

Appeal In The Matter Of Department Permits L-24572-24-C-N, L-24572-TF-D-N, L-24572-IW-E-N, L-24572-24-F-N and L 24572-TF-G-N // Approval for Oakfield Wind Project Expansion

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Review of the Oakfield Wind Project Visual Impact Assessment by Dr. James F. Palmer, September 9, 2011 (“Palmer Review”)

**Review of the
Oakfield Wind Project
Visual Impact Assessment**

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1. Introduction

On January 21, 2010, the Maine Department of Environmental Protection (MDEP) approved the application of Evergreen Wind Power II, LLC (Evergreen II) to construct and operate the 34 wind turbine, 51-megawatt (MW) Oakfield Wind Project in Oakfield (DEP#L-24572-24-A-N/L-24572-TF-B-N).

On June 10, 2011, Evergreen Wind Power II, LLC submitted an amendment to the Oakfield Wind Project that:

- changed the turbine type and number from 34 GE 1.5-MW with a 77-meter rotor diameter to 50 Vestas V-112 3.0-MW turbines, with a 112-meter rotor diameter;
- changed turbine pad size, turbine locations, road widths, and some road locations;
- added temporary and permanent meteorological (met) tower locations;
- changed the point of electrical interconnection and location of the substation;
- added an approximately 59-mile generator lead line.

The nameplate capacity of this amended project is 150 MW. The turbines are located on the ridges of the Oakfield Hills (including Sam Drew Mountain), Hunt Ridge, and an unnamed ridge between Pleasant and Skitacook Lakes in Oakfield and T4 R3 WELS, in Aroostook County. The line will extend through 12 towns and townships: Chester, Woodville, Mattawamkeag, Molunkus Township, Macwahoc Plantation, North Yarmouth Academy Grant, Reed Plantation, Glenwood Plantation, T3R3 WELS, T4R3 WELS, Linneus, and Oakfield. The project is within the area designated for expedited grid-scale wind development.

The generation facilities include:¹

- **Turbines.** Fifty Vestas turbines with an output of 3.0 MW per turbine. The height of the turbine hub height is 84-meters (276 feet) and the diameter swept by the turbine blades is 112 meters (367 feet) for a total height of 140 meters (459 feet). The turbines will be painted white.
- **Night warning lights.** Red warning lights will be installed according to Federal Aviation Administration (FAA) guidelines. Typically lights are placed on the ends of a turbine string, and on alternating turbines between them.
- **Tower foundation.** The tower is affixed to a 24±-foot diameter foundation.
- **Electrical collection system.** Underground conductors will connect the turbines to an above ground collection line that will deliver the generated electricity to the substation to be located at the eastern end of South Oakfield Road, approximately one mile north of Mud Lake in Oakfield. The collection line will consist of wooden poles, typically 35-45

¹ DEP has not determined exactly which project components are generation facilities, and which are associated facilities. This review follows LURC's April 21, 2011 procedural order defining generating facilities to be "wind turbines, including their blades, towers, and concrete foundations, and transmission lines... Associated facilities means all other facilities that are not generating facilities." The Commission clarified that the "transmission lines that run between turbines...are generating facilities" (Hilton 2011, page 3)

‡ These were inadvertently taken with the camera set for wide angle. The photosimulations were adjusted to approximate a 'normal' lens view (TJDA 2011a, footnote 2 on page 4), but it is not possible to verify the photosimulation's horizontal angle and appropriate viewing distance.

§ Viewing distance is calculated using the method described by Sheppard (1989, page 185).

* This is the viewing width for the single frame photosimulations, not the panoramas.

Photosimulations begin with the photographs described in Table 1. TJDA uses a GPS to locate simulation viewpoints, and the longitude and latitude are included on each panoramic photosimulation. TJD&A uses WindPRO to prepare a digital perspective drawing of the wind turbines and the horizon line as seen from the same location and using the same "lens" as the photograph used. This horizon line is based only on topography and is limited to the extent of the study area. This drawing is superimposed over the photograph and the simulation technician registers them by matching the topographic horizon line to the horizon line of the photograph, as shown in Figure 1. This registration must take into account the height of the trees that are typically covering topography in the photo. WindPRO has tools to assist in removing parts of the turbines that are behind landscape elements in the photograph and making other adjustments. Sometimes PhotoShop may also be used to graphically clean up the image.



Figure 1. A draft of Photosimulation 2A from Pleasant Lake showing how the WindPRO drawing is registered to the photograph by aligning the landform ridge line. *Source:* TJD&A 2011c.

While there is some interpretation that must be made to create photosimulations, those presented in the VIA appear generally accurate and well-constructed, as is apparent when compared to the ArcScene Visualizations in Appendix 3.

Pleasant Lake, T4 R3 WELS—Viewpoint 1. The scope and scale of Visualizations 1, 2 and 3 are very similar to the photosimulations in the VIA's Figure 1A, 1B and 1C. This supports the accuracy of the photosimulation.

Pleasant Lake, T4 R3 WELS —Viewpoint 2. The scope and scale of Visualizations 4, 5 and 6 are very similar to the photosimulations in the VIA's Figure 2A, 2B and 2C. This supports the accuracy of the photosimulation.

Pleasant Lake, T4 R3 WELS —Viewpoint 3. The scope and scale of Visualizations 7 and 8 are very similar to the photosimulations in the VIA's Figure 3A, and 3B. This supports the accuracy of the photosimulation. However, the contrast between the turbines and clouds is such that it is difficult to see the turbines. While this may be technically accurate for the time of day the photograph was taken, it would be more appropriate if the turbines were made whiter as shown in the photosimulation Figure 2A. This seems more expeditious than requiring that the photograph be retaken to represent conditions for higher visual contrast.

Route 2, Island Falls—Viewpoint 4. This viewpoint is not a SRSNS.

Mattawamkeag Lake, Island Falls—Viewpoint 5. The scope and scale of Visualization 9 is very similar to the photosimulation in the VIA's Figure 5A. This supports the accuracy of the photosimulation.

2.7 Evaluation of Potential Scenic Impacts

Logically, the information about the project, surrounding area, and scenic resources' character and use should be presented first in a VIA. Then the scenic impact and whether it is Not Adverse, Adverse, or Unreasonably Adverse can be systematically evaluated by applying the Evaluation Criteria to what is presented about each scenic area and their views of the proposed development.

Essentially, this is what the *Section 30: Visual Impact of a Generation Facility* has done.

1. **Context.** The existing character of the surrounding area and the context of the proposed activity. (35-A MRSA § 3452.3.B and 3452.3.D).
2. **Significance.** The significance of the potentially affected scenic resource of state or national significance (§ 3452.3.A).
3. **Public Uses.** The extent, nature and duration of potentially affected public uses of the scenic resource of state or national significance. (§ 3452.3.E).

4. **Viewer Expectations.** The expectations of the typical viewer who would be using or enjoying the scenic resource of state or national significance. (§ 3452.3.C).
5. **Project Impact.** The scope and scale of the potential effect of views of the Project on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance, and the effect of prominent features of the development on the landscape. (§ 3452.3.F).
6. **Potential Effect on Public Use.** The potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance. (§ 3452.3.E).
7. **Overall Scenic Impact.** A determination of whether the development significantly compromises views from a scenic resource of state or national significance such that the development has an unreasonable adverse effect on the scenic character or existing uses related to scenic character of the scenic resource of state or national significance. (§ 3452.1). (TJDA 2011a, page 13).

The VIA evaluates all of the fourteen SRSNSs within 8 miles of the proposed turbines. The four sites listed on the National Register of Historic Places listed in Table 1 are not SRSNSs because they are all privately owned and the public does not have a legal right of access. In addition, during the field investigation it was determined that the only one of these four sites with potential views of turbines was the Oakfield Grange.

2.7.1 Pleasant Lake

Context and Character: The lake's location, size (1,832 acres), land cover (mixed forest), topography (low-lying hills and mountains create a varied horizon line), and level of development (approximately 150 camps and year-round homes) are stated. The direction of the most prominent feature is identified (Outlet Mountain at the far eastern end of the lake). The closest turbines are approximately a mile away.

Significance: Pleasant Lake is listed as a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987).⁵ The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine's Unorganized Towns* (Jones 1986).

A rating of 20 is the lowest a lake can receive and still be considered a significant scenic resource.

The VIA also indicates that Pleasant Lake has been assigned a Management Class of 7 by LURC. Pleasant Lake is not identified for protection as a remote lake.

⁵ The VIA is in error when it describes only half of Pleasant Lake being a SRSNS. *Maine's Finest Lakes*, the study of lakes in the organized townships states that "lakes that are located wholly or partially in unorganized townships are not included. For a summary of findings on these lakes see *Maine Wildlands Lake Assessment: Findings* (June 1, 1987)" (Parkin et al. 1989, page 221).

Scenic Attributes	Rating for Pleasant Lake
Relief (30)	None (0)
Physical features (25)	Med (15)
Shore configuration (15)	Low (5)
Vegetation diversity (15)	None (0)
Special features (15)	Med (10)
Inharmonious development (-20)	High (-10)
Total (100)	20

Public Use: Pleasant Lake has a public motorboat launch. Typical uses include “boating, fishing, ice fishing, camping, swimming, snowmobiling, and seasonal camps.” The owner of a campground with cottages on the lake “estimates that on a busy day there may be two dozen boats on the five-mile long lake” (TJDA 2011a, page 16). There are no formal statistics on the extent, nature, and duration of uses on Pleasant Lake.

Viewer Expectations: There are no data about viewer expectation, but they are assumed to be “moderate to high” (TJDA 2011a, page 17).

Project Impact: Panoramic simulations, including eight single-frame enlargements are prepared for three viewpoints on Pleasant Lake. The closest turbines will be 2.2 to 2.5 miles away, and the hubs of up to 20 turbines will be visible from most of the lake. It is asserted that “while several of the turbines will be highly visible... none of the will dominate the landforms that line the lake or the sky backdrop” (TJDA 2011a, page 17).

Potential Effect on Public Use: It is noted that most of the camps are on the lake’s northern shore where they will not have views to the turbines. In addition, it is thought that people do not go fishing or motor boating to primarily look at the scenery. Finally, “public use levels appear to be dropping as a result of changing demographics and other factors,” the implication being that this reduces the importance of the visual impact because there are fewer viewers (TJDA 2011a, page 18).

Overall Scenic Impact. “The visual impact of the amended layout will be somewhat greater than the impact of the original turbine layout that was approved by DEP due to the additional visible turbines,” and one might add the increased size of the turbines. In addition, “the closest turbines are now generally more screened from view by surrounding hills” because of changes in siting. It is concluded that the scenic impact is “Low tending toward Medium” and not unreasonably adverse (TJDA 2011a, page 18).

2.7.2 Mattawamkeag Lake

Context and Character: Mattawamkeag Lake is two large basins, the Upper and Lower lakes, that are managed as a single lake. The lake’s location, size (3,330 acres), land cover (mixed forest), topography (low-lying hills create a relatively flat horizon line), and level of development (approximately 50 camps on the northeastern side of the upper lake, and a

scattering of camps on the remainder of the lake) are stated. There are no prominent landscape features other than the lake itself.

Significance: Mattawamkeag Lake is listed as a significant scenic resource in the *Maine Wildlands Lake Assessment* (Giffen et al. 1987). The VIA also describes the attribute ratings from the *Scenic Lakes Character Evaluation in Maine's Unorganized Towns* (Jones 1986).

Scenic Attributes	Rating for Duck Lake
Relief (30)	None (0)
Physical features (25)	Med (15)
Shore configuration (15)	High (15)
Vegetation diversity (15)	Low (5)
Special features (15)	None (0)
Inharmonious development (-20)	Medium (-5)
Total (100)	30

The VIA also indicates that Mattawamkeag Lake has been assigned a Management Class of 7 by LURC. Mattawamkeag Lake is not identified for protection as a remote lake.

Public Use: Mattawamkeag Lake has a public motorboat launch and an informal put-in at Sandy Cove. Typical uses include “boating, canoeing, fishing, hunting, ice fishing, camping, swimming, snowmobiling, and seasonal camps.” (TJDA 2011a, page 21). There are no formal statistics on the extent, nature, and duration of uses on Mattawamkeag Lake.

Viewer Expectations: There are no data about viewer expectation, but they are assumed to be “moderate to high” (TJDA 2011a, page 21).

Project Impact: Turbines will be visible from about 10 percent of Upper Mattawamkeag Lake; and 80 percent of Lower Mattawamkeag lake. A panoramic photosimulation, including two single-frame enlargements are prepared for one viewpoint on western shore of Lower Mattawamkeag Lake. At this point approximately 10 turbines will be visible from 5.1 to 6.6 miles away. A more suitable location might have been anywhere from 750 to 4,500 feet south along the shore, where 25 to 28 turbines will be visible.

Potential Effect on Public Use: It is noted that “views of up to 30± turbines on the horizon at distances of over 2.7 to 8.0 miles will have a moderate to strong effect on the scenic character of Mattawamkeag Lake” (TJDA 2011a, page 22). However, it is noted that people do not go fishing or motor boating to primarily look at the scenery.

Overall Scenic Impact. “The project should not have an unreasonable adverse effect on its scenic character or the uses related to the scenic character of the lake.” The overall scenic impact to Upper Mattawamkeag Lake will be “Minimal to Low” and on Lower Mattawamkeag Lake it will be “Medium tending to High” (TJDA 2011a, page 22).

2.7.3 Associated Facilities

Except for the generator lead line, the associated facilities (i.e., O&M building, access roads, crane paths and turbine pads) have little possibility of being seen from any SRSNS or other public area. It is therefore concluded that "The associated facilities will not have an unreasonable adverse effect on scenic character and existing uses" (TJDA 2011a, page 24). However, it is noted that the met towers and the generator lead line do have the potential to be visible from public locations.

Met towers. The met towers are tall, but only 18 inches wide and built with a lattice construction. As a result "Their slim profile and light color will greatly reduce their visibility at distances greater than one mile" (TJDA 2011a, page 24). There is no discussion of the visibility of the FAA warning lights, which may be visible from those SRSNS locations where turbine hubs will be visible.

Generator lead line. There is no attempt to evaluate the generator lead line according to the Wind Energy Act's criteria. As a result, there is no attempt to identify SRSNSs within 3 miles of the generator lead line.

A separate VIA using DEP's traditional evaluation procedures is prepared for the generator lead line (TJDA 2011b). This VIA does not include a project location map, though it does provide a verbal description of the route. The generator lead line will be carried primarily on 70± foot-tall single pole structures. For most of its length it parallels an existing power line that uses an H-frame structure. In most locations there will be a buffer of trees between the two cleared rights-of-ways. Because of the relatively flat topography, the generator lead line will not normally be visible except at road or river crossings. In both of these cases, woody vegetation will be established that is not capable of growing into the conductor safety zone. No scenic resources are identified with views of the generator lead line. The conclusion is "that the applicant has made adequate provision for fitting the generator lead line harmoniously into the existing natural environment and that the development will not adversely affect the scenic character in the municipalities that it traverses or the neighboring municipalities" (TJDA 2011b, page 10).

2.7.4 Evaluation Summary and Conclusions

Sections 7.0 and 8.0 of the VIA summarize the impacts described above. Though the Oakfield Grange is not discussed in detail, it is shown as receiving a low impact. The conclusion is that "the MDEP determined the scenic impact of the original layout was acceptable under the criteria established by the Maine Wind Energy Act. Although the amendment results in greater impacts to each of the scenic areas of state or national significance, the impacts are incremental and are generally not significantly greater in terms of the scale and magnitude of Project visibility" (TJDA 2011a, page 26). As a result, the scenic impacts will not be unreasonably adverse.

2.7.5 Concluding Comment about the Adequacy Review

The adequacy review has only identified five possible shortcomings.

1. There is no consideration of scenic impacts from FAA night-time warning lights on the wind turbines.

2. The potential visual impact from FAA night-time warning lights on the met tower may be sufficient to require that they also be evaluated using DEP's traditional criteria (38 MRSA, § 484, sub-§3) as described by the Wind Energy Act (35-A MRSA, § 3452, sub-§2). It is unclear how and when DEP would make this decision.
3. It appears that the public does not have a legal right of access to any of the four sites listed on the National Register of Historic Places, and as a result they cannot be considered SRSNSs (35-A MRSA, § 3452, sub-§3). Formal documentation should be presented verifying that this is so.
4. The whole of Pleasant Lake is a SRSNS, not just half of it. DEP recognizes and accepts the resource assessments in *Maine Wildlands Lakes Assessment* (Parkin et al. 1989, page 221).
5. There is the inclusion of information that the Wind Energy Act directs DEP not to consider, namely Photosimulation 4 from Route 2, Island Falls. This viewpoint is not from a SRSNS (35-A MRSA, § 3451, sub-§9).

However these are relatively minor shortcomings and the visual impact assessment for the Oakfield Wind Project is generally of high quality.

3. Field Review and Additional Analysis

This section of the review presents my independent analysis of the potential scenic impacts that may be caused by the Oakfield Wind Project. The analysis may not be as thorough as a complete VIA. Its primary purpose is to present the analysis that was used to conduct the assessment of the VIA's adequacy, and to share any additional analyses that were pursued.

3.1 Determination of the Area of Potential Effects and Scenic Resources of State or National Significance

Area of Potential Effects (APE). The VIA must evaluate potential scenic impacts to all SRSNSs within 3 miles of generating facilities (i.e., turbines and transmission line) and an unspecified distance from associated facilities. The permitting authority may require within 30 days of its acceptance of the application as complete for processing the evaluation of potential scenic impacts to SRSNSs within 8 miles of generating facilities. It may also require within the 30 day period the evaluation of scenic impacts from associated facilities (e.g., buildings, access roads, generator lead lines, and substations) using the "traditional" approach applied to non-wind energy projects.

In practice, no one has requested that the APE be extended to 8 miles from the wind turbines, but all VIAs have used the 8-mile APE. Typically, the associated facilities have not explicitly effected determination of the APE because they were well within the 8-mile APE. However, the 59-mile Oakfield generator lead line raises the question of it should be evaluated under the Wind Energy Act. T.J. DeWan and Associates sidestepped this issue by deciding to use DEP's traditional criteria for evaluating visual impacts (38 MRSA, § 484, sub-§3). In particular the *MDEP Visual Evaluation Field Survey Checklist* (NRPA, 38 M.R.S.A. §§ 480 A-Z) focuses attention on scenic resources significantly closer than 3 miles of a proposed project. It is unclear whether all SRSNSs within 3 miles (and possibly 8 miles) of the associated facilities need to be identified.

However, it does not appear that there are any SRSNSs within 3 miles of the generator lead line that were not identified by the generator lead line VIA (TJDA 2011b).

Scenic Resources of State or National Significance. The VIA correctly identifies the potential SRSNSs under the Wind Energy Act. There are only two SRSNSs:

1. Pleasant Lake
2. Mattawamkeag Lake (Upper and Lower)

The VIA indicates that only the eastern half of Pleasant Lake is a SRSNS, but this is in error; all of the lake is an SRSNS.⁶

⁶ The VIA is in error when it describes only half of Pleasant Lake being a SRSNS. *Maine's Finest Lakes*, the study of lakes in the organized townships states that "lakes that are located wholly or partially in unorganized townships are not included. For a summary of findings on these lakes see *Maine Wildlands Lake Assessment: Findings* (June 1, 1987)" (Parkin et al. 1989, page 221).

The four historic sites listed on the National Register of Historic Places do not qualify as SRSNSs because they are all privately owned and the public does not appear to have a legal right of access (Mitchell 2011). A fifth site, Bible Point State Historic Site has been raised by members of the public. However this site is not listed on the National Register of Historic Places.

3.2 Visibility Analysis

Visibility analysis determines whether a line-of-sight exists between two specified points. Typically a geographic information system (GIS) is used to map the viewshed from which specified targets are visible. In principle this is an objective exercise in geometry highly suited to a computer application. In practice however, since the data are only approximations of the actual condition and may include errors or require assumptions, the resulting viewshed maps are best considered a preliminary analysis of potential visibility under simplified conditions. The maps are useful for providing a preliminary investigation of the overall potential visual impact, and particularly for comparing alternatives. If potential visual impacts appear to exist for significant scenic resources, they need to be confirmed through field investigation and other visualization techniques.

For this review, visibility analyses were performed using ArcGIS 10 software (ESRI 2010). The digital data were provided by Stantec Consulting (2011), and it appears to have been resampled to a 14.4-foot raster. The analysis procedure is relatively standardized, though analysts can reasonably make different assumptions about the analysis variables, and the results can be presented in a variety of ways.

In addition to investigating visibility limited only by landform, the VIA conducted a vegetated viewshed analysis that assigned a height of 40 feet to deciduous, evergreen and mixed forest cover types. No height is assigned to forested wetlands, forested areas harvested since 1995, or areas dominated by shrub-scrub vegetation. Forty feet is commonly used by professionals in the northeast as a conservative, but reasonable forest canopy height in a visibility analysis.

Visibility of the Oakfield Wind Project. The eight viewshed maps prepared to investigate several issues associated with the Oakfield Wind Project are included in Appendix 2. The first two maps investigate the greatest possible area from which a part of any turbine could possibly be visible. In this case it is an upraised blade tip 459 feet (140 meters) above the ground. Three different constraints on visibility are considered: (1) just bare topography and (2) topography with forest cover. The resulting viewshed maps are:

Map 1: Topographic Viewshed for Blade Tip

Map 2: Forested Viewshed for Blade Tip

While there may be a line-of-sight to just an upraised blade tip, it may not be noticeable and would never be visually dominant. Therefore another analysis investigates the area from which a significant portion of a turbine could possibly be visible. In this case it is visibility of the turbine hub, located 276 feet (84 meters) above the ground. The same three constraints on visibility resulted in the following viewshed maps:

Map 3: Topographic Viewshed for Turbine Hub

Map 4: Forested Viewshed for Turbine Hub

There has been a growing concern about the visibility of the FAA warning lights at night. Therefore a analysis investigates the area from which the FAA warning lights mounted on turbine could possibly be visible. The 33 turbines that are involved are located on the FAA lighting plan, which is the last map in the VIA (TJDA 2011a). Based on information in the online brochure for the Vestas V112—3.0 MW turbine (Vestas) 2009), the light is approximately 294 feet (89.7 meters) above the ground:

Map 5: Topographic Viewshed for Turbine Warning Lights

Map 6: Forested Viewshed for Turbine Warning Lights

A similar analysis was conducted for the FAA warning lights mounted on the met towers. In this case there are eight potential met tower locations, though only up to five will be used. The analysis was conducted using all eight potential sites. The warning light was located at 276 feet (84 meters) above the ground.

Map 7: Topographic Viewshed for Met Tower Warning Lights

Map 8: Forested Viewshed for Met Tower Warning Lights

All eight maps are included in Appendix 2 of this review.

Visual inspection indicates that this review's topographic viewshed of blade tips is similar to the VIA's (TJDA 2011a) Topographic Viewshed Map, and that this review's forested viewshed map of blade tips is similar to the VIA's Topographic and Landcover Viewshed Map for Blade Tip. However, the maps from the VIA include turbines that are further away from the viewer than 8 miles. For instance look at the southeastern part of the study area. The VIA's Topographic Viewshed Map, shows that there are potentially 38 to 50 visible turbines right up to the 8 mile study area boundary. However, the Wind Energy Act specifies that "the effects of portions of the development's generating facilities located more than 8 miles, measured horizontally, from a scenic resource of state or national significance" are "insignificant."⁷ If the 8-mile threshold is incorporated into the analysis, then the edges of the viewshed map will appear "feathered" as turbines drop out of range for consideration as having a significant scenic impact, as seen in the viewshed maps prepared for this review.

It is important to remember that the primary purpose of these visibility maps is to inform and guide the field investigation. For instance, any SRSNS outside the area of topographic visibility need not be surveyed for visual effects from the proposed project and Maine Historic Preservation Commission has agreed to this for potential historic resources (Mohny 2011). **This guidance to only evaluate state or nationally significant scenic resources with potential views of a turbine tip as indicated by the topographic visibility analysis is reasonable and should be adopted by others.**

It is frequently argued that accounting for the screening effect of forest cover provides a more realistic assessment of a wind project's visibility. Such an analysis is useful for identifying "worst case" viewpoints. However, it is important not to use these results as the primary evaluation tool.

⁷ 35-A MRSA, § 3452, § 3

Potentially “worst case” viewpoints at all SRSNSs need to be investigated in the field, and also should be investigated through geometrically accurate visual simulations and perhaps cross sections that include tree heights measured in the field.

3.3 ArcScene Visualizations

This review used ArcScene, the perspective representation tool from the GIS program ArcMap, to construct visualizations from the same viewpoints and camera lens as T.J. DeWan and Associates used to create their photosimulations. These visualizations are primarily used to evaluate the reasonableness with which the photosimulations are representing the “scope and scale of the potential effect of view of the generating facilities on the scenic resource of state or national significance.”⁸ When considering the scene represented by the visualizations, it is important to remember that the forest canopy is set to only 40 feet, though mature trees could be 20 to 30 feet taller. In the absence of field data about tree height, it is generally accepted to use this lower value. In addition, only areas of upland forest cover are represented; there are other areas that may also have trees of varying density and heights, including forested wetlands and areas harvested after 1995. Some of these limitations become apparent when one compares the visualization to the photograph used in the photosimulation. In particular, shoreline vegetation may obscure more of the view than is represented by the visualizations. These visualizations are presented in Appendix 3 at the end of this review. Additional information about the visualizations and photosimulations can be found in section 2.5 Visual Simulations.

3.4 Field Review

A field review of the Oakfield Wind Project was conducted on Thursday August 25 and Friday August 26, 2011. In addition to James Palmer, the party included Terry DeWan (TJDA). The purposes of the fieldwork included:

- Verification that the VIA presents a reasonable characterization of the landscape condition, particularly from state or nationally significant scenic resources.
- Verification that the visibility analysis maps are reasonably accurate and that the viewpoints used for the photosimulations are both reasonable and from the locations reported in the VIA.
- Verify that the topography through with the generator lead line is routed is sufficiently flat that it will have very limited visibility from publicly accessible places.
- Identify the existence of any particularly sensitive state or nationally significant scenic resources not discussed in the VIA.

In general, the fieldwork found the visibility maps and photosimulations to be reasonable representations of the existing visible conditions and what the visible conditions will be if the project is built as proposed. While our length of our observation was limited, it seems clear that neither lake is heavily used.

4. Evaluation of Scenic Impacts

4.1 Evaluation Criteria

⁸ 35-A MRSA, § 3452, sub-§3(F)

Six places were identified as potential state or nationally significant scenic resources under the Wind Energy Act criteria. This section evaluates the scenic impact to these resources based on my understanding of the Wind Energy Act's scenic impact Evaluation Criteria.⁹

- A **Significance of resource:** Consider the role of scenic quality in the designation, and the level of significance relative to similar designations. Indicators may be obtained from the designation reports or forms, supplemented by descriptions from widely used guide books.
- B **Character of surrounding area:** Describe the landscape visible from the scenic resource and how it may be experienced by the viewer. Consider contrasts within the existing landscape and the presence of other contrasting elements. User surveys may provide a direct measure of the existing scenic quality. This may also be based on a descriptive landscape characterization, typically prepared by a landscape professional. Apparent ROS class may also be an appropriate indicator.
- C **Typical viewer expectation:** Consider the resource's scenic reputation for the most common activities, and the centrality of scenic quality to the typical user's experience. User surveys may provide an indicator of expectations. In the absence of direct empirical data, distance traveled or descriptions from widely used guide books may provide alternative indicators:
- D **Development's purpose and context:** This criterion incorporates the Wind Energy Act's goal of achieving significant wind energy development into the Evaluation Criteria for scenic impacts. Consider site quality—wind suitability, proximity to transmission line, and potential power generation if all potential turbine sites in the area are used. Low evaluation means that if all sites in the area are developed, it makes a major contribution to Wind Energy Act's goals or contributes to reducing wind energy sprawl (i.e., a lower contribution to overall scenic impact). High evaluation means the area makes a minor contribution when all potential sites are developed or significantly increases wind turbine sprawl (i.e., a higher contribution to overall scenic impact).
- E.1 **Extent, nature and duration of uses:** Consider the number of users, role of scenic quality in use of the resource, and typical length of stay. User surveys provide the most direct indicators, but trail logs or traffic counters may also be useful. Potential accessibility may be an indicator in the absence of empirical data. Apparent ROS may be used to determine the appropriate intensity of use (Hass et al. 2004, USDA 1982).
- E.2 **Effect on continued use and enjoyment:** If the project were built, what is the likelihood of users returning, and the impact on their enjoyment of the scenic resource? User surveys incorporation accurate photographic visual simulations may provide indicators.

⁹ 35-A MRS, § 3452, sub-§3

- F Scope and scale of project views:** Consider the number of visible project elements, their relative magnitude, and the proportion of total angle of view occupied by the project. Accurate photographic simulations and visibility analyses may provide indicators.

The levels of severity for the Evaluation Criteria are as follows:

- **None.** The Evaluation Criterion makes no contribution to scenic impact. For some criteria a rating of None means that there is No Adverse Impact (e.g., there are no people present at possible viewpoints—Criterion E, or the project is not visible—Criterion F).
- **Low.** The severity of the contribution is low. While the scenic impact may be Adverse, it appears to be within the acceptable range for any type of development (e.g., only one or two turbines will be partially visible at a distance of nearly 8 miles—Criterion F).
- **Medium.** The severity of the contribution is medium, which is Adverse but typical of wind energy development, and within the range of impacts that the Wind Energy Act anticipates (e.g., other towers or large scale structures are present that contrast highly with the surrounding landscape).
- **High.** The severity of the contribution is high from this criterion, which in association with other criteria may make the overall scenic impact Unreasonably Adverse (e.g., a possible scenario suggesting an Unreasonable Adverse impact might be that the scenic resource is a national icon—Criterion A is High, though there are only modest numbers of viewers—Criteria E.1 is Low, and to a person their enjoyment will seriously decline—Criteria E.2 is High).

The Evaluation Criteria for each of the state or nationally significant scenic resources are discussed below, and summarizes in Table 2 the Evaluation Criteria ratings for the Oakfield Wind Project. The VIA has employed a very similar approach using slightly different criteria to summarizing the impacts to the state and nationally significant scenic resources (LandWorks 2011, pages 34-40).

4.2 William Sewall House, Main Street, Island Falls

This site, which is listed on the National Register of Historic Places is privately owned and the public does not appear to have a legal right of access.

4.3 Island Falls Opera House, Patten Road and Sewall Street, Island Falls

This site, which is listed on the National Register of Historic Places is privately owned and the public does not appear to have a legal right of access.

4.4 Oakfield Station

This site, which is listed on the National Register of Historic Places is privately owned and the public does not appear to have a legal right of access.

4.5 Oakfield Grange No. 414

This site, which is listed on the National Register of Historic Places is privately owned and the public does not appear to have a legal right of access.

4.6 Pleasant Lake

Criterion A: Significance of resource. This is a scenic resource of statewide significance. In the *Scenic Lakes Character Evaluation in Maine's Unorganized Towns*, it received a score of 20, the lowest score possible for a significant scenic resource. While there are a great number of residences along its shoreline, they are generally screened by vegetation. Its rating is Low.

Criterion B: Character of surrounding area. This is a medium sized lake¹⁰ surrounded by low-lying hills covered with a mixed forest. Views from on the lake are in all directions. While topographic relief is evident along the horizon line, there does not appear to be any clearly dominant feature visible from the lake, such as a near-by mountain with a distinctive form. There is active forest management within this general area. There are approximately 150 camps or full size homes; generally they are partially screened by trees.¹¹ LURC has assigned Pleasant Lake to Lake Management Class 7, meaning that it will be managed for multiple uses. Because of its Lake Management Class, the moderate density of well screened homes, docks and a public boat launch, the probable WROS class for the lake is Rural Natural or Rural Developed Setting.¹² The rating is Low to Medium.

Criterion C: Typical viewer expectation. There are no existing data to directly address this criterion.¹³ An alternative approach is to apply deductive reasoning to respond to this criterion using common knowledge and assumptions. Because it is not empirically grounded, it may not be valid or reliable.

This lake and the surrounding area are not a well-known scenic or recreation destination in Maine. While it is somewhat developed, one suspects that people come to their camps to get away and be closer to nature. However, nothing in this assumption suggests that the scenic expectations would be high. The most common activity appears to be fishing perhaps accompanied by boating, followed by paddling, hiking, and camping. There is some evidence that scenic quality may be less important to people engaged in fishing or motor boating as compared to those hiking or paddling (Palmer 1999). Its rating is Medium.

¹⁰ The *Scenic Lakes Evaluation for the Unorganized Towns in Maine*. (Jones 1986, pages 2 and 14) defines a small lake as being less than 500 acres, a medium sized lake as between 500 and 1,999 acres, and a large lake as larger than 2,000 acres.

¹¹ Reported in the VIA on page 26 and Exhibit 5: Photo Inventory. "Structures were identified by Stantec based on the 2009 NAIP imagery for Penobscot and Washington counties as well as the 24K USGS quads, and LURC parcel maps."

¹² Recreation Opportunity Spectrum (ROS) was used to help describe how Plum Creek's proposed concept plan might change the character of the Moosehead Lake region. Hass, et al. (2004) developed a guidebook to apply the ROS to water-based recreation resources. The WROS class suggested here is of a preliminary nature, since a WROS study has not been conducted.

¹³ The Telephone Survey cannot be used for this criterion because a nonprobability sampling procedure was used, therefore the data cannot be generalized beyond the specific 191 respondents (Portland Research Group 2011a).

Criterion D: Development's purpose and context. At 150 MW, the Oakfield Wind Project will make a substantial contribution to Maine's wind energy goal. Therefore the rating for this criterion is Low (meaning that it provides a significant counter balance to scenic impacts and that as a large project, it reduces the cumulative impact of wind development sprawl that would significantly affect the state's overall scenic quality).

Criterion E.1: Extent, nature and duration of uses. This is unknown. However, a the owner of a campground on the lake indicated that usage was low and seeing as many as a dozen boats would be unusual. This translates into 150 boats per acre, which is very low use, even for a Rural Natural WROS Class lake (Hass et al. 2004, page 94). The rating is Low.

Criterion E.2: Effect on continued use and enjoyment. This is unknown for the Oakfield Wind Project. However, we can apply indirect evidence and deductive reasoning to respond to this criterion.

To date surveys of hikers have found that proposed grid-scale wind projects in Maine will have a slightly negative effect on their recreation enjoyment, though it will not significantly affect the likelihood they will return. One survey investigated the effect on water-based activities. It found that the Bull Hill wind turbines would have no effect on respondents' likelihood of returning to Donnell Pond¹⁴ for water activities such as boating, paddling, swimming or fishing, and it is likely to be similar here (Robertson and MacBride 2010). Respondents were not asked about its effect on enjoyment. In addition, fishing is anticipated to be the primary use and Palmer (1999) found that fishing was an activity where people did not appear to place as high a value on scenic quality as people who hiked or paddled. It is assumed that the effect on continued use and enjoyment is Low.

Criterion F: Scope and scale of project views. Views toward the Oakfield Wind Project are to the northeast. The nearest visible turbine is 2.4 miles from photosimulation viewpoint 1, 2.2 miles from viewpoint 2, and 3.2 miles from viewpoint 3. The forested viewshed analysis indicates that as many as 19 turbine hubs plus 15 blade tips potentially will be visible from the lake's southern shore; the only areas without turbine visibility are close to the northern shore, in the visual shadow of the shoreline vegetation.

The photosimulation and visualization from viewpoint 1 show 20 turbines on the horizon that occupy a horizontal arc of about 68° (60° if one does not count the blade tip on the right side). The simulation from viewpoint 2 shows 24 turbines spanning an arc of 69°, and from viewpoint 3 the 9 turbines span 31°. To put this in perspective, the "visual angle of the width of the thumb held at arm's length is about 2 degrees" (O'Shea 1991). If the fingers and thumbs of both hands were held side-by-side at arm's length with the palms facing outward it would be span approximately 20°. While a visual angle of 60° is clearly large, it is not sufficient to create a sense of being surrounded by turbines. In addition, the turbines will be too far away to give a sense of "looming" over users of the lake. However they will have a very significant visual presence, and several turbines or hubs will be visible from most areas of the lake.

¹⁴ Donnell Pond is identified a significant scenic resource in the *Maine Wildlands Lake Study*. It is adjacent to the Donnell Pond Unit Maine Reserved Land which is designated as a significant scenic resource (Maine DOC 2009a)

At night, FAA warning lights will be visible from the much of Pleasant Lake's surface and shoreline. Based on an assessment of the visualizations, lights on 10 turbines and 2 met towers may be visible from viewpoint 1, 8 turbine and two met tower lights at viewpoint 2, and 7 turbine and 2 met towers at viewpoint 3.¹⁵ A viewer that can see the lights looking over Pleasant Lake may also see them reflected as "pillars" on the surface of the water.

The rating for scope and scale is Medium to High.

Overall scenic impact. The turbines will have a significant visual presence above the horizon line from almost all of Pleasant Lake, including as close as 2.2 miles. It is anticipated that there is a only a very modest level of recreation use on Pleasant Lake. However scenic quality is not generally thought to be central to the types of activities that are expected to be most common—fishing, boating and swimming. Therefore the Overall Scenic Impact is set at Medium.

4.7 Mattawamkeag Lake

Criterion A: Significance of resource. This is a scenic resource of statewide significance. In the *Scenic Lakes Character Evaluation in Maine's Unorganized Towns*, it received a score of 30. Its rating is Low to Medium.

Criterion B: Character of surrounding area. This is a large sized lake¹⁶ surrounded by low-lying hills covered with a mixed forest. Views from on the lake are in all directions. And the horizon line is relatively flat and uniform. There does not appear to be any clearly dominant feature visible from the lake, such as a near-by mountain with a distinctive form. Big Island is in the middle of the lake and contributes to the sense of spatially interest. Even so, there is a feeling of spaciousness on this lake. There is active forest management within this general area. There are more than 50 camps or full size homes, primarily along the northeastern shore; generally they are partially screened by trees.¹⁷ LURC has assigned Mattawamkeag Lake to Lake Management Class 7, meaning that it will be managed for multiple uses. Because of its Lake Management Class, the lower density of well screened homes, docks and a public boat launch, the probable WROS class for the lake is Rural Natural Setting.¹⁸ The rating is Low to Medium.

Criterion C: Typical viewer expectation. There are no existing data to directly address this criterion.¹⁹ An alternative approach is to apply deductive reasoning to respond to this criterion

¹⁵ Up to 5 permanent met towers are to be installed at 8 possible sites. All 8 sites were used in the analysis, even though it is not known which will be used.

¹⁶ The *Scenic Lakes Evaluation for the Unorganized Towns in Maine*. (Jones 1986, pages 2 and 14) defines a small lake as being less than 500 acres, a medium sized lake as between 500 and 1,999 acres, and a large lake as larger than 2,000 acres.

¹⁷ Reported in the VIA on page 26 and Exhibit 5: Photo Inventory. "Structures were identified by Stantec based on the 2009 NAIP imagery for Penobscot and Washington counties as well as the 24K USGS quads, and LURC parcel maps."

¹⁸ Recreation Opportunity Spectrum (ROS) was used to help describe how Plum Creek's proposed concept plan might change the character of the Moosehead Lake region. Hass, et al. (2004) developed a guidebook to apply the ROS to water-based recreation resources. The WROS class suggested here is of a preliminary nature, since a WROS study has not been conducted.

¹⁹ The Telephone Survey cannot be used for this criterion because a nonprobability sampling procedure was used, therefore the data cannot be generalized beyond the specific 191 respondents (Portland Research Group 2011a).

using common knowledge and assumptions. Because it is not empirically grounded, it may not be valid or reliable.

This lake and the surrounding area are not a well-known scenic or recreation destination in Maine. While it is somewhat developed, one suspects that people come to their camps to get away and be closer to nature. However, nothing in this assumption suggests that the scenic expectations would be high. The most common activity appears to be fishing perhaps accompanied by boating, followed by paddling, hiking, and camping. There is some evidence that scenic quality may be less important to people engaged in fishing or motor boating as compared to those hiking or paddling (Palmer 1999). Its rating is Medium.

Criterion D: Development's purpose and context. At 150 MW, the Oakfield Wind Project will make a substantial contribution to Maine's wind energy goal. Therefore the rating for this criterion is Low (meaning that it provides a significant counter balance to scenic impacts and that as a large project, it reduces the cumulative impact of wind development sprawl that would significantly affect the state's overall scenic quality).

Criterion E.1: Extent, nature and duration of uses. This is unknown. However, a discussion with a former town council member and year-round resident on the lake indicated that usage was low and seeing as many as a dozen boats would be unusual. This translates into 277 boats per acre, which is very low use, even for a Rural Natural WROS Class lake (Hass et al. 2004, page 94). The rating is Low.

Criterion E.2: Effect on continued use and enjoyment. This is unknown for the Oakfield Wind Project. However, we can apply indirect evidence and deductive reasoning to respond to this criterion.

To date surveys of hikers have found that proposed grid-scale wind projects in Maine will have a slightly negative effect on their recreation enjoyment, though it will not significantly affect the likelihood they will return. One survey investigated the effect on water-based activities. It found that the Bull Hill wind turbines would have no effect on respondents' likelihood of returning to Donnell Pond²⁰ for water activities such as boating, paddling, swimming or fishing, and it is likely to be similar here (Robertson and MacBride 2010). Respondents were not asked about its effect on enjoyment. In addition, fishing is anticipated to be the primary use and Palmer (1999) found that fishing was an activity where people did not appear to place as high a value on scenic quality as people who hiked or paddled. It is assumed that the effect on continued use and enjoyment is Low.

Criterion F: Scope and scale of project views. Views toward the Oakfield Wind Project are to the northeast. The nearest visible turbine from the Mattawamkeag Lake photosimulation is 5.1 miles and elsewhere on the lake there may be turbines visible as close as 3.2 miles. More turbines would have been visible if the photosimulation viewpoint were moved less than half a mile to the south, but it does accurately represent the scale of the turbines seen from this distance. The forested viewshed analysis indicates that as many as 26 turbine hubs plus 10

²⁰ Donnell Pond is identified a significant scenic resource in the *Maine Wildlands Lake Study*. It is adjacent to the Donnell Pond Unit Maine Reserved Land which is designated as a significant scenic resource (Maine DOC 2009a)

additional blade tips potentially will be visible from the lake's western bay. Turbines will be visible from over half of the lake, though they will be too distant to create the feeling that they are "looming" over users of the lake. There are patches around the lake without visibility because of the vegetation of the island, a peninsula or the northern shoreline.

The photosimulation and visualization show 24 turbines on the horizon that occupy a horizontal arc of about 15°. To put this in perspective, the "visual angle of the width of the thumb held at arm's length is about 2 degrees" (O'Shea 1991). This is a bit less than the area that would be blocked if the fingers (with the thumbs tucked into the palm) of both hands were held side-by-side at arm's length with the palms facing outward. The turbines will have a significant visual presence, and several turbines or hubs will be visible from most areas of the lake.

At night, FAA warning lights will be visible from the much of Mattawamkeag Lake's surface and shoreline. Based on an assessment of the visualization, lights on 7 turbines and 2 met towers may be visible from viewpoint 5.²¹ A viewer that can see the lights looking over Mattawamkeag Lake may also see them reflected as "pillars" on the surface of the water.

The rating for scope and scale is Medium.

Overall scenic impact. The turbines will have a significant visual presence above the horizon line from approximately two-thirds of Mattawamkeag Lake, including as close as 3.2 miles. It is anticipated that recreation use on Mattawamkeag Lake is very low. In addition, scenic quality is not generally thought to be central to the types of activities that are expected to be most common—fishing, boating and swimming. Therefore the Overall Scenic Impact is set at Low to Medium.

4.8 Summary of Impacts

Table 2 summarizes the above findings from applying the scenic impact evaluation criteria to the 7 resources identified within 8 miles of a turbine and possibly having state or national significance as a scenic resource.

²¹ Up to 5 permanent met towers are to be installed at 8 possible sites. All 8 sites were used in the analysis, even though it is not known which will be used.

Table 2. Summary of Evaluation Criteria Ratings for the Oakfield Wind Project

Scenic Resources of State or National Significance	Scenic Impact Evaluation Criteria										Overall Scenic Impact		
	A	B	C	D	E.1	E.2	F						
Historic Sites													
Bible Point State Historic Site	*	*	*	*	*	*	*	*	*	*	*	*	None
Island Falls Opera House	†	†	†	†	†	†	†	†	†	†	†	†	None
Oakfield Grange No. 414	†	†	†	†	†	†	†	†	†	†	†	†	None
Oakfield Station	†	†	†	†	†	†	†	†	†	†	†	†	None
William Sewall House	†	†	†	†	†	†	†	†	†	†	†	†	None
Great Ponds													
Pleasant Lake	Low	Low-Med	Med	Low	Med-High	Medium	Medium						
Mattawamkeag Lake	Low-Med	Low-Med	Medium	Low	Medium	Low-Med	Low-Med						

Notes: The Evaluation Criteria are: (A) Significance of resource, (B) Character of surrounding area, (C) Typical viewer expectation, (D) Development's purpose and context, (E.1) Extent, nature and duration of uses, (E.2) Effect on continued use and enjoyment, and (F) Scope and scale of project views.

* This historic site is not listed on the National Register of Historic Places, and is therefore not a scenic resource of state or national significance as defined by the Wind Energy Act (§ 3451 (9)).

† The public does not have a legal right of access to these sites listed on the national Register of Historic Places, and therefore they are not scenic resources of state or national significance as defined by the Wind Energy Act (§ 3451 (9)).

5. Summary and Conclusions

This review evaluates the adequacy of the VIA for the Oakfield Wind Project which includes *Section 30: Visual Impact of a Generation Facility* and the *Visual Impact Assessment: Proposed 115 KV Generator Lead Line, Chester to Oakfield* (TJDA 2011a and 2011b). Overall this VIA is accurate and clearly presented. Additional analyses were conducted for this review; including visibility mapping of turbines and FAA warning lights, fieldwork at each of the potential scenic resources of state or national significance, and visualizations at the photosimulation viewpoints.

The apparent scenic impact to the state and nationally significant scenic resources (SRSNSs) is Adverse at some locations but it is my judgment that the scenic impact to SRSNSs does not rise to the level of Unreasonably Adverse. I

Observations and recommendations. The preparation of this review has resulted in several observations and recommendations that are worth repeating.

1. There is real difficulty in obtaining existing information about the “extent, nature and duration of potentially affected public uses of scenic resources.” No attempt was made to gather original data about use of impacted SRSNS. **Future VIAs need to obtain or develop reasonable estimates of the extent, nature and duration of use for locations in significant scenic resources with potential views of wind energy development components.**
2. Nighttime visibility of FAA warning lights, particularly over open water where the lights may create a “pillar” reflection has become a topic of concern at public hearings for grid-scale wind energy projects in Maine. No analysis of this possible scenic impact is presented. **At a minimum, future VIAs need to prepare visibility maps for FAA warning lights mounted on turbines and permanent met towers. It may also be useful to present some form of visualization or photographs of existing FAA lights located in a similar manner to those considered in the VIA.**
3. The Wind Energy Act is unclear about how to evaluate Associated Facilities. For instance, must the Wind Energy Act’s procedures and criteria be applied before deciding whether to also apply the traditional DEP (or LURC) scenic impact assessment procedures? **Guidance needs to be provided developers about how to determine the area of potential effects for Associated Facilities and which scenic impact evaluation criteria to use.**
4. This VIA considered a 59-mile generator lead line. The field investigation verified that the structures and cleared right-of-way will seldom be visible from publicly accessible viewpoints. However, this does not excuse a fully documented assessment and evaluation of this and all other Associated Facilities. For instance, the VIA did not include a plan showing the generator lead line corridor, its relation to the existing power line, and the location of mitigation treatments. **Associated Facilities need to be thoroughly evaluated, and adequate documentation supporting the evaluation must be presented, including visibility maps and “worst case” photosimulations.**

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Appendix 1

**Maine's Wind Energy Act
and the Evaluation of Scenic Impacts**

Maine's Wind Energy Act and the Evaluation of Scenic Impacts

James F. Palmer

On April 18, 2008, Governor John Baldacci signed *An Act to Implement Recommendations of the Governor's Task Force on Wind Power Development* (the Wind Energy Act). It establishes a favorable State policy encouraging grid-scale wind energy development in appropriate locations. In particular, it designates a large portion of the state for expedited grid-scale wind energy development. While most environmental impacts are evaluated in the same manner as previously, special provisions are made for scenic impacts.

While the provisions of the Wind Energy Act can be viewed as an effort to simplify and clarify visual impact assessments, questions of interpretation still remain. There are several major determinations that effect how a visual impact assessment is to be conducted. This Q&A presents the Wind Energy Acts' approach to scenic impact evaluation.

What is the standard of scenic impact evaluation? The standard is "Unreasonably Adverse," and it only applies to views from significant scenic areas. "The primary siting authority shall determine...whether the development significantly compromises views from a scenic resource of state or national significance such that the development has an unreasonable adverse effect on the scenic character or existing uses related to scenic character of the scenic resource of state or national significance;"²² whether the development "fits harmoniously into the existing natural environment" is explicitly not required.²³

Is this standard applied to all proposed facilities? It is clear that this standard applies to "generating facilities"—turbines and transportation lines. However, there is the possibility of an exception for certain "associated facilities," making it somewhat less clear how to approach them.²⁴ Associated facilities include "elements of a wind energy development other than its generating facilities that are necessary to the proper operation and maintenance of the wind energy development, including but not limited to buildings, access roads, generator lead lines and substations."²⁵

"If the primary siting authority determines that application of the standard [unreasonably adverse, not harmonious fit] to the development may result in unreasonable adverse effects due to the scope, scale, location or other characteristics of the associated facilities"²⁶ then "the primary siting authority shall evaluate the effect of associated facilities of a wind energy development in terms of potential effects on scenic character and existing uses related to scenic character in accordance with Title 12, section 685-B, subsection 4, paragraph C or Title 38, section 484,

²² 35-A MRSA, § 3452, sub-§1

²³ 35-A MRSA, § 3452, sub-§1

²⁴ 35-A MRSA, § 3452, sub-§2

²⁵ 35-A MRSA, § 3451, sub-§1

²⁶ 35-A MRSA, § 3452, sub-§2

subsection 3, in the manner provided for development other than wind energy development.”²⁷

In other words, if the primary siting authority determines that there may be unreasonably adverse impacts under the Wind Energy Act’s standard due to the associated facilities, then they shall evaluate the associated facilities using the standards for non-wind projects. Further, “The primary siting authority shall make a determination pursuant to this subsection within 30 days of its acceptance of the application as complete for processing.”²⁸

What evaluation criteria are to be used? The Wind Energy Act lists six evaluation criteria:²⁹

- A. **“Significance of...affected scenic resource;”** The Wind Energy Act does not explicitly describe how significance should be considered. One possible interpretation is that all scenic resources are equally significant. Another interpretation might be to distinguish between state and nationally designated scenic resources. However, this difference does not seem to have much to do with scenic quality, *per se*. Perhaps the most appropriate interpretation of this criterion is the significance of scenic quality to the identification and designation of a particular scenic resource. Sometimes the level of significance is indicated in the report responsible for the designation (e.g., designation as significant or outstanding scenic quality in the *Maine’s Finest Lakes* or *Maine Wildlands Lake Assessment* studies, or local, state or national significance on a Nation Register of Historic Places nomination form).
- B. **“Existing character of surrounding area;”** The Wind Energy Act explicitly states that whether “a wind energy development fits harmoniously into the existing natural environment in terms of potential effects on scenic character and existing uses related to scenic character is not required.”³⁰ Since harmonious fit cannot be the criterion, perhaps it is whether perception of the landscape’s character type is significantly changed. For instance, does the visible presence of many wind turbines change the perceived landscape character from “wooded hillside with scattered residences,” to “industrial facility”?
- C. **“Expectations of the typical viewer;”** Viewers may have certain expectations for the visible character of certain scenic resources. For instance, they may expect that views from a particular state park or hiking trail be predominately natural appearing. However, it is reasonable to question the appropriateness of viewer expectations, such as when people describe lands intensively managed for timber as “wilderness.” In addition, viewer expectations change in reaction to changed circumstances. A few turbines may be approved because the project is small—once built people’s expectations change, making it possible to build additional turbines. Consideration of this incremental cumulative change may be the point of the next criterion.
- D. **“Expedited wind energy development’s purpose and...context;”** The Wind Energy Act makes it clear that the Legislature believes tapping the state’s wind resource is desirable, and has set substantial wind energy generation goals.³¹ In addition, the

²⁷ 35-A MRSA, § 3452, sub-§2

²⁸ 35-A MRSA, § 3452, sub-§2

²⁹ 35-A MRSA, § 3452, sub-§3

³⁰ 35-A MRSA, § 3452, sub-§1

³¹ 35-A MRSA, § 3402, sub-§2

Legislature recognizes that “wind turbines are potentially highly visible landscape features that will have an impact on views.”³² It seems reasonable that the Legislature intended that areas determined to be suitable for grid-scale energy development be utilized to their full capacity. This criterion may require consideration of the wind energy potential of the surrounding context, and evaluating the scenic impacts of fully building-out the area’s capacity to produce wind energy. The greatest impact comes from the initial wind turbines built in an area; additional turbines will add a smaller incremental scenic impact, making it very difficult to determine where to stop further development. It may be most responsible to consider potential cumulative wind development impacts to an area as part of an initial proposal.

- E. **“Extent, nature and duration of the... public use of the scenic resource... and the... effect... on the public’s continued use and enjoyment of the scenic resource;”** This evaluation criterion says that we need to know what activities are occurring at significant scenic resource sites, how many people engage in these activities, for how long, and what the impact of seeing the project will have on the enjoyment of these activities. Said another way, “Is an Adverse scenic impact Unreasonable if turbines are only visible from a rarely visited viewpoint, or is visible only to people engaged in an activity for which scenic quality is not central to its enjoyment?”
- F. **“Scope and scale of the... effect of views of the generating facilities... including... number and extent of [visible] turbines, ... distance [to visible facilities]... and effect of prominent features of the development on the landscape”** The issue is whether the generating facilities become dominating elements in the landscape, primarily because of their proximity to the viewer and the area they occupy in the visual field.

What constitutes a significant scenic resource? The Wind Energy Act specifies that only designated state or nationally significant scenic resources be evaluated and provides a list of qualifying designations. In this review further reference to scenic resources will assume that they are state or nationally significant.

- A national natural landmark, federally designated wilderness area or other comparable outstanding natural or cultural feature.
- A property listed on the National Register of Historic Places.
- A national or state park.
- A great pond identified as having outstanding or significant scenic quality in the *Maine’s Finest Lakes* study or *Maine’s Wildlands Lake Assessment*.
- A segment of a river or stream identified as having unique or outstanding scenic attributes in the *Maine Rivers Study*.
- Viewpoints from state public reserve land or on a trail that is used exclusively for pedestrian use, as designated by the Department of Conservation.
- Scenic turnouts on scenic highways constructed by the Department of Transportation.
- Scenic viewpoints located in coastal areas that are ranked as having state or national significance in terms of scenic quality in inventories published by the Executive Department, State Planning Office.

³² 35-A MRSA, § 3402, sub-§2(C)

While a major step toward specificity, it is anticipated that interpretation of this list will be contested. For instance, this list includes resources typically designated for non-scenic reasons (e.g., national landmark or listed historic place), and only minor portions of resources that are designated for scenic reasons (e.g., only the turnouts of a scenic byway). In addition, “the public [must have] a legal right of access” if the significant scenic resources is not on public land (e.g., listed historic place or coastal viewpoint).³³

What is the area of potential effects (APE)? The regulations presume that potential scenic impacts to scenic resources must be evaluated within 3 miles of generating facilities (i.e., turbines and transmission lines). The primary siting authority may also require the evaluation of potential scenic impacts to state and nationally significant scenic resources located between 3 and 8 miles from generating facilities if there is substantial evidence that it is needed.³⁴ Interested parties have 30 days after the acceptance of the application to submit such information.³⁵ The Wind Energy Act states that scenic impacts from generating facilities (i.e., turbines or transmission lines) located 8 or more miles from a scenic resource are “insignificant.”³⁶

What is the Process of Conducting a Visual Impact Assessment?

While the Wind Energy Act has identified specific resources from which views are to be considered and established criteria and a standard for their evaluation, there is no apparent reason that the process by which a visual impact assessment (VIA) is conducted would be changed. While there are slight variations, a professionally conducted VIA includes the following:

1. **Project Description.** The foundation of any VIA is an accurate and complete description of the visible attributes of all project elements—their location, dimensions, form, color, reflectance, surface texture, etc. It is also important to describe the surrounding site and how it will change. For instance, accurate information must be provided about the location and heights of trees that may screen the project, and the extent of site clearing and regrading. The purpose and context of the project must be described, as it is one of the evaluation criteria.³⁷
2. **Landscape Character.** The description of the landscape character establishes the context for evaluating any visual change from introducing the proposed development.³⁸ What is the visual character of the landform and vegetation? What is the visual character of the settlement pattern and road network? How does the project site relate to the larger regional landscape context—is it unusual or mundane? The US Forest Service describes landscape character this way:

Landscape Character descriptions are a combination of the objective information contained within ecological unit descriptions and the cultural values that people assign to landscape. Together they help define the meaning of “place”, and its scenic expression (USDA FS 1995, page 1-1).

³³ 35-A MRSA, § 3451, sub-§9

³⁴ 35-A MRSA, § 3452, sub-§4

³⁵ 35-A MRSA, § 3452, sub-§4

³⁶ 35-A MRSA, § 3452, sub-§3

³⁷ 35-A MRSA, § 3452, sub-§3, criterion D

³⁸ 35-A MRSA, § 3452, sub-§3, criterion B

The regional landscape character is described first. Often there are several distinct landscape units to describe. The character (e.g., ecological zone) and scenic attractiveness (e.g., vividness, intactness, unity) of each landscape unit is summarized (USDA FS 1995, page 1-15). A somewhat more detailed description is given for the project site and its APE.

3. **Visibility Analysis.** A visibility or viewshed analysis identifies those areas with potential views of the proposed development. The minimum professional standard is to map the topographic viewshed for the highest point of each major project element. This shows those areas that have a potential view of the tip of an upright turbine blade if all land cover were removed. Since it is possible that views to a project could be opened by the removal of land cover, a topographic viewshed is considered a useful conservative assessment of the maximum area of potential project visibility.

Typically, a second visibility analysis includes the screening effect of forest cover. However such analyses should be used with caution and carefully field checked, since vegetation data can change quickly. The three forest classes (deciduous, evergreen and mixed) of the National Land Cover Database are most commonly used. Forest height is typically set to a regionally appropriate 40 feet for the analysis, though the minimum tree height for an area to be classified as forest is 16 feet. This use of generalized rather than location specific tree heights is another reason to use the vegetated visibility analysis with caution.

Additional visibility analyses might show how many turbines are visible, or the viewshed for larger portions of each project element (i.e., the nacelle rather than the upright blade tip). Current practice has been to only evaluate visibility of the turbines, but the transmission line must also be considered. It may also be appropriate to include associated facilities, such as access roads, substation, maintenance building and other structures.

Normally only views from scenic resources within the topographic viewshed are evaluated in detail (though the accuracy of the analysis must field checked). A visibility analysis may also be helpful in describing the potential number, extent, and distance of visible turbines.³⁹

4. **Significant Scenic Resources.** Identify the state or nationally significant scenic resources within the study area, based on the list in the statute.⁴⁰ A description of each identified scenic resource needs to be presented in sufficient detail that the criteria for evaluating scenic impacts can be applied.⁴¹ Each scenic resource will be documented as part of the fieldwork, include the general scenic character of the resource, the “worst case” potential views of the proposed development, and perhaps other views.
5. **Public Use and Expectations.** The extent, number and duration of public uses of the identified scenic resources, and the expectations of the “typical viewer” must be described.⁴²

³⁹ 35-A MRSA, § 3452, sub-§3, criterion F

⁴⁰ 35-A MRSA, § 3451, sub-§9

⁴¹ 35-A MRSA, § 3452, sub-§3, criterion A

⁴² 35-A MRSA, § 3452, sub-§3, criteria E and C

6. **Evaluation of Potential Impacts.** The findings from applying each of the criteria for evaluating scenic impacts should be reported.⁴³

Accurate visual simulations are particularly useful when conducting this evaluation. The selection of viewpoints for the visual simulations is frequently a source of controversy. Opponents are likely to want simulations that represent “worst case” views, while the developer and other proponents will argue that “typical views” provide a fairer representation. Worst case views are closer, show larger portions of the project, represent situations where the project appears less compatible with its surroundings. Typical views normally do not show the project at its worst, but are at viewpoints that might have many viewers, or that are selected to represent a diversity of viewing conditions (e.g., distances from the project, types of screening, and levels of incompatibility). It is very unusual for a scientific method (i.e., probability sampling) to be used to select the typical viewpoints—normally they are simply declared “typical” by the analyst. Both types of simulations are useful to decision makers. However, it is difficult to imagine why they would not want to be aware of the very worst case situations.

7. **Mitigation.** It is normal in a professional VIA that the approaches taken to mitigate adverse effects are described. Typically, if Unreasonably Adverse scenic impacts were found, approaches to further mitigation would be discussed. This might include revisions to project siting or design, or screening at impacted viewpoints. However, mitigation is not one of the evaluation criteria for scenic impacts.⁴⁴ The Attorney General’s Office has advised both DEP and LURC that it does not believe mitigation can be required for scenic impacts—if scenic impacts are Unreasonably Adverse, the project should be denied, otherwise it should be approved.

⁴³ 35-A MRSA, § 3452, sub-§3

⁴⁴ 35-A MRSA, § 3452, sub-§3

Appendix 2

Review Maps

Map 1: Topographic Viewshed for Blade Tip

Map 2: Forested Viewshed for Blade Tip

Map 3: Topographic Viewshed for Turbine Hub

Map 4: Forested Viewshed for Turbine Hub

Map 5: Topographic Viewshed for Turbine Warning Lights

Map 6: Forested Viewshed for Turbine Warning Lights

Map 7: Topographic Viewshed for Met Tower Warning Lights

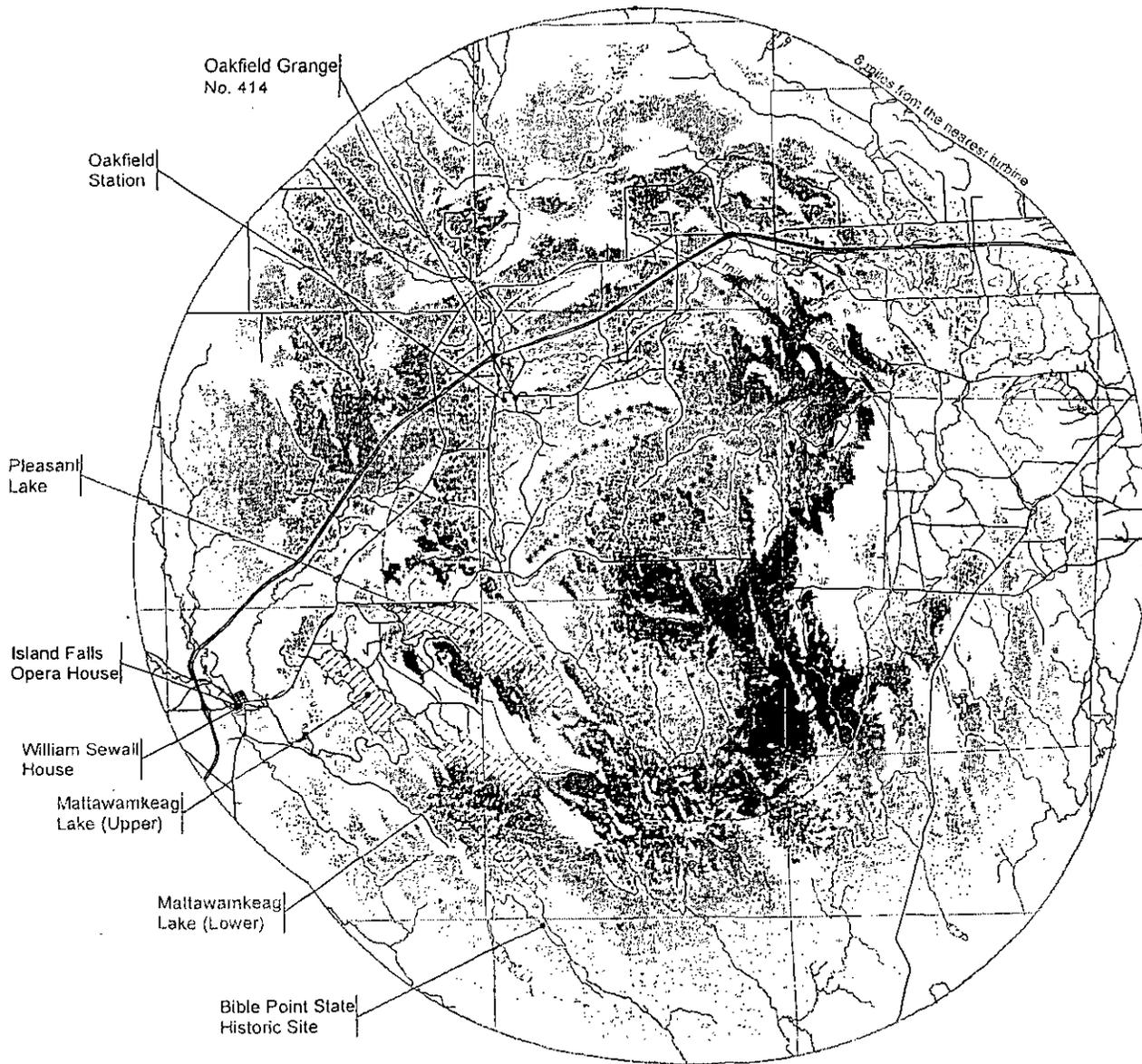
Map 8: Forested Viewshed for Met Tower Warning Lights

Visibility analysis determines whether a line-of-sight exists between two specified points. A geographic information system (GIS) is used to map the viewsheds from which the Oakfield Wind Project's turbines are potentially visible. In principle this is an objective exercise in geometry highly suited to a computer application. In practice however, since the data are only approximations of the actual condition and may include errors and assumptions, the resulting viewshed maps are best considered a preliminary analysis of potential visibility under specified conditions. The maps are useful for providing a preliminary investigation of the overall potential visual impact. If potential visual impacts appear to exist for significant scenic resources, they need to be confirmed through field investigation and other visualization techniques.

Map 1 Topographic Viewshed for Blade Tips

Oakfield Wind Project

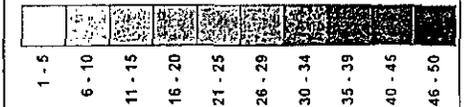
GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.



Legend

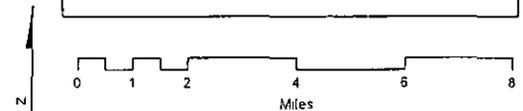
* Turbine Locations

Number of Blade Tips Visible

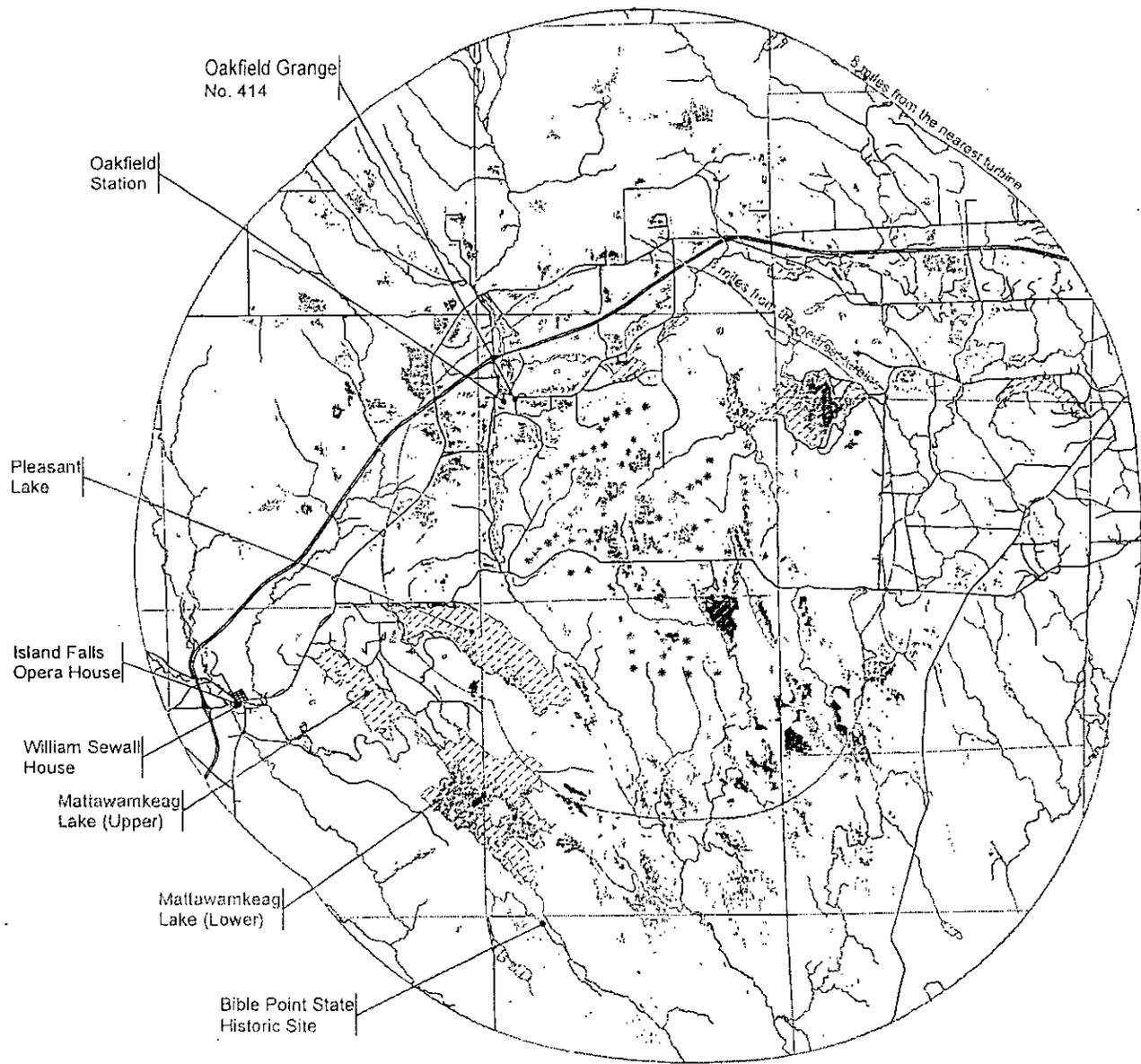


Scenic Resources of
State or National Significance

- Great Ponds
- National Register of Historic Places
- Other Historic Resource



Map 2 Forested Viewshed for Blade Tips Oakfield Wind Project



GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

Legend

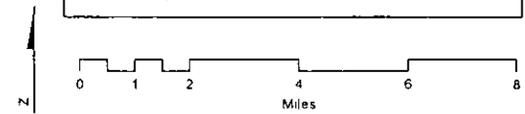
- ★ Turbine Locations

Number of Blade Tips Visible

1 - 5	6 - 10	11 - 15	16 - 20	21 - 25	26 - 29	30 - 34	35 - 39	40 - 45	46 - 50
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Scenic Resources of State or National Significance

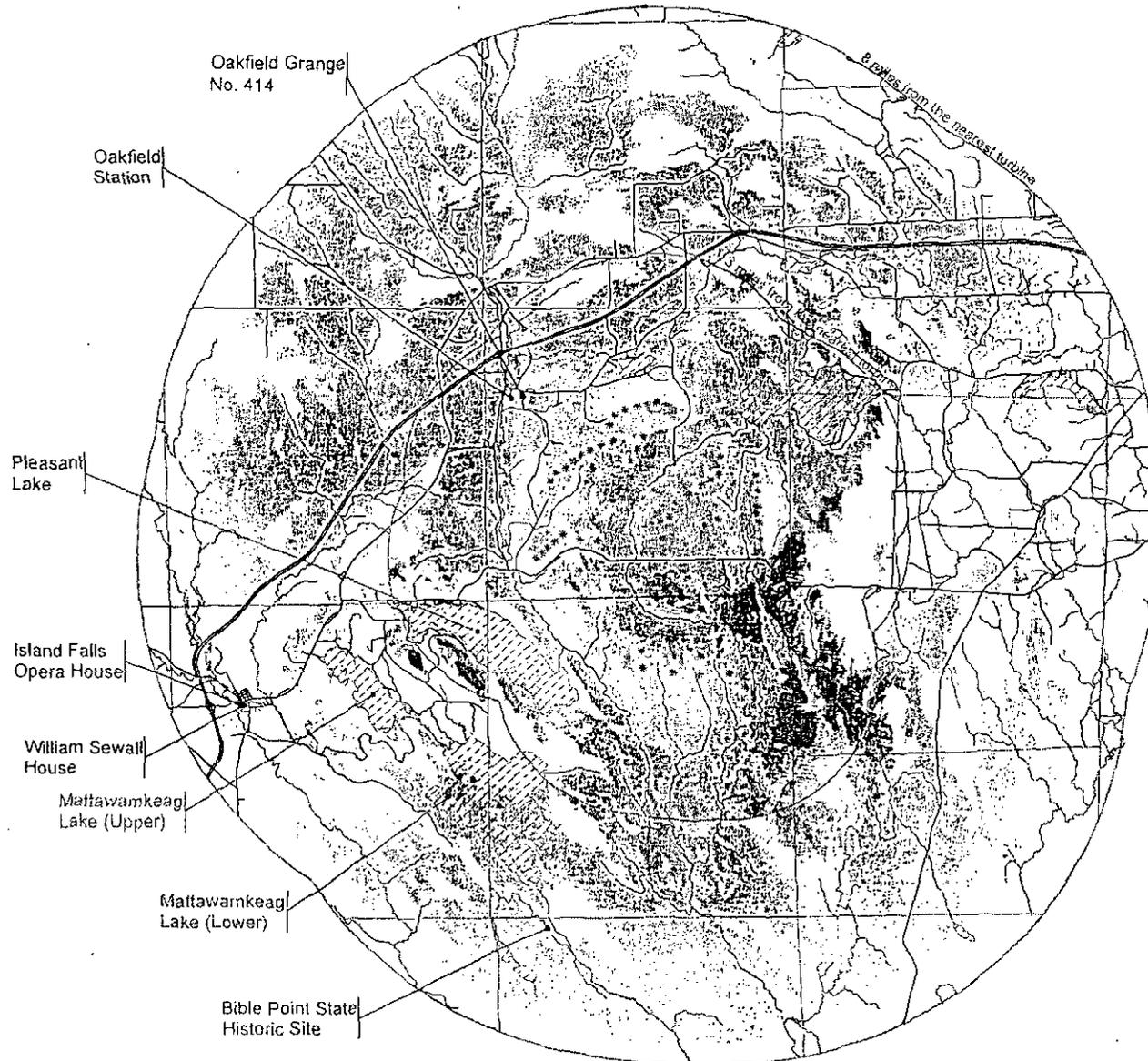
- Great Ponds
- National Register of Historic Places
- Other Historic Resource



Map 3 Topographic Viewshed for Turbine Hubs

Oakfield Wind Project

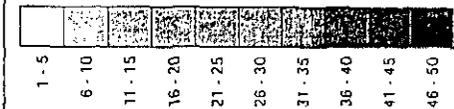
GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.



Legend

* Turbine Locations

Number of Turbine Hubs Visible



Scenic Resources of State or National Significance

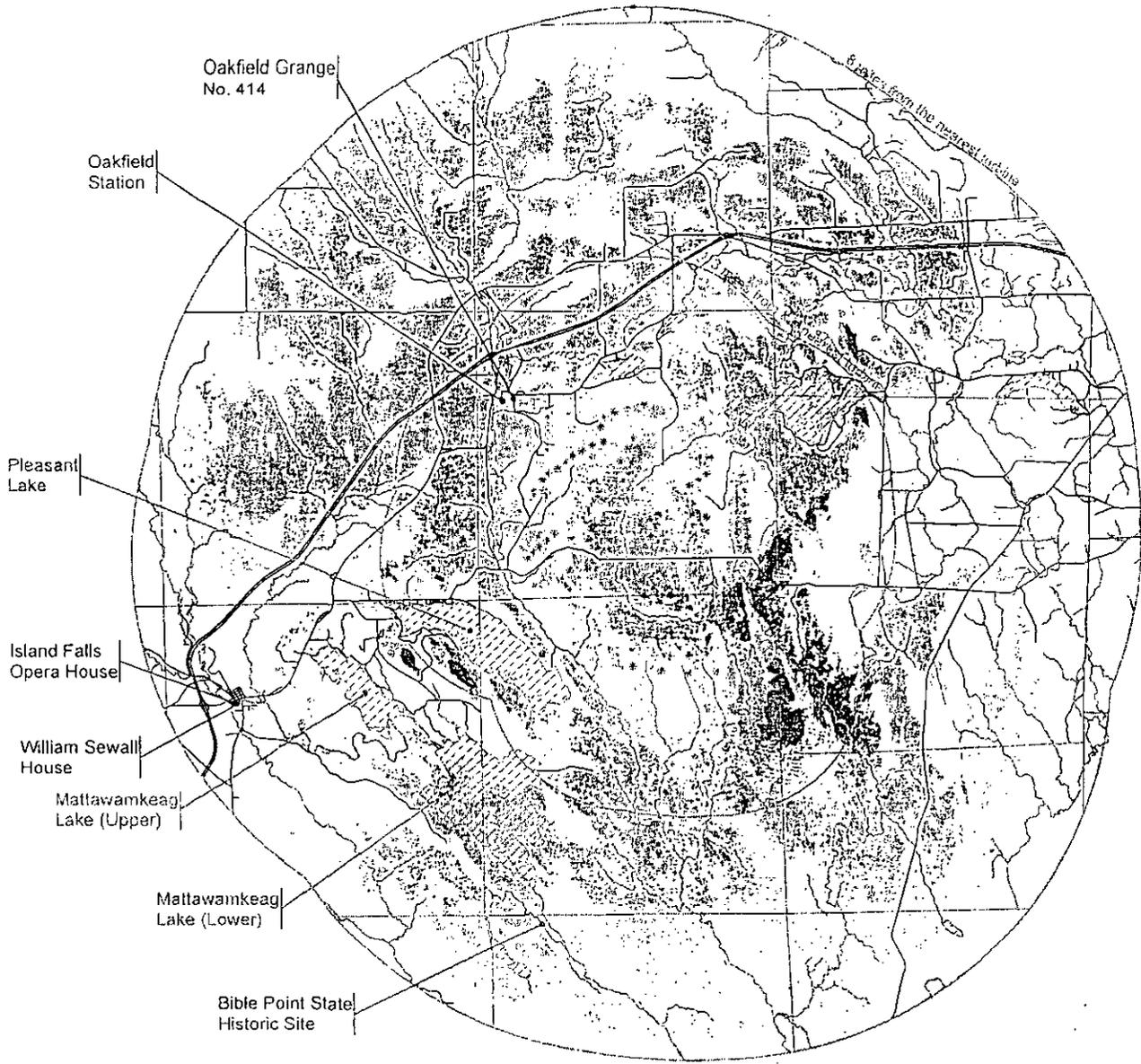
- Great Ponds
- National Register of Historic Places
- Other Historic Resource



Map 4 Forested Viewshed for Turbine Hubs

Oakfield Wind Project

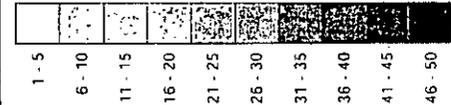
GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.



Legend

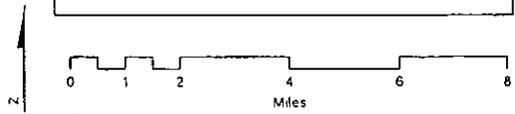
* Turbine Locations

Number of Turbine Hubs Visible



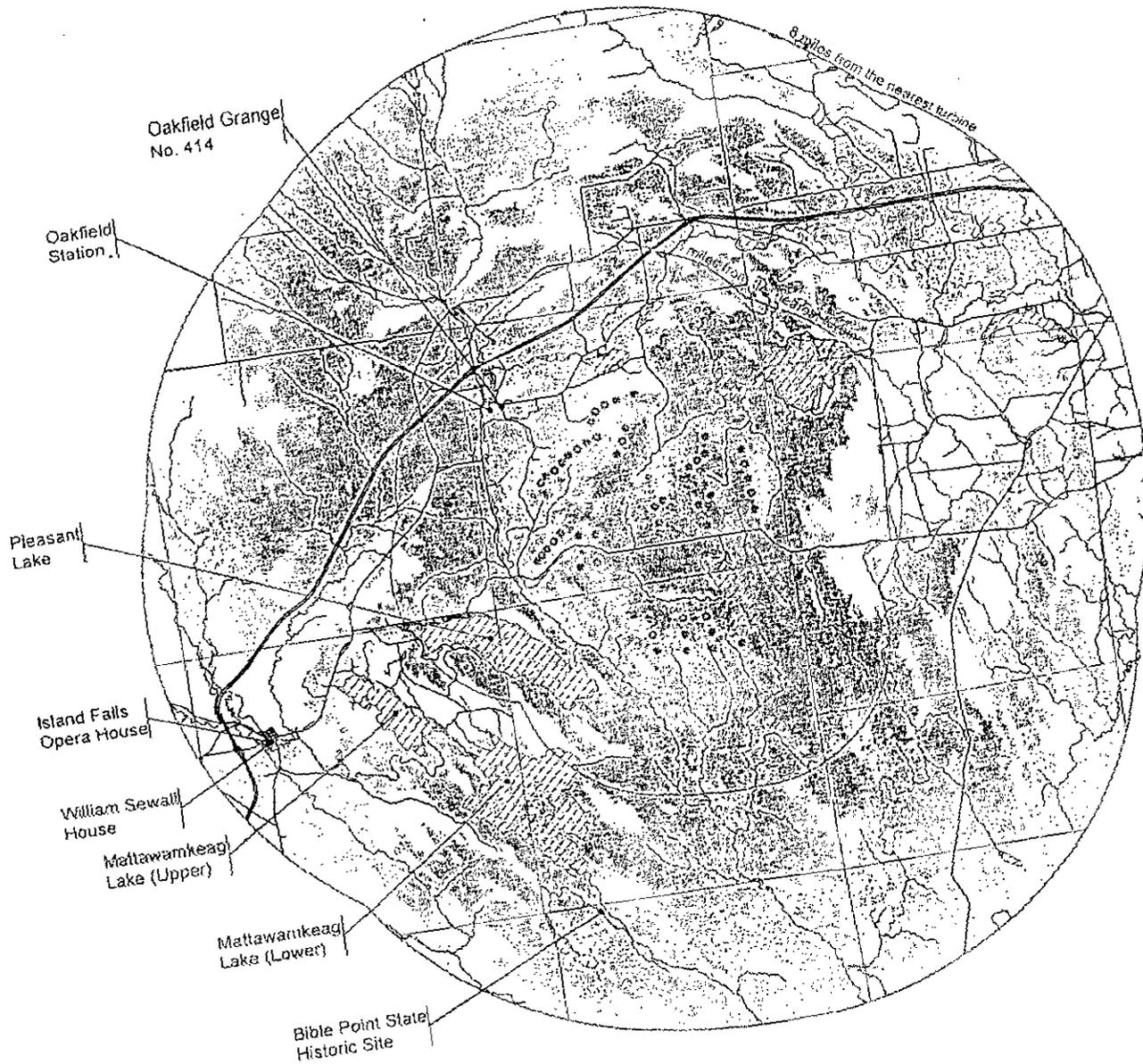
Scenic Resources of State or National Significance

- Great Ponds
- National Register of Historic Places
- Other Historic Resource



Map 5 Topographic Viewshed for Turbine Lights

Oakfield Wind Project

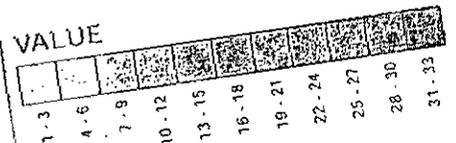


GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

Legend

- Turbine Locations
- FAA Warning Lights

VALUE



Scenic Resources of State or National Significance

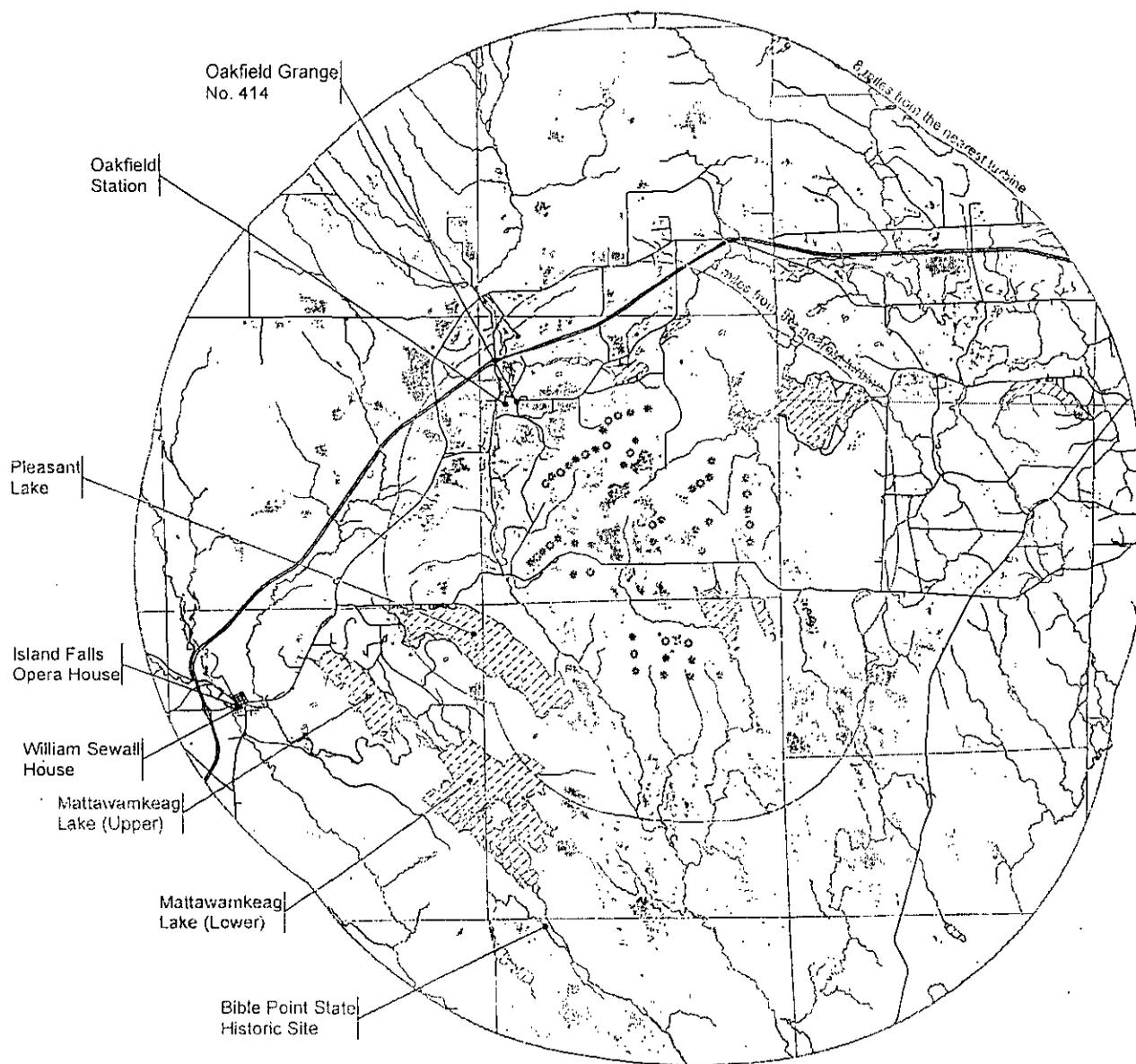
- Great Ponds
- National Register of Historic Places
- Other Historic Resource



Map 6 Forested Viewshed for Turbine Lights

Oakfield Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.



Legend

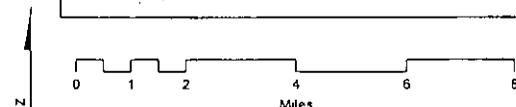
- ◊ Turbine Locations
- * FAA Warning Lights

Number of Visible Turbine Lights

1 - 3	4 - 6	7 - 9	10 - 12	13 - 15	16 - 18	19 - 21	22 - 24	25 - 27	28 - 30	31 - 33

Scenic Resources of State or National Significance

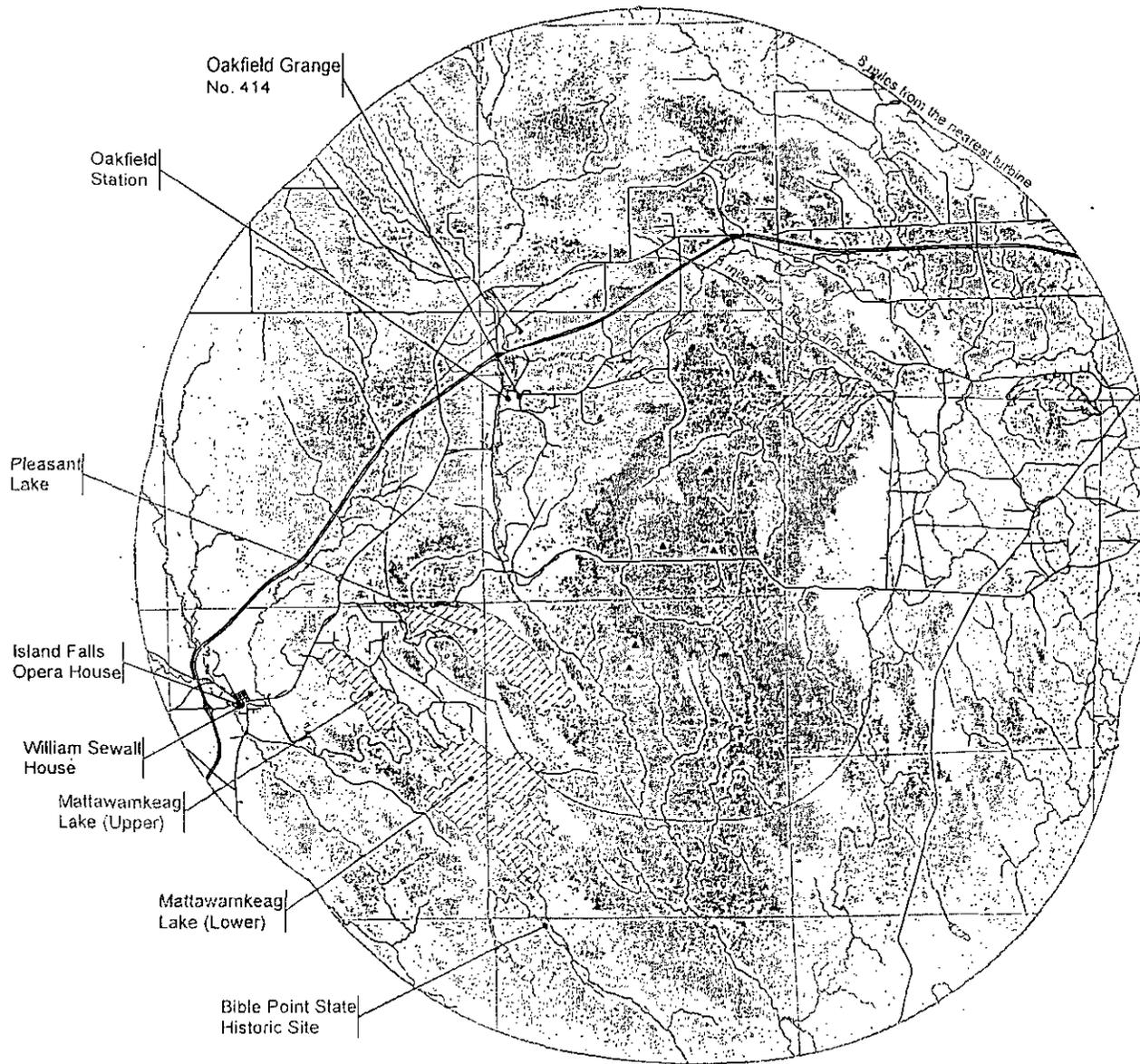
- Great Ponds
- National Register of Historic Places
- Other Historic Resource



Map 7 Topographic Viewshed for Met Tower Lights

Oakfield Wind Project

GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.



Legend

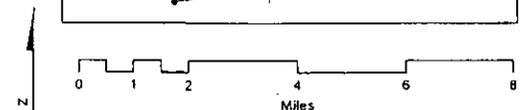
▲ Met Towers Locations

No. of Visible Met Tower Lights



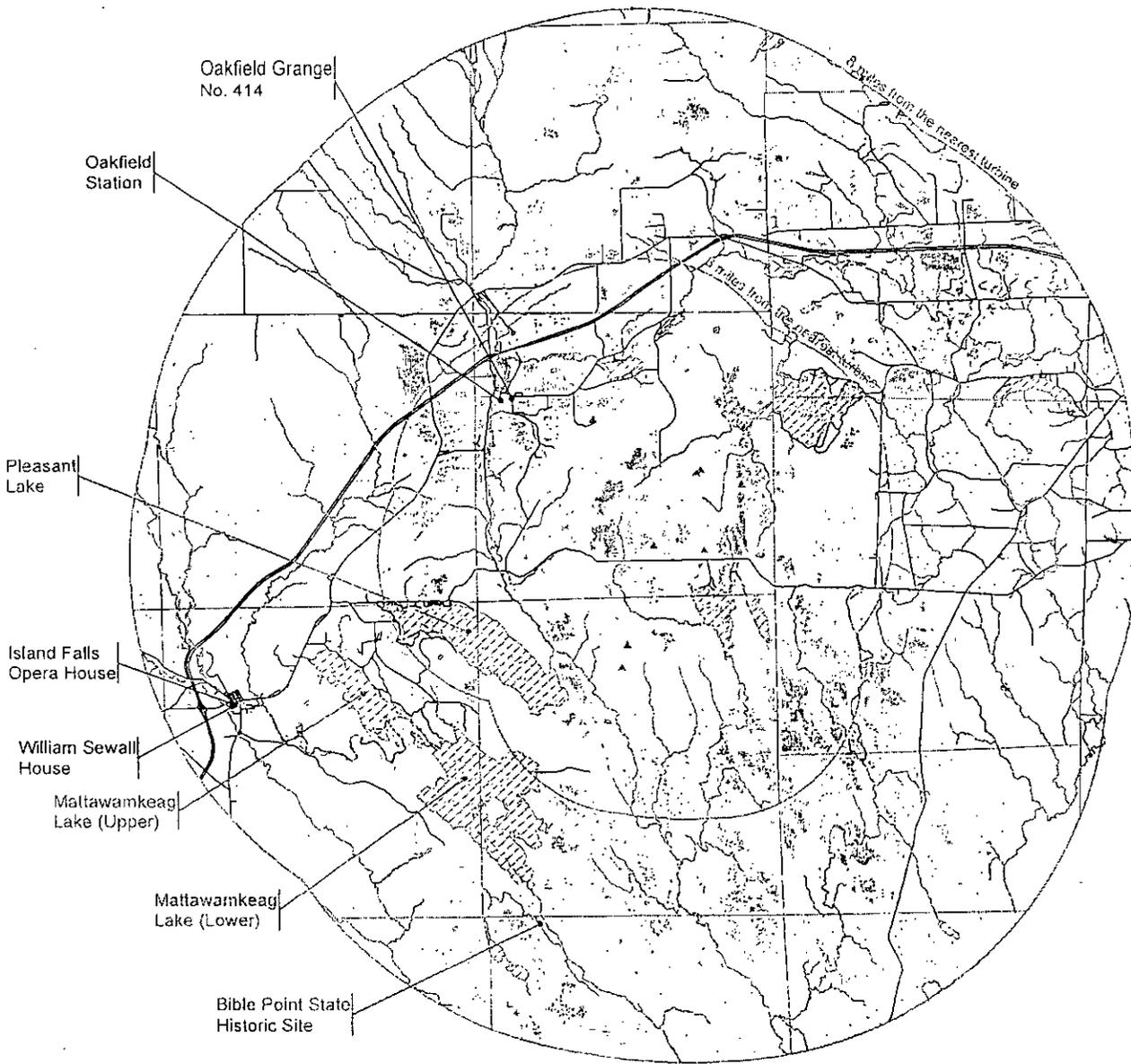
Scenic Resources of
State or National Significance

- Great Ponds
- National Register of Historic Places
- Other Historic Resource



Map 8 Forested Viewshed for Met Tower Lights

Oakfield Wind Project



GIS viewshed mapping is a preliminary means of visual analysis. While beneficial for preliminary orientation and investigation, because of data assumptions and omissions, viewshed maps are not a definitive indication of visibility. Potential visibility needs to be confirmed through field investigation and other visualization techniques.

Legend

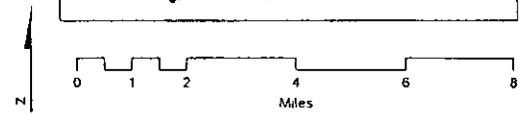
- ▲ Met Towers Locations

No. of Visible Met Tower Lights

0	1	2	3	4	5	6	7	8	

Scenic Resources of State or National Significance

- Great Ponds
- National Register of Historic Places
- Other Historic Resource

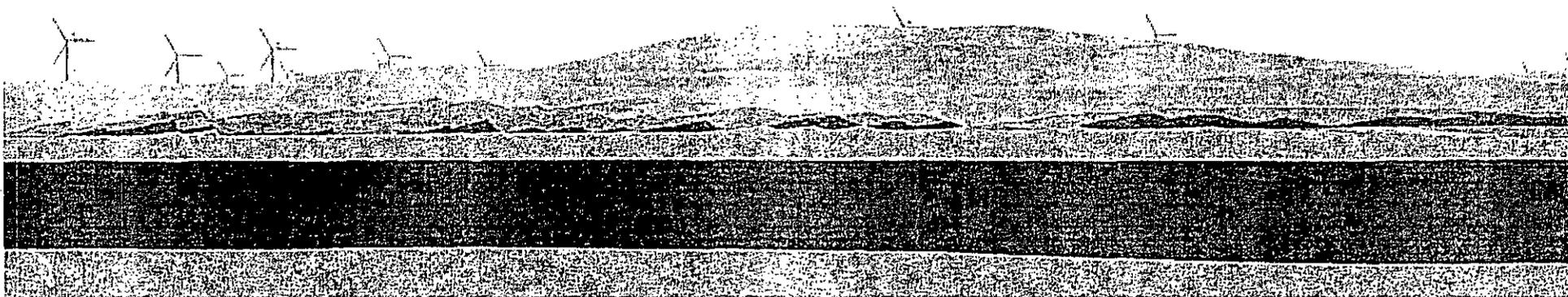


Appendix 3

ArcScene Visualizations

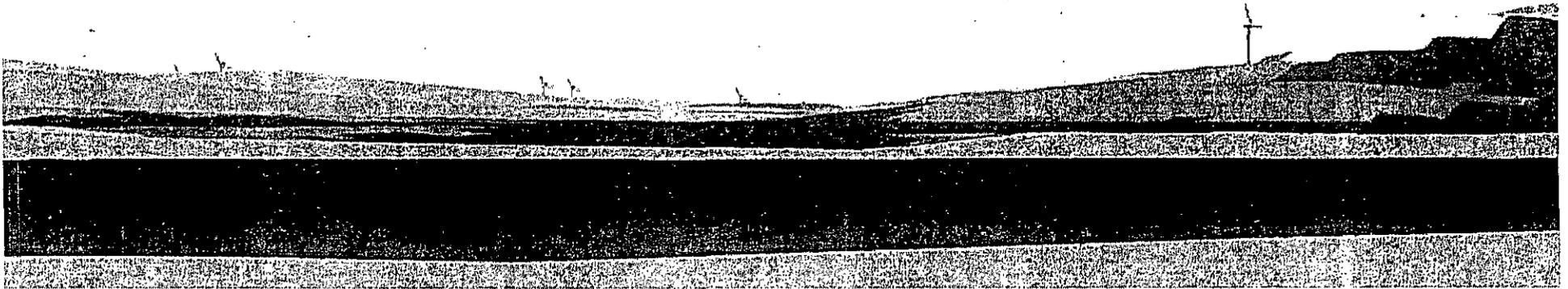
- Visualization 1: Pleasant Lake, T4 R3 WELS (Figure 1A)
- Visualization 2: Pleasant Lake, T4 R3 WELS (Figure 1B)
- Visualization 3: Pleasant Lake, T4 R3 WELS (Figure 1C)
- Visualization 4: Pleasant Lake, Island Falls (Figure 2A)
- Visualization 5: Pleasant Lake, Island Falls (Figure 2B)
- Visualization 6: Pleasant Lake, Island Falls (Figure 2C)
- Visualization 7: Pleasant Lake, Island Falls (Figure 3A)
- Visualization 8: Pleasant Lake, Island Falls (Figure 3B)
- Visualization 9: Mattawamkeag Lake, Island Falls (Figure 5A)

The purpose of these visualizations is to validate the relative accuracy of the *Section 30. Visual Impact of a Generating Facility* photographic simulations (TJDA 2011a). They are created using the location and camera information from the photograph metadata and GIS database that were used to prepare the photosimulations. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995. The representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights; floating black dots are warning lights at possible met tower sites. The horizontal angle of view is 45 degrees, which is similar to the VIA photosimulations, and the visualization will be in proper perspective when viewed from a distance slightly greater than its width.



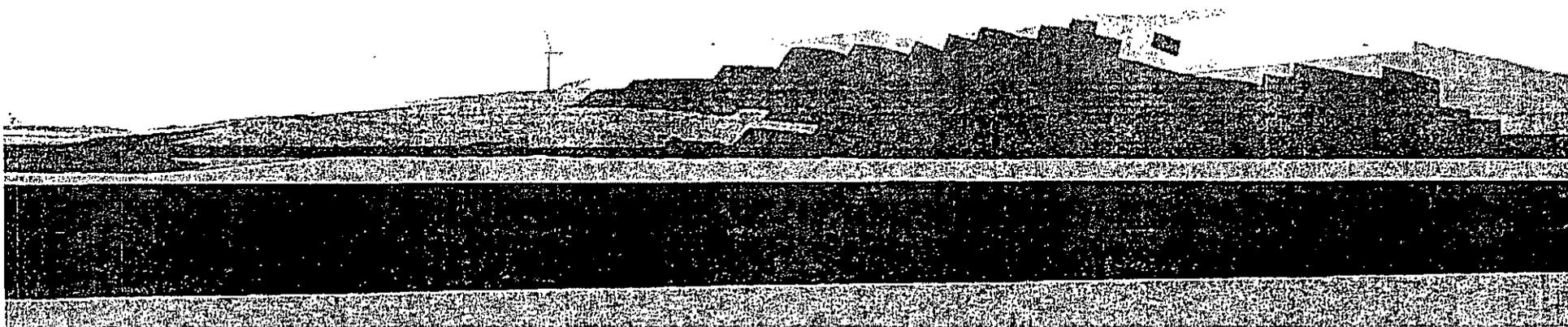
Visualization 1: Pleasant Lake, T4 R3 WELS (Figure 1A)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.



Visualization 2: Pleasant Lake, T4 R3 WELS (Figure 1B)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights; floating black dots are warning lights at possible met tower sites. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.

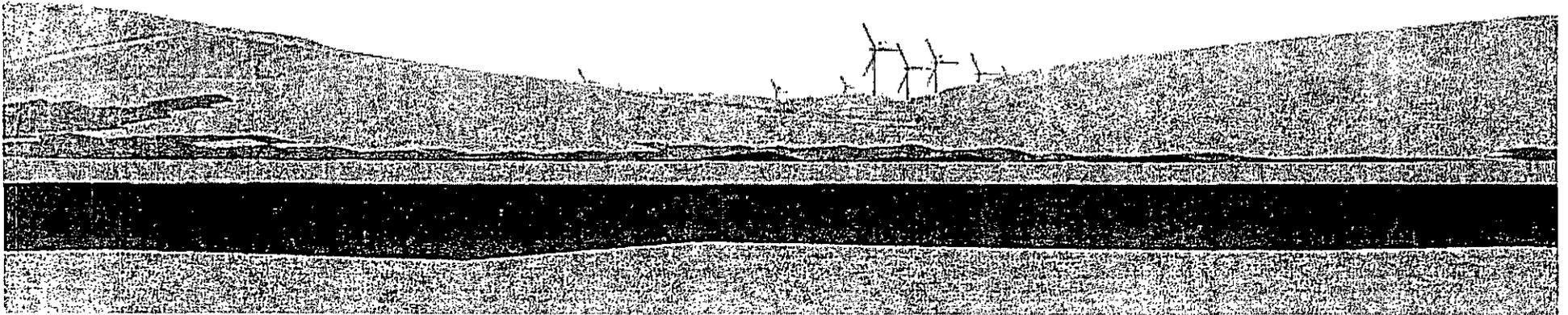


Visualization 3: Pleasant Lake, T4 R3 WELS (Figure 1C)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights; floating black dots are warning lights at possible met tower sites. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.

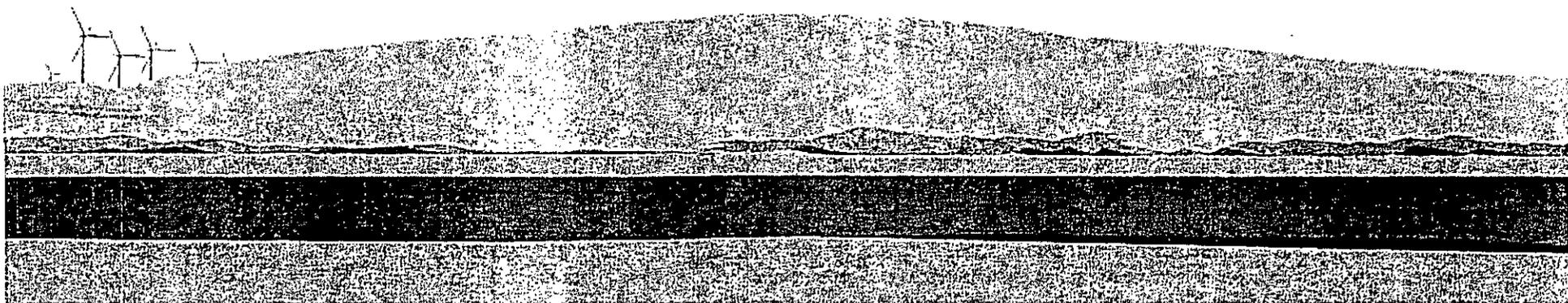
Visualization 4: Pleasant Lake, Island Falls (Figure 2A)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.



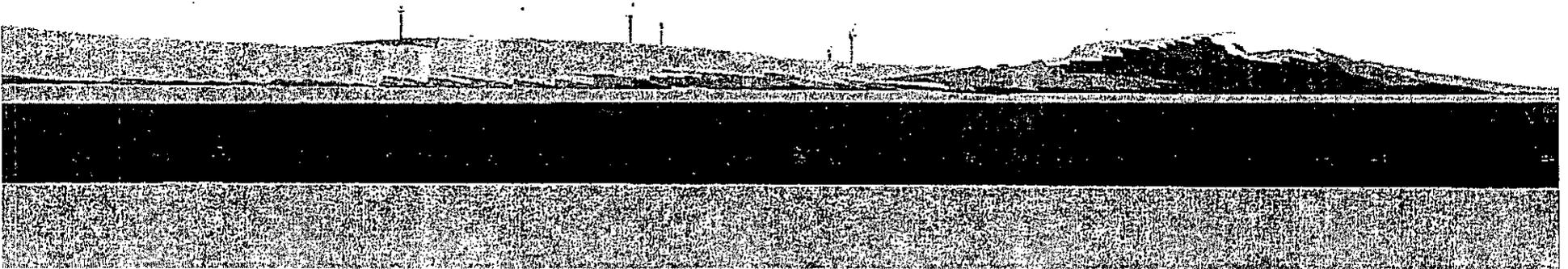
Visualization 5: Pleasant Lake, Island Falls (Figure 2B)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.



Visualization 6: Pleasant Lake, Island Falls (Figure 2C)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights; floating black dots are warning lights at possible met tower sites. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.



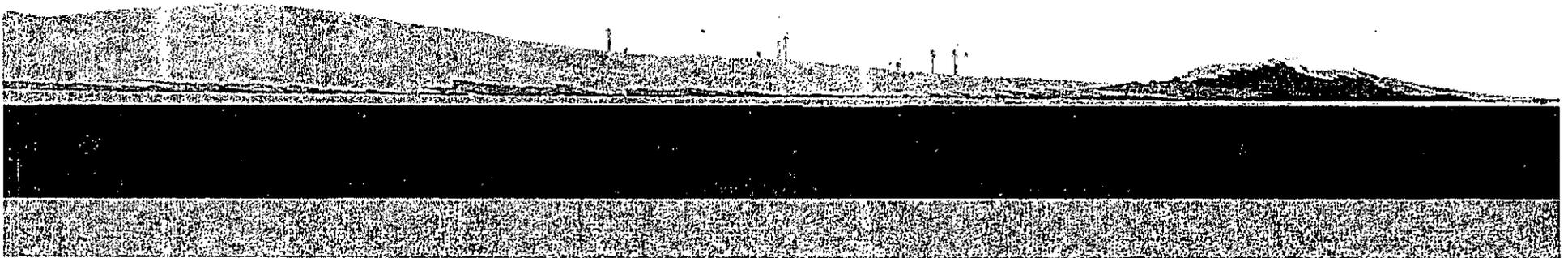
Visualization 7: Pleasant Lake, Island Falls (Figure 3A)

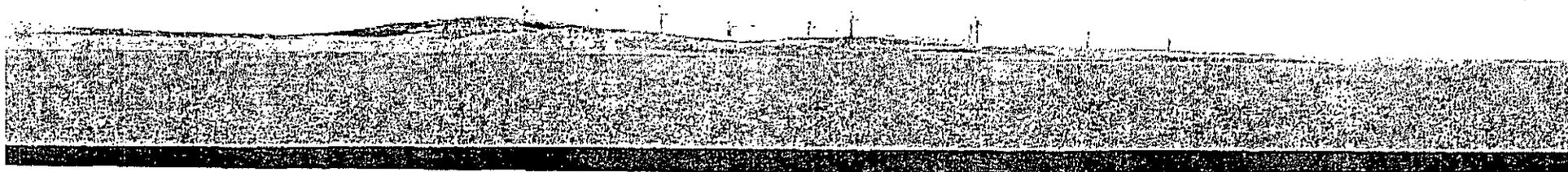
The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.



Visualization 8: Pleasant Lake, Island Falls (Figure 3B)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995; the representation of foreground vegetation may not be accurate. Turbines marked with a red dot have FAA warning lights; floating black dots are warning lights at possible met tower sites. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.





Visualization 9: Mattawamkeag Lake, Island Falls (Figure 5A)

The purpose of this visualization is to validate the relative accuracy of a photographic simulation. It is created using the location and camera information from the photograph metadata and GIS database that were used to prepare the *Section 30. Visual Impact of a Generating Facility*. Forest cover is set to 40 feet and does not include forested wetlands or areas harvested since 1995. The representation of foreground vegetation may not be accurate--shoreline trees will screen the turbine tips to the left. Turbines marked with a red dot have FAA warning lights; floating black dots are warning lights at possible met tower sites. The horizontal angle of view is 45 degrees, and the visualization will be in proper perspective when viewed from a distance of approximately 1.5 times its width.