

Testimony of Jean Vissering

For

Peter Roth, Counsel for the Public, New Hampshire Department of Justice

Please state your name, profession and business address.

My name is Jean Vissering. I am a landscape architect and my office is located at 3700 North Street, Montpelier, Vermont.

What is the purpose of your testimony?

I have been retained by Peter Roth, Counsel for the Public to provide an independent assessment of the aesthetic impacts of the proposed Antrim Wind Project (Docket No. 2011002). Specifically I have been asked to determine if the project meets the requirements for aesthetic impacts as defined in RSA 162-H:16, IV, (c), i.e. whether the project would result in an “unreasonable adverse effect on aesthetics”.

What are your qualifications for assessing the aesthetic impacts of Wind Energy Projects?

My resume is provided as Appendix B of a report I prepared, *Visual Impact Assessment: Antrim Wind Project*, explaining my assessment of the proposed project. Briefly, I have provided visual impact assessments for numerous types of development since 1975. I have reviewed wind energy projects since 2002 and have worked on behalf of developers, towns, regional planning commissions, government agencies and organizations. I have provided testimony on wind energy projects before the Vermont Public Service Board, the New Hampshire Site Evaluation Committee, and the Maine Land Use Regulatory Commission. I have also developed methodologies for review and planning of wind energy projects for the National Academies, the Department of Energy, and the Vermont Public Service Board.

Please explain how you evaluated the proposed wind project?

As explained in greater detail in my Visual Impact Assessment – Antrim Wind Project, dated July 30, 2012, (“Report”), which I incorporate herein by reference, I reviewed information provided by

the applicant on the proposed wind project including the Report prepared by Saratoga Associates' Visual Impact Assessment (Appendix 9A). I spent two days in Antrim and nearby towns visiting sites from which the project would be visible. I documented views using photographs and the gps locations of most vantage points. I also prepared additional simulation photographs that are presented in Appendix A of the Report. The Report focuses on the most visually sensitive vantage points within the area. It describes the visual characteristics of these locations and how the wind project would appear within views. It evaluates the effects on aesthetics from individual vantage points and the project's effects on the aesthetics with regard to the surrounding area as a whole.

Please summarize your conclusions concerning the aesthetic impacts of the proposed Antrim Wind Project.

It is my conclusion the proposed Antrim Wind Project would, as currently designed, have unreasonable adverse effects on the scenic quality and resources of the surrounding area. The site is not completely unsuited to an appropriately scaled and sited wind energy facility but, as outlined in my Report, significant mitigation measures would be required in order for the Committee to find that the site and facility of this project will not have an adverse effect on aesthetics.

VISUAL IMPACT ASSESSMENT

ANTRIM WIND PROJECT (Docket No. 2011002)



Willard Pond

Jean Vissering
Jean Vissering Landscape Architecture

For
Peter Roth, Counsel for the Public, New Hampshire Department of Justice

July 30, 2012

A. Purpose of Report and Qualifications

I have been retained by the Counsel for the Public in order to provide an independent assessment of the aesthetic impacts of the proposed Antrim Wind Project and to determine if the project meets the requirements for aesthetic impacts as defined in RSA 162-H:16,IV,(c), i.e. whether the project would result in unreasonable adverse effect on aesthetics and on the scenic resources of the surrounding area.

My qualifications and experience are outlined in my Resume (see Appendix B). Briefly, as a landscape architect I have provided visual impact assessments for numerous types of development since 1975. I have reviewed wind energy projects since 2002 and have worked on behalf of developers, towns, regional planning commissions, government agencies and organizations. I have developed methodologies for review and planning of wind energy projects for the National Academies, the Department of Energy, and the Vermont Public Service Board.

This report describes the project and its relation to its setting. In particular it focuses on the more visually sensitive viewing areas and describes how the project would be seen and the extent to which the project would appear in a manner which would be unreasonably out of character with the setting. Visibility by itself does not determine whether or not aesthetic impacts would be unreasonable. There are however commonly used criteria which are used to evaluate the scenic attributes of landscape and the degree of aesthetic impacts to a particular landscape. The report will also examine the extent to which the Visual Impact Analysis prepared by Saratoga Associates adequately describes the aesthetic impacts and portrayed them in illustrations (e.g. photographs, simulations and viewshed maps). Conclusions will summarize the project's aesthetic impacts and discuss mitigation measures necessary to address any unreasonably adverse aesthetic impacts.

B. Simulations

The applicant provided simulation photographs illustrating the appearance of the project from a number of vantage points. I have prepared additional simulations (Appendix A) which illustrate two new viewpoints and one that was illustrated by the applicant. The duplicative effort provides a comparison in order to check the accuracy of the applicant's simulations. Vantage points illustrated are 1) Willard Pond at the Dam, 2) Goodhue Hill, and 3) Gregg Lake from the lake itself. All simulation photographs were taken by Jean Vissering using a Nikon D200 SLR camera. Each frame was taken at approximately 50mm. This represents an image that is closest to reality when shown at approximately 11"x17" format and held at about 18" from the eyes. Due to the proximity of the project some photographs required two frames to capture all turbines. These are shown as individual

photographs and also merged to illustrate the combined or panorama view. Note that panorama views will make the turbines appear smaller than they will in reality.

C. Viewshed Maps

The applicant's viewshed maps appear to be accurate but were limited to a five-mile radius around the project site. While in most cases the most significant impacts will occur within 5 miles of a project, this is not always the case. Generally a 10-mile radius is recommended for all but very small wind projects (3 turbines). There are two reasons for this. First, the size of the turbines and their location on higher ridgelines, makes them easily visible at 10 miles away (assuming no obstructions). Lights are similarly visible at these distances. Secondly, combined or cumulative impacts may occur within a region if turbines are visible from numerous recreation or scenic areas. We did not provide an independent viewshed map but we identified at least one important vantage point beyond the 5-mile radius study area which we investigated (Pitcher Mountain).

D. Summary of Findings

As currently designed the proposed project will result in unreasonable adverse impacts to the scenic resources of the surrounding area. The site is not unsuited for a wind energy project, but substantial mitigations would be required in order to bring the project into compliance with RSA 162-H:10,V;3.

E. Project Description

The project would consist of 10 turbines located along the upper elevations of the Tuttle Hill ridge and extending to the eastern peak of Willard Mountain. This is a distance of approximately 2.5 miles of ridgeline and 4 miles of roadway. The nameplate generating capacity is proposed to be 30 Megawatts (MW) of electrical power. Access to the project will be from Route 9 (Franklin Pierce Highway) east of Lovern's Mill and west of Hillsborough villages. A substation, operations and maintenance building (O&M), and parking/laydown area would be located just off Route 9 and adjacent to an existing 115kV transmission line and 34.5kV subtransmission line. An access road would extend up the north side of Tuttle Hill with access to the turbines. Collector lines would be above ground on poles up to the first turbine pad, and underground from that point along the road to the ten turbines. The access road would be approximately 16 feet wide. Once it reaches the turbine pads, it will extend to 34 feet wide with a nine-foot crane path on either side. Additional width will be required for clearing and grading. The crane path would be revegetated (seeded with grasses) except for a permanent road 16-feet in width. Turbine pads and accompanying laydown/assembly areas would consist of a rectangular area about 175'x200' alongside the access road.

Specific turbines have not been selected but an Acciona AW3000/116 turbine has been identified by the applicant as a likely choice. This turbine is 302 feet (approximately 92 meters) in height to the rotor hub or nacelle and a total of 492 feet (approximately 150 meters) to the tip of the blade at

maximum elevation. The rotor diameter is 380 feet or 116 meters. The diameter of the tower at the base would be about 16 feet. Some turbines would be lit with FAA required aviation obstruction lighting consisting of a red pulsing L-864 light during nighttime hours only.

F. General Character of the Surrounding Area

The Tuttle to Willard ridges extend more or less along the northwest border of the Town of Antrim. A second peak of Willard Mountain ridgeline lies to the west followed by Robb Mountain to the south and Bald Mountain (2,030 feet) and Goodhue Hill (1,620) forming the southwest boundary of Antrim. These mountains cradle Willard Pond and Gregg Lake along with numerous wetlands. This western part of town tends to be forested with several lakes, ponds and wetlands but sparse settlement. Willard Pond is part of the dePierrefeu-Willard Pond Wildlife Sanctuary and includes 1700 acres owned by New Hampshire Audubon¹.

Gregg Lake lies near the center of town. The eastern and southern shorelines of Gregg Lake are developed and include a town beach and picnic area. At the northern end is the town-owned Meadow Marsh Preserve with a trail. The Town of Antrim has many natural areas which are identified in the Town Plan. East of Gregg Lake Antrim is more settled with several village centers or hamlets. Several historic structures and sites remain in and around Antrim's former centers including Meetinghouse Hill and Antrim center but today's primary center is near the Contoocook River and along Routes 31 and 202 on the eastern side of town. To the north is Franklin Pierce Lake (extending into Hillsborough). This lake is near Route 9 and has a considerable number of homes and camps along the shores. There is also a beach serving the Town of Hillsborough near the northern end of the lake's northern shore. Riley and Gibson Mountains are southeast of the lake (1,450 and 1,312 feet high respectively) but there are no trails.

Antrim is surrounded by the towns of Stoddard, Windsor, Hillsborough, Deering, Bennington, Hancock and Nelson. All are rural towns. Small hills are common throughout the area. The larger nearby mountains outside of Antrim include Pitcher Mountain in Stoddard, Crotched Mountain on the Bennington/Francestown border (with a ski area on its eastern face), Skatertakee Mountain in Hancock (part of the Harris Center Preserve), and Rollstone Mountain in Nelson.

G. Project Visibility and Sensitivity Levels

The Saratoga Associates report identifies 72 resources within the 5-mile study area. Of these 50 are indicated as having potential visibility. A number of the 50 visible locations are forested and impacts are not likely to be significant. While it may be possible to glimpse the project from forested areas either through a small area of blowdown, or through sparse trees during leaf-off periods, these

¹Additional protected lands have been acquired by various state or non-profit organizations within the area over the years. This so-called "supersatuary" includes about 10,000 acres of protected lands.

impacts are likely to be minor. The vertical turbines are unlikely to appear as dominant elements seen through the vertical trunks of trees. The focus of this report will be on areas that are considered to have particular visual sensitivities for one or more of the following reasons:

- The viewpoint is used by the public.
- The viewpoint has identified recreational, scenic or cultural values
- The viewpoint is valued as a natural setting,
- The viewpoint would permit a clear view of the project
- The project would permit views of relatively long duration or over an extended area or corridor.
- The resource area provides a unique experience.
- The viewpoint is in close proximity to the project.

Sensitive viewpoints include hiking trails, lakes and ponds, natural areas (especially along public trails), cultural resources that are open to the general public, recreation areas, and town centers. Areas which are valued for providing a natural setting are particularly sensitive to change that involves built elements.

The focus of analysis will be on the following resources within the surrounding area that are characterized by one or more of the criteria noted above.

- Willard Pond
- Bald Mountain
- Goodhue Hill
- Gregg Lake
- Meadow Marsh
- Pitcher Mountain
- Meetinghouse Hill
- State Roads
- Loveren's Mill Cedar Swamp
- Franklin Pierce Lake (Jackman Reservoir)
- Other Lakes and Ponds

The analysis will not include a discussion of private homes or properties. While it is true that there is the potential for views of long duration from a private home, the focus of the law is to protect resources that provide scenic values of public importance. It is not possible to visit each private home or property. This is not to say that there may not be an unreasonably adverse aesthetic impact for a private homeowner, but those arguments would require separate documentation by the homeowner or their representative.

A Note About Distance Zones

The Saratoga report discusses the distance zones referred to as foreground, middleground and background. This report categorizes the middleground zone slightly differently than the applicant's report. Foreground is consistently identified as within a half mile. Within this distance detail can be perceived, such as the textures of individual trees. The middleground zone is important to experiencing landscape and it is where forms, colors and patterns are easily distinguished. For example patterns of trees, deciduous vs evergreen, gradations of color, sometimes the forms of individual trees, patterns of field and forest, and even certain buildings can be perceived. This zone is dependent on atmospheric conditions and the US Forest Service originally identified it as from 3-5 miles depending on haze. The USFS now uses 4 miles for clerical simplicity. But on very clear days, this zone can extend even farther than 5 miles. In this report, the middleground will be referred to as up to 5 miles while background is beyond this distance. Background is the area in which the landscape becomes more bluish and details are difficult to perceive except perhaps the general outline of mountains and ridges.

H. Aesthetic Impacts from Vantage Points

Below is a discussion of the characteristics of the views from each vantage point below. Aesthetic impacts are noted as minimal, moderate or significant depending on the change or contrast introduced to the existing condition. In the next section the aesthetic impacts resulting from the combination of these views as experienced throughout the study area will be discussed.

- **Willard Pond:** Significant Impact

Willard Pond is a scenic 108 acre pond known for its pristine setting, extremely clean water and excellent fishing. No petroleum motors are permitted and there is no development on the pond. There is a small put-in for canoes and kayaks and it is a popular swimming spot even though swimming is technically not permitted. The pond is owned by the state but completely surrounded by the dePierrefeu-Willard Pond Wildlife Sanctuary which consists of 1700 acres owned by New Hampshire Audubon² and which abuts the proposed Antrim Wind Project to the south. From a well-used parking area set back from the pond, one can access a number of trails. The most popular are Bald Mountain and Goodhue Hill (see below).

Nine turbines plus the meteorological tower are visible in the simulation provided by the applicant from the dam on Willard Pond. This area is a popular destination for walkers and swimmers. All ten turbines will be visible from various points around the pond, and most turbines will be visible from nearly all points on the pond. The turbines will be seen at relatively close proximity with distances ranging from 1.4 to 3.2 miles away. The impacts will be significant because of the existing condition which is entirely natural with no

² The dePierrefeu-Willard Wildlife Sanctuary is part of a much larger "supersanctuary" including approximately 30,000 acres of mostly contiguous lands acquired with funding from federal, state and/or non-profit organizations over many years.

development currently visible from the pond. Because this is a wildlife sanctuary and Audubon Preserve, there is an expectation that one will experience a natural setting that will be different from settings such as Gregg Lake. The pond is very scenic and one of the area's more popular destinations. (See Appendix A Simulation 1B)



Figure 1: Willard Pond at the Access Area (panorama)

- **Bald Mountain:** Significant Impact

Like Willard Pond, Bald Mountain is located within the dePierrefeu-Willard Pond Wildlife Sanctuary. It offers spectacular views from a series of ledges near the top. Willard Pond is seen below and the project would be visible at about 1.4 miles away to the north. Rob Hill is now seen in close proximity but turbine #10 would be visible and prominent just beyond. Approximately 8 turbines plus the met tower would be visible from this vantage point. The total view encompasses about 180° and includes several nearby hills including Goodhue Hill as well as several more distant mountains such as Crotched Mountain, North Pack Monadnock, Mount Kearsarge and Cardigan Mountain. The aesthetic impacts would be significant because of Bald Mountain's location within the sanctuary and therefore the expectation of a natural setting. The proximity of the project will make it highly noticeable and prominent. The existing natural character of the views from the summit of Bald Mountain would result in a strong contrast with the existing condition.



Figure 2: View from Bald Mountain toward project area. Robb Mountain is seen in the foreground and the east summit of Willard is just behind. The Tuttle Hill ridge is seen to the right (green).



Figure 3: View from Bald Mountain to Willard Pond below.

- **Goodhue Hill:** Moderate - Significant

There are two primary trail systems within the dePierrefeu-Willard Pond Wildlife Sanctuary, one ascending Bald Mountain, the other ascending Goodhue Hill. Audubon initiated a clearing program at the summit of Goodhue Hill in order to improve wildlife habitat and provide views. The clearing was done within old stone walls that had historically been a pasture. The view looks primarily toward the north and the proposed project would occupy nearly the entire view in this direction at a distance of approximately 2 - 3.2 miles away (See Appendix A: Simulation 2B). This is the primary summit opening though there are also limited views from the summit to the southwest.

Although the trail up Goodhue Hill is well established the more distant views are a fairly recent occurrence. Because logging took place within the past few months, foreground views remain somewhat raw (Figure 4) and currently detract from the scenic quality of the view. The position of the wind project within the views would nevertheless be very prominent. Simulation 2B shows that project roads and clearing would be visible from this vantage point, especially around turbine #9 and the road between turbines #5 and #6. Note that only the clearings are shown in the simulation but the roads and cut and fill slopes are likely to be visible.



Figure 4: View from Goodhue Hill to the Project Ridge. The recent summit clearing was intended to enhance wildlife habitat as well as views.

- **Gregg Lake:** Moderate - Significant

Gregg Lake is approximately 200 acres in size and is a popular town focal point. At the northern end of the lake is a town beach, picnic area and boat launch. Private camps are most visibly concentrated along Gregg Lake Road on the east side of the lake, but other camps are located around the lake. Camp Chenoa, a girls scout camp is located along the western shore of the lake. The Tuttle Hill to Willard Mountain ridgeline is one of the more visually dominant ridgelines within views from Gregg Lake.

All 10 turbines as well as the met tower would be visible from various points on the lake and from the town beach/picnic area. They would also be seen in relatively close proximity with distances ranging from 1.8 miles to 2 miles away. The ridgeline is also fairly low in elevation ranging from 1,920 on Willard Mountain to 1,760 at the top of Tuttle Hill, and less on the lower portions of the ridge. Gregg Lake itself is at approximately 1040 feet above sea level. So the turbines at 492 feet in height will appear quite large in relation to the ridge itself. The beach is oriented away from the proposed project ridge and some foreground trees within this area will appear taller than the turbines moderating the apparent height and visibility of the turbines to some extent. Because the lake is developed and used by motorboats, there is not an expectation by users for an entirely natural setting as there is at Willard Pond. Nevertheless, the turbines will be a very dominant visual element from the vantage point of the picnic area, the lake itself and from portions of Gregg Lake Road.



Figure 5: Gregg Lake Panorama from Gregg Lake Road looking northwest to town beach. The project ridge is seen beyond.

- **Meadow Marsh Preserve:** Moderate

Meadow Marsh Preserve provides a scenic natural walk a short distance from the Town Beach. There are lovely views over a series of wetlands and open water ponds. The project ridge is seen prominently to the west in some views. It is a short trail of about a half mile in length. Development can be seen looking east to a bridge and the town beach area. The project would be visible at about 1.6 miles away and will certainly alter the existing character of the area.



Figure 6: View to project ridge from Meadow Marsh Trail.

- **Pitcher Mountain:** Moderate

Pitcher Mountain in Stoddard is one of the region's most popular hikes. It is one of the area's highest mountains but because Route 123 climbs quite high over its flanks, the trail to the summit is quite short. Spectacular summit views and lots of blueberries are the primary attraction. There is a fire tower but views including to the project ridge are easily visible from the open areas around the tower. At the summit there are 360° views and the project will be visible at about 6.4 miles away but it will be easily visible but occupy a relatively small part of the overall view. The Lempster Wind Project is visible to the north. The view toward the southeast and the project site is a commonly photographed view because of the scenic open meadows visible in the foreground.



Figure 7: Pitcher Mountain Summit View. The project ridge extends from the summit of Willard Mountain north (left) to the left side of the photo.

- Meetinghouse Hill:** Minimal - Moderate
 Meetinghouse Hill was the site of the earliest settlement in Antrim. A cemetery established in 1785 remains although the original town meetinghouse no longer stands. The project ridge is slightly visible through a row of mature deciduous trees. A denser forest is growing beyond. The project is likely to be visible in winter through tree trunks but use would be expected primarily in spring, summer and fall. The turbines would not be prominent through tree trunks but will be noticeable.



Figure 8: Meetinghouse Hill Cemetery toward the Project Ridge

- **State Roads:** Minimal - Moderate

There will be several views of the project along Route 9 (the Franklin Pierce Highway). A view descending a hill near Hillsborough toward Tuttle Hill will be particularly prominent. These views would be brief and are not located within areas of high scenic quality.



Figure 9: Looking toward Tuttle Hill from Route 9 (Franklin Pierce Highway) north of Hillsborough.

- **Lovern's Mill Cedar Swamp Preserve:** Minimal - Moderate

The Lovern's Mill Cedar Swamp is a 613-acre preserve owned by The Nature Conservancy (TNC) in cooperation with the Society for the Protection of New Hampshire's Forests (SPNHF). There are several trails which focus on a 50-acre boreal cedar swamp. The property links the 5,000 acre SPNHF owned Peirce Reservation and the Nature Conservancy's 1693 acre Otter Brook Preserve. Views are unlikely within the forested swamp (not visited), but turbines on Tuttle Hill will be prominently visible at the entry and parking area on Lovren's Mill Road.



Figure 10: Looking toward Tuttle Hill ridge from the entrance of the Lovern's Mill Cedar Swamp Trail (property of The Nature Conservancy).

- **Franklin Pierce Lake (Jackman Reservoir):** Moderate

Franklin Pierce Lake is 520 acres in size. It is used for flood control and power generation. There are many homes, camps, vacation rentals and a public beach along its shores. Manahan Park is the only public access and there would be no project visibility from the park and beach. However, the applicant's viewshed analysis indicates high visibility with 9-10 turbines visible over much of the lake. This lake is fairly thickly settled with homes and camps and does not have noted scenic or natural values; nevertheless the project will change

the character of this setting. Note: views from Franklin Pierce Lake were not documented by the applicant or by this author.



Figure 11: Town of Hillsborough Beach. There would be no project visibility at this location but visibility of 9-10 turbines is indicated on most of the lake (not photographed).

- **Other Lakes And Ponds With Visibility: Moderate**

The project will be visible from a number of other lakes and ponds within the surrounding area. Robb Reservoir is part of a conservation area recently acquired by the Trust for Public Land with funding assistance from the Antrim Conservation Commission. It is an entirely natural body of water. Visibility of up to 8 turbines is indicated on portions of Robb Reservoir. Similarly Island Pond shows high visibility from portions of the pond. Highland Lake, Nubanusit Pond and Black Pond will also have some visibility of the project.



Figure 12: Robb Reservoir. The project would not be visible from this location but the Viewshed Analysis indicates visibility at the southern end (not visited).

I. Discussion of the impacts of Roads, Collector Lines, Lighting and other Associated Facilities

• Substation/Operations & Maintenance Facility

The project layout combines the two substations (115kV and 34.5KV) and the O&M building and parking area in a linear fashion extending along the slope over a distance of 360 feet and a vertical drop of about 27 feet. Part of the lower fill slope is very close to the property line. It is not anticipated that this facility would be visible from Route 9 or the Lovern's Mill Cedar Swamp Preserve, but some remediation in the form of landscaping may be required if there is high visibility.

• Collector lines

Collector lines will be buried along the ridges making the impacts minimal. Above ground poles could be visible in areas where vegetation is low or steep slopes reveal the poles. Poles are likely to be seen against a vegetated backdrop so that impacts would not be significant.

- **Roads, Turbine Pads, Cut and Fill Slopes**

Visibility of roads, turbine pads, or cut and fill slopes along a ridgeline can be particularly problematic if they are visible from off-site vantage points. Higher elevation vantage points such as mountain summits often reveal roads and clearings even when they are not visible from lower elevations. It does not appear that roads or clearings were shown on the applicant's simulations. There are several areas of concern. The simulation from Goodhue Hill (Appendix A Simulation 2B) shows visibility of clearing near Turbine #10 as well the road clearing descending from turbine #5 to turbine #6.

Additional problems could result in the following areas depending on the height of existing vegetation near the cut and fill slopes. Turbine #2 has a fill slope facing north totaling 40'. Between turbines #5 and #6 there are combined cut and fill slopes (above and below the road) totaling up to 45 feet facing in a northerly direction. Just beyond turbine #8 there are slopes of fill facing south totaling up to 40'. Just before turbine #9 there are fill slopes totaling 40' facing southeast (toward Gregg Lake). In addition to the visibility of clearing around turbine #9 shown on Simulation 2 (Appendix A) the southwest corner of Turbine #9 has cut and fill slopes facing toward the Lovern's Mill Cedar Swamp (visibility from this resource is undetermined). Studies should be conducted based on the current vegetative conditions to determine whether any visibility of roads or cut and fill slopes could occur from important vantage points. Revegetation of cut and fill slopes along roadways will also be important.

- **FAA Hazard Lighting**

Hazard lighting of the project is likely to be a significant problem especially in views from Willard Pond, Bald Mountain, Goodhue Hill, Rob Reservoir and other lands that are within natural areas and conserved lands. No lights are currently visible from these areas and the proximity and number of lights would present a substantial contrast to the existing experience. The number and prominence of red flashing lights will also be a significant concern from Gregg Lake where there are currently no other similar lights visible.

J. Evaluation of Overall Project Impacts

As discussed above the project would result in significant aesthetic impacts as viewed from certain vantage points that are highly sensitive such as Willard Pond and Bald Mountain. Impacts from other vantage points are moderate to significant for a variety of reasons such as the number of turbines visible, the proximity of views, and/or a heavy use for recreational purposes that include scenic enjoyment of the surrounding landscape. While unreasonably adverse impacts are unlikely to result from significant impacts from a single setting, when significant impacts to scenic resources

occur from numerous vantage points impacts are likely to have unreasonable adverse effects. The Antrim Wind project will appear very prominently from numerous vantage points including several that have very high sensitivity due to the importance of the natural setting. The cumulative or combined impact within the surrounding area is exacerbated by the fact that the majority of lakes and ponds within the area will have at least some visibility of the project and from a few, notably Willard Pond, Gregg Pond, and Franklin Pierce Reservoir all of the turbines will be visible over most of the water surface. In addition the project will be visible from most of the surrounding mountains and hills in the area that are accessible by trails. While it may be true that as the Saratoga Report noted, there would be no visibility from 95% of the study area, the places where visibility will occur are those areas in which one lingers, recreates and where the experience of the natural landscape is often highly valued. Night lighting will further detract from the scenic enjoyment of these resources.

K. Evaluation of Applicant's Aesthetic Review

Saratoga Associates is a well-respected firm with considerable experience in conducting visual impact assessments. The vantage points selected for illustrating the project (simulations) were well selected and present reasonably accurate portrayals of how the project will appear in the landscape. The difference in our conclusions regarding the project results from the lack of any detailed analysis of the specific vantage points within the region on the part of Saratoga Associates. A careful examination of the particular attributes of each resource area and how the project would be viewed within those areas is important for understanding how an individual area may be affected and how the study area as a whole may be affected. The differences in our analyses are as follows:

- Hiking trails and lakes and ponds are resources appreciated for their scenic attributes and thus are particularly sensitive to visual impacts. While there are many accessible water bodies and hiking opportunities within the area, some are characterized by more motorized forms of recreation (e.g. motorboats) and are contexts in which development is part of the setting while others are noted as places where one can be away from these more common attributes of civilization and where one can experience a predominantly natural setting. Places like the dePierrefeu-Willard Pond Wildlife Sanctuary are set aside with contributions by numerous individuals and often public funds involving years of effort. They provide a unique opportunity to experience the beauty of nature. While many find wind turbines to be visually appealing, this author included, they are power generation facilities and not necessarily appropriate to every situation, particularly locations valued for a pristine setting.
- The second difference in our analyses is the examination of the combined effect of the areas within the study area from which the project would be visible. The areas from which visibility would occur are the open areas and in a predominantly forested landscape these open areas, though few in number are often the focal points: the lakes, ponds, ledgy summits and open meadows. The proximity and number of turbines visible from so many of these areas within the Town of Antrim will be significant.

L. Conclusions and Recommendations

Based on the above analysis, it is my conclusion that the project as currently designed would result in unreasonable adverse effects to the scenic quality of the surrounding area. The Mitigation measures discussed in section 4.0 of the Saratoga Visual Report are basic measures employed in nearly all recently proposed wind energy projects. They are minimum measures and they do not address the particular characteristics, resources and impacts that will result from this particular project. This project will be highly visible and dominating from numerous sensitive vantage points. While I believe that an appropriately scaled and designed wind project would work within this setting, I believe that substantial modification will be required for this project to meet the requirements of RSA 162-H:16,IV,.(c) and to fit reasonably within this context. The following combined mitigation measures are the minimum necessary to adequately reduce the significant and unreasonable impacts of the project:

- Eliminate turbines #9 and #10. These two turbines are the most prominent as viewed from Willard Pond, Bald Mountain and Goodhue Hill and will result in unreasonable adverse aesthetic impacts. Visibility of clearing around turbine #9 will also result in significant visual impacts.
- Use an OCAS or similar motion activated collision avoidance system. This will be essential as night lighting will result in significant and unreasonable adverse aesthetic impacts to the area given the high visibility of the project from numerous lakes and ponds and especially from within wildlife sanctuaries and conservation areas.
- Use smaller turbines. The scale of the landscape in this part of New Hampshire is small with relatively low hills and mountains. The proposed turbines will overwhelm the ridgeline especially from a vantage point like Gregg Lake.
- Specific plans for land conservation as part of an off-site mitigation program must be identified and provide a meaningful counterbalance to the impacts to the natural and scenic resources of the area. Audubon's dePierrefeu-Willard Pond Sanctuary will be heavily impacted as a result of the project. The developer should work with Audubon to find a reasonable conservation off-set in conjunction with other measures identified here to reduce the visual impacts of the project.
- Identify and address all areas from which portions of roads, ridgeline clearing, cut and fill slopes and or turbine/pads may be visible. Of particular concern is the visibility of the road between turbines #5 and #6 from Goodhue Hill, any other areas where project infrastructure other than turbines are visible will be a significant concern. The applicant should conduct line-of-sight studies from portions of roadway and turbine clearings to all sensitive vantage points. Specific plans need to be provided showing how these areas of project infrastructure visibility will be mitigated. Among the measures that must be considered would be reducing the size of clearings, reducing the size of cut and fill slopes, eliminating turbines in areas where visibility could be high, revegetating cut and fill slopes using indigenous species.

- General revegetation of cut and fill slopes and all non-permanent surfaces must occur immediately following construction. Revegetation must be with native plants and seed sources preferably using stock-piled soil. Introduction of exotic species should be avoided. Planting of indigenous species may be required in some areas as discussed above. A specific plan should be developed and approved by the NH Department of Forestry and Lands including on-going monitoring to ensure revegetation is successful.
- Any significant visibility of the substation and O&M facility may need to be mitigated with screening plantings.

APPENDIX A

PHOTOSIMULATIONS



NOTE:
THESE PHOTOS ARE INTENDED TO BE VIEWED AT 11X17
AT APPROXIMATELY 17" FROM THE VIEWER.



VISUAL SIMULATION

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ANTRIM WIND PROJECT:
WILLARD POND DAM - NORTHWEST

Prepared For:
Jean Vissering Landscape Architecture
Prepared By:
 SE GROUP

1B

July 30, 2012



VISUAL SIMULATION

NOTE:
THESE PHOTOS ARE INTENDED TO BE VIEWED AT 11X17
AT APPROXIMATELY 17" FROM THE VIEWER.

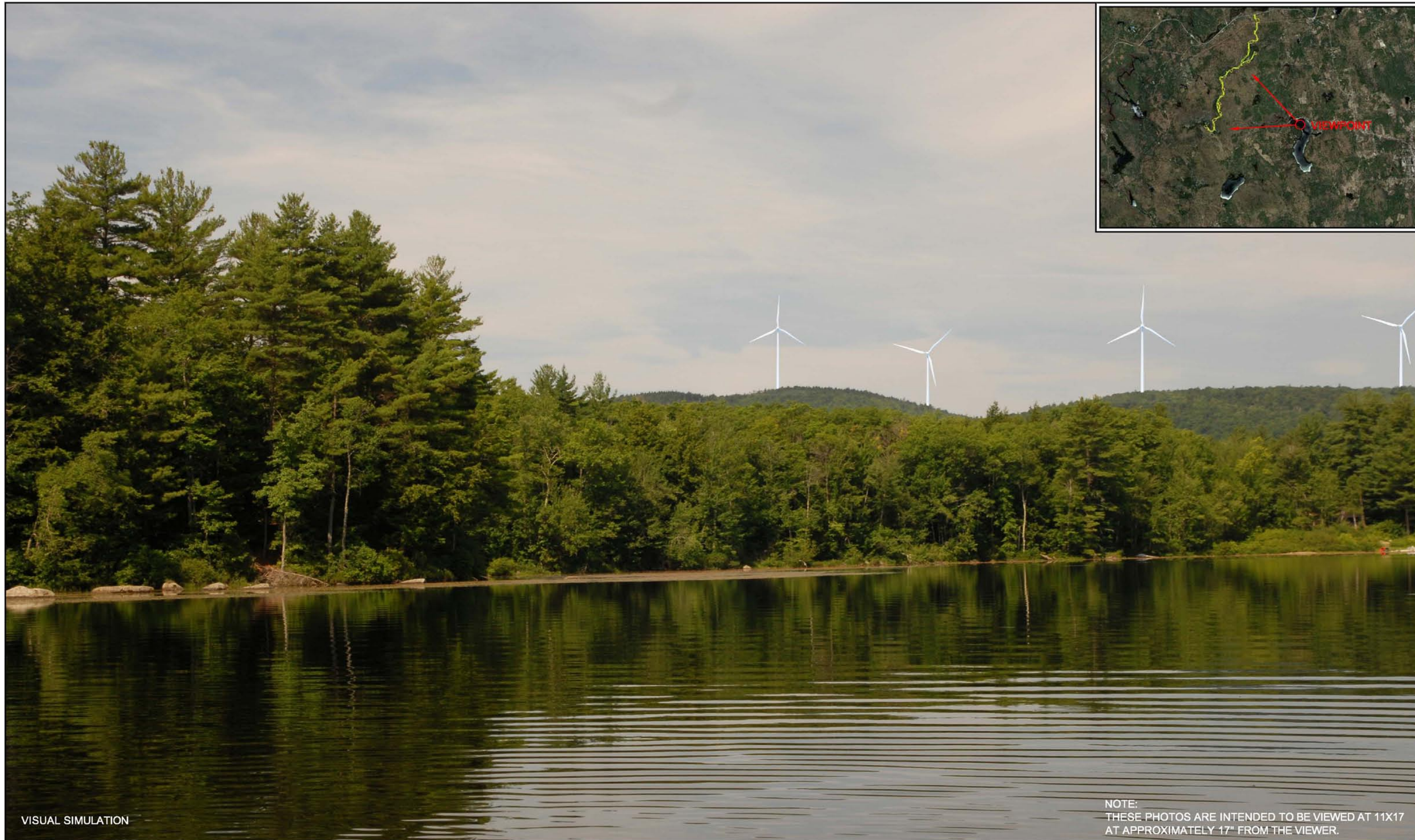


NOTE:
THESE PHOTOS ARE INTENDED TO BE VIEWED AT 11X17
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VISUAL SIMULATION

NOTE:
THESE PHOTOS ARE INTENDED TO BE VIEWED AT 11X17
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VISUAL SIMULATION

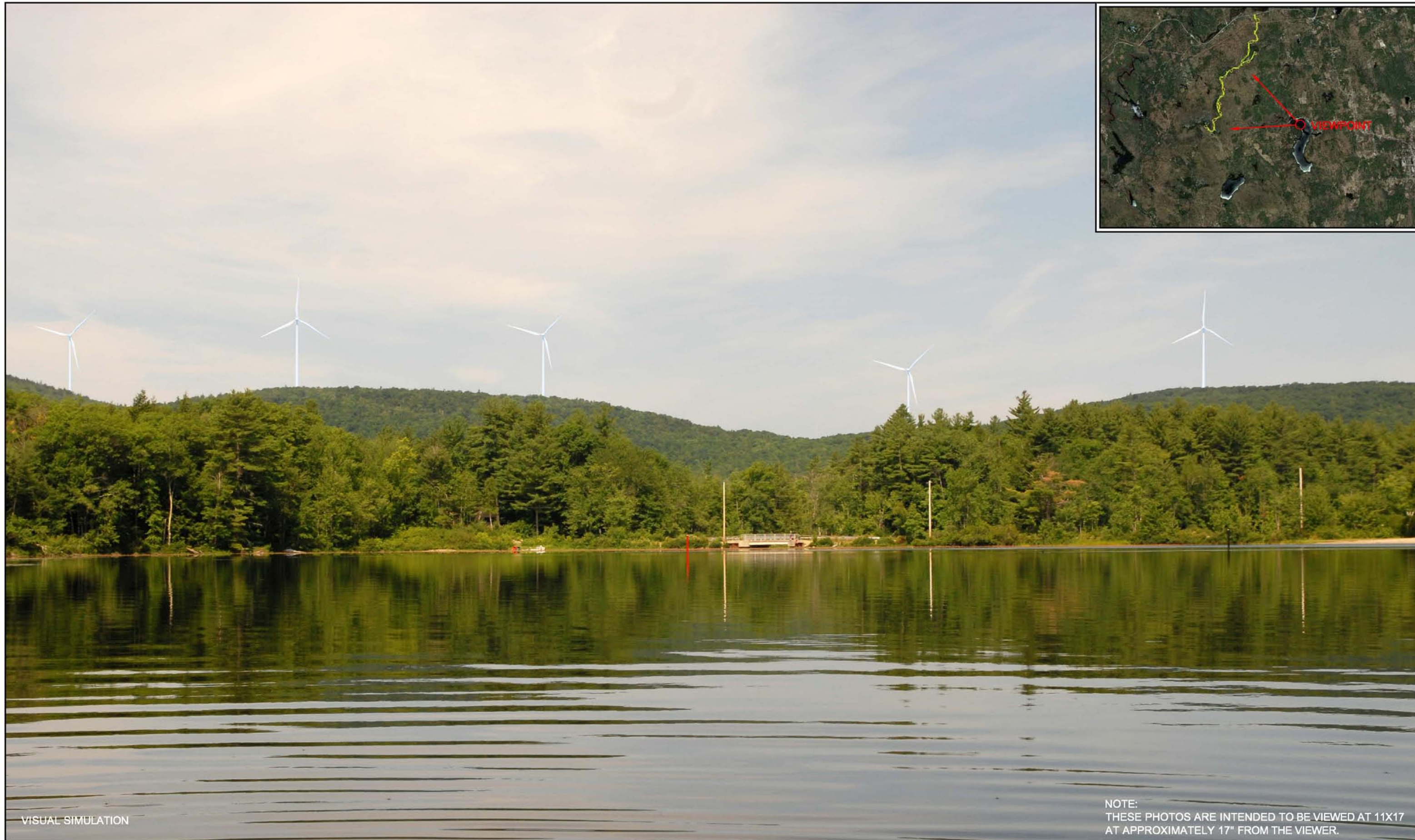
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AT APPROXIMATELY 17" FROM THE VIEWER.

ANTRIM WIND PROJECT: GREGG LAKE - WEST

Prepared For:
Jean Vissering Landscape Architecture
Prepared By:
SE GROUP

3A

July 30, 2012





VISUAL SIMULATION

NOTE:
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AT APPROXIMATELY 17" FROM THE VIEWER.

ANTRIM WIND PROJECT:
GREGG LAKE - NORTH NORTHWEST

Prepared For:
Jean Vissering Landscape Architecture
Prepared By:
SE GROUP

3C

July 30, 2012



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VISUAL SIMULATION

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APPENDIX B
RESUME OF JEAN VISSERING

Jean Vissering Landscape Architecture

3700 NORTH STREET MONTPELIER VERMONT 05602 802-223-3262/jeanviss@attglobal.net

RESUME

EDUCATION

Master of Landscape Architecture - 1975, North Carolina State University, Raleigh, NC,
American Society of Landscape Architects Book Award.

Bachelor of Science in Landscape Architecture - 1972, University of Massachusetts, Amherst, MA. Cum Laude. Honors Thesis on Pedestrian Environments.

PROFESSIONAL EXPERIENCE AND EXAMPLES OF PROJECTS

Professional Consulting: Visual Resource Planning and Visual Impact Assessment Projects

- Currently providing independent review of telecommunications and electrical generation projects for the Vermont Department of Public Service under the §248 process.
- Currently working with Goddard College in Plainfield, VT on aesthetic impact review of a proposed wood fired electrical generation plant for the college.
- Currently working with Winstanley Enterprises on aesthetic impact review of a 25MW biomass electrical generation plant in North Springfield, VT (North Springfield Sustainable Energy Project)
- Aesthetic Impact Review on behalf of the City of Burlington on Act 250 Review of the proposed Champlain Parkway.
- Prepared a methodology for state review of visual impacts of wind energy projects with the Clean Energy States Alliance (CESA), A *Visual Assessment Process for Wind Energy Projects*. The project is funded by a grant from the U.S. Department of Energy (DOE). A 2 hour webinar presentation was viewed by state and federal officials and organization representatives from around the country.
- Prepared visual impact assessment for the proposed Lowell Wind Project, Lowell, Vermont for the Green Mountain Club.
- Visual Impact Assessment of proposed shopping center outside Brandon village, Vermont for Preservation Trust of Vermont
- Work with the Preservation Trust of Vermont in evaluating the visual impacts of a proposed commercial facility in Ferrisburgh.
- Visual Impact Assessment for Kibby Expansion Project on Sisk Mountain in Chain of Ponds and Kibby Townships, Maine (TransCanada).
- Visual Assessment of proposed Fuel Station, Convenience Store and Restaurant Facility for Friends of Ferrisburgh.

- Visual Impact Assessment for Georgia Wind Project as an independent witness for the Vermont Public Service Department.
- Visual assessment of the Deerfield Wind Project on behalf of Iberdrola. The project is proposed within the Green Mountain National Forest and was approved by the Vermont Public Service Board and is currently under review by the GMNF.
- Visual Impact Assessment for Granite Reliable Wind Park in Coos County, NH approved by the NH Siting Evaluation Committee, on behalf of Noble Environmental Energy.
- Visual Impact Assessment of the proposed Kibby Wind Energy Project in the Boundary Mountains of Maine on behalf of TransCanada (Approved by Maine LURC).
- Independent visual impact assessment of a proposed subdivision adjacent to Interstate 91 in Windsor Vermont District for the District #2 Environmental Commission.
- Visual Impact Assessment of the proposed Redington and Black Nubble Wind projects on behalf of the Appalachian Trail Conservancy (Maine LURC concurred with my findings, project denied).
- Appointed as member of the National Academy of Science Wind Energy Committee which produced a report, *Environmental Impacts of Wind-Energy Projects* (National Research Council of the National Academies 2007).
- Visual Impact assessment of a small wind turbine in Huntington for the Foundation for a Sustainable Future.
- Aesthetic review under §248 of the Vermont Electric Coop (VELCO) Northwest Reliability Project for the Addison County Regional Planning Commission.
- Preliminary assessment of a proposed wind energy project in the vicinity of Jordanville and Cherry Valley, NY for Otsego 2000.
- Assisted the Bennington Regional Commission and the Town of Manchester in a public information and review process by providing information regarding the aesthetic effects of the proposed Little Equinox Wind Energy Project.
- Scenic evaluation methodology and protection strategies for the Town of Huntington's Conservation Commission to be used as a tool for prioritizing conservation efforts.
- Visual assessment for the proposed Glebe Mountain wind project on behalf of the Town of Londonderry.
- Presentation to Scenic America's Board of Directors and Affiliates of the visual issues involved in wind energy development at their annual meeting in Washington, D.C.
- Visual assessment methodology for the Public Service Board, published as a brochure: *Siting a Wind Turbine on Your Property*; designed to encourage the sensitive siting of small wind turbines to protect scenic views.
- Prepared the report, *Wind Energy and Vermont's Scenic Landscape*, for the Vermont Public Service Department summarizing discussions among stakeholders concerning the visual impacts of wind energy. The guidelines are intended for use by the PSB, prospective developers, and by local and regional planning organizations.
- *Open Space Plan Views and Vistas Study* for the City of Montpelier's Conservation Commission. The Study recommended priorities for green space and open space protection.
- "Scenic Resource Evaluation Process": a team project to develop guidelines for Vermont Agency of Natural Resources' review of Act 250 projects.

Professional Consulting: Design and Planning Projects

- Design for the George Aiken Native Vermont Plant Garden viewed from the Statehouse cafeteria;
- Work with the Trust for Public Land to facilitate discussions with stakeholders and illustrate options for the development and conservation of Sabin's Pasture, a 100 acre parcel in Montpelier. Designs illustrated a compact neighborhood approach for up to 300 mixed use and affordable housing units, recreation paths and storm water retention areas.
- Design of a ceremonial garden the Center for Victims of Violent Crimes to honor those who have been affected by violent crimes. The garden is located on State property near the State House in Montpelier and includes a plaza and accessible pathway.
- Re-Design of City Hall Plaza in Montpelier
- Street Tree Plan for Route 2 in Plainfield, VT
- Design for Martin Bridge Park for the Town of Marshfield; the park includes parking and handicapped access to a historic covered bridge, information about the natural and cultural history of the area, picnic areas, and trails connecting to the Cross Vermont Trail.
- Design and construction supervision for numerous residential and institutional projects.
- Elm Court Park: a small pocket park and entry way developed by the Trust for Public Land and the City of Montpelier. The park includes a small plaza, sitting areas and demonstrates ecological approaches to design and contains a butterfly garden.
- Turntable Park, Stonecutters Way, Montpelier: design for restoration of an historic turntable, along with accommodation of recreational and theatrical use of a small park. (Designed in collaboration with the Office of Robert White).
- Randolph Family Housing and Templeton Court, landscape design for low-income housing projects in Randolph and White River Junction, VT.
- Plainfield Common, a public riverside park and small formalized parking area in the village center of Plainfield; this project involved extensive public involvement
- Streetscape Master Plan for Chelsea village: village plantings and other amenities for the village center's greens and streets, as well as for several parks and public areas.
- Street tree inventory and plan for the City of Montpelier.
- Conservation and development plans for landholdings in various towns including Hardwick and Calais. Plans provide for the protection of important resources including scenic values, agricultural lands, wetlands, and valuable forestland while identifying appropriate areas for development.

Teaching Experience

- **2000-20011:** Landscape Design courses at Studio Place Arts in Barre.
- **1982 -1997: Lecturer (University of Vermont, School of Natural Resources and Department of Plant and Soil Science)**
Teaching and Advising: Courses included *Park and Recreation Design* (Recreation Management); *Landscape Design Studio*, *Colloquium in Ecological Landscape Design* (Plant and Soil Science), and *Visual Resource Planning and Management* (Natural Resources graduate level), and *Environmental Aesthetics and Planning* (Natural Resources).

- **1996: Faculty (Vermont Design Institute)**
Faculty facilitator for a summer workshop on finding patterns in rural landscapes and historic town centers which could be used as a planning and design tool.
- **1995: Lecturer (Norwich University, Department of Architecture)**
Course in Landscape Design, the first to be taught in the school.

Additional Experience

- **1981 - 1982: State Lands Planner (Agency of Natural Resources, Department of Forests, Parks and Recreation)**
Preparation and coordination of all land management plans for the Department of Forests, Parks, and Recreation; review of plans under Act 250 and Act 248 for aesthetic impacts; design services and related expertise to other Agency departments and to municipalities.
- **1978 - 1981: Park Planner (VT. Dept. of Forests, Parks and Recreation)**
Design of state park facilities including site analysis, working drawings, grading plans, construction details, planting plans, and supervision of construction. Reviewed plans under Act 250 for aesthetic impacts. Helped organize a new state lands management unit.

PUBLICATIONS AND ILLUSTRATIONS

A Visual Assessment Process for Wind Energy Projects, Clean Energy States Alliance with Mark Sinclair and Anne Margolis, contributing authors, May 2011

Minimize the Visual Impact of Turbines, Burlington Free Press, January 17, 2010

Environmental Impacts of Wind-Energy Projects, National Research Council of the National Academies, May 2007

Sabin's Pasture: A Vision for Development and Conservation, Central Vermont Community Land Trust, March 2003.

Siting a Wind Turbine on Your Property: Putting Two Good Things Together, Small Wind Technology & Vermont's Scenic Landscape, Public Service Board, December 2002

Wind Energy and Vermont's Scenic Landscape: A Discussion Based on the Woodbury Stakeholder Workshops, Vermont Public Service Department, August 2002.

Scenic Resource Evaluation Process, Vermont Agency of Natural Resources, July 1, 1990. Guidelines to be used by the Agency of Natural Resources in reviewing visual impacts of development projects under Act 250 in areas of regional and statewide scenic significance.

"Impact Assessment of Timber Harvesting Activity in Vermont: Final Report-March 1990": a research project conducted by the University of Vermont on behalf of the Vermont Department of Forests, Parks, and Recreation. My focus was the visual impacts of timber harvesting.

"Landscapes, Scenic Corridors and Visual Resources": a chapter of the 1989 Vermont Recreation Plan which outlines a five year plan for protecting and enhancing scenic resources in Vermont.

"Healing Springs Nature Trail Guide": Guide for a nature trail at Shaftsbury State Park including text, illustrations (I also designed the trail and bridges).

"The View from the Sidewalk": a walking tour emphasizing the interconnections of environment and culture that shaped the cityscape of Raleigh, North Carolina, text and illustrations.