.5 miles away from the nearest turbine that would be visible in the view. The viewpoint is representative of the City/Village LSZ, and the typical viewer would be a local resident and/or a visitor to the cemetery. The existing view to the south-southeast looks toward the City of Norwich from an elevated vantage point and features a mix of commercial development situated along State Route 12. The strip of development along the highway is nestled in a broad wooded valley that transitions to gently rolling wooded hills that comprise the background of the view. A patchwork of evergreen and deciduous forest is evident on the rolling hills, and the afternoon sun provides a slight orange hue to the landscape. There is an abrupt color transition at the horizon where the hills meet the light blue sky. This view represents a mix of natural and man-made features and appears relatively cluttered with the mix of commercial businesses, road infrastructure, and utility structures in the foreground and middle ground disrupting the broad expanse of the surrounding forest. The contrasting colors, textures, and lines of the developed features draw viewer attention away from the natural features of the landscape. Overall scenic quality of the existing view is low.



Inset 5.3-28. Project simulation from State Route 12, Town of Norwich

Proposed Project (see Inset 5.3-28)

With the proposed Project in place, multiple turbines can be seen extending above the ridgeline in the background of the view. The turbines appear insignificant in terms of color and scale contrast with the existing landscape. Due to their relatively low profile when viewed from this distance, the turbines do not interrupt the strong linear form presented by the ridgeline at the horizon. While the turbines are prominently located along the background ridge, their light color blends well with the sky, and is further muted by atmospheric haze along the horizon. Due to the turbines' distance from the viewer and muted color, the commercial development remains the dominant character-defining feature in the view. The turbines will be noticeable by the viewer, but the focus of this view will likely remain on the complex structures in the foreground. The overall visual impact associated with the Project is minimal at this location.

Viewpoint 81 (see Appendix D – Sheets 54-56)

Inset 5.3-29. Existing view from State Route 8, Town of New Berlin

Existing View (see Inset 5.3-29)

This viewpoint is located along State Route 8 in the Town of New Berlin, approximately 7.6 miles from the nearest proposed turbine that would be visible in this view. The Unadilla Valley Snow Drifters snowmobile trail also crosses State Route 8 at this location. Viewpoint 81 is representative of the Rural Residential/Agricultural LSZ and viewers would include local residents, through-travelers, and recreational users of the snowmobile trail. The existing view to the south-southwest toward the Project site includes a portion of an agricultural field in the immediate foreground which extends outside the field of view on the left side of the selected photograph. The field edge gives way to the road which provides a strong focal point as it extends away from the viewer before disappearing from view in the middle ground. The middle ground is comprised of several residential structures which introduce contrasting (white) colors in an otherwise muted earth tone color palette. The homes are situated amongst several tall deciduous and evergreen trees which are strong vertical elements that extend above the horizon. Beyond the middle ground, undulating hills which enclose the valley, extend from the right and left side of the viewer and into the background toward the center of the view. The hills that form the background in the center of the view appear distant, as indicated by the haze which softens the transition to a bluish-white sky along the horizon line. The sky becomes a darker blue toward the top of the view. Overall scenic quality of the existing view is moderate.



Inset 5.3-30. Project simulation from State Route 8, Town of New Berlin

Proposed Project (see Inset 5.3-30)

With the proposed Project in place, portions of several turbines can be seen on the background ridge in the center of the view. Substantial portions of some of the towers are screened by the ridge line, but the nacelle and blades are visible above the horizon. The turbines are also partially to substantially screened by trees in the foreground and the middle ground of the view, and this partial screening will likely become more effective under leaf-on conditions. At this distance, the turbines appear comparable in scale with existing elements in the view and present minimal color contrast against the sky due to the muted bluish-white sky at the horizon. Their color contrast is far less noticeable than the contrasting colors of the structures present in the foreground. However, turbine motion would likely draw the viewer's attention, making the Project noticeable from this location. While the turbines are visible in the background, the existing trees and structures in the foreground and middle ground remain dominant focal points. Viewers driving on the state highway are less likely to notice the turbines than nearby residents with prolonged, stationary views. However, the overall visual impact associated with the Project is expected to be minimal at this viewpoint due to the distance of the viewer from the viewer and substantial screening provided by landform, structures, and vegetation.

5.3.2 Visual Impact Assessment Rating

As described in Section 4.2.3 of this VIA, five (three in-house, two independent) registered landscape architects (LAs) evaluated the visual impact of the proposed Project. Utilizing 11 x 17-inch digital color prints of the 15 selected viewpoints described above (see Table 4.2-1), the rating panel reviewed the existing and proposed views, evaluated the contrast/compatibility of the Project with various components of the landscape (landform, vegetation, land use, water, sky, land use and viewer activity), and assigned quantitative visual contrast ratings on a scale of 0 (insignificant) to 4 (strong). The average contrast score assigned by each rating panel member was calculated for each viewpoint, and a composite average score for each viewpoint was determined. Copies of the completed rating forms are included in Appendix E, and the results of this evaluation process are summarized below in Table 5.3-1.

Table 5.3-1. Summary of Results of Contrast Rating Panel Review of Simulations

Viewpoint Number	Distance to Nearest Visible Turbine (mi)	Distance Zone	Landscape Similarity Zone	Viewer Groups			Contrast Rating Scores ²						Contrast Rating Result	
				Local Residents	Through Travelers/Commuter	Tourists/Recreation	#1	#2	#3	#4	#5	Average		
1	11.8	Background	Transportation Corridor		•		0.0	0.0	0.0	0.0	0.0	0.0	0.0	Insignificant
5	6.0	Background	Rural Residential / Agricultural	•		•	0.0	0.0	0.0	0.0	0.3	0.1	Insignificant	
29	1.7	Middle Ground	Rural Residential / Agricultural / Forest	•			2.7	1.3	2.7	2.1	2.4	2.2	Moderate	
30	1.3	Foreground	Rural Residential / Agricultural	•			2.8	1.8	2.7	2.3	3.4	2.6	Moderate / Appreciable	
33	1.3	Foreground	City / Village / Forest	•	•		2.2	1.5	2.2	1.8	2.2	2.0	Moderate	
34	1.0	Foreground	Rural Residential/ Agricultural, Open Water	•		•	3.1	1.9	2.9	3.6	3.3	3.0	Appreciable	
35	2.8	Middle Ground	Rural Residential / Agricultural	•			2.4	0.8	2.0	1.4	2.6	1.8	Moderate	
41	1.0	Foreground	Rural Residential / Agricultural, Open Water	•		•	3.3	1.8	3.7	2.2	4.0	3.0	Appreciable	
42	0.8	Foreground	Rural Residential / Agricultural	•			2.8	1.6	3.4	3.1	2.8	2.7	Moderate / Appreciable	
58	3.9	Middle Ground	Rural Residential / Agricultural	•	•		1.8	0.9	2.4	1.7	2.2	1.8	Moderate	
66	3.2	Middle Ground	Rural Residential / Agricultural	•			2.2	1.1	2.0	2.0	2.0	1.9	Moderate	
70	9.8	Background	Rural Residential / Agricultural / Forest	•		•	0.0	0.0	0.5	0.0	0.0	0.1	Insignificant	
74	5.2	Background	City / Village	•	•		0.4	0.1	2.0	1.5	0.4	0.9	Minimal	
80	7.5	Background	City / Village	•		•	1.2	0.0	1.7	1.3	1.0	1.0	Minimal	
81	7.6	Background	Rural Residential / Agricultural	•	•		0.3	0.0	1.9	1.9	0.0	0.8	Minimal	
Total Average Contrast Rating Scores							1.7	0.9	2.0	1.7	1.8	1.6	Minimal / Moderate	

¹Distance in miles.

² Contrast Rating Scale: 0.0 - 0.2 (Insignificant), 0.3 – 0.7 (Insignificant/Minimal), 0.8 – 1.2 (Minimal), 1.3 – 1.7 (Minimal/Moderate), 1.8 - 2.2 (Moderate), 2.3 – 2.7 (Moderate/Appreciable), 2.8 – 3.2 (Appreciable) 3.3 – 3.7 Appreciable/Strong), 3.8 – 4.0 (Strong).

As Table 5.3-1 indicates, the average overall composite contrast ratings for the 15 visual simulations ranged from 0.0 (Insignificant) to 3.0 (Appreciable). The results of this evaluation are summarized by LSZ below:

Rural Residential/Agricultural LSZ (Viewpoints 5, 29, 30, 34, 35, 41, 42, 58, 66, 70, & 81)

The Rural Residential/Agricultural LSZ offers by far the greatest opportunities for view of the proposed Project. Simulations of the Project from viewpoints located within this LSZ received ratings from individual panel members that ranged from 0 to 4.0. Average contrast rating scores that ranged from 0.1 for Viewpoint 5, to 3.0 for Viewpoints 34 and 41. Simulations within the Rural Residential/Agricultural LSZ received an overall average contrast rating of 1.8. Scoring indicates a highly variable, but generally moderate level of impact can be expected within this LSZ. The low average contrast rating for Viewpoint 5 is largely attributable to the distance of the viewer from the Project as well as the screening provided by intervening topography and vegetation, which will conceal views of the proposed turbines even during leaf-off/winter conditions. Comments from the rating panel indicated that the turbines were indiscernible from this location and would not be noticed by the viewer unless being actively searched for. Viewpoints 34 and 41 received highest individual ratings, and an average contrast rating of 3.0 due largely to the proximity of the turbines to the viewer, the number of turbines visible, and the turbines' line, form, and scale contrast with existing features of the landscape. Under these conditions the turbines become the dominant features of the landscape and focal points in the view.

City/Village LSZ (Viewpoint 33, 74, & 80)

Views of the proposed Project will be extremely limited from the City/Village LSZ due to the distance of the turbines from population centers, and/or the abundance of man-made features and surrounding vegetation and hills that effectively in screen views from these areas. Simulations from viewpoints located within the City/Village LSZ received ratings from individual panel members that ranged from 0.0 to 2.2, and average contrast rating scores that ranged from 0.9 at Viewpoint 74 to 2.0 at Viewpoint 33. Simulations within the City/Village LSZ received an overall average contrast rating of 1.3, which indicates a minimal to moderate level of impact can generally be expected in this LSZ within the APE. The low contrast rating received by Viewpoint 74 can largely be attributed to the distance of the viewpoint from the proposed Project as well as the dominance of man-made elements in the foreground that typify City/Village areas. Viewpoint 33 received a higher average contrast rating of 2.0 due largely to the proximity of the viewpoint to the Project and the contrast in scale and form of the turbines with existing landscape elements in the view. However, in most cases viewshed analysis and field review indicates that open views from this LSZ will be very limited, and will usually feature the Project in the background, where it will be less noticeable to the viewer and less likely to dominate the view. The presence of existing manmade and utility infrastructure within this LSZ further mitigates the contrast presented by the Project.

Open Water LSZ (Viewpoints 34 & 41)

Unscreened views of the Project from shorelines adjacent to open water are very rare due to lack of public access and/or screening provided by trees and hills that typically surround waterbodies within the study area. Simulations from viewpoints that include prominent waterbodies (also within the Rural Residential/Agricultural LSZ) received average contrast rating scores of 3.0 at Viewpoints 34 and 41, which indicates an appreciable level of impact can be expected in portions of this LSZ with foreground views of the Project. The high contrast ratings received by the viewpoints within this LSZ can be attributed to the proximity of the viewpoints to the Project, the number of turbines visible, and the high degree of scale contrast between the turbines and the existing landscape features. In both instances the presence of the waterbody did not enhance Project visibility but may have increased overall scenic quality and Project contrast.

Transportation Corridor LSZ (Viewpoint 1)

The viewpoint located within the Transportation Corridor LSZ (Viewpoint 1) is a representative example of the limited views toward the Project that will be available from Interstate Route 88. Viewpoint 1 is one of the few open views along this transportation corridor that will have views of the Project, and received an overall contrast rating score of 0, which indicates an insignificant level of impact can be expected throughout this LSZ. The low contrast rating received by Viewpoint 1 can be attributed to the distance of the viewpoint from the Project, the fleeting nature of the view, variation in the surrounding landscape types that border the corridor, and the degree of visual clutter in the existing view. In general, views within this LSZ are characterized by the dominance of roadside infrastructure in the foreground and high-speed travel, which distracts from potential views of turbines that may be available in the background. While the turbines may be noticeable to the viewer from some locations within this LSZ, these views will generally be distant and partially screened by the existing landform and vegetation that surrounds this LSZ.

Forest LSZ (Viewpoints 29,33 & 70)

As discussed in Sections 3.3.1 and 5.1.3 the Forest LSZ provides minimal opportunities for views toward the Project due to the presence of dense vegetation and lack of available long distance views. Generally, only the outer perimeter of forested areas, where they border other LSZs, provide opportunities for views toward the Project. Viewpoints 29, 33, and 70, while not in the Forest LSZ, provide examples in which the forest is a significant compositional element in the view. These viewpoints received average contrast rating scores of 2.2 at Viewpoint 29, 2.0 at Viewpoint 33, and 0.1 at Viewpoint 70, resulting in an overall average contrast rating of 1.4. These scores indicate that a variable, but generally minimal to moderate level of impact can be expected in portions of the APE adjacent to this LSZ. The average ratings for each of

these views are largely a function of distance from the Project and screening provided by vegetation. Viewpoints 29 and 33 occur in the middle ground (1.7 miles) and foreground zones (1.3 mile), respectively and have relatively unobstructed visibility of several WTG's. Viewpoint 70 occurs in the background zone (9.8 miles) and has partial visibility of the distant turbines. These results are not what would be expected within the Forest LSZ where views are typically fully or substantially screened. However, this range of contrast can be expected throughout the Forest LSZ within the APE.

As indicated by the contrast ratings/summary in Table 5.3.1 (see also Appendix E), the rating scores provided by the five rating panel members were generally consistent, except for panel member 2 who generally noted lower contrast than the other raters. This reflects the variability in how wind turbines are perceived by the general public. Although appreciable to strong contrast was noted for some viewpoints by some of the panel members, the overall contrast presented by the Project is minimal to moderate. Rating panel results indicated that distance from the viewer, degree of scale contrast, and perceived change in land use were the primary sources of visual contrast with the existing landscape. The greatest perceived visual impact typically occurs at viewpoints where multiple turbines are visible at close distances and/or when the turbines appear out of place with the existing land use. These conditions tend to heighten the Project's contrast with existing elements of the landscape in terms of line, form, and especially scale. Factors mitigating visual impact within the visual study area include 1) the abundance of mature forest, which limits open views to a relatively small portion of the study area, 2) the rolling topography that reduces opportunities for long-distance views in many locations, 3) the relatively small number of viewers present on the elevated hills and ridgetops where views of numerous turbines and near foreground views will be available, 4) the substantial screening provided by existing foreground landscape features in areas of concentrated human settlement, and 5) the working agricultural character of much of the landscape in which the Project would be viewed.

As the rating panel results demonstrate, at distances greater than 5.0 miles, the turbines generally presented insignificant to minimal contrast with the existing landscape. This is particularly the case in locations where only a few of the 25 proposed turbines are visible. In fact, it is expected that in many cases the turbines will go unnoticed to the casual observer at these distances.

Although at times offering strong contrast with existing elements of the landscape, the proposed Project will not necessarily be perceived by viewers as having an adverse visual impact. Wind turbines are unlike most other energy/infrastructure facilities, such as transmission lines or conventional power plants, that are almost universally viewed as aesthetic liabilities. In EDR's experience, operating wind power projects in New York State have generally received a positive public reaction following their construction. This observation is supported by several surveys conducted by Jefferson County Community College in Lewis County, New York (location of the 195-turbine Maple Ridge Farm Project in operation since 2006), which revealed strong community support for wind power (JCCC, 2008, 2010, 2011, 2012). A significant majority (approximately 90%) of Lewis County residents who participated in these surveys expressed support for the development of additional

wind energy projects (JCCC, 2010, 2011, 2012). Approximately 70% of respondents have consistently indicated that wind farms have had a positive impact on Lewis County (JCCC, 2008, 2010, 2011, 2012). The 2008 survey indicated that 77% of individuals that were able to see and/or hear turbines from their homes indicated that the wind farms have had a positive impact on Lewis County. Additionally, only 7.5% of participants who live within 1 mile of the nearest wind turbine felt that wind farms have had a negative impact (JCCC, 2008).

This finding is consistent with a number of broader studies that have found increased local support for wind projects once they are constructed and become operational. Public support often follows a “U” pattern, in which acceptance is initially high, drops during the planning and construction, and then rebounds after the wind farm commences operation, and impacts are found to be less detrimental than feared (Firestone et al., 2009).

Similar results have also been documented in public opinion/acceptance surveys regarding constructed wind power projects in other locations. The National Survey of Attitudes of Wind Power Project Neighbors is the largest survey its kind regarding neighbors' attitudes toward wind power projects. This survey included 1,705 homeowners living within 5 miles of one of 250 wind farms throughout the United States. Results from this study suggest that overall attitudes regarding wind turbines are generally positive, even amongst individuals living as close as 0.5 mile from turbines. Only about 8% of the respondents had negative attitudes toward wind turbines within 5 miles of their home (Firestone et al. 2017).

Based on the rating panel results and analysis provided in this VIA, it is expected that within the APE the built Project will generally result in minimal to moderate impact on most viewers, with some minor individual variability.

5.3.3 Nighttime Impacts

The potential visibility of FAA warning lights for the proposed turbines is described in Section 5.1.1 of this VIA (see Table 5.1.1 and Figure 5.1.1). Nighttime photos from the Fenner Wind Power Project (Figure 5.3-1), which is located in Madison County, New York and has been in operation since 2001, are included to illustrate the type of nighttime visual impact that could occur at certain viewpoints. The contrast of the aviation warning lights with the night sky could be appreciable in dark, rural settings, and their presence suggests a more commercial/industrial land use. Viewer attention is drawn by the flashing of the lights, and any positive reaction that wind turbines engender (due to their graceful form, association with clean energy, etc.) is lost at night. While generally not an issue from roads or public resources visited almost exclusively during the day (parks, trails, historic sites, etc.), turbine lighting could be perceived negatively by area residents who may be able to view these lights from their homes and yards. However, this impact will be limited by the extensive forest cover that occurs within the study area, and in areas of more concentrated human settlement, where existing light sources will limit the visibility and contrast of the aviation warning lights.

It should be noted that the size and brightness of the lights depicted in Figure 5.3-1 are due to the use of a long exposure during photography to ensure that the lights were visible in the photographs, and therefore, are not representative of what would be seen with the naked eye.

The O&M facility will require full time lighting, not dissimilar to typical residential security lights, but will also utilize full-cutoff fixtures in order to minimize light trespass beyond the O&M facility property limits. Similarly, the substations will require some full-time security lighting. Security lighting may be automatically activated by motion-sensors. Greater nighttime visual impacts could occur at the O&M facility and substations during limited time periods when support lighting may be necessary to safely perform nighttime maintenance activities. During such maintenance activities, task lighting will be manually operated as needed. During normal operation, the nighttime visual impacts associated with these facilities will be minimal.



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Figure 5.3-1: Representative Evening/Nighttime Photos

Note: Images in this figure are from the Fenner
Wind Farm in Madison County, New York.



5.3.4 Visual Impact of Above-Ground Interconnection Facilities

The proposed wind turbines are the most visually dominant feature of the proposed Project and therefore are the focus of the detailed analyses presented in this VIA. However, the Project does also include above-ground electrical components, which will also have a visual effect on the visual study area.

Substations

As described in Section 2.2 and shown on Figure 2.2-1 of this VIA, the Project includes construction of a collection and POI substation, collectively referred to as the interconnection facilities. The interconnection facilities occur on the same property, located on County Road 36 in the Town of Guilford. The appearance of the proposed interconnection facilities is illustrated in the visual simulations provided in Appendix D, Sheets 22 and 41. These simulations illustrating the substations are also described in Section 5.3.1. The rating panel members generally agree that the turbines remain the dominant feature of the view. However, siting the interconnection facility near a public road and residences raised concern amongst some panel members. While the viewshed results suggest relatively localized visibility, it is anticipated that the potential visual impact of the interconnection facilities on adjacent residents will be relatively strong. However, such impacts can be mitigated (see Section 6.0), and due to its relatively remote setting, the number of viewers and VSRs potentially affected will be small.

O&M Facility

As described in Section 2.2.6 and shown on Figure 2.2-1, Sheet 3 of this VIA, the Project includes construction of two O&M buildings within a 3-acre fenced lot, collectively referred to as the O&M facility. The O&M facility is proposed to be located adjacent to the construction staging/laydown yard on the south side of County Road 37, west of Keach Road, in the Town of Guilford. This location is relatively remote and sited away from VSR's. The appearance of the O&M facility is illustrated in Figure 2.2-2, Sheet 3 as well as in the visual simulations provided in Appendix D, Sheet 29. The simulation illustrating the O&M facility is also described in Section 5.3.1. The buildings will be a neutral earth tone color with a green metal roof in order to reduce contrast with the existing landscape. Members of the rating panel agreed that the color, size, design, and siting of the buildings work together to facilitate a good fit within the surrounding landscape. The low profile and neutral color of the O&M facility minimize its visual prominence, and the building style is similar in appearance to existing agricultural structures in the area. Consequently, the O&M facility is unlikely to have an adverse visual impact on area residents.

5.3.5 Visual Impacts During Construction

Visual impacts during construction are anticipated to be relatively minor and temporary in nature. Representative photographs of construction activities are included in Insets 5.3-31 to 5.3-36. As shown on these photographs, anticipated visual effects during construction include the following:

- During construction, there will be a temporary increase in truck traffic on area roadways. Construction vehicles for the Project will include pick-up trucks, dump trucks, crane transporters, concrete trucks, and oversized semi-trailers. The transportation of turbine components and associated construction material involves numerous conventional and specialized transportation vehicles. For instance, wind turbine blades are transported on trailers with one blade per vehicle. Blades typically control the length of the vehicle, and the radius of the curves along the travel route to the site. Specialized transport vehicles are designed with articulating (manual or self-steering) rear axles to allow maneuverability through curves. Towers are typically transported in three to four sections depending on the supplier (one section per truck). Towers generally control the height and width of the transportation vehicle.



Inset 5.3-31. Transportation of Turbine Components

- As described in Exhibit 25 of the Article 10 Application, it is anticipated that temporary widening of the pavement surface with an aggregate roadway surface will be required to accommodate the turning movements of delivery vehicles in some locations, including some road intersections. This activity may involve tree removal along some narrow, seasonal roads. Temporary expansion of the pavement surface will generally be removed at the completion of construction and restored to their pre-construction condition. Areas of cleared vegetation will be allowed to regrow. However, after completion of construction activities, public road restoration or permanent road improvements may be needed to address any damage caused by heavy construction vehicle traffic (especially on any roads that had temporary repairs made during construction activities).
- As described in Exhibits 21 and 22 of the Article 10 Application, construction of the Project will result in some vegetation clearing and temporary soil disturbance at turbine sites and along the routes of access roads and

electrical collection lines. It is generally assumed that a radius of up to 265 feet will be cleared around each turbine, a 75-foot wide corridor will be cleared along access roads, and a 30-foot-wide corridor per collection line circuit will be cleared along underground electric collection lines that are not adjacent to access roads.

- Vegetation removal will be minimized primarily through careful site planning. Large areas of forest and wetland are being avoided to the extent practicable. Project access roads will be sited on existing farm lanes and forest roads wherever possible, and areas of disturbance will be confined to the smallest area possible. In addition, a comprehensive sediment and erosion control plan will be developed and implemented prior to Project construction to protect adjacent undisturbed vegetation and aquatic resources. In addition to protecting natural resources, these measures will minimize the visual impact associated with landscape clearing and disturbance during construction of the Project.
- The construction laydown yard will be developed by stripping the topsoil, grading as necessary, and installing a level gravel-surfaced working area. Electric and communication lines will be brought in from existing distribution poles to allow connection with construction trailers. During Project construction, the yard will be occupied by vehicles, construction trailers and stockpiled materials. The laydown yard will be removed, and the site restored, at the completion of construction.



Inset 5.3-32. Construction staging and laydown area

- Road construction will involve topsoil stripping and grubbing of stumps, as necessary. Stripped topsoil will be stockpiled along the road corridor for use in site restoration. Following removal of topsoil, subsoil will be graded, compacted, and surfaced with approximately 12 inches of gravel or crushed stone. During construction, access roads with a travel surface of up to 60 feet wide will be required to accommodate large cranes and oversized construction vehicles. This road width will be narrowed to 20 feet following completion of construction.



Inset 5.3-33. Construction of Access Roads (topsoil stripping)

- Once the roads are complete for a particular group of turbine sites, turbine foundation construction will commence on that completed access road section. Initial activity at each tower site will typically involve tree clearing (as needed) around each tower location. Topsoil will then be stripped from the excavation area and stockpiled for future site restoration. Following topsoil removal, heavy equipment will be used to excavate the foundation hole. Subsoil and rock will be segregated from topsoil and stockpiled for reuse as backfill. Once the concrete foundation is poured and sufficiently cured, the excavation area around and over it is backfilled with the excavated on-site material. The base of each tower will be surrounded by a 6-foot wide gravel skirt, and an area approximately 100 feet by 60 feet will remain as a permanent gravel crane pad.



Inset. 5.3-34 Turbine foundation construction

- Whenever possible, underground collection lines will be installed by direct burial, which involves the installation of bundled cable (electrical and fiber optic bundles) directly into a narrow cut or “rip” in the ground. The rip disturbs

an area approximately 24 inches wide with bundled cable installed to a minimum depth of 36 inches. Where direct burial is not possible, an open trench will be excavated. Using this installation technique, topsoil and subsoil are excavated, segregated, and stockpiled adjacent to the trench. Following cable installation, the trench is backfilled with suitable fill material and any additional spoils are spread out or otherwise properly disposed of. Following installation of the buried collection line, areas will be returned to pre-construction grades and revegetated.

- Turbine assembly and erection involves mainly the use of large track mounted cranes, smaller rough terrain cranes, boom trucks, and rough terrain fork-lifts for loading and off-loading materials. The tower sections, rotor components, and nacelle for each turbine will be delivered to each site by flatbed trucks and unloaded by crane. A large erection crane will set the tower segments on the foundation, place the nacelle on top of the tower, and install the rotor either by individual blade installation or, following ground assembly, place the rotor onto the nacelle. The visibility of these cranes will be comparable to the visibility of the proposed turbines (in terms of height). However, the presence of crane equipment at each turbine site will be temporary; limited to the time necessary to complete turbine erection.



Inset 5.3-35. Turbine laydown and assembly

- Following construction activities, temporarily disturbed areas will be restored to original grades (where feasible) and seeded (and stabilized with mulch and/or straw if necessary) to reestablish vegetative cover in these areas. Other than in active agricultural fields, native species will be allowed to revegetate these areas. This will avoid long term visual impacts associated with soil and vegetation disturbance during construction.



Inset 5.3-36. Stabilization and restoration of temporarily disturbed soils

5.3.6 Cumulative Visual Impacts

Per the requirements set forth in 16 NYCRR § 1001.24(a), the potential cumulative visual effect of the High Bridge Wind Project along with other wind energy projects currently operating or proposed in the surrounding region must be considered. Cumulative impacts are two or more individual visual effects which, when taken together, are significant or compound or increase visual effects. This section addresses the potential cumulative visual impacts that may arise from the cumulative visibility of the High Bridge Wind Project and the proposed Bluestone Wind Project. No other existing or proposed wind power projects occur within 18 miles of the High Bridge Project. In addition, the closest Bluestone turbine is approximately 19.7 miles from the nearest proposed Project turbine, so cumulative impacts are expected to be negligible considering the scarcity of long-distance views within the visual study area.

In order to evaluate the potential cumulative visual impacts of the Bluestone Wind Project and the Project turbines within the visual study area, a cumulative viewshed analysis was conducted. The DSM viewshed analysis for the High Bridge Wind Farm (based on maximum blade tip height) was overlaid on a similar viewshed analysis prepared for the proposed Bluestone Wind Project. Both viewsheds employed the same methodology as described in Section 4.1. Data on turbine dimensions for both projects was based on information provided by the Applicant (who is the sponsor for both projects). The viewsheds for the both projects were then plotted on a base map, and areas of viewshed overlap identified. Results of the cumulative viewshed analysis of the proposed wind projects is presented in Table 5-3.2 and Figure 5.3-3.

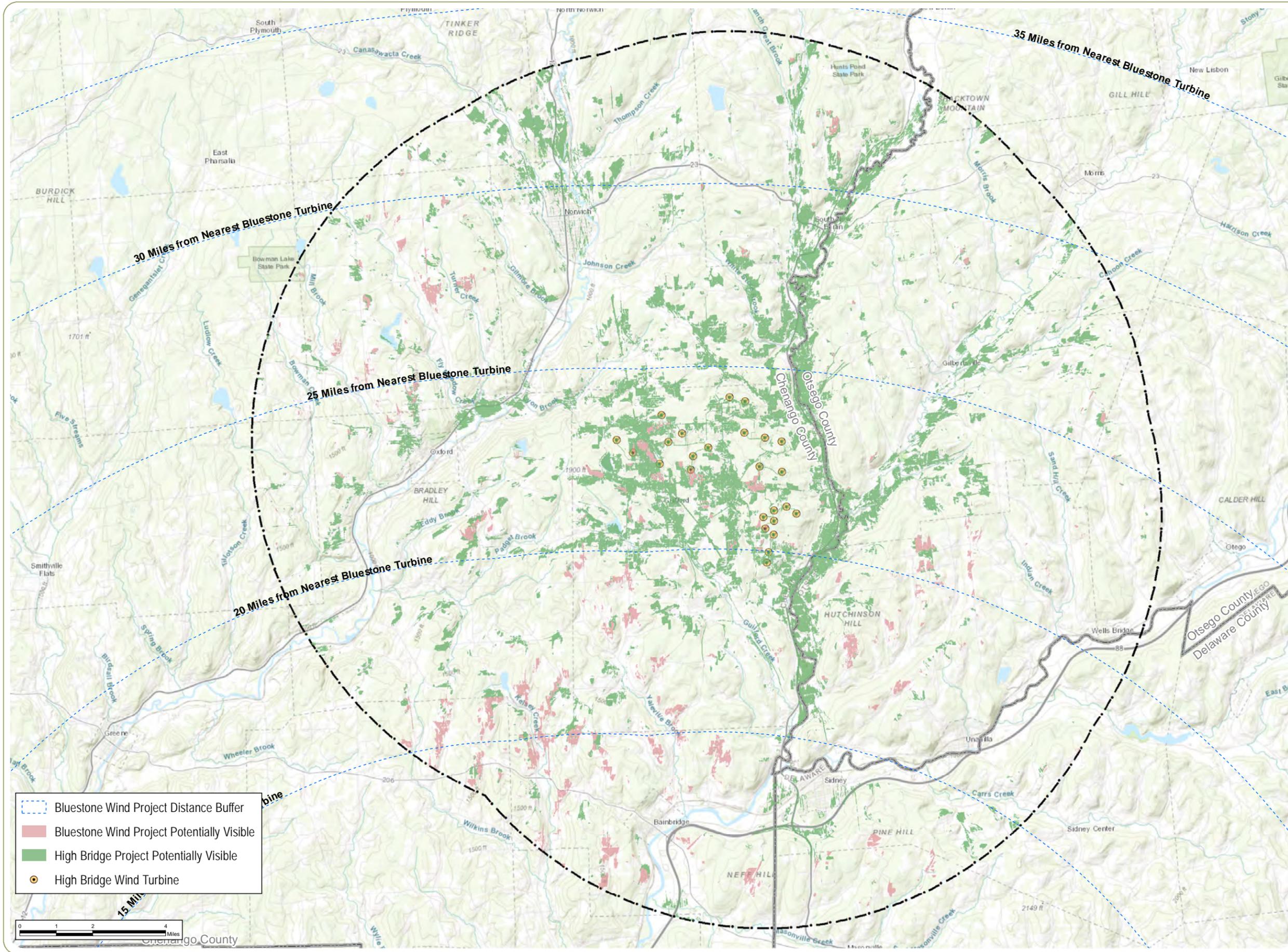
Table 5.3-2. Cumulative Viewshed Analysis Results

Total Number of Turbines Potentially Visible ¹	Visual Study Area Cumulative Viewshed Results ²	
	Square Miles	% of Visual Study Area
0	419.1	89.5
1-10	35.3	7.5
11-20	10.7	2.3
21-30	2.8	0.6
31-40	0.3	0.1
41-52	0.1	0.02
Total Visible	49.2	10.5

¹The cumulative viewshed analysis accounts for proposed turbines from the High Bridge and Bluestone Wind Projects (25 and 27 turbines, respectively).

²The cumulative viewshed analysis area (within 10 miles of the proposed High Bridge Wind Project) includes approximately 468.2 square miles, or 299,674 acres.

As shown in Table 5.3-2, the cumulative viewshed analysis indicates that approximately 89.5% of the visual study area will not have views of any proposed Highbridge or Bluestone wind turbines due to screening provided by topography, structures and mapped forest vegetation. The majority of the remaining area where Bluestone and/or Highbridge turbines may potentially be visible (10.5% of the visual study area), could have views of between one and 10 wind turbines. As visibility goes over 10 turbines the percentage of the visual study area with potential cumulative visibility drops substantially. Areas with potential visibility of 11-20 turbines account for 2.3% the visual study area, and areas with potential views of 21-52 turbines account for only approximately 0.7%. The locations of greatest cumulative visibility are almost exclusively located in the Rural Residential/Agricultural LSZ where open fields offer more open long-distance views of the landscape. Areas that will have cumulative views of turbines from both projects are generally concentrated in the southern portion of the visual study area. This suggests that coincident cumulative views (i.e. both projects appear in the same field of view) will be relatively rare throughout the visual study area since the views of the High Bridge turbines would be to the north, while views of the Bluestone turbines would be to the south (see Figure 5.3-3). Visually sensitive resources that may have a view of over 30 wind turbines are limited to the NRHP-eligible Guilford Historic District, several isolated areas along snowmobile trails, Interstate Route 88, and State Routes 206, 220, and 8, small patches within the Village of Sidney, and state forests in the southern portion of the High Bridge visual study area. It is also important to note that locations which will offer views of both Projects within the same view will be in excess of 20 miles and more likely 25-30 miles from the Bluestone Project. As demonstrated by the simulations prepared for this VIA at these distances the turbines are difficult to perceive, and cumulative visibility no longer has the potential to generate significant visual impacts. Due to the distance and lack of coincident views of both the High Bridge Wind Project and the proposed Bluestone Wind Project, the cumulative impact was not addressed in visual simulations.



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Figure 5.3-3: Cumulative Viewshed Analysis

Cumulative Wind Turbine Blade Tip Visibility Based on Topography, Vegetation and Structures

Notes: 1. Basemap: ESRI ArcGIS Online "World Topographic Map" map service. 2. This map was generated in ArcMap on July 3, 2019. 3. This is a color graphic. Reproduction in grayscale may misrepresent the data. 4. Potential turbine visibility is based on the screening effects of topography, vegetation, and man-made structures as represented in the FEMA Susquehanna Basin 2007 lidar dataset. Viewshed analysis based on maximum blade tip height of 204 meters (671 feet) for the turbines of both projects. 5. Newly visible area represents areas where the high bridge turbines have predicted visibility and the bluestone turbines have none.

6.0 Conclusions

The VIA for the High Bridge Wind Project allows the following conclusions to be drawn:

1. Maximum visibility analysis (i.e., based only on topography) conducted as part of this VIA indicates that the Project could theoretically be visible from approximately 55.0% of the visual study area. However, factoring forest vegetation and structures into the viewshed analysis significantly reduces potential Project visibility. Vegetation and structures, in combination with topography, will serve to completely screen daytime views of the Project from approximately 89.5% of the visual study area (i.e., approximately 10.5% of the visual study area is indicated as having potential Project visibility). Potential visibility of the Project (based on the blade tip DSM viewshed analysis) from the various LSZs within the visual study area is summarized as follows:
 - The LSZ with the least amount of potential Project visibility is Forest, which offers very limited outward views due to the screening effects of the forest canopy. Only 2.1% of the Forest LSZ within the study area is indicated as having potential views of the proposed turbines. These areas of potential visibility are generally limited to small breaks in the vegetation that allow for occasional outward views from forest areas. However, even in these areas views of the Project will be substantially screened.
 - The Transportation Corridor LSZ presents potential opportunities for Project visibility in 6.1% of its area within the visual study area. This LSZ, which is limited to the Interstate Route 88 corridor, is over 6 miles from the Project at its nearest point. Therefore, any views of the Project from this LSZ will be distant and fleeting.
 - The more populated portions of the visual study area that make up the City/Village LSZ offer potential Project visibility in 8.0% of its acreage within visual study area. However, field review confirmed that even where open views are available, only a limited number of turbines are likely to be visible and their visual impact is moderated by the abundance of man-made features. As suggested in the viewshed analysis, narrow corridors of visibility may extend along village streets, but due to the presence of utility lines, street signs, and cars in the City/Village environment, the turbines are likely to go unnoticed in the background.
 - The Open Water LSZ has potential visibility in 12.1% of its area within the visual study area. Open Water areas can provide opportunities for distant view due to the lack of screening by intervening foreground vegetation or topography. However, within the visual study area for this Project, with few exceptions, waterbodies are generally small and surrounded by tall forest vegetation, hills, and/or residential structures which limit long distance views. Visibility within this zone is also noted along the Unadilla River, where it runs through agricultural areas. However, field review indicates that the river is lined by tree which will generally screen outward views.
 - The greatest potential for visibility of the turbines is indicated within the Rural Residential/Agricultural LSZ. The DSM viewshed indicates that 23.3% of the acreage within this zone will potentially offer views of the Project.

However, as the viewshed analysis indicates, even in this most open LSZ, the Project is screened by topography and/or vegetation in over 75% of this zone.

2. The DSM viewshed analysis indicates that 66% (167 out of 252) of the VSRs could have views of some portion of one or more of the proposed turbines. However, field review indicated that Project visibility at VSRs within the visual study area will generally be much more limited than suggested by viewshed analysis due to the effects of distance and screening provided by trees, street signs, overhead poles, and other objects in the landscape that may be too detailed for inclusion in the viewshed analysis or that were eliminated from the analysis due to their proximity to the road. As demonstrated in the visual simulations, locations that depicted turbine visibility from several VSRs resulted in insignificant visual ratings due to distance and partial screening features such as trees, buildings, and general visual clutter.
3. The DSM viewshed analysis completed for the proposed collection substation and POI station indicates that topography and vegetation will effectively screen approximately 17.5% of the 1-mile substation study area surrounding the proposed interconnection facilities. Visibility of the substations will be largely limited to the area immediately surrounding the interconnection facilities and the southwestern corner of the 1-mile substation study area. Visibility and visual impact of this Project component is expected to be localized (i.e., it will not extend significantly beyond 1 mile).
4. The viewshed analysis suggests Project visibility at VSRs. Within the APE will generally be limited to 1-5 turbines. Simulations from more distant VSRs (6-11 miles from the nearest turbine) suggest that the Project will have a negligible impact to these resources due to the effects of distance and substantial screening provided by vegetation.
5. The majority of VSRs visited during field review will be fully or substantially screened from view of the proposed Project, including state forests and NRHP-listed and eligible sites in developed areas. This was particularly the case with many of the resources identified in the City of Norwich where the distance from the Project, combined with numerous competing foreground elements, substantially reduced the potential for Project visibility and visual impact.
6. Simulations of the proposed Project indicate that the visibility and visual impact of the wind turbines will be highly variable based on landscape setting, extent of natural screening, presence of other man-made features in the view, baseline scenic quality, viewer sensitivity, distance of the viewer from the Project, and the number of turbines visible in the view.
 - Evaluation by a rating panel indicates that the Project's overall average contrast with the character of the existing landscape ranged from insignificant to appreciable. Based on the contrast rating scores and comments provided by the rating panel, greater levels of visual impact can be anticipated where open views

of foreground turbines and/or large numbers of turbines are available from elevated vantage points or areas where the turbines contrast with existing land uses (e.g., summer camp, residential areas). Conversely, impact is reduced in instances where turbines are partially screened, viewed at greater distances, seen in the context of a working agricultural landscape, or viewed in a setting with existing man-made features.

- The simulations that received the highest visual contrast ratings (in descending order of rating) were from the following viewpoints:
 1. Viewpoint 34 from Furnace Hill Road in the Town of Guilford
 2. Viewpoint 41 from North Pond Road in the Town of Guilford
 3. Viewpoint 42 from County Road 36 in the Town of Guilford
 4. Viewpoint 30 from High Bridge Road in the Town of Guilford
 5. Viewpoint 29 from Furnace Hill Road in the Town of Guilford

The above viewpoints are all located in the Rural Residential/Agricultural LSZ and contained either foreground views of multiple turbines or panoramic views of turbines in the middle ground and background distance zones. In all of these views, the Project tends to become a dominant feature in the landscape. Viewpoint 41, in particular, received elevated ratings as a result of the Project's contrast with the existing land use associated with Camp Mesorah.

- The simulations that received the lowest visual contrast rating of 0.0 (insignificant) was from Viewpoint 1, along Interstate Route 88, and Viewpoint 5, located within the Village of Sidney. Additionally, Viewpoint 70, located along East Side Road, received an average contrast rating of 0.1 (insignificant). These views have the following similar characteristics, even while located in different LSZs: 1) dominant foreground elements that draw viewer attention, 2) low number of visible turbines (only a portion of the turbine is visible above the horizon) or visible turbines at a great distance from the viewer, and 3) user activity/enjoyment is unlikely to be impacted by the installation of the Project.
7. Based on the nighttime photos/observations of existing wind power projects, the red flashing lights on the turbines could result in a nighttime visual impact on certain viewers. The actual significance of this impact from a given viewpoint will depend on how many turbines are visible, what other sources of lighting are present in the view, the extent of screening provided by existing structures and trees, and nighttime viewer activity/sensitivity. However, night lighting could have an adverse effect on rural residents and recreational users that currently experience (or expect) dark nighttime skies. It is anticipated that nighttime visibility/visual impact will be reduced due to hills and forest vegetation

that screen portions of the Project from many areas. As indicated by the DSM viewshed analysis, 92.6% of the visual study area will be completely screened from nighttime views of the FAA obstruction warning lights, and 98.8% will have the potential for views of between zero and 10 turbines. The concentration of residences in the city, villages, hamlets, and along highways where existing lights already compromise dark skies and compete for the viewer's attention will also limit nighttime visual impacts.

8. Visibility and visual impact of the proposed substation will be limited due to the relatively low profile of the components, distance from existing VSRs, low density of adjacent residential properties, generally low traffic volume on the adjacent road, and screening provided by surrounding topography and/or forest vegetation within the substation viewshed.
9. The visual impact associated with the proposed O&M facility will be minimal due to the design of the two buildings, which is generally consistent with other agricultural/utility buildings found throughout the visual study area. The buildings are anticipated to be an earth tone color which mutes their contrast with the surrounding visible elements. Additionally, the height of these components does not exceed that of other structures or vegetation surrounding it. The evaluations performed by the rating panel generally agreed that the O&M facility is designed in such a way that it fits into the existing environment.
10. Based on rating panel results, first-hand experience with operating wind projects in New York, and various published studies regarding neighbor/public reaction to operating wind projects, public reaction to the visual effect of the proposed turbines is likely to be highly variable. Reactions will be based on proximity to the turbines, the affected landscape, and personal attitude of the viewer regarding wind power. Numerous studies have documented a long term positive reaction to wind projects by local residents and the general public (Hoen, 2018).
11. Construction impacts are short term/temporary impacts that will last only for the duration of construction (typically less than one year). In addition, because the turbines are generally well removed from adjacent public roads and residences, most on-site construction activities (other than increased traffic on local roads) will be screened from the majority of viewers. Upon completion of construction, construction vehicles and equipment will depart, the laydown yard will be restored, and temporarily cleared areas on the Project Site will be allowed to revegetate.
12. The cumulative visibility and visual effect of the Project turbines and the proposed Bluestone Wind Project is expected to be relatively minor due to the relatively small number of areas from which both projects will be visible, the lack of views in which both projects will be coincident in the same field of view, and the distance between the two projects.

13. Mitigation options are limited, given the nature of the Project and its siting criteria (very tall structures typically located in open fields and/or at the highest locally available elevations). However, in accordance with NYSDEC Program Policy (NYSDEC, 2000), various mitigation measures were considered. These included the following:

- A. Professional Design. All turbines will have uniform design, speed, color, height and rotor diameter. Turbines will be mounted on conical steel towers that minimize visual clutter. The placement of any advertising devices (including commercial advertising, conspicuous lettering, or logos identifying the Project owner or turbine manufacturer) on the turbines will be prohibited, although certain small mandatory warning and related signs will be located on or adjacent to the turbines at ground level.
- B. Screening. Due to the height of individual turbines and the geographic extent of the proposed Project, screening of individual turbines with earthen berms, fences, or planted vegetation will generally not be effective in reducing Project visibility or visual impact. Additionally, based on site-specific field investigation and rating panel review, the proposed O&M Facility is not anticipated to have significant adverse visual effect, and therefore visual screening is not anticipated to be necessary. The proposed interconnection facilities (substations) are located in area where few, if any, VSRs will be affected. However, these facilities do contrast with the existing rural landscape, and will be visible from some adjacent residences. Screening in the form of perimeter plantings could be effective in reducing the visibility/visual impact of the substations.
- C. Relocation. Because of the limited number of suitable locations for turbines within the Project Site, and the variety of viewpoints from which the Project can be seen, turbine relocation will generally not significantly alter visual impact. Moving individual turbines to less windy sites would not necessarily reduce impacts but could affect the productivity and viability of the Project. Where visible from sensitive resources within the visual study area, views of the Project are highly variable and include different turbines at different vantage points. Therefore, turbine relocation would generally not be effective in mitigating visual impacts. Additionally, the Project layout has been designed to accommodate various set-backs from roads and residences. Options for relocation of individual Project components are constrained by compliance with these setbacks.
- D. Camouflage. The 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. This is demonstrated by simulations prepared under a variety of sky conditions. Consequently, it is recommended that this color be utilized on the High Bridge Wind Project. The size and movement of the turbines prevents more extensive camouflage from being a viable mitigation alternative (i.e., the turbines cannot be made to look like anything else). Nielsen (1996) notes that efforts to camouflage or hide wind farms generally fail, while Stanton (1996) feels that such efforts are inappropriate. She

believes that wind turbine siting "*is about honestly portraying a form in direct relation to its function and our culture; by compromising this relationship, a negative image of attempted camouflage can occur.*" Other components of the Project will be designed to minimize contrast with the existing agricultural character in the Project area. For instance, new road construction will be minimized by utilizing existing farm lanes wherever possible.

- E. **Low Profile.** A significant reduction in turbine height is not possible without significantly decreasing power generation. Less generating capacity (resulting from smaller turbines) could threaten the Project's economic feasibility. To avoid generation losses, use of smaller turbines would require that additional turbines be constructed. Several studies have concluded that people tend to prefer fewer larger turbines to a greater number of smaller ones (Thayer and Freeman, 1987; van de Wardt and Staats, 1988). There will be minimal visual impact from the electrical collection system because the proposed collection system will be installed underground to the maximum extent practicable. If overhead collection line sections are proposed at some later date, it is anticipated that the poles would be relatively low profile and would likely have limited visibility within the visual study area. However, depending on the location of potential overhead sections and the sensitivity of proximate resources (unknown at this time), additional visual analysis may be warranted.
- F. **Downsizing.** Reducing the number of turbines could reduce visual impact from certain viewpoints, but from most locations within the visual study area where more than one turbine is visible, the visual impact of the Project would change only marginally, unless the reduction was substantial. The Project already includes a relatively small number of turbines (25) and from most locations where visibility is possible, fewer than 10 turbines could be seen. In addition, elimination of turbines could significantly reduce the socioeconomic benefits of the Project and reduce the Project's ability to assist the State in meeting its energy policy objectives and goals.
- G. **Alternate Technologies.** Alternate technologies for comparable power generation, such as gas-fired or solar-powered facilities, would have different, and perhaps more significant, visual and other impacts than wind power. Viable alternative wind power technologies (e.g., vertical axis turbines), that could reduce visual impacts, do not currently exist in a form that could be used on a commercial/utility-scale project.
- H. **Non-specular Materials.** Non-reflective paints and finishes will be used to the extent practicable on Project components to minimize reflected glare. If sections of overhead collection line are proposed at a later date, it is anticipated that non-specular conductors will be considered for use.
- I. **Lighting.** 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. Lighting at the substations and O&M facility will be kept to a minimum, and turned on only as needed by manual switch.

- J. Maintenance. The turbines and turbine sites will be maintained to ensure that they are clean, attractive, and operating efficiently. Research and anecdotal reports indicate that viewers find wind turbines more appealing when the rotors are turning (Pasqualetti et al., 2002; Stanton, 1996). In addition, the Project developer will establish a decommissioning fund to ensure that if the Project goes out of service and is not repowered/redeveloped, all visible above-ground components will be removed.
- K. Offsets. Correction of an existing aesthetic problem within the viewshed is a viable mitigation strategy for wind power projects that result in significant adverse visual impact. Historic structure restoration/maintenance activities could be undertaken to offset any identified visual impacts on cultural resources.

7.0 Literature Cited/References

- Breyer, Lucy A. 1982. *Gilbertsville Historic District Boundary Increase, Village of Gilbertsville, Otsego County, NY*. National Register of Historic Places Inventory – Nomination Form, National Park Service, U.S. Department of the Interior, Washington, D.C. On file, New York State Office of Parks, Recreation and Historic Preservation, Waterford, NY. Available at <https://cris.parks.ny.gov>.
- Bryce, S.A., G.E. Griffith, J.M. Omernik, G. Edinger, S. Indrick, O. Vargas, and D. Carlson. 2010. *Ecoregions of New York (color poster with map, descriptive text, summary tables, and photographs)*. Map scale 1:1,250,000. U.S. Geological Survey, Reston, VA.
- Cole, Anna. 2013. *Sidney Historic District*. National Register of Historic Places Registration Form. National Park Service, U. S. Department of the Interior, Washington, D.C. On file, New York State Office of Parks, Recreation and Historic Preservation, Waterford, NY. Available at <https://cris.parks.ny.gov>.
- Committee on Environmental Impacts of Wind Energy Projects (CEIWEP). 2007. Appendix D: A Visual Impact Assessment Process for Evaluating Wind-Energy Projects. In, *Environmental Impacts of Wind Energy Projects*, pp. 349-376. National Research Council, The National Academies Press, Washington, D.C.
- DCMO BOCES. 2019. DCMO BOCES [website]. Available at: <https://www.dcmoboces.com/> (Accessed June 28, 2019).
- Englert, Robert T. 1985. *Oxford Village Historic District, Village of Oxford, Chenango County, NY*. National Register of Historic Places Inventory – Nomination Form. National Park Service, U. S. Department of the Interior, Washington, D.C. On file, New York State Office of Parks, Recreation and Historic Preservation, Waterford, NY. Available at <https://cris.parks.ny.gov>.
- Environmental Design & Research, Landscape Architecture, Engineering, & Environmental Services, D.P.C. (EDR). 2019. *Historic Architectural Resources Survey: High Bridge Wind Project, Town of Guilford, Chenango County, NY*. EDR, Syracuse, NY.
- Federal Aviation Administration (FAA). 2018. *Obstruction Marking and Lighting AC No. 70/7460-1L Change 2*. DOT/FAA/AR-TN 05/50. U.S. Department of Transportation, Washington, D.C. August 17, 2018.
- Finger Lakes Trail Conference. 2019. *About the Finger Lakes Trail* [website]. Available at: <https://fingerlakestrail.org/plan-hikes-finger-lakes-trail/about-the-finger-lakes-trail/> (Accessed June 28, 2019).
- Firestone, Jeremy, Ben Hoen, Joseph Rand, Debi Elliott, Gundula Hubner & Johannes Pohl. 2017. Reconsidering barriers to wind power projects: community engagement, developer transparency and place. *Journal of Environmental Policy & Planning*, DOI: 10.1080/1523908X.2017.1418656
- Firestone, J., W. Kempton, and A. Krueger. 2009. *Public Acceptance of Offshore Wind Power Projects in the United States*. *Wind Energy*, 12, 183-202.
- Gipe, P. 1993. The Wind Industry's Experience with Aesthetic Criticism. *Leonardo*, No. 26, pp. 243-248.
- Great Schools. 2019. *Unadilla Valley Elementary School* [website]. Available at: <https://www.greatschools.org/new-york/new-berlin/72-Unadilla-Valley-Elementary-School/> (Accessed June 28, 2019).
- Great Schools. 2019b. *Unadilla Valley Central School* [website]. Available at: <https://www.greatschools.org/new-york/new-berlin/74-Unadilla-Valley-Central-School/> (Accessed June 28, 2019).

Hoen, B., Rand, Joseph, Wiser, Ryan, et. al. 2018. National Survey of Attitudes of Wind Power Project Neighbors: Summary of Results. Electricity Markets and Policy Group. Summary of Project Results. Berkeley Lab.

Jefferson County Community College (JCCC). 2008. *Presentation of Results: Second Annual Lewis County Survey of the Community, December 2008*. Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: <http://www.sunyjefferson.edu/ccs/index.html>.

JCCC. 2010. *Presentation of Results: Third Annual Lewis County Survey of the Community, February 2010*. Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: <http://www.sunyjefferson.edu/ccs/index.html>

JCCC. 2011. *Presentation of Results: Fourth Annual Lewis County Survey of the Community, February 2011*. Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: <http://www.sunyjefferson.edu/ccs/index.html>

JCCC. 2012. *Presentation of Results: Fifth Annual Lewis County Survey of the Community, February 2012*. Jefferson County Community College, Center for Community Studies, Watertown NY. Available at: <http://www.sunyjefferson.edu/ccs/index.html>

Macaulay Land Use Research Institute (MLURI). 2010. *Perceptual Studies of Windfarms* [website]. Available at: <http://www.macaulay.ac.uk/ccw/task-two/strategies.html> (Accessed August 15, 2018).

Manley, Doris and Mangold, Anne. 1973. *Gilbertsville Historic District, Village of Gilbertsville, Otsego County, NY*. National Register of Historic Places Inventory – Nomination Form, National Park Service, U.S. Department of the Interior, Washington, D.C. On file, New York State Office of Parks, Recreation and Historic Preservation, Waterford, NY. Available at <https://cris.parks.ny.gov>.

McDougall, Ellen T. 1975. *Chenango County Courthouse District (Broad Street – Main Street Historic District), City of Norwich, Chenango County, NY*. National Register of Historic Places Inventory – Nomination Form, National Park Service, U.S. Department of the Interior, Washington, D.C. On file, New York State Office of Parks, Recreation and Historic Preservation, Waterford, NY. Available at <https://cris.parks.ny.gov>.

National Park Service (NPS). 2017. *Nationwide Rivers Inventory* [website]. Available at: <http://www.nps.gov/nrcr/programs/rtca/nri/index.html> (Accessed June 27, 2019). U.S. Department of the Interior, National Center for Recreation & Conservation.

NPS. 2019a. *National Natural Landmarks in New York* [website]. Available at: <https://www.nps.gov/subjects/nlandmarks/state.htm?State=NY> (Accessed June 27, 2019).

NPS. 2019b. *National Register of Historic Places* [website]. Available at: <https://www.nps.gov/subjects/nationalregister/index.htm/> (Accessed June 27, 2019). U.S. Department of the Interior.

NPS. 2019c. *Find a Park in NY* [website]. Available at: <http://www.nps.gov/state/ny/index.htm> (Accessed June 27, 2019). U.S. Department of the Interior.

National Register of Historic Places (NRHP). 2019. *Historic Districts* [website]. Available at: <http://www.nationalregisterofhistoricplaces.com/districts.html> (Accessed June 27, 2019).

NRHP. 2019b. *State Listings* [website]. Available at: <http://www.nationalregisterofhistoricplaces.com/state.html> (Accessed June 27, 2019).

- National Wild and Scenic Rivers. 2019. *Explore Designated Rivers* [website]. Available at: <https://www.rivers.gov/new-york.php> (Accessed June 27, 2019).
- New York State Department of Environmental Conservation (NYSDEC). 2018. *Program Policy: Assessing and Mitigating Visual Impacts*. DEP-00-2. Division of Environmental Permits, Albany, NY.
- NYSDEC. 2019. *Wild, Scenic, and Recreational Rivers* [website]. Available at: <http://www.dec.ny.gov/permits/32739.html> (Accessed June 27, 2019).
- NYSDEC. 2019b. *List of State Forests By Region* [website]. Available at: <http://www.dec.ny.gov/lands/34531.html> (Accessed June 27, 2019).
- NYSDEC. 2019c. *State Lands Interactive Mapper* [website]. Available at: <http://www.dec.ny.gov/outdoor/45415.html> (Accessed June 27, 2019).
- NYSDEC. 2019d. *New York's Forest Preserve* [website]. Available at: <http://www.dec.ny.gov/lands/4960.html> (Accessed June 27, 2019).
- NYSDEC. 2019e. *Public Fishing Rights Maps, Waters with Public Fishing Rights* [website]. Available at: <http://www.dec.ny.gov/outdoor/9924.html> (Accessed June 27, 2019).
- NYSDEC. 2019f. *Wildlife Management Areas* [website]. Available at: <http://www.dec.ny.gov/outdoor/7768.html> (Accessed June 27, 2019).
- NYSDEC. 2019g. *Unadilla River* [website]. Available at: <https://www.dec.ny.gov/outdoor/63437.html> (Accessed June 28, 2019).
- NYSDEC. 2019h. *Chenango River* [website]. Available at: <https://www.dec.ny.gov/outdoor/63442.html> (Accessed June 28, 2019).
- NYSDEC. 2019i. *Susquehanna River* [website]. Available at: <https://www.dec.ny.gov/outdoor/42299.html> (Accessed June 28, 2019).
- NYS Department of State (NYS DOS). 2019. *Scenic Areas of Statewide Significance* [website]. Available at: <http://www.dos.ny.gov/opd/programs/consistency/scenicass.html> (Accessed June 27, 2019). Office of Planning and Development.
- New York State Department of Transportation (NYSDOT). 2013. *Geotechnical Design Manual*. Engineering Division – Office of Technical Services. Available online at: <https://www.dot.ny.gov/divisions/engineering/technical-services/geotechnical-engineering-bureau/gdm> (Accessed April 8, 2019).
- NYSDOT. 2015. *Annual Average Daily Traffic (AADT)* [shapefile]. Available at: <https://www.dot.ny.gov/tdv> (Accessed June 27, 2019).
- NYSDOT. 2019. *New York State Scenic Byways* [website]. Available at: <https://www.dot.ny.gov/scenic-byways> (Accessed June 27, 2019).
- NYSDOT. 2019b. *Bicycling in New York* [website]. Available at: <https://www.dot.ny.gov/bicycle> (Accessed June 27, 2019).
- New York State Education Department (NYSED). 2018. *Gilbertsville-Mount Upton CSD At A Glance* [website]. Available at: <https://data.nysed.gov/profile.php?instid=800000039903> (Accessed June 28, 2019).

- New York State Education Department (NYSED). 2018b. Norwich High School At A Glance [website]. Available at: <https://data.nysed.gov/profile.php?instid=800000053953> (Accessed June 28, 2019).
- New York State Education Department (NYSED). 2018c. Perry Browne intermediate School At A Glance [website]. Available at: <https://data.nysed.gov/profile.php?instid=800000053998> (Accessed June 28, 2019).
- New York State Historic Preservation Office (NYSHPO). 2019. *Welcome to the Cultural Resource Information System* [website]. Available at: <https://cris.parks.ny.gov/Login.aspx?ReturnUrl=%2f> (Accessed June 27, 2019).
- New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP). 2019. *State Parks* [website]. Available at: <http://parks.ny.gov/parks/> (Accessed June 27, 2019).
- NYSOPRHP. 2019b. *Heritage Areas* [website]. Available at: <https://parks.ny.gov/historic-preservation/heritage-areas.aspx> (Accessed June 27, 2019).
- NYSOPRHP. 2019c. *Trails* [website]. Available at: <http://www.nysparks.com/recreation/trails/> (Accessed June 27, 2019)
- NYSOPRHP. 2019d. *Bowman Lake State Park* [website]. Available at: <https://parks.ny.gov/parks/76/> (Accessed June 28, 2019)
- Niche. 2019. *Holy Family School* [website]. Available at: <https://www.niche.com/k12/holy-family-school-norwich-ny/> (Accessed June 28, 2019).
- Niche. 2019b. *Stanford J. Gibson Primary School* [website]. Available at: <https://www.niche.com/k12/stanford-j-gibson-primary-school-norwich-ny/> (Accessed June 28, 2019).
- Niche. 2019c. *Sidney Elementary School* [website]. Available at: <https://www.niche.com/k12/sidney-elementary-school-sidney-ny/> (Accessed June 28, 2019).
- Niche. 2019d. *Sidney High School* [website]. Available at: <https://www.niche.com/k12/sidney-high-school-sidney-ny/> (Accessed June 28, 2019).
- Nielsen, F.B. 1996. *Wind Turbines and the Landscape: Architecture and Aesthetics*. Prepared for the Danish Energy Agency's Development Programme for Renewable Energy. 63 pp.
- Pasqualetti, M.J., P. Gipe, and R.W. Righter (eds.). 2002. *Wind Power in View: Energy Landscapes in a Crowded World*. Academic Press, San Diego, CA.
- Peckham, Mark. 1994. *White Store Church and Evergreen Cemetery, Town of Norwich, Chenango County, NY*. National Register of Historic Places Registration Form. National Park Service, U.S. Department of the Interior, Washington, D.C. On file, New York State Office of Parks, Recreation and Historic Preservation, Waterford, NY. Available at <https://cris.parks.ny.gov>.
- Private School Review. 2019. *Valley Heights Christian Academy* [website]. Available at: <https://www.privateschoolreview.com/valley-heights-christian-academy-profile> (Accessed June 28, 2019).
- Public School Review. 2019. *Guilford Elementary School* [website]. Available at: <https://www.publicschoolreview.com/quilford-elementary-school-profile/13780> (Accessed June 28, 2019).

Smardon, R.C., J.F. Palmer, A. Knopf, K. Grinde, J.E. Henderson and L.D. Peyman-Dove. 1988. *Visual Resources Assessment Procedure for U.S. Army Corps of Engineers*. Instruction Report EL-88-1. Department of the Army, U.S. Army Corps of Engineers. Washington, D.C.

Stanton, C. 1996. *The Landscape Impact and Visual Design of Windfarms*. ISBN 1-901278-00X. Edinburgh College of Art, Heriot-Watt University. Edinburgh, Scotland.

Thayer, R.L. and C.M. Freeman. 1987. Altamont: Public Perception of a Wind Energy Landscape. *Landscape and Urban Planning*. Vol. 14, pp. 379-398.

Thayer, R.L. and Hansen, H. 1988. Wind on the Land. *Landscape Architecture*. Vol. 78, No. 2, pp. 69-73.

United States Department of Agricultural (USDA), National Forest Service. 1995. *Landscape Aesthetics, A Handbook for Scenery Management*. Agricultural Handbook 701. Washington D.C.

United States Department of the Interior (USDI), Bureau of Land Management. 1980. *Visual Resource Management Program*. U.S. Government Printing Office. 1980. 0-302-993. Washington, D.C.

United States Department of Transportation, Federal Highway Administration. 1981. *Visual Impact Assessment for Highway Projects*. Office of Environmental Policy. Washington, D.C.

United States Department of Transportation (USDOT) Federal Highway Administration (FHWA). 2015. *Guidelines for the Visual Impact Assessment of Highway Projects*. Office of Environmental Policy. Washington, D.C.

United States Fish and Wildlife Service (USFWS). 2019. *National Wildlife Refuge Locator* [website]. Available at: <http://www.fws.gov/refuges/refugeLocatorMaps/index.html> (Accessed June 27, 2019).

United States Forest Service (USFS). 2013. *Find National Forests and Grasslands* [website]. Available at: <http://www.fs.fed.us/recreation/map/finder.shtml> (Accessed June 27, 2019).

Van de Wardt, J.W. and H. Staats. 1998. *Landscapes with wind turbines: environmental psychological research on the consequences of wind energy on scenic beauty*. Research Center ROV Leiden University.