

**ATTORNEY GENERAL
DEPARTMENT OF JUSTICE**

33 CAPITOL STREET
CONCORD, NEW HAMPSHIRE 03301-6397

JOSEPH A. FOSTER
ATTORNEY GENERAL



ANN M. RICE
DEPUTY ATTORNEY GENERAL

May 23, 2016

VIA ELECTRONIC MAIL AND
HAND DELIVERY

Ms. Pamela Monroe, Administrator
Site Evaluation Committee
21 South Fruit Street
Concord, New Hampshire 03301

Re: Docket 2015-12: Antrim Wind Energy, LLC Petition for Certificate of Site and Facility –
Pre-filed Testimony of Kellie Connelly

Dear Ms. Monroe:

Please find enclosed for filing in the above-captioned matter, an original and one copy of the Pre-filed Testimony of Kelly Anne Connelly, on behalf of Counsel for the Public. Along with the testimony are Exhibits A, Ms. Connelly's Resume, Exhibit B, Terraink, Incorporated's Visual Impact Assessment, and Exhibit C, Jean Vissering's Visual Impact Assessment conducted in Docket 2012-01.

Because Terraink's Visual Impact Assessment is too large to file electronically, a Compact Disc containing the document is being sent via first class mail to Antrim Wind Energy, LLC and all of the Interveners.

If you have any questions regarding any of the forgoing, please so not hesitate to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Mary Maloney".

Mary Maloney
Counsel for the Public
Assistant Attorney General
Environmental Protection Bureau

(603) 271-3679
Fax: (603) 271-2110

Enclosures
cc: AWE, LLC and Interveners

**STATE OF NEW HAMPSHIRE
BEFORE THE
SITE EVALUATION COMMITTEE**

SEC Docket No. 2015-02

**APPLICATION OF ANTRIM WIND ENERGY, LLC
FOR A CERTIFICATE OF SITE AND FACILITY**

PRE-FILED TESTIMONY OF KELLIE CONNELLY

FOR

**MARY MALONEY, COUNSEL FOR THE PUBLIC, NEW HAMPSHIRE
DEPARTMENT OF JUSTICE**

May 23, 2016

1 **Q: Please state your name, profession and business address.**

2 **A:** My name is Kellie Anne Connelly, I am a Registered Landscape Architect in New York
3 and Massachusetts and Co-owner/Principal of Terraink, Incorporated located at 7 Central Street,
4 Arlington, Massachusetts.

5 **Q: Please summarize your educational background and work experience?**

6 **A:** My resume is attached as Exhibit A. I received a Master of Landscape Architecture
7 degree from the Harvard University Graduate School of Design, located in Cambridge,
8 Massachusetts, in 2000. During that time I worked extensively with respected planner and visual
9 expert Carl Steinitz in both classroom and studio settings as a member of regional planning
10 teams in the Middle East, and under Mr. Steinitz's mentorship, I personally developed a set of
11 visual quality guidelines for Plymouth, Massachusetts and the New England Region. I also
12 received a Bachelor of Landscape Architecture degree from the SUNY College of Environmental
13 Science and Forestry (ESF), located in Syracuse, New York, in 1995, where I studied with
14 respected visual experts Richard Smardon and James Palmer in classroom settings. I completed
15 my senior project; a visual analysis of the Village of Celestun, Mexico under the direct
16 supervision of Rick Smardon. Lastly, I have an Associate in Applied Science degree that I
17 received in 1991 from the SUNY College of Technology at Alfred, located in Alfred, New York,
18 where I studied the application of landscape design, contracting and nursery management
19 principals.

20 My work experience in Boston, Massachusetts and Syracuse, New York Landscape Architecture
21 firms includes Project Management roles on commercial, institutional and residential land
22 development. It was during my employment by EDR in Syracuse, New York that I first applied
23 my educational background in visual analysis to a professional setting by working both as a

1 Landscape Architect and a visual impact assessment rating panel and field crew member, in
2 addition to serving as a visual expert team member for various wind, coal and powerline
3 projects. After leaving EDR to return to Boston, Massachusetts, I continued to provide EDR with
4 rating panel member services on various wind and powerline projects as part of the work load for
5 Terraink.

6 In tandem to my professional practice at EDR, I was also an Adjunct Professor at the
7 SUNY College of Environmental Science and Forestry at Syracuse, New York where I taught a
8 senior design studio and also oversaw the project work for 5th year off-campus studio groups. I
9 continue to invest in teaching by continuing as an Instructor at the Rhode Island School of
10 Design in Providence, Rhode Island teaching the Tech & Materials III lecture that focuses on
11 sustainable practices and the real life application of technical drafting skills and construction
12 documentation.

13 **Q: What is the purpose of your testimony?**

14 **A:** Terraink, Incorporated (“Terraink”) has been retained by the New Hampshire Counsel for
15 the Public to prepare a visual impact assessment (VIA) for the re-submitted Antrim Wind Power
16 Project (the Project) in Antrim, New Hampshire. The purpose of the VIA is to determine if the
17 re-submitted Project meets the requirements for aesthetic impacts as defined in New Hampshire,
18 RSA 162-H:16,IV,.(c), which states (c) *The site and facility will not have an unreasonable*
19 *adverse effect on aesthetics, historic sites, air and water quality, the natural environment, and*
20 *public health and safety*, and also by the standards defined in *Site 301.50 Effects on Aesthetics*.
21 The VIA report encompasses a version of existing agency approved/developed methodologies to
22 reach a determination on the potential visual effect by describing the proposed project and study
23 area, inventorying the sensitive resources, developing and evaluating visual simulations based

1 upon the Project's specifications and location, and then assessing the potential visual impact of
2 the Project on the study area. This VIA report and associated rating panel assessments were
3 completed by Registered Landscape Architects that are experienced in the participation and
4 preparation of visual impact assessments. See Exhibit B, Terraink, VIA

5 In addition to conducting the VIA on behalf of the New Hampshire Counsel for the Public for
6 the Antrim Wind Power Project, Terraink was also asked to review the Applicant's VIA that was
7 completed by LandWorks (LW), a landscape architecture firm located in Middlebury, Vermont.

8 **Q: Please describe the character of the Project area?**

9 **A:** The proposed project site is made up of approximately 1,870-acres of private land leased
10 by Antrim Wind Energy LLC (AWE) from six landowners in the Town of Antrim in
11 Hillsborough, New Hampshire. The project is located in a rural conservation zoning district and
12 will permanently occupy 11.3-acres of land; including roads, turbine foundations, and
13 miscellaneous facilities. The staging areas and work pads will include approximately 45.8-acres
14 of additional disturbance that is proposed to be revegetated with native grasses. The project is
15 located on an elevated ridgeline that starts with Tuttle Hill; approximately .75-miles south of NH
16 Route 9 to Willard Mountain, approximately 2-miles to the south-southwest. The project site is
17 located approximately 4-miles northwest of the Town of Antrim, approximately 5-miles north of
18 the Town of Hancock, and approximately 4-miles southeast of the Town of Stoddard. The
19 project ridgeline runs nearly parallel to, and is bordered by, NH State Route 9 approximately .75-
20 miles to the north, bordered to the east by NH State Route 31/ US Route 202, to the south by NH
21 State Route 137 and NH State Route 123 to the west, until it intersects with NH State Route 9
22 creating a full loop. Land use within the project site is dominated by rural conservation and
23 lakefront residential zoning districts. There is an existing Public Service of New Hampshire

1 (PSNH) transmission corridor with 115kV electric transmission and 34.5 kV electric distribution
2 lines that run between the ridge and NH State Route 9. Dense settlement and human activity are
3 concentrated to the north and east of the project site in the Town of Antrim and along the State
4 route corridors.

5 **Q: Please describe the methodology used by Terraink in conducting the VIA?**

6 **A:** RSA 162-H:16,IV(c), which states: (c) The site and facility will not have an unreasonable
7 adverse effect on aesthetics, historic sites, air and water quality, the natural environment, and
8 public health and safety, has led to the development of a set of visual impact assessment
9 standards as defined in N.H. Admin. Rules, Site 301.50 Effects on Aesthetics. This VIA has
10 utilized the standards put forth in N.H. Admin. Rules, Site 301.50 Effects on Aesthetics as well
11 as encompassing a version of existing agency approved/developed methodologies that include,
12 but are not limited to; the Bureau of Land Management, Visual Resource Management System
13 (VRM), the United States Army Corp of Engineers, Visual Resource Assessment Process
14 (VRAP), the United States Department of Agriculture, Forest Service, Landscape Aesthetics
15 Handbook, and the United States Department of Transportation, Federal Highway Commission,
16 Guidelines for the Visual Assessment of Highway Projects, and the New York State Department
17 of Environmental Conservation, DEP-00-2; Assessing and Mitigation Visual Impacts.

18 Terraink consulted with Environmental Design & Research (EDR) Landscape
19 Architecture, Engineering & Environmental Services, D.C.P. , located in Syracuse, New York, to
20 develop the technical portions of the VIA, including the Viewshed Analysis, Field Data
21 Collection, Visual Simulations, Methodology Text, and Figures.

22 **Q: Please summarize your conclusions concerning the aesthetic impacts of the proposed**
23 **Antrim Wind Project.**

1 **A:** The Terraink Visual Impact Assessment for the Antrim Wind Power project finds that the
2 project, as currently designed, would result in an overall high-moderate study area visual contrast
3 rating and an unreasonable adverse visual impact to (6) sensitive resources within the study area.
4 While the various sensitive resources studied in this VIA indicate varying levels of potential
5 visual impact, it is the DePierrefeu-Willard Pond Wildlife Sanctuary as a whole that is most
6 significantly impacted by the installation of the wind turbines. The conservation land and
7 associated educational facilities in the wildlife sanctuary are permanently affected by the
8 proposed industrial installation. Terraink acknowledges and agrees with both LandWorks and
9 Jean Vissering’s evaluation that the Antrim site appears to be a “good” location for a wind
10 project on paper due to the topography, “moderate” visual effects on many of the SEC
11 determined sensitive resources, limited views from towns, major roadways, water bodies, and
12 wooded lands; however, what cannot be accounted for by the “on paper” assessment is the vigor
13 and commitment of the local population’s passion and investment in purchasing, connecting,
14 protecting, and preserving local conservation lands as a means to protect the regional landscape,
15 which goes beyond National and State significance.

16 As indicated in my Visual Impact Analysis the Project Study Area Resource Contrast
17 Rating average of 14.65 is reviewed in tandem with Table 7 - Summary of Terraink Potential
18 Visual Impact Results, which indicates that there are (6) sensitive resources that are anticipated to
19 have the highest potential visual impact due to the installation of the wind turbine project. These
20 viewpoints include VP#1 – Willard Pond; VP#5 – Meadow Marsh Preserve; VP#7 – White Birch
21 Point Historic District, Gregg Lake; VP#27 – Bald Mountain; VP# 33 – Goodhue Hill (Trail) and
22 VP#67 – Black Pond. The only means to reduce or mitigate the potential visual impact on these
23 (6) sensitive resources of regional significance is to relocate the project since further reducing the

1 turbine heights will potentially create an increased visual disturbance situation due to the
2 occurrence of bisected blades on the horizon, and reorganizing the wind turbines on the existing
3 ridge will not result in obscured views.

4 As per N.H. Admin. Rules, Site 102.46, the SEC definition of “Sequential Observation”
5 means “a viewer is capable of seeing multiple energy facilities from different viewpoints as the
6 viewer travels along a particular route such as a trail, river, scenic byway, or on a lake.” In
7 addition, as per N.H. Admin. Rules, Site 102.52, “Successive Observation” means, “a viewer
8 sees multiple energy facilities from a particular viewpoint, but not within the same viewing arc,
9 by changing the viewer’s cone of vision.” (Source #10993, eff. 12-16-15) Therefore, in applying
10 these definitions to the Antrim Wind Project, there is no cumulative visual impact; combined,
11 sequential or successive, that result from the Antrim wind power project. The existing Lempster
12 Wind Power project, located in Lempster, New Hampshire, has no visibility from (13) of the (14)
13 sensitive sites, and is only visible from Pitcher Mountain when looking north-northwest, which is
14 away from the view of the Antrim wind power project location. The undulating topography and
15 dense vegetation of the region will limit the potential visibility of both wind power installations
16 except for summit locations with 360-degree view such as Pitcher Mountain.

17 Therefore, it is the professional opinion of Terraink, based upon this comprehensive
18 visual impact analysis, that the Antrim Wind Project as proposed does not create a cumulative or
19 sequential effect; however it does create an unreasonable adverse effect on aesthetics within the
20 study area.

21 **Q: Please summarize your differences with the Visual Impact Assessment conducted by**
22 **Land Works.**

23 **A:** LandWorks is a well-respected firm with extensive experience in the development of

1 visual impact assessments. The 191-page Visual Assessment for the Antrim Wind Project is
2 dense with project specific information, VIA methodology, results and references to other wind
3 power projects throughout the New England Region. While the breadth and detail of the
4 information within the visual assessment is commendable and almost textbook in nature, it made
5 for a large document that was often difficult to navigate and hone in on the specific Antrim VIA
6 methodology and results.

7 LandWorks' conclusion for the Antrim Wind Power Project, as indicated on page 131 of
8 the VA report, is that the Antrim wind power location is an "excellent site for a wind project."
9 LandWorks determined that the "visual effects are extraordinarily limited given the number of
10 resources in the project area, and the lack of resources of State or National scenic significance."
11 It was also stated on page 132, that "there will be a limited effect on local resources, including
12 the fact that the use of Willard Pond and its environs will not be substantially diminished if this
13 project is constructed." Given these statements, it was LandWorks opinion that "the project as
14 proposed will not have an unreasonable adverse effect on aesthetics." However, this opinion is
15 made without LandWorks fully considering and evaluating the regionally sensitive resources
16 throughout the project area by applying the SEC definition of "Scenic Resources" which
17 includes State, Federal and Regional resources. It is important to note that within the 10-mile
18 project study area is nearly 1/3 conservation land (105-square miles), which reflects significant
19 public and private investment in the region to prevent these areas from development. The most
20 potentially affected location throughout the conservation land study area is the DePierrefeu-
21 Willard Pond Wildlife Sanctuary, which has also received significant State and Federal
22 investment to maintain it as a natural resource for recreational and educational users. It is also
23 important to note that there are experiential woodland areas that could be potentially affected by

1 the proposed project, such as the Gregg Trail, Accessible Route at Crotched Mountain, which
2 provides disabled users the opportunity to engage with the natural environment while
3 experiencing a pristine skyline view of the mountains, which is often unavailable to them.

4 However, it is the finding of Terraink that the (5) sensitive resources would have a high
5 potential for visual impact and, therefore, an unreasonable aesthetic impact would be incurred by
6 the construction of the project. These sites include Willard Pond, Meadow Marsh Preserve,
7 White Birch Point Historic District, Bald Mountain and Goodhue Hill. In reviewing Jean
8 Vissering's VIA, she also concluded that (4) of the (5) sensitive resources as listed by Terraink
9 would also have significant aesthetic impacts, which included Willard Pond, White Birch Point
10 Historic District, Bald Mountain and Goodhue Hill. See Exhibit C, Vissering Visual Assessment
11 Report on Antrim Wind. In contrast, LandWorks determined that only Willard Pond had a
12 "Moderate-High" overall visual effect rating (Table 14, page 87), and a "Moderate" overall
13 viewer effect rating (Table 19; page 90) and therefore, "the effect to a reasonable viewer is not
14 considered significant," thus supporting the LandWorks conclusion that there would be no
15 unreasonable adverse effect on aesthetics with the wind power project in place.

16 In addition, the LandWorks rating of the (4) remaining sensitive resources that were
17 found to be visually impacted within the Terraink VIA were eliminated from impact assessment
18 during the LandWorks rating process. For example, the Bald Mountain earned a "Low-
19 Moderate" visual effect rating in Table 14, Meadow Marsh Preserve and Goodhue Hill did not
20 make the initial "Moderate-High" overall sensitivity threshold cutoff in Table 7, and the White
21 Birch Point Historic District; Gregg Lake was not included as part of the 290 sensitive resources
22 listed in Table 2. In addition, it was noted in the LandWorks VA that Highland Lake was
23 determined to have "No Project Visibility" in Table 2 and no further evaluation was provided for

1 this resource; however, Terraink found there were views and included the Highland Lake
2 sensitive resource as part of our visual simulation and rating package.

3 While it can be argued that each visual expert will have a varying sense of what the
4 scenic quality and sensitivity level is for a viewpoint, and the resulting level of the potential
5 visual contrast with the project in place due to personal bias and preference, Terraink's
6 employment of the (3) person rating panel is intentional to provide a defensible process of
7 determining scenic quality, sensitivity, contrast and the resulting visual impact that goes beyond
8 a single, individual judgment and determination. It is impossible for Terraink to fully interpret
9 the LandWorks ratings in each of the Tables since the empirical data associated with the
10 resulting High, Moderate, and Low rating, by an undetermined one or more raters, is not
11 included in the report or appendices. Therefore, the rating system is assumed to be a "letter"
12 system without the numerical backup despite rating numbers being offered in the LandWorks
13 Table footnotes.

14 In addition to the review of the rating system, Terraink also reviewed the proposed visual
15 simulations offered by LandWorks for the Antrim Project. The visual simulations submitted as
16 part of the February 19, 2016 Supplemental Application Information are generally in keeping
17 with the updated Site 301.05(b)(7) requirements and supersede the original visual simulations
18 contained within the LandWorks Visual Assessment dated 09/03/2015. The LandWorks VA
19 offers that the visual simulations contain a "range of weather and light conditions that are typical
20 of the area" (page 11); however, it is the preferred standard practice to develop visual
21 simulations that show the "worse-case" scenario of clear visibility, blue sky, and leaf-off
22 conditions when photographing the proposed project area. The majority of the LandWorks
23 simulations, even the leaf-off winter views, contain an atmospheric haze and cloudiness that can

1 affect the viewer's perception of potential visual contrast and aesthetic impact.

2 **Q: Do you have an opinion as to whether the Project is out-of-scale with the**
3 **surrounding area?**

4 **A:** Scale as defined by Francis D.K. Ching in "*Architecture; Form Space and Order*"
5 (1996) is a proportion determining the relationship of a representation to that which it represents.
6 Also, a certain proportionate size, extent, or degree, usually judged in relation to some standard
7 or point of reference.

8 Scale is an important design component for Landscape Architects and it is used and
9 applied in a multitude of design opportunities from regional land planning, community massing,
10 local site design, down to private garden design. The challenge with the application of the
11 definition is that it is complicated by "absolute scale" and "relative scale." Absolute scale is
12 the actual size of an element, whereas relative scale is how the element is perceived based upon
13 the space within which it occurs. This explains why the Rating Panel Members determined that
14 the wind turbines that are located 3.5-miles and closer generally appear to be "out-of-scale" with
15 their surroundings, while the same Raters found that those same turbines at a long-distance view
16 (such as 8-miles), do not invoke the same scale reaction.

17 **Q: Do you have an opinion as to mitigation measures that might reduce the**
18 **unreasonable aesthetic impacts of this project?**

19 **A:** The visual mitigation options are limited given the nature of the wind turbine project and
20 their required siting criteria on open ridges without vegetative obstruction. Mitigation options
21 based upon the BLM VRM methodology were included on the Proposed Conditions Rating
22 Form and the rating panel members were asked to consider and indicate any that were
23 appropriate to the project. The mitigation options include the following:

1 Reduce Density

2 Reducing the number of turbines would minimize some of the visual impacts; however, many of
3 the most sensitive views have views to multiple turbines and, therefore, the visual impact would
4 only be slightly mitigated. This option was suggested by a Terraink rating panel member on (2)
5 occasions.

6 Reduce Height

7 Reducing the height of the turbines will assist with some of the scale concerns; however, in areas
8 where the turbines have a disorganized and variable appearance, the lower profile turbines will
9 not resolve that condition. In addition, the effect of downsizing the turbine size as it relates to
10 power generation would need to be understood to confirm that it is a feasible option. This option
11 was suggested by a Terraink rating panel member on (2) occasions.

12 Reduce Clearing

13 Reducing the amount of existing woodland that needs to be cleared and the landform re-
14 contoured to install the turbines will help to mitigate the flattening of ridge tops and swaths of
15 removed vegetation. This option was suggested by a Terraink rating panel member on 1
16 occasion.

17 Reduce Light Pollution

18 For the purpose of this VIA, the effects of nighttime lighting are not included in this study due to
19 the ongoing coordination between AWE and the FAA regarding the use of radar technology to
20 engage the aviation safety lights when there is an aircraft in the vicinity thereby eliminating the
21 need for a constant strobing red light. All efforts should be made to limit the amount, direction
22 and duration of aviation safety lights that are required. In addition, all lighting that is required at
23 the support facilities, O&M building and substation should be kept to a minimum and only

1 engaged when needed by switch or motion detector.

2 Add Screening

3 The addition of constructed screening and vegetative screening is effective in the area of the
4 O&M Building and Substation; however the use of earthen berms, fences or screen plantings will
5 not be effective in screening the wind turbines. Terraink would recommend that the use of Pinus
6 strobus; white pine as indicated on the LandWorks Exhibit 19: Sub Station Mitigation Plan
7 should not be used as a screening species due to the issues that white pines have with losing their
8 lower limbs, wind shearing their tops, and providing little screening value at the ground level.
9 Terraink would recommend the use of other native trees such as Abies balsamea, Balsam Fir;
10 Abies concolor, Concolor Fir; and Picea glauca, White Spruce, all evergreen tree species that are
11 native and maintain their lower branches.

12 Add Camouflage

13 The use of white or off-white coloring on the turbines will typically blend best with the sky.
14 Given the nature of the wind turbine, it does not lend itself to having supplemental camouflaging
15 materials added to, or near, the turbine.

16 Modify Color

17 The use of white or off-white coloring on the turbines typically helps to blend the turbines into
18 the sky. The Antrim project is already utilizing this approach; therefore, this mitigation option
19 was not noted by the rating panel.

20 Alternate Location

21 This was the mitigation strategy that was most often selected by the Terraink rating panel
22 member (33) times; however, given the location of the Antrim project, an alternate location
23 would mean abandoning the project site for another regional location.

1 Alternate Technology

2 Using an alternate technology such as coal, nuclear, solar, etc. have their own set of constraints
3 and opportunities, some of which are more impactful to the environment as well as the visual
4 landscape.

5 Alternate Design

6 Unfortunately, at this time wind turbine technologies that would reduce visual impacts but still
7 accommodate the utility power requirements do not exist.

8 Alternate Material

9 At this time, there is not an alternate material available for wind turbines.

10 **Q: Do you have an opinion as to the grant of additional off site conservation land as a**
11 **mitigation measure to address adverse unreasonable impacts to aesthetics?**

12 **A:** As a Landscape Architect and Visual Expert, I would not recommend the option of
13 granting off-site conservation land as a means for mitigation in land development projects,
14 whether it is a condition of adverse site conditions or visual aesthetics because this approach
15 does not actively mitigate the site concern or potential impact within an area, but rather utilizes
16 the promise of an unknown entity to justify leaving the offensive project in place.

17 **Q: Do you have an opinion as to the grant of forty thousand dollars (\$40,000) to the**
18 **Town of Antrim as a mitigation measure to address adverse unreasonable impacts to**
19 **aesthetics?**

20 **A:** The one-time payment of \$40,000 to the Town of Antrim is not an appropriate method of
21 mitigation. It sets a precarious precedent for how the Town justifies potential development
22 impacts within the community because this approach is based upon a momentary fiscal gain that
23 is not grounded by the long-term checks and balances of regulated town growth and

1 development.

2 **Q: Do you have an opinion as to other mitigation measures for the current project**
3 **affecting, in particular, Willard Pond, Bald Mountain, Goodhue Hill, Gregg Lake, Robb**
4 **Reservoir, Island Pond, Highland Lake, Nubanusit Pond, Blank Pond, Franklin Pierce**
5 **Lake, Meadow Marsh, and Pitcher Mountain?**

6 **A:** Several of the resources determined by the SEC in the prior docket to be adversely
7 impacted by the project, in particular Highland Lake, Robb Reservoir, Island Pond, and
8 Nubanusit Pond, under the current Project, have such limited views to the project turbines that
9 additional adjustments to turbine heights and layout could fully mitigate some of the views to the
10 turbines.

11 However, Terraink's Visual Impact Assessment determined that with the wind project in
12 place, the overall project's resource contrast within the entire study area was 14.65, or high-
13 moderate, and the threshold of acceptable Visual Impact was exceeded in (6) sensitive resources
14 occurring at Willard Pond, Meadow Marsh Preserve, White Birch Point Historic District (Gregg
15 Lake), Bald Mountain, Goodhue Hill and Black Pond. The only means to reduce, or mitigate,
16 Visual Impact in these (6) regional sensitive resources is to relocate the project. It is also true
17 that if the sensitivity scores had been higher for Franklin Pierce Lake and Pitcher Mountain, they
18 would have also been best mitigated through project relocation.

19 **Q: In your opinion will this Project have an unreasonable adverse impact on**
20 **aesthetics?**

21 **A:** Yes. The visual impact assessment that was conducted by Terraink investigated the
22 potential project visibility and visual impact of the proposed project by using viewshed analysis,
23 field review, visual simulations, and a rating panel to determine the existing scenic quality and

1 user sensitivities, and the resulting contrast with the project in place. The Terraink VIA
2 determined that with the wind project in place, the overall project's resource contrast within the
3 entire study area was 14.65, or high-moderate, and the threshold of acceptable visual impact was
4 exceeded in (6) sensitive resources. Given the large number of sensitive resources with
5 significant impacts the project is determined to have adverse visual impact and the only means to
6 reduce, or mitigate, the visual impact is to relocate the project.

7 **Q: Does this conclude your pre-filed testimony?**

8 **A:** Yes

Kellie Anne Connelly | RLA

Principal | Terraink - Landscape Architecture + Planning



Ms. Connelly is a registered landscape architect experienced in all phases of site design and implementation through to contract administration. She is also experienced in providing visual impact assessment services, having evaluated numerous projects with respect to visual impacts and potential mitigation measures. She is adept at balancing environmental and aesthetic needs with user and site engineering requirements. Her experience also includes interacting with various community constituencies to reach design consensus.

Education

Harvard University Graduate School of Design (2000), **Master of Landscape Architecture.** Cambridge, Massachusetts

SUNY College of Environmental Science and Forestry (1995), **Bachelor of Landscape Architecture.** Syracuse, New York

SUNY College of Technology at Alfred (1991), **Associate in Applied Science.** Alfred, New York

Certifications

Commonwealth of Massachusetts WBE | Federal DBE Certification

Registered Landscape Architect, State of New York, License #1875

Registered Landscape Architect, Commonwealth of Massachusetts, License #1214

Professional

Instructor, Rhode Island School of Design (2014 - Present); Providence, Rhode Island

Principal Landscape Architect, Terraink, Inc. (2010 - Present); Arlington, Massachusetts

Project Manager, Gregory Lombardi Design, Inc. (2008 - 2010); Cambridge, Massachusetts

Visiting Professor, Site Design and Grading Seminar; Rhode Island School of Design

Project Manager, Shadley Associates (2007 - 2008); Lexington, Massachusetts

Project Manager | Visual Expert, EDR Companies (2003 - 2007); Syracuse, New York

Adjunct Professor, SUNY College of Environmental Science and Forestry (2003 - 2007); Syracuse, New York

Landscape Architect, Reisen Design Associates (1999 - 2003); Cambridge, Massachusetts

Landscape Architect, Jacques Whitford Company, Inc. (1998 - 1999); Woburn, Massachusetts

Project Manager, Pressley Associates, Inc. (1995 - 1998); Cambridge, Massachusetts

Publications

"Protecting the Rural Landscape: Visual Quality Guidelines for Plymouth, Massachusetts and the New England Region." Graduate School of Design, Harvard University. Cambridge, Massachusetts

"Toward a Joint Palestine-Israel Industrial Development in al-Shoka and Karem Shalom: An Assessment of Location and Future Planning Flexibility." Graduate School of Design, Harvard University. Cambridge, Massachusetts

Studio Works Seven. Graduate School of Design, Harvard University. Cambridge, Massachusetts

Kellie Anne Connelly | RLA

Principal | Terraink - Landscape Architecture + Planning

Experience

Block Island Wind Farm

Evaluated visual impacts for wind turbines and transformer station improvements on Block Island, Rhode Island.

Client: EDR Companies | Deepwater Wind

Status: Under Construction

Howard Wind Farm

Evaluated visual impacts for wind turbines in Steuben County, New York.

Client: EDR Companies | EverPower Wind Holdings, Inc.

Status: Operational 2012

Allegheny Wind

Evaluated visual impacts for wind turbines in Cambria and Blair Counties, Pennsylvania.

Client: EDR Companies | Allegheny Wind, LLC.

Status: Operational 2009

New England East-West Solution (NEEWS)

Evaluated visual impacts for transmission line and transformer station improvements in New England.

Client: EDR Companies | Northeast Utilities and National Grid

Status: Unknown

Interstate Reliability

Evaluated visual impacts for transmission line and transformer station improvements in New England.

Client: EDR Companies | Northeast Utilities and National Grid

Status: Unknown

Experience with other Firms

Southern Rhode Island Transmission Project

Expert Witness with Court Testimony that was not challenged. Oversaw preparation of the Visual Impact Assessment (VIA) and the Supplemental Tower Hill Tap Line VIA prepared for the proposed upgrade and extension of approximately 26 miles of an existing L-190 115 kilovolt transmission line in southern Rhode Island. Coordinated fieldwork, defined landscape similarity zones and viewer groups, identified sensitive resources/receptors, supervised the development of viewshed maps and visual simulations, participated in the preparation of the VIA report and provided expert witness testimony on visual issues.

Firm: EDR Companies | Client: The Narragansett Electric Company (National Grid)

Status: Unknown

Kellie Anne Connelly | RLA

Principal | Terraink - Landscape Architecture + Planning

Experience

Tompkins County Public Safety Communications System

Directed preparation of Visual Impact Assessment component of the Draft Environmental Impact Statement (DEIS) prepared for the siting of nine new towers for wireless communications in Tompkins County, New York. Coordinated fieldwork, defined landscape similarity zones and viewer groups, identified sensitive resources/receptors, supervised the development of viewshed maps and visual simulations and participated in the preparation of the VIA report.

Firm: EDR Companies | Client: Tompkins County; Planning Department | Status: Implemented

New York State Statewide Wireless Network

Participated in the preparation of the Generic Visual Impact Assessment (GVIA) report component of the DEIS prepared for the siting of wireless communications towers throughout New York State. Defined landscape similarity zones and viewer groups, identified sensitive resources/receptors, supervised the development of visual simulations and participated in the preparation of the GVIA report.

Firm: EDR Companies | Client: New York State | Status: Implemented

Visual Impact Assessment, Top Notch Wind Power Project

Evaluated visual impacts for Fairfield, Norway and Little Falls in Herkimer County, New York. The VIA report described visible components of the proposed project, defined the visual character of the study area, and inventoried and evaluated visual resources and viewer groups. The study also evaluated potential project visibility within the study area, identified key views and assessed visual impacts associated with the proposed wind power project.

Firm: EDR Companies | Client: Atlantic Wind LLC | Status: Unknown

Visual Impact Assessment, Cohocton Wind Power Project

Evaluated visual impacts for Visual Impact Assessment (VIA) report for an 82 MW, 41-turbine project proposed in the Town of Cohocton in Steuben County, New York. The VIA report described visible components of the proposed project, defined the visual character of the study area, and inventoried and evaluated visual resources and viewer groups. The study also evaluated potential project visibility within the study area, identified key views and assessed visual impacts associated with the proposed wind power project.

Firm: EDR Companies | Client: First Wind | Status: Operational 2009

Visual Impact Assessment, Marble River Wind Farm

Assessed visual impacts for Visual Impact Assessment (VIA) report from 200 MW, 109-turbine project proposed for a 19,310-acre site in the Town of Clinton and Ellenburg in Clinton County, New York. The VIA report described visible components of the proposed project, defined the visual character of the study area, and inventoried and evaluated visual resources and viewer groups. The study also evaluated potential project visibility within the study area, identified key views and assessed visual impacts associated with the proposed wind power project.

Firm: EDR Companies | Client: Marble River, LLC | Status: Operational 2012

Kellie Anne Connelly | RLA

Principal | Terraink - Landscape Architecture + Planning

Visual Impact Assessment, Jordanville Wind Power Project

Coordinated study and prepared Visual Impact Assessment (VIA) report for a proposed 150 MW 75-turbine project proposed in the Towns of Stark and Warren in Herkimer County, New York. The VIA report described visible components of the proposed project, defined the visual character of the study area, and inventoried and evaluated visual resources and viewer groups. The study also evaluated potential project visibility within the study area, identified key views and assessed visual impacts associated with the proposed wind power project.

Firm: EDR Companies | Client: Jordanville Wind, LLC | Status: Unknown

Visual Impact Assessment, Dairy Hills Wind Farm

Evaluated visual impacts for Visual impact Assessment (VIA) report for a 160 MW, 80-turbine project proposed in the Towns of Castile, Covington, Perry, and Warsaw in Wyoming County, New York. The VIA report described visible components of the proposed project, defined the visual character of the study area, and inventoried and evaluated visual resources and viewer groups. The study also evaluated potential project visibility within the study area, identified key views and assessed visual impacts associated with the proposed wind power project.

Firm: EDR Companies | Client: Dairy Hills Windfarm, LLC. | Status: Unknown

Jamestown Board of Public Utilities Power Plant and Operations Center VIA

Evaluated visual impacts for Visual Assessment (VIA) report for a 40 MW clean-coal power-generating plant and operations center in Jamestown, New York. The VIA report described the analysis of project visibility, including view shed analysis and field verification. Visual impacts of the project were assessed by creating computer models of the proposed facilities and computer-assisted visual simulations of potential impacts as viewed from representative viewpoints. The report listed conclusions concerning potential visually sensitive receptors and identified mitigation options, which included recommendations regarding design and siting, the color and texture of built materials and lighting.

Firm: EDR Companies | Client: Jamestown Board of Public Utilities (JBPU) | Status: Unknown

Graduate
Experience**Development of Rural Landscape Visual Quality Guidelines**

This project focused on the creation of visual quality guidelines for Plymouth, Massachusetts and the New England region. The Town of Plymouth's 1990 Strategic Plan called for expanded development; however, concerns were raised regarding the potential growth impact on the rural quality of life and historic character of the region. This project developed design criteria through visual preference survey, while providing a basis for additional research (including a local case study) to the development standards for the Town.

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 "supersactuary" 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 "supersactuary" 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

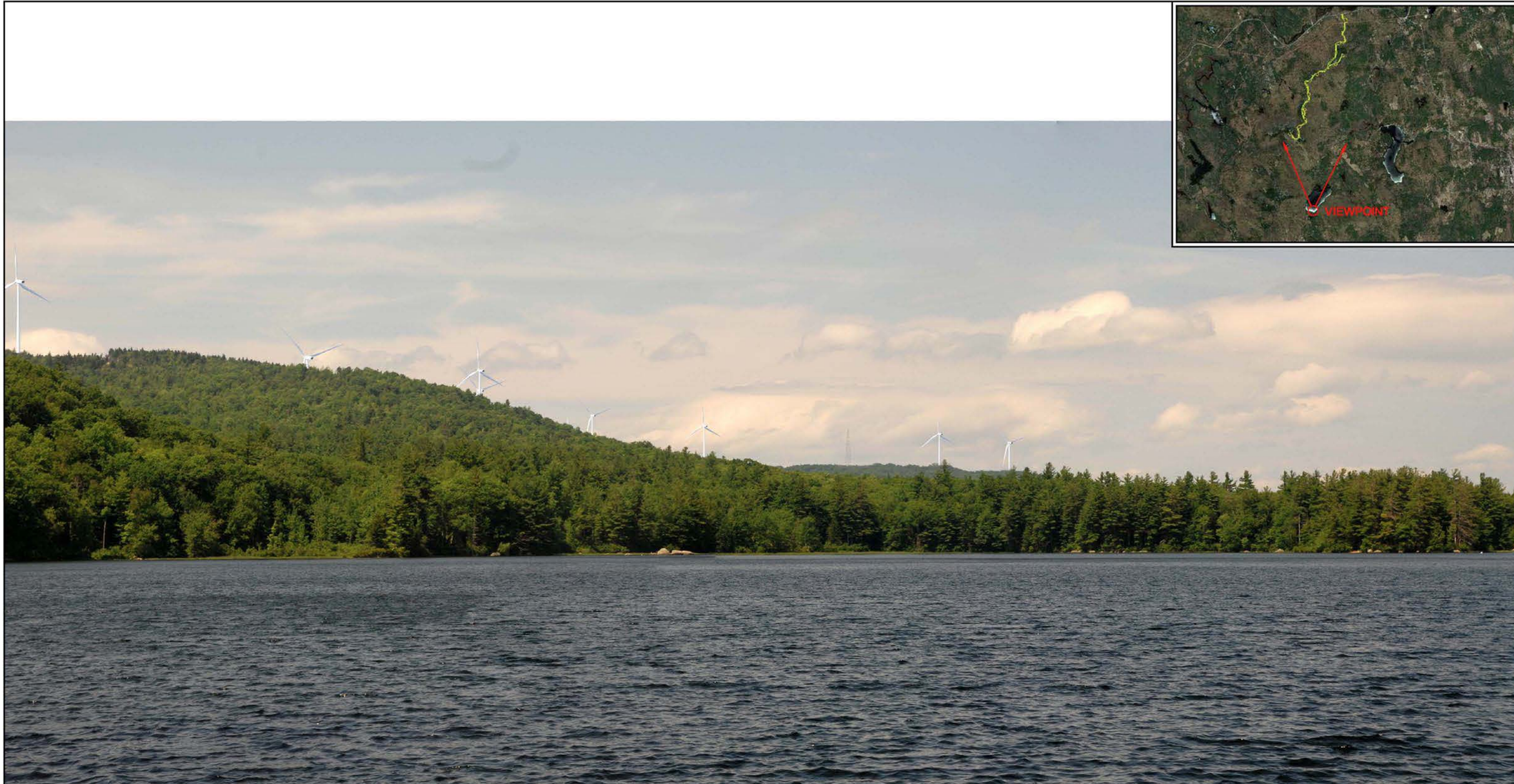
NOTE:
THESE PHOTOS ARE INTENDED TO BE VIEWED AT 11X17
AT APPROXIMATELY 17" FROM THE VIEWER.

ANTRIM WIND PROJECT:
WILLARD POND DAM - NORTHWEST

Prepared For:
Jean Vissering Landscape Architecture
Prepared By:


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:
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AT APPROXIMATELY 17" FROM THE VIEWER.

ANTRIM WIND PROJECT:
GOODHUE HILL - NORTHEAST

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

2B

July 30, 2012



VISUAL SIMULATION

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



ANTRIM WIND PROJECT:
GREGG LAKE - NORTHWEST

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

3B

July 30, 2012



VISUAL SIMULATION

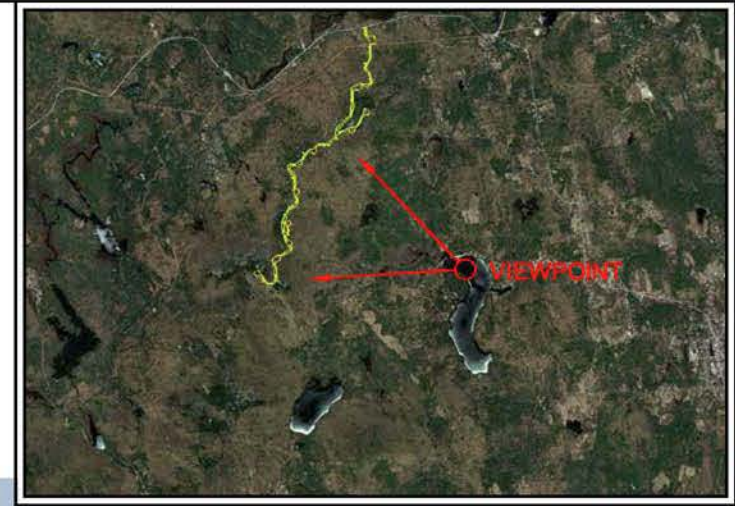
NOTE:
THESE PHOTOS ARE INTENDED TO BE VIEWED AT 11X17
AT APPROXIMATELY 17" FROM THE VIEWER.

ANTRIM WIND PROJECT:
GREGG LAKE - NORTH NORTHWEST

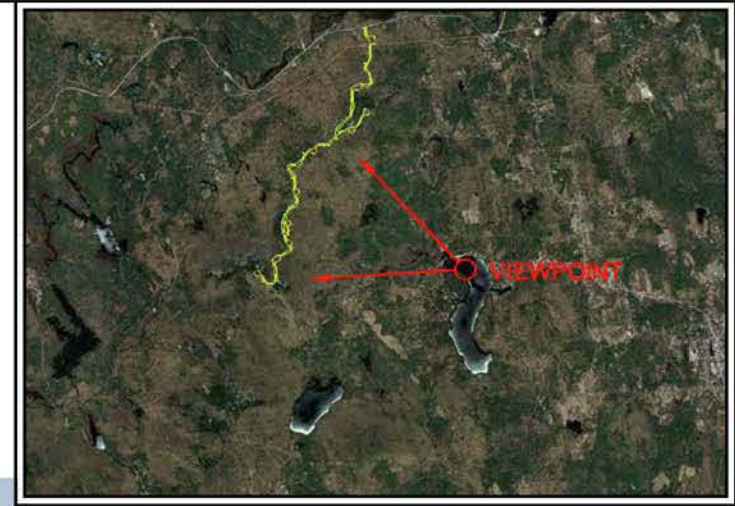
Prepared For:
Jean Vissering Landscape Architecture
Prepared By:
SE GROUP

3C

July 30, 2012



NOTE:
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VISUAL SIMULATION

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