



January 6, 2021

Mr. Michael Carey
SWEB Development USA LLC
209 West Central Street, Suite 306
Natick, MA, USA, 01760

Dear Mr. Carey,

Re: Visual Impact Assessment
Silver Maple Wind Farm

Attached is the Visual Impact Assessment Addendum report prepared for the Silver Maple Wind Farm Project.

This report documents our observations and findings.

We trust this to be satisfactory at this time. Once you have had an opportunity to review this correspondence, please contact us to address any questions you may have.

Thank you,

Scott Dickey, MREM
Environmental Scientist
sdickey@strum.com

Shawn Duncan, BSc.
Vice President
sduncan@strum.com

Engineering • Surveying • Environmental

Head Office
Railside, 1355 Bedford Hwy.
Bedford, NS B4A 1C5
t. 902.835.5560 (24/7)
f. 902.835.5574

Antigonish Office
3-A Vincent's Way
Antigonish, NS B2G 2X3
t. 902.863.1465 (24/7)
f. 902.863.1389

Moncton Office
45 Price Street
Moncton, NB E1A 3R1
t. 1.855.770.5560 (24/7)
f. 902.835.5574

St. John's Office
#E120 - 120 Torbay Road
St. John's, NL A1A 2G8
t. 709.738.8478 (24/7)
f. 709.738.8494

TABLE OF CONTENTS

	<i>Page</i>
1.0 INTRODUCTION	1
1.1 Regulatory Overview.....	1
1.1.1 Scenic Resource Identification	1
1.1.2 Regulatory Standards.....	2
1.2 Methodology	3
1.2.1 Viewshed Analysis.....	3
1.2.2 Supporting Information	4
2.0 PROJECT DESCRIPTION	4
3.0 SRSNS IDENTIFICATION	4
3.1 SRSNS Evaluation.....	6
3.1.1 Evaluation Criteria	6
3.1.2 Hatcase Pond.....	6
3.1.2.1 Scenic Impact of Associated Facilities	6
3.1.2.2 Significance of the SRSNS	6
3.1.2.3 Existing Character of the Surrounding Area	7
3.1.2.4 Viewer Expectations	7
3.1.2.5 Purpose and Context.....	7
3.1.2.6 Public Use and Enjoyment.....	8
3.1.2.7 Scope and Scale of the Potential Effect.....	8
3.1.2.8 Cumulative Scenic Impact or Effect	9
3.1.3 Floods Pond	11
3.1.3.1 Scenic Impact of Associated Facilities.....	11
3.1.3.2 Significance of the SRSNS	11
3.1.3.3 Existing Character of the Surrounding Area	11
3.1.3.4 Viewer Expectations	11
3.1.3.5 Purpose and Context.....	11
3.1.3.6 Public Use and Enjoyment.....	12
3.1.3.7 Scope and Scale of the Potential Effect.....	13
3.1.3.8 Cumulative Scenic Impact or Effect	13
3.1.4 Burnt Pond.....	15
3.1.4.1 Scenic Impact of Associated Facilities.....	15
3.1.4.2 Significance of the SRSNS	15
3.1.4.3 Existing Character of the Surrounding Area	15
3.1.4.4 Viewer Expectations	15
3.1.4.5 Purpose and Context.....	16
3.1.4.6 Public Use and Enjoyment.....	17
3.1.4.7 Scope and Scale of the Potential Effect.....	17
3.1.4.8 Cumulative Scenic Impact or Effect	18
4.0 MITIGATIONS	19
5.0 CONCLUSION	20
6.0 CLOSURE	20
7.0 STATEMENT OF QUALIFICATIONS AND LIMITATIONS	21

LIST OF TABLES

Table 1. Visual Impact Parameters for Proposed Silver Maple Turbines	9
Table 2. Cumulative Visual Impact Parameters for Proposed Silver Maple Turbines and Existing Pisgah Mountain Turbines	10
Table 3. Visual Impact Parameters for Proposed Silver Maple Turbines	13
Table 4. Cumulative Visual Impact Parameters for Proposed Silver Maple Turbines and Existing Pisgah Mountain Turbines	14
Table 5. Visual Impact Parameters for Proposed Silver Maple Turbines	17
Table 6. Cumulative Visual Impact Parameters for Proposed Silver Maple Turbines and Existing Pisgah Mountain Turbines	18

LIST OF DRAWINGS

Appendix K

Drawing K1	Hatcase Pond Existing Character of Surrounding Area
Drawing K2	Hatcase Pond Extent of View
Drawing K3	Viewshed Hatcase Pond (Bare Ground/185 m total height)
Drawing K4	Viewshed Hatcase Pond (Bare Ground/117 m hub height)
Drawing K5	Viewshed Hatcase Pond (12 m or 40 ft Forest/185 m total height)
Drawing K6	Viewshed Hatcase Pond (12 m or 40 ft Forest/117 m hub height)
Drawing K7	Cumulative Impacts Hatcase Pond (Bare Ground/185 m & 145 m total heights)
Drawing K8	Cumulative Impacts Hatcase Pond (Bare Ground/ 117 m & 95 m hub heights)
Drawing K9	Cumulative Impacts Hatcase Pond (12 m or 40 ft Forest/185 m & 145 m total heights)
Drawing K10	Cumulative Impacts Hatcase Pond (12 m or 40 ft Forest/117 m & 95 m hub heights)

Appendix L

Drawing L1	Floods Pond Existing Character of Surrounding Area
Drawing L2	Floods Pond Extent of View
Drawing L3	Viewshed Floods Pond (Bare Ground/185 m total height)
Drawing L4	Viewshed Floods Pond (Bare Ground/117 m hub height)
Drawing L5	Viewshed Floods Pond (12 m or 40 ft Forest/185 m total height)
Drawing L6	Viewshed Floods Pond (12 m or 40 ft Forest/117 m hub height)
Drawing L7	Cumulative Impacts Floods Pond (Bare Ground/185 m & 145 m total heights)
Drawing L8	Cumulative Impacts Floods Pond (Bare Ground/ 117 m & 95 m hub heights)
Drawing L9	Cumulative Impacts Floods Pond (12 m or 40 ft Forest/185 m & 145 m total heights)
Drawing L10	Cumulative Impacts Floods Pond (12 m or 40 ft Forest/117 m & 95 m hub heights)

Appendix M

Drawing M1	Burnt Pond Existing Character of Surrounding Area
Drawing M2	Burnt Pond Extent of View
Drawing M3	Viewshed Burnt Pond (Bare Ground/185 m total height)
Drawing M4	Viewshed Burnt Pond (Bare Ground/117 m hub height)
Drawing M5	Viewshed Burnt Pond (12 m or 40 ft Forest/185 m total height)
Drawing M6	Viewshed Burnt Pond (12 m or 40 ft Forest/117 m hub height)
Drawing M7	Cumulative Impacts Burnt Pond (Bare Ground/185 m & 145 m total heights)
Drawing M8	Cumulative Impacts Burnt Pond (Bare Ground/ 117 m & 95 m hub heights)
Drawing M9	Cumulative Impacts Burnt Pond (12 m or 40 ft Forest/185 m & 145 m total heights)
Drawing M10	Cumulative Impacts Burnt Pond (12 m or 40 ft Forest/117 m & 95 m hub heights)

1.0 INTRODUCTION

Strum Consulting was retained by SWEB Development USA LLC (SWEB) to conduct a visual impact assessment for the proposed Silver Maple Wind Project (the Project) located near the town of Clifton, Maine, USA. SWEB is proposing the development of a 20 megawatt (MW) wind power project that would consist of five wind turbines, and would be located adjacent the existing 9 MW Pisgah Mountain wind energy project that is also owned by SWEB.

SWEB is considering two turbine models which are largely the same, with the exception of the hub height [100m (328 feet) and 117m (384 feet)]. The taller of these two turbine models will be used for this analysis.

Pursuant to section 38 M.S.R.A. § 480-D (1) of the State of Maine's Natural Resource Protection Act (NRPA), applicants for permits under the NRPA must demonstrate that a proposed activity will not unreasonably interfere with existing scenic and aesthetic resources.

The purpose of this assessment is to conduct a visual impact assessment consistent with the requirements of the State of Maine's Wind Energy Act 35-A M.R.S.A. § 3451 (the WEA).

A Visual Impact Assessment for the Project dated May 5th, 2020 was submitted previously. At that point, it was our understanding that Hatcase Pond, Floods Pond and Burnt Pond did not qualify as Scenic Resources of State or National Significance (SRSNS) as they are located within protected watersheds where public access is restricted. A request by the Department of Environmental Protection to conduct an analysis for these three ponds was received in December, 2020. This report details the assessment of these three ponds.

1.1 Regulatory Overview

1.1.1 Scenic Resource Identification

Scenic resources of state or national significance (SRSNS) are defined in the WEA (35-A M.R.S.A. § 3451) as an area or place owned by the public or to which the public has legal right of access that is:

- A. A National Natural Landmark, a federally designated wilderness area or other comparable outstanding natural and cultural feature, such as the Orono Bog or Meddybemps Heath;
- B. A property listed on the National Register of Historic Places pursuant to the National Historic Preservation Act of 1966, as amended, including, but not limited to, the Rockland Breakwater Light and Fort Knox;
- C. A national or state park;
- D. A great pond that is:
 - 1. One of the 66 great ponds located in the State's organized area identified as having outstanding or significant scenic quality in the "Maine's Finest Lakes" Study published by the Executive Department, State Planning Office in October 1989; or

2. One of the 280 great ponds in the State's unorganized or deorganized areas designated as outstanding or significant from a scenic perspective in the "Maine Wildlands Lakes Assessment" published by the Maine Land Use Regulation Commission in June 1987;
- E. A segment of a scenic river or stream identified as having unique or outstanding scenic attributes listed in Appendix G of the "Maine Rivers Study" published by the former Department of Conservation in 1982;
- F. A scenic viewpoint located on state public reserved land or on a trail that is used exclusively for pedestrian use, such as the Appalachian Trail, that the Department of Agriculture, Conservation, and Forestry designates by rule adopted in accordance with section 3457;
- G. A scenic turnout constructed by the Department of Transportation pursuant to Title 23, section 954 on a public road that has been designated by the Commissioner of Transportation pursuant to Title 23, section 4206, subsection 1, paragraph G as a scenic highway; or
- H. Scenic viewpoints located in the coastal area, as defined by Title 38, section 1802, subsection 1, that are ranked as having state or national significance in terms of scenic quality in: (1) One of the scenic inventories prepared for and published by the Executive Department, State Planning Office: "Method for Coastal Scenic Landscape Assessment with Field Results for Kittery to Scarborough and Cape Elizabeth to South Thomaston," Dominie, et al., October 1987; "Scenic Inventory Mainland Sites of Penobscot Bay", DeWan and Associates, et al., August 1990; or "Scenic Inventory: Islesboro, Vinalhaven, North Haven and Associated Offshore Islands," DeWan and Associates, June 1992; or (2) A scenic inventory developed by or prepared for the Executive Department, State Planning Office.

1.1.2 Regulatory Standards

A wind energy development must not significantly compromise views from a Scenic Resource of State or National Significance (SRSNS) as defined in 35-A M.R.S. §3451(9). Locations identified as potential SRSNS were evaluated to determine whether the Project significantly compromises views from a SRSNS such that the Project has an unreasonable adverse effect on the scenic character or existing uses related to scenic character. As outlined in 35-A M.R.S.A. §3452, SRSNS were assessed for the following:

- A. The significance of the potentially affected scenic resource of state or national significance;
- B. The existing character of the surrounding area;
- C. The expectations of the typical viewer;
- D. The expedited wind energy development's purpose and the context of the proposed activity;
- E. The extent, nature, and duration of potentially affected public uses of the scenic resource of state or national significance and the potential effect of the generating facilities' presence on the public's continued use and enjoyment of the scenic resource of state or national significance; and

- F. The scope and scale of the potential effect of views of the generating facilities on the scenic resource of state or national significance, including but not limited to issues related to the number and extent of turbines visible from the scenic resource of state or national significance, the distance from the scenic resource of state or national significance and the effect of prominent features of the development on the landscape.

In 2018, the department released new rules to provide guidance and clarification on the review process and standards for projects under the WEA. The information provided in Chapter 382 outlines the evaluation criteria used in the Visual Impact Assessment for the assessment of impacts related to scenic character, including:

- A. Review of Scenic impact of associated facilities;
- B. Significance of a potentially affected SRSNS;
- C. Existing character of the surrounding area;
- D. Expectations of the typical viewer;
- E. Purpose and context of the proposed activity;
- F. Public use and enjoyment of a potentially affected SRSNS;
- G. Scope and scale of the potential effect;
- H. Cumulative scenic impact or effect;
- I. Unreasonable adverse effect on scenic character.

1.2 Methodology

1.2.1 Viewshed Analysis

ArcGIS Desktop 10.7 was used to generate viewshed models for the proposed Silver Maple Wind Farm expansion in order to determine the number of turbines visible at each SRSNS. Four of the models predict turbine visibility at hub height or total height (hub + ½ rotor length) for the proposed turbines or all turbines (proposed and existing) based on a bare terrain model. The remaining four models predict turbine visibility using the aforementioned parameters as well as a screening effect for forest cover.

The bare terrain models were based on the 1/3 arc-second National Elevation Data raster 'USGS_13_n45w069' which was clipped to the project extents, projected to NAD 1983 UTM Zone 19N, and resampled to 10 metres.

The forest screen was based on the 2016 National Landcover raster which was clipped to the project extents, reprojected to NAD 1983 UTM Zone 19N and reclassified so that forested cells were assigned a value of 0 and all other landcover types were assigned a value of 1. Using the 'Times' tool in the Math toolbox (Spatial Analyst extension), the forest screen raster and each viewshed raster were multiplied together on a cell-by-cell basis. In the resulting output viewshed rasters, cells corresponding to forest cover were changed to a value of 0, representing zero visibility, while all other cells retained their original value. This methodology is based on a personal communication with Dr. James F. Palmer (February, 19, 2020), who advised that this approach is considered the industry standard.

For SRSNSs which were polygon features (waterbodies and focus areas), the areas within each polygon were calculated for the number of turbines visible based on the viewshed analyses. The viewshed rasters were converted to polygons using the 'Raster to Polygon' tool (Conversion Toolbox) in ArcGIS Desktop 10.7, then within each new feature class, the polygon areas representing no visibility were removed and the feature classes were clipped to the extents of the SRSNSs and focus areas. The areas representing 1 through 10 visible turbines were summed and the areas were recorded in a table.

The distance of each SRSNS from the nearest and farthest turbine was measured from the camera location for sites where photo-simulations were completed, the remaining locations represent points of highest elevation at each SRSNS within the 8 mile area around the proposed project.

1.2.2 Supporting Information

Information to support SRSNS evaluation was gathered through the review of numerous desktop resources. Primary information relating to scenic character and significance ratings for SRSNS as outlined in the resources identified in the WEA (see Section 1.2.1):

- Maine Wildlands Lakes Assessment: published by the Maine Land Use Regulation Commission in June 1987;
- Maine Rivers Study: Final Report, published by the State of Maine, department of Conservation in May 1982;
- Maine's Finest Lake: The Results of the Maine Lakes Study, published by the Maine State Planning Office Critical Areas Program in October 1989;
- Beginning with Habitat: Focus Areas of Statewide Ecological Significance; and
- National Register of Historic Places.

To expand upon this information, satellite imagery was thoroughly reviewed (Google Earth, 2020) as well as public resources including community supported organizations, SRSNS webpages, media articles, and conservation organizations.

2.0 PROJECT DESCRIPTION

The proposed Silver Maple Wind Project would be co-located with the existing Pisgah Mountain Wind Power Project, which consists of five 2 MW turbines. The Silver Maple Wind Project would add five additional turbines that would be located to the south and east of the existing machines. Access roads and power distribution infrastructure would be shared between the two projects, but the road and transmission line network would need to be expanded to accommodate the new turbines.

3.0 SRSNS IDENTIFICATION

Eighteen (18) potential SRSNS that meet the criterion described in Section 1.2.1 of the WEA were identified. Four (4) sites were found to have no visibility of the turbines due to topographical obstructions (according to the viewshed analysis), and as such there would be

no visual impact to these 4 SRSNS. The viewshed analysis indicated that 14 SRSNS may have visibility (or partial visibility) of project components. The visual impact of the Project to the 11 SRSNS was completed in accordance with the WEA and detailed in a VIA report dated May 6th, 2020. These SRSNS are:

- Chemo Pond
- Hopkins Pond
- Mountainy Pond
- Parks Pond
- Upper Union River Focus Area
- Bald Bluff River Focus Area
- West Branch Union River (Graham Lake to Great Pond)
- Cliffwood Hall
- Harold Allen Schoolhouse
- East Eddington Public Hall
- Holden Town Hall

It was our understanding that the remaining three SRSNS locations listed below did not qualify as SRSNS as they are located within protected watershed areas where public access is restricted; however, the Department of Environmental Protection requested that a VIA for these three SRSNS be conducted. These remaining three SRSNS are:

- Hatcase Pond
- Floods Pond
- Burnt Pond

3.1 SRSNS Evaluation

3.1.1 Evaluation Criteria

SRSNS were evaluated for numerous resources based on the evaluation criteria outlined in the WEA (35-A M.R.S.A. §3452) and the Chapter 382. These resources are as follows:

- Scenic impact of associated facilities: a review of the visual impact that the wind farm's associated facilities are likely to have on the SRSNS (Chapter 382.3.A);
- Significance of the SRSNS: a review of the significance of the potentially affected SRSNS (§3452.3.A, Chapter 382.3.B and Chapter 382.3.I)
- Existing character of the surrounding area: a review of the existing character of the surrounding area of a SRSNS, including a description of the landscape, vegetation and forest cover, topography, and development within the viewshed (§3452.3.B and Chapter 382.3.C)
- Viewer expectations: a review of the expectations of the typical viewer who would be visiting or enjoying the SRSNS (§3452.3.C, Chapter 382.3.D and Chapter 382.3.I)
- Purpose and context: a review of the purpose and the context of the Project in both the physical sense and in the practical sense (§3452.3.D and Chapter 382.3.E).
- Public use and enjoyment: a review of the extent, nature, and duration of potentially affected public uses of the SRSNS and the potential effect of the Project on the continued use and enjoyment (§3452.3.E and Chapter 382.3.F)
- Scope and scale of the potential effect: a review of the scale of the project, including number of turbines, visibility of turbines, horizontal view angle of visible turbines, distance to the visible turbines, and distance to turbines from the more affected viewpoints of the SRSNS (§3452.3.F and Chapter 382.3)
- Cumulative scenic impact or effect: a review of the cumulative scenic impacts of the Project in conjunction with scenic impacts from other wind energy developments (Chapter 382.3.H).

3.1.2 Hatcase Pond

3.1.2.1 Scenic Impact of Associated Facilities

The visibility of the associated facilities is expected to be low for this location as they would be blocked or largely obscured by topography and vegetation. Blackcap Hill and Woodchuck Hill both lie between Hatcase Pond and the Project site, and would likely block visibility of the majority of access roads and transmission collector infrastructure.

3.1.2.2 Significance of the SRSNS

Hatcase Pond is located within the Brewer Water Department's protected drinking watershed, which protects most of the watershed for Hatcase Pond, and is the drinking water source for the city of Brewer. Maine's Finest Lakes Study lists Hatcase Pond has having outstanding scenic features as it possesses high dramatic relief and a partially bouldered shore which contribute to the outstanding scenery of this pond, despite it being partially developed.

Public access to Hatcase Pond is largely restricted, with the main access being the Hatcase Pond Road which is a gated road that extends to the northwest shoreline of the pond and

services the pumphouse. The southeast shoreline of Hatcase Pond is partially developed with a few houses or cottages built near the shoreline. The southeast portion of the Pond can be accessed from Fire Road 100, which is also gated.

3.1.2.3 Existing Character of the Surrounding Area

The area surrounding Hatcase Pond is largely a natural forested landscape that is mostly undeveloped on account of the Pond's location within the protected watershed area (Drawing K1, Appendix K). A number of hills and areas of topographic relief are present around the Pond. A pumphouse building is located on the Pond's northwest shore, which is serviced by the (gated) Hatcase Pond Road. A few houses or cottages are built near the Pond's southeast shoreline, which are accessed by Fire Road 100. The area to the west of the pond appears to have been managed for silviculture, while a steep slope to the Pond's north provides a natural forested area of somewhat dramatic topographic relief.

3.1.2.4 Viewer Expectations

Viewers of this pond would largely be limited to Brewer Water Department employees who are accessing the Pond for waterworks purposes, as well as the few residents of the dwellings located on the Pond's southeast shore. These residents likely expect views of un-disturbed forested landscapes from their properties. Public access is largely restricted as both access roads are gated.

3.1.2.5 Purpose and Context

The location of the Silver Maple Wind Project was determined by its proximity to the Pisgah Mountain Wind project. Silver Maple benefits directly from much of the infrastructure built for Pisgah Mountain, including the roads, collector system, and some interconnection infrastructure. The project also will benefit from Pisgah Mountain's compiled wind data, which has allowed SWEB to more accurately predict the expected wind resource of Silver Maple. Further, the Silver Maple project will benefit from the permitting work done for Pisgah Mountain. Including but not limited to, the acoustic data and modelling used for the Pisgah Mountain, and Pisgah Mountain survey work.

- (1) *Data related to the magnitude and reliability of the wind resource at the proposed development site, and the potential energy output expected from the development, as compared with any alternative sites in Maine investigated by the applicant.*

The particular placement of the five turbines was determined via analysis of the strongest locations on these ridgelines, given the annual average wind directions. Further, the turbine locations consider low interference with the existing five turbines of the Pisgah Mountain wind project.

- (2) *The location of the proposed development in relation to existing transmission lines, roads or other infrastructure.*

As stated above, the project location benefits from existing road infrastructure which was specifically designed for delivery and construction of wind energy equipment. The proximity of power lines and an existing substation further bolster

the strength of this ridgeline as a uniquely strong location for the Silver Maple Wind Project.

- (3) *The topography and existing characteristics of the area surrounding the proposed development.*

The wind resource in this area is particularly strong, being located on a high elevation ridgeline in an exposed area.

- (4) *The existence of any other permitted wind energy development in the viewshed of any affected SRSNS.*

The Pisgah Mountain project will be directly adjacent to Silver Maple. The fact that the community and passersby are accustomed to viewing wind turbines at this location is expected to mitigate the marginal impacts of these particular five turbines. As opposed to constructing the project on a bare or undeveloped parcel elsewhere in Penobscot or Hancock County.

- (5) *Evidence of any mitigation proposals, such as improved access to the affected SRSNS, or improvements to the quality of the resource.*

The project has taken into effect its proximity to several of Maine's Finest Lakes and will limit its impacts on local SRSNS through use of a radar lighting system.

3.1.2.6 Public Use and Enjoyment

Public access to Hatcase Pond is restricted as both access roads are gated. Access will likely continue to be restricted into the indefinite future to protect Brewer's drinking water supply.

3.1.2.7 Scope and Scale of the Potential Effect

The viewshed analyses indicate that at best one turbine may be visible from ~8% of Hatcase Pond, while at worst five turbines may be visible from ~3% of Hatcase Pond (Drawings K3-K6, Appendix K). Applying the forest screen had minimal impact on the percentage of Hatcase Pond where the turbines would be visible, 0 – 0.13%.

The closest turbine (SM1) would be 3.3 miles from the High Visual Impact Investigation Area selected for Hatcase Pond (Drawing K2, Appendix K). At more than three miles away, these turbines would be considered background views and would take up an insignificant portion of the overall view, 14° of a 360° field of view (Drawing K2, Appendix K), resulting in a minimal visual impact.

Table 1 provides a summary of the visual impact assessment for the proposed Silver Maple turbines.

Table 1. Visual Impact Parameters for Proposed Silver Maple Turbines

View Angle	Nearest Turbine (miles)		Farthest Turbine (miles)	
14°	SM1 – 3.3		SM5- 3.9	
Viewshed	Bare Terrain - Total Height (185 m)	Bare Terrain - Hub Height (117 m)	Forest Screen - Total Height (185 m)	Forest Screen - Hub Height (117 m)
% of Hatcase Pond where 5 Turbines are Visible	2.86	0.00	2.73	0.00
% of Hatcase Pond where 4 Turbines are Visible	5.31	0.83	5.26	0.80
% of Hatcase Pond where 3 Turbines are Visible	4.58	4.28	4.45	4.17
% of Hatcase Pond where 2 Turbines are Visible	2.57	2.39	2.57	2.40
% of Hatcase Pond where 1 Turbines are Visible	7.88	7.62	7.85	7.51
Total %	23.20	15.12	22.86	14.87

3.1.2.8 Cumulative Scenic Impact or Effect

The cumulative visual impact of the proposed Silver Maple Wind Project with the existing Pisgah Mountain Wind Farm was assessed using the same analyses as above, but inclusive of the five existing turbines associated with the Pisgah Mountain Project

The viewshed analyses indicate that at best one turbine may be visible from ~7% of Hatcase Pond, while at worst 10 turbines may be visible from ~9% of Hatcase Pond (Drawings K7-K10, Appendix K); though this percentage drops to ~3% at hub height, suggesting that the majority of turbine visible would be the rotors as they pass above the horizon/tree line.

The closest turbine to the High Visual Impact Investigation Area selected for Hatcase Pond (Drawing K2, Appendix K) is SM1, at a distance of 3.3 miles. The proposed Silver Maple turbines would extend the view of the existing wind farm to the southeast, widening the potential angle of view to 18°, resulting in minimal visual impact.

Table 2 provides a summary of the cumulative visual impact assessment for the proposed Silver Maple and existing Pisgah Mountain turbines.

Table 2. Cumulative Visual Impact Parameters for Proposed Silver Maple Turbines and Existing Pisgah Mountain Turbines

View Angle	Nearest Turbine (miles)		Farthest Turbine (miles)	
18°	SM1 – 3.3		SM5- 3.9	
Viewshed	Bare Terrain - Total Height (185 m)	Bare Terrain - Hub Height (117 m)	Forest Screen - Total Height (185 m)	Forest Screen - Hub Height (117 m)
% of Hatcase Pond where 10 Turbines are Visible	9.38	2.57	9.36	2.57
% of Hatcase Pond where 9 Turbines are Visible	1.67	1.89	1.66	1.89
% of Hatcase Pond where 8 Turbines are Visible	5.45	3.83	5.34	3.84
% of Hatcase Pond where 7 Turbines are Visible	0.73	1.92	0.73	1.89
% of Hatcase Pond where 6 Turbines are Visible	1.24	1.72	1.24	1.71
% of Hatcase Pond where 5 Turbines are Visible	1.07	1.43	1.07	1.43
% of Hatcase Pond where 4 Turbines are Visible	3.23	1.37	3.19	1.34
% of Hatcase Pond where 3 Turbines are Visible	5.17	5.85	5.04	5.76
% of Hatcase Pond where 2 Turbines are Visible	2.97	2.25	2.98	2.20
% of Hatcase Pond where 1 Turbines are Visible	7.16	7.59	7.10	7.47
Total %	38.07	30.41	37.71	30.10

For the nighttime lighting to be visible, the hub of the turbine would need to be visible from the observer's location and not blocked by vegetation. The forest screen – hub height (117 m) viewshed model is the best proxy for this. This model indicates that the night lighting may be

visible from 1-10 turbines (cumulatively including all Silver Maple and Pisgah Mountain turbines) from 30.10% of Hatcase Pond (Drawing K10, Appendix K).

3.1.3 Floods Pond

3.1.3.1 Scenic Impact of Associated Facilities

The visibility of the associated facilities is expected to be low to moderate for this location as they would be blocked or largely obscured by vegetation. This vegetation would likely block visibility of the majority of access roads and transmission collector infrastructure, but powerlines may be visible from certain areas of Floods Pond. During the winter, access roads may be visible due to the lack of foliage.

3.1.3.2 Significance of the SRSNS

Floods Pond is located within the Bangor Water's protected drinking watershed, which protects most of the watershed for Floods Pond, which is the drinking water source for the city of Bangor. The watershed has been protected since 1959. Maine's Finest Lakes Study lists Floods Pond as having outstanding scenic features as it possesses dramatic relief, island, cliffs and a bouldered shore. The vegetation diversity includes hardwoods such as red maple and sugar maple, birch and white pine. It is a nice undeveloped deep pond with extremely clear water. Public access to the Pond is restricted, with the only access coming from the Bangor Waterworks Road which is a gated road that extends near the pond from the north. Likewise, a number of activities, including fishing, boating, hiking and swimming, are restricted in the pond and its surrounding watershed as part of Bangor Water's watershed protection initiatives.

3.1.3.3 Existing Character of the Surrounding Area

The area surrounding Floods Pond is largely a natural forested landscape that is mostly undeveloped on account of the Pond's location within the protected watershed area (Drawing L1, Appendix L). A number of hills and areas of topographic relief are present around the Pond. The Bangor Waterworks Road runs along the Pond's north shore. A building (likely a pump station) is present on the Pond's north shore.

3.1.3.4 Viewer Expectations

Viewers of this Pond would largely be limited to Bangor Water employees who are accessing the Pond for waterworks purposes. As boating is restricted on the Pond, viewers would only be able to enjoy the scenery from the shoreline. While the Pond is said to be highly scenic, members of the public would not be able to enjoy the scenery on account of the Pond's remote location and restricted access.

3.1.3.5 Purpose and Context

The location of the Silver Maple Wind Project was determined by its proximity to the Pisgah Mountain Wind project. Silver Maple benefits directly from much of the infrastructure built for Pisgah Mountain, including the roads, collector system, and some interconnection infrastructure. The project also will benefit from Pisgah Mountain's compiled wind data, which has allowed SWEB to more accurately predict the expected wind resource of Silver Maple. Further, the Silver Maple project will benefit from the permitting work done for Pisgah Mountain. Including but not limited to, the acoustic data and modelling used for the Pisgah Mountain, and Pisgah Mountain survey work.

- (1) *Data related to the magnitude and reliability of the wind resource at the proposed development site, and the potential energy output expected from the development, as compared with any alternative sites in Maine investigated by the applicant.*

The particular placement of the five turbines was determined via analysis of the strongest locations on these ridgelines, given the annual average wind directions. Further, the turbine locations consider low interference with the existing five turbines of the Pisgah Mountain wind project.

- (2) *The location of the proposed development in relation to existing transmission lines, roads or other infrastructure.*

As stated above, the project location benefits from existing road infrastructure which was specifically designed for delivery and construction of wind energy equipment. The proximity of power lines and an existing substation further bolster the strength of this ridgeline as a uniquely strong location for the Silver Maple Wind Project.

- (3) *The topography and existing characteristics of the area surrounding the proposed development.*

The wind resource in this area is particularly strong, being located on a high elevation ridgeline in an exposed area.

- (4) *The existence of any other permitted wind energy development in the viewshed of any affected SRSNS.*

The Pisgah Mountain project will be directly adjacent to Silver Maple. The fact that the community and passersby are accustomed to viewing wind turbines at this location is expected to mitigate the marginal impacts of these particular five turbines. As opposed to constructing the project on a bare or undeveloped parcel elsewhere in Penobscot or Hancock County.

- (5) *Evidence of any mitigation proposals, such as improved access to the affected SRSNS, or improvements to the quality of the resource.*

The project has taken into effect its proximity to several of Maine's Finest Lakes and will limit its impacts on local SRSNS through use of a radar lighting system.

3.1.3.6 Public Use and Enjoyment

Public access to Floods Pond has been restricted since 1959. Access will likely continue to be restricted into the indefinite future to protect Bangor's drinking water supply. Additionally, boating, fishing, hiking, swimming and motor vehicle access are also restricted within the watershed as part of Bangor Water's watershed protection measures.

3.1.3.7 Scope and Scale of the Potential Effect

The viewshed analyses indicate that at best (hub height) one turbine may be visible from ~ 4% of Floods Pond, while at worst (total height) up to five turbines may be visible from 65% of Floods Pond (Drawings L3-L6, Appendix L). Applying the forest screen had no impact on turbine visibility from Floods Pond.

The closest turbine (SM1) would be 1.3 miles from the High Visual Impact Investigation Area selected for Floods Pond, and would be conspicuous within the 14° field of view that would be occupied by the Silver Mountain turbines (Drawing L2, Appendix L).

Table 3 provides a summary of the visual impact assessment for the proposed Silver Maple turbines.

Table 3. Visual Impact Parameters for Proposed Silver Maple Turbines

View Angle	Nearest Turbine (miles)		Farthest Turbine (miles)	
14°	SM1 – 1.3		SM5 – 2.2	
Viewshed	Bare Terrain - Total Height (185 m)	Bare Terrain - Hub Height (117 m)	Forest Screen - Total Height (185 m)	Forest Screen - Hub Height (117 m)
% of Floods Pond where 5 Turbines are Visible	65.28	53.60	65.28	53.60
% of Floods Pond where 4 Turbines are Visible	5.52	6.35	5.52	6.35
% of Floods Pond where 3 Turbines are Visible	4.35	6.10	4.35	6.10
% of Floods Pond where 2 Turbines are Visible	7.89	11.94	7.89	11.94
% of Floods Pond where 1 Turbines are Visible	3.51	5.14	3.51	5.14
Total %	86.55	83.13	86.55	83.13

3.1.3.8 Cumulative Scenic Impact or Effect

The cumulative visual impact of the proposed Silver Maple Wind Project with the existing Pisgah Mountain Wind Farm was assessed using the same analyses as above, but inclusive of the five existing turbines associated with the Pisgah Mountain Project

The viewshed analyses indicate that at best one turbine may be visible from 1% of Floods Pond, while at worst up to 10 turbines may be visible from ~63% of Floods Pond (Drawings L7-

L10, Appendix L); though this percentage drops to ~20% at hub height and when the forest screen is applied, suggesting that the majority of turbine visible would be the rotors as they pass above the horizon/tree line. Applying the forest screen had no impact on turbine visibility from Floods Pond.

The closest turbine (SM1) would be 1.3 miles from the High Visual Impact Investigation Area selected for Floods Pond (Drawing L2, Appendix L), and would be conspicuous from Floods Pond Drawing L2, Appendix L). The proposed Silver Maple turbines would extend the view of the existing wind farm to the east, widening the potential angle of view to 14°, resulting in overall minimal visual impact.

Table 4 provides a summary of the cumulative visual impact assessment for the proposed Silver Maple and existing Pisgah Mountain turbines.

Table 4. Cumulative Visual Impact Parameters for Proposed Silver Maple Turbines and Existing Pisgah Mountain Turbines

View Angle	Nearest Turbine (miles)		Farthest Turbine (miles)	
14°	SM1 – 1.3		PM2- 2.4	
Viewshed	Bare Terrain - Total Height (185 m)	Bare Terrain - Hub Height (117 m)	Forest Screen - Total Height (185 m)	Forest Screen - Hub Height (117 m)
% of Floods Pond where 10 Turbines are Visible	63.07	19.51	19.51	19.51
% of Floods Pond where 9 Turbines are Visible	13.14	43.94	43.94	43.94
% of Floods Pond where 8 Turbines are Visible	3.89	5.89	5.89	5.89
% of Floods Pond where 7 Turbines are Visible	4.07	5.28	5.28	5.28
% of Floods Pond where 6 Turbines are Visible	4.08	5.33	5.33	5.33
% of Floods Pond where 5 Turbines are Visible	2.08	2.00	2.00	2.00
% of Floods Pond where 4 Turbines are Visible	2.94	4.37	4.37	4.37

% of Floods Pond where 3 Turbines are Visible	0.99	4.88	4.88	4.88
% of Floods Pond where 2 Turbines are Visible	0.91	2.07	2.07	2.07
% of Floods Pond where 1 Turbines are Visible	1.11	1.96	1.96	1.96
Total %	96.29	95.23	95.23	95.23

For the nighttime lighting to be visible, the hub of the turbine would need to be visible from the observer's location and not be blocked by vegetation. The forest screen – hub height (117 m) viewshed model is the best proxy for this. This model indicates that the night lighting may be visible from 1-10 turbines (cumulatively including all Silver Maple and Pisgah Mountain turbines) from 95.23% of Floods Pond (Drawing L10, Appendix L).

3.1.4 Burnt Pond

3.1.4.1 Scenic Impact of Associated Facilities

The visibility of the associated facilities is expected to be low for this location as they would be blocked or largely obscured by vegetation and topography. Woodchuck Hill would likely block visibility of the majority of access roads and transmission collector infrastructure, but taller powerlines may be visible from certain areas of Burnt Pond. During the winter, access roads may be visible due to the lack of foliage.

3.1.4.2 Significance of the SRSNS

Burnt Pond is located within the Bangor Water's protected drinking watershed, which protects most of the watershed for Burnt Pond, which is the drinking water source for the city of Bangor. The watershed has been protected since 1959. Maine's Finest Lakes Study lists Burnt Pond has having outstanding scenic and shoreline features including: numerous islands, an irregular shoreline, no development, large boulders along the shore and mixed vegetation communities of white pine, spruce, fir, oak, maple and birch. Public access to the Pond is restricted, with the only access coming from the Bangor Waterworks Road which is a gated road that extends near the pond from the north. Likewise, a number of activities, including fishing, boating and swimming, are restricted in the pond as well as part of Bangor Water's watershed protection initiatives.

3.1.4.3 Existing Character of the Surrounding Area

The area surrounding Burnt Pond is largely a natural forested landscape that is mostly undeveloped on account of the Pond's location within the protected watershed area (Drawing M1, Appendix M). A number of hills and areas of topographic relief are present around the Pond. The Bangor Waterworks Road runs parallel to the Pond's northeast shore.

3.1.4.4 Viewer Expectations

Viewers of this pond would largely be limited to Bangor Water employees who are accessing the Pond for waterworks purposes. As boating is restricted on the Pond, viewers would only

be able to enjoy the scenery from the shoreline. While the Pond is said to be highly scenic, members of the public would not be able to enjoy the scenery on account of the Pond's remote location and restricted access.

3.1.4.5 Purpose and Context

The location of the Silver Maple Wind Project was determined by its proximity to the Pisgah Mountain Wind project. Silver Maple benefits directly from much of the infrastructure built for Pisgah Mountain, including the roads, collector system, and some interconnection infrastructure. The project also will benefit from Pisgah Mountain's compiled wind data, which has allowed SWEB to more accurately predict the expected wind resource of Silver Maple. Further, the Silver Maple project will benefit from the permitting work done for Pisgah Mountain. Including but not limited to, the acoustic data and modelling used for the Pisgah Mountain, and Pisgah Mountain survey work.

- (1) *Data related to the magnitude and reliability of the wind resource at the proposed development site, and the potential energy output expected from the development, as compared with any alternative sites in Maine investigated by the applicant.*

The particular placement of the five turbines was determined via analysis of the strongest locations on these ridgelines, given the annual average wind directions. Further, the turbine locations consider low interference with the existing five turbines of the Pisgah Mountain wind project.

- (2) *The location of the proposed development in relation to existing transmission lines, roads or other infrastructure.*

As stated above, the project location benefits from existing road infrastructure which was specifically designed for delivery and construction of wind energy equipment. The proximity of power lines and an existing substation further bolster the strength of this ridgeline as a uniquely strong location for the Silver Maple Wind Project.

- (3) *The topography and existing characteristics of the area surrounding the proposed development.*

The wind resource in this area is particularly strong, being located on a high elevation ridgeline in an exposed area.

- (4) *The existence of any other permitted wind energy development in the viewshed of any affected SRSNS.*

The Pisgah Mountain project will be directly adjacent to Silver Maple. The fact that the community and passersby are accustomed to viewing wind turbines at this location is expected to mitigate the marginal impacts of these particular five

turbines. As opposed to constructing the project on a bare or undeveloped parcel elsewhere in Penobscot or Hancock County.

- (5) Evidence of any mitigation proposals, such as improved access to the affected SRSNS, or improvements to the quality of the resource.

The project has taken into effect its proximity to several of Maine's Finest Lakes and will limit its impacts on local SRSNS through use of a radar lighting system.

3.1.4.6 Public Use and Enjoyment

Public access to Burnt Pond has been restricted since 1959. Access will likely continue to be restricted into the indefinite future to protect Bangor's drinking water supply. Additionally, boating, fishing, hiking, swimming and motor vehicle access are also restricted within the watershed as part of Bangor Water's watershed protection measures.

3.1.4.7 Scope and Scale of the Potential Effect

The viewshed analyses indicate that at best one turbine may be visible from ~5% of Burnt Pond, while at worst up to five turbines may be visible from ~58% of Burnt Pond (Drawings M3-M6, Appendix M); though this percentage drops to ~35% at hub height, suggesting that the majority of turbine visible would be the rotors as they pass above the horizon/tree line. Applying the forest screen had no impact on turbine visibility from Burnt Pond.

The closest turbine (SM1) would be 1.0 miles from the High Visual Impact Investigation Area selected for Burnt Pond, and would be conspicuous within the 15° field of view that would be occupied by the Silver Mountain turbines (Drawing M2, Appendix M).

Table 5 provides a summary of the visual impact assessment for the proposed Silver Maple turbines.

Table 5. Visual Impact Parameters for Proposed Silver Maple Turbines

View Angle	Nearest Turbine (miles)		Farthest Turbine (miles)	
	SM1 – 1.0		SM5 – 1.8	
Viewshed	Bare Terrain - Total Height (185 m)	Bare Terrain - Hub Height (117 m)	Forest Screen - Total Height (185 m)	Forest Screen - Hub Height (117 m)
% of Burnt Pond where 5 Turbines are Visible	57.76	34.82	57.76	34.82
% of Burnt Pond where 4 Turbines are Visible	8.49	11.93	8.49	11.93

% of Burnt Pond where 3 Turbines are Visible	5.87	9.64	5.87	9.64
% of Burnt Pond where 2 Turbines are Visible	10.35	14.29	10.35	14.29
% of Burnt Pond where 1 Turbines are Visible	5.37	11.57	5.37	11.57
Total %	87.84	82.26	87.84	82.26

3.1.4.8 Cumulative Scenic Impact or Effect

The cumulative visual impact of the proposed Silver Maple Wind Project with the existing Pisgah Mountain Wind Farm was assessed using the same analyses as above, but inclusive of the five existing turbines associated with the Pisgah Mountain Project

The viewshed analyses indicate that at best one turbine may be visible from ~2% of Burnt Pond, while at worst (bare terrain - total height) up to 10 turbines may be visible from ~67% of Burnt Pond (Drawings M7-M10, Appendix M); though this percentage drops to ~42% at hub height, suggesting that over 20% of turbine visible would be the rotors as they pass above the horizon/tree line. Applying the forest screen had no impact on turbine visibility from Burnt Pond.

The closest turbine to the High Visual Impact Investigation Area selected for Burnt Pond (Drawing M2, Appendix M) is SM1, at a distance of 3.5 miles. The proposed Silver Maple turbines would extend the view of the existing wind farm to the east, widening the potential angle of view to 26°, resulting in minimal visual impact.

Table 6 provides a summary of the cumulative visual impact assessment for the proposed Silver Maple and existing Pisgah Mountain turbines.

Table 6. Cumulative Visual Impact Parameters for Proposed Silver Maple Turbines and Existing Pisgah Mountain Turbines

View Angle	Nearest Turbine (miles)		Farthest Turbine (miles)	
26°	SM1 – 3.5		PM2- 4.4	
Viewshed	Bare Terrain - Total Height (185 m)	Bare Terrain - Hub Height (117 m)	Forest Screen - Total Height (185 m)	Forest Screen - Hub Height (117 m)
% of Burnt Pond where 10 Turbines are Visible	67.37	42.20	67.37	42.20

% of Burnt Pond where 9 Turbines are Visible	5.42	10.20	5.42	10.20
% of Burnt Pond where 8 Turbines are Visible	6.67	10.34	6.67	10.34
% of Burnt Pond where 7 Turbines are Visible	1.82	4.39	1.82	4.39
% of Burnt Pond where 6 Turbines are Visible	1.82	4.00	1.82	4.00
% of Burnt Pond where 5 Turbines are Visible	1.71	2.69	1.71	2.69
% of Burnt Pond where 4 Turbines are Visible	1.54	2.56	1.54	2.56
% of Burnt Pond where 3 Turbines are Visible	3.83	6.57	3.83	6.57
% of Burnt Pond where 2 Turbines are Visible	5.82	5.50	5.82	5.50
% of Burnt Pond where 1 Turbines are Visible	1.61	6.92	1.61	6.92
Total %	97.62	95.37	97.62	95.37

For the nighttime lighting to be visible, the hub of the turbine would need to be visible from the observer's location and not blocked by vegetation. The forest screen – hub height (117 m) viewshed model is the best proxy for this. This model indicates that the night lighting may be visible from 1-10 turbines (cumulatively including all Silver Maple and Pisgah Mountain turbines) from up to 95% of Burnt Pond (Drawing M10, Appendix M).

4.0 MITIGATIONS

SWEB has committed to installing a radar-based obstruction lighting control system that complies with all Federal Aviation Administration (FAA) requirements as part of the development of the Silver Maple Wind Farm. This system would trigger the night-time navigation lighting system only when necessary as an airplane approaches the Project. This system would effectively mitigate any visual impact that the night-time navigation lighting system would cause.

5.0 CONCLUSION

The viewshed model indicates fairly high visibility of the Project from Burnt and Floods Ponds, and moderate to low visibility for Hatcase Pond. Public access to these ponds is heavily restricted on account of their location within protected watershed areas and their use as drinking water supplies for the cities of Bangor and Brewer. The impacts to the viewshed of these Ponds should be weighed against the public access restrictions when determining the Project's impact to these SRSNS.

6.0 CLOSURE

Thank you for your review of the visual impact assessment for the proposed Silver Maple Wind Farm. While some aspects of this study are subjective in nature, we strived to maintain our objectivity as a third-party consultant. If you have questions about this assessment, please contact us.

7.0 STATEMENT OF QUALIFICATIONS AND LIMITATIONS

This Report (the "Report") has been prepared by Strum Consulting ("Consultant") for the benefit of SWEB Development USA LLC (SWEB) ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations, and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations")
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports
- may be based on information provided to Consultant which has not been independently verified
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued
- must be read as a whole and sections thereof should not be read out of such context
- was prepared for the specific purposes described in the Report and the Agreement
- in the case of subsurface, environmental, or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental, or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

The Report is to be treated as confidential and may not be used or relied upon by third parties, except:

- as agreed in writing by Consultant and Client
- as required by law
- for use by governmental reviewing agencies

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss, or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information (“improper use of the Report”), except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any damages arising from improper use of the Report or parts thereof shall be borne by the party making such use.

This Statement of Qualifications and Limitations forms part of the Report and any use of the Report is subject to the terms hereof.

Should additional information become available, Strum requests that this information be brought to our attention immediately so that we can re-assess the conclusions presented in this report. This report was prepared by Scott Dickey, BSc., MREM, Environmental Scientist.