Hillside Boularderie Wind Farm
Noise Impact Assessment Report
March 2013

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Report Information

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** The WindPRO v2.8, Decibel Module Calculation Results for the Enercon E-92 2.3 MW @ 98m Hub Height and the Enercon E-82 2.0 MW @ 98m Hub Height. To review General Specification for the Enercon E-92 2.3 MW and Enercon E-82 2.0 MW please contact:

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1. Introduction

Natural Forces Wind Inc. has undertaken a noise impact assessment for the proposed Hillside Boularderie Wind Farm site to assess the impact of the wind farm's sound emissions at the surrounding points of reception. Details outlining the project, noise receptors, prediction methodology and assumptions made for the assessment are included herein, with WindPRO results for the each specific turbine, supplied in the annexes. The Land Use By-law for the Cape Breton Regional Municipality does not state any restriction pertaining to sound pressure levels relating to wind turbines activities. Therefore, the Ontario *Noise Guidelines for Wind Farms* will be used during this assessment as a guideline regarding acceptable noise emission from the proposed Hillside Boularderie Wind Farm.

The noise analysis was conducted using the ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation model within the Decibel module of the software package, WindPRO version 2.8.

2. General Description of Project Site and Surrounds

The proposed Hillside Boularderie Wind Farm consists of a maximum of 2 wind turbine generators (WTGs) located in Cape Breton Regional Municipality, Nova Scotia. Currently, Enercon E-92 2.0 MW and Enercon E-82 2.0 MW WTG types are being considered for the project. For this initial assessment, Enercon E-92 2.3 MW and Enercon E-82 2.0 MW were used to calculate predicted sound pressure levels, however if the WTG type was to change a new noise assessment would be conducted. The project site is situated approximately 8 kilometres north west of North Sidney and adjacent to the Hillside Boularderie Road. Land around the proposed project area is zoned as a General Zone and so, will not require re-zoning. A map of the site and surrounding receptors is included in Annex A.

The predominant noise sources in the area are from road traffic along Hillside Boularderie Road, the Trans-Canada Highway and waves from Bras d'Or Lake.

3. Noise Guidelines for Wind Farm

3.1. Provincial and Municipal Noise Guidelines

As previously mentioned, the Land Use By-law for the Cape Breton Regional Municipality does not include any restrictions concerning acceptable sound pressure levels being emitted from wind turbines. A joint federal-provincial-territorial initiative to create national guidelines concerning wind turbine noise is underway. Although this initiative is only in draft format, Nova Scotia may choose to adopt these guidelines.

3.2. Ontario Provincial Noise Guidelines

For the proposed Hillside Boularderie Wind Farm, the Ontario *Noise Guidelines for Wind Farms* was used as a general guideline. The guidelines describe receptors in rural environments as Class 3. Table 1 demonstrates the sound level limits for wind turbines at different wind speeds.

Table 1 - Summary of sound level limits for wind turbines (Ministry of the Environment, 2008).

Wind Speed (m/s) at 10 m height	4	5	6	7	8	9	10
Wind Turbine Sound Level Limits Class 3 Area, dB(A)	40.0	40.0	40.0	43.0	45.0	49.0	51.0

To ensure a conservative assessment of the sound level limits emitted by the proposed Hillside Boularderie Wind Farm, a general limit of 40 dB(A) was used for wind speeds ranging between and including 4 and 12 m/s.

The noise assessment used the height above grade at the centre of the receptors of 4.5 m as proposed by the Ontario guideline for single and two story dwellings.

4. Description of Receptors

The 71 points of reception taken into consideration for this noise impact assessment are to represent residential buildings and/or seasonal homes located within 2,000 metres (m) of the nearest proposed WTG. Every dwelling within the 2.000 m buffer is represented by a receptor. It should be noted that there are no residential buildings and/or seasonal homes located within 1,000m of the turbines. Details of receptor locations and distances to nearest WTG are detailed in Table 2. Receptor IDs included in Table 2 correspond with the WindPRO generated map included in Annex B and Annex C for the Enercon E-92 2.3 and E-82 2.0 respectively.

Table 2 - Description of receptors.

No.	Easting	Northing	Distance from WTG 1	Distance from WTG 2
A	702,233	5,124,332	2,008	2,209
B	702,245	5,124,439	1,967	2,184
C	702,322	5,124,229	1,957	2,138
D	702,338	5,124,594	1,844	2,082
E	702,373	5,124,595	1,809	2,046
F	702,401	5,124,196	1,895	2,068
G	702,413	5,124,325	1,838	2,031
H	702,415	5,124,204	1,879	2,053
I	702,442	5,124,309	1,817	2,006
J	702,450	5,124,392	1,782	1,985
K	702,483	5,124,244	1,801	1,977
L	702,487	5,124,266	1,789	1,969
M	702,501	5,124,373	1,740	1,938
N	702,519	5,124,262	1,761	1,939
O	702,605	5,124,401	1,632	1,831
P	702,611	5,124,315	1,656	1,839
Q	702,639	5,124,305	1,634	1,813
R	702,649	5,124,422	1,584	1,784
S	702,668	5,124,603	1,518	1,751
T	702,677	5,124,540	1,524	1,746
U	702,708	5,124,552	1,491	1,713
V	702,749	5,124,554	1,451	1,673
W	702,749	5,124,416	1,491	1,686
X	702,763	5,124,463	1,463	1,666
Y	702,779	5,124,440	1,454	1,652
Z	702,800	5,124,224	1,520	1,673
AA	702,829	5,124,411	1,418	1,607
AB	702,921	5,124,318	1,371	1,534

No.	Easting	Northing	Distance from WTG 1	Distance from WTG 2
AC	703,203	5,124,469	1,051	1,229
AD	703,223	5,124,201	1,174	1,276
AE	703,273	5,124,261	1,099	1,209
AF	703,321	5,124,255	1,064	1,166
AG	703,543	5,123,998	1,104	1,090
AH	703,586	5,124,088	1,005	1,003
AI	703,623	5,123,909	1,140	1,085
AJ	703,893	5,123,660	1,285	1,118
AK	703,970	5,123,685	1,247	1,061
AL	703,972	5,123,489	1,441	1,241
AM	703,982	5,123,364	1,563	1,354
AN	703,993	5,123,326	1,600	1,387
AO	704,013	5,123,289	1,635	1,417
AP	704,016	5,123,593	1,332	1,127
AQ	704,028	5,123,386	1,537	1,319
AR	704,038	5,123,276	1,646	1,422
AS	704,045	5,123,584	1,338	1,126
AT	704,062	5,123,279	1,641	1,412
AU	704,066	5,123,581	1,340	1,122
AV	704,075	5,123,344	1,576	1,347
AW	704,135	5,123,490	1,428	1,190
AX	704,191	5,123,479	1,439	1,189
AY	704,251	5,123,479	1,442	1,179
AZ	704,269	5,123,386	1,537	1,269
BA	704,368	5,123,374	1,559	1,273
BB	704,462	5,123,310	1,638	1,337
BC	704,688	5,123,259	1,743	1,413
BD	704,712	5,126,656	1,826	2,031
BE	704,735	5,123,166	1846	1514
BF	704,788	5,123,217	1816	1476
BG	704,911	5,123,205	1873	1523
BH	705,007	5,123,161	1954	1597
BI	705,062	5,123,136	2001	1641
BJ	705,365	5,123,038	2237	1866
BK	705,461	5,123,291	2087	1709
BL	705,468	5,123,354	2043	1664
BM	705,480	5,123,239	2140	1763
BN	705,517	5,123,121	2256	1879

No.	Easting	Northing	Distance from WTG 1	Distance from WTG 2
BO	705,536	5,123,330	2106	1726
BP	705,549	5,123,264	2164	1785
BQ	705,713	5,123,690	1985	1609
BR	705,867	5,123,593	2167	1791
BS	705,894	5,123,646	2156	1782

5. Description of Sources

5.1. Turbine Locations

A map of the project area with the proposed WTG layout is illustrated in Annex A. There is only one proposed wind farm project within 10 kilometres the project, in Point Aconi. The project is located approximately 9 km away, thus there is no need to include cumulative noise impacts as per the Ontario guidelines. UTM coordinates of the WTGs are given below in Table 3. WTG ID numbers included in Table 3 correspond with the labels to the WindPRO generated map included Annex B.

Table 3 - Coordinates of proposed turbine locations.

WTG ID Number	Proposed WTG Location (UTM Zone 20, NAD 83)	
	Easting	Northing
1	704,153	5,124,918
2	704,419	5,124,646

5.2. Turbine Types

The WTG models being considered for the proposed wind farm are the Enercon E-82 2.0 MW and the Enercon E-92 2.0 MW. The Enercon E-92 2.3MW turbine is being used to represent the Enercon E-92 2.0 MW as the power curve and sound data is not currently available for the 2.0 MW WTG. This is deemed an acceptable representation because the 2.3 MW WTG and 2.0 MW WTG are very similar as the only mechanical difference would be one less power conversion cabinet. By using the E-92 2.3 MW WTG in the model, the calculations represent a conservative result. Both turbine models utilize horizontal axis, 3-blade design and a microprocessor pitch control system. (Enercon Canada, 2012)

Table 4 and Table 5 below outline the WTGs main characteristics.

Table 4 - Enercon E-92 2.3 MW turbine characteristics (Enercon Canada, 2012).

WTG Type	Rotor Diameter (m)	Hub Height (m)	Rated Output (MW)
E-92 2.3	92.0	98	2.3

Table 5 - Enercon E-82 2.0 MW turbine characteristics (Enercon Canada, 2012).

WTG Type	Rotor Diameter (m)	Hub Height (m)	Rated Output (MW)
E-82-2.0	82.0	98	2.0

5.3. Power Curve Data

The power curve for the Enercon E-92 2.3 MW WTG at Noise Mode 0 and with an air density of 1.225 kg/m³ is shown below in Figure 1.

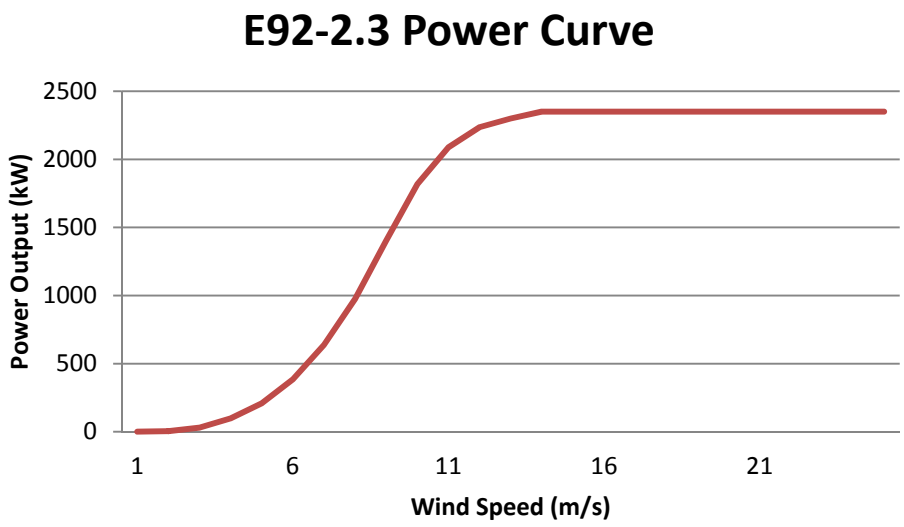

Figure 1 – Power curve for the Enercon E-92 2.3 (Enercon Canada, 2012).

The power curve for the Enercon E-82 2.0 MW WTG at Noise Mode 0 and with an air density of 1.225 kg/m³ is shown below in Figure 2.

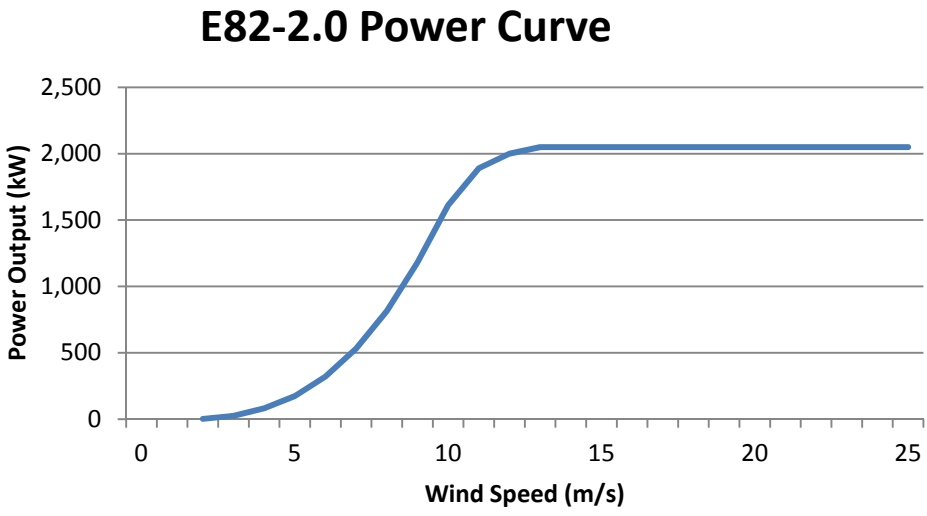

Figure 2 – Power curve for the Enercon E-82 2.0 (Enercon Canada, 2012).

6. Wind Turbine Noise Emission Rating

The noise emission data for the Enercon E-92 2.3 WTG, shown in Table 6, and Enercon E-82 2.0 WTG, shown in Table 7 was provided by Enercon Canada (2012). The sound pressure levels were measured to IEC 61400-11 standards, which stipulate measurements at a height of 10 m above ground level with an air density of 1.225 kg/m^{3}that is taken to be representative of the project area. Where data is shown as 'N/A', WindPRO has extrapolated octave band data to generate appropriate sound pressure level values in order to complete the calculation. These source noise levels are incorporated in the prediction calculations referenced in Section 7.

6.1. Enercon E-92 2.3 Noise Emission

Table 6 - Enercon E-92 2.3 MW noise emission data for 98 m hub height.

Wind speed at 10m a.g.l. (m/s)	SPL (LWA) (dB(A) re 10^{-12} Watts)	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
4	97.6	79.2	86.2	89.6	92.2	92.0	89.1	84.3	74.8
5	99.9	81.5	88.5	91.9	94.5	94.3	91.4	86.6	77.1
6	102.2	83.8	90.8	94.2	96.8	96.6	93.7	88.9	79.4
7	103.4	85.0	92.0	95.4	98.0	97.8	94.9	90.1	80.6
8	104.4	86.0	93.0	96.4	99.0	98.8	95.9	91.1	81.6
9	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
10	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
11	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2
12	105.0	86.6	93.6	97.0	99.6	99.4	96.5	91.7	82.2

6.2. Enercon E-82 2.0 Noise Emission

Table 7 - Enercon E-82 2.0 MW noise emission data for 98 m hub height.

Wind speed at 10m a.g.l. (m/s)	SPL (LWA) (dB(A) re 10^{-12} Watts)	Octave Band Centre Frequency (Hz)							
		63	125	250	500	1000	2000	4000	8000
4	96.4	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
5	98.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
6	100.0	85.7	90.9	92.0	94.4	95.1	88.8	75.8	75.8
7	101.8	85.9	91.9	93.3	96.5	97.1	91.3	78.0	77.2
8	102.5	85.4	92.7	94.4	97.3	97.5	92.3	79.6	73.9
9	102.4	85.4	93.4	93.9	97.0	97.5	92.3	80.3	73.6
10	102.0	85.2	93.2	92.8	95.9	97.3	93.3	81.9	74.0
11	101.6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
12	101.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

7. Impact Assessment

7.1. Prediction Methodology

The SPL was calculated at each point of reception (listed in Table 2) using the Decibel module of WindPRO v.2.8 which uses the ISO 9613-2 model "Attenuation of sound during propagation outdoors, Part 2: A general method of calculation". The calculations were performed using the Enercon E-92 2.3 MW WTG and the Enercon E-82 2.0 MW WTG, both with a hub height of 98m. A global ground attenuation of zero was used; this is to represent a 'worst case scenario' that produces results that are unaffected by vegetation characteristics such as trees or grass etc. The WindPRO generated noise contour maps for the Enercon E-92 2.3 and Enercon E-82 2.0 MW, both with a 98m hub height, which can be found in Annex B and Annex C, respectively.

As another conservative measure, downwind propagation has been assumed to occur simultaneously in all directions and from all WTGs. Furthermore, no attenuation from topographical shielding (other buildings, barns, trees etc.) has been considered between the WTGs and receptors. In reality, noise propagation in an upwind direction would lead to a significant reduction of incident noise levels at receptors located in the upwind direction.

No correction for special audible characteristics such as clearly audible tones, impulses or modulation of sound levels has been made. These are not common characteristics of modern well designed WTGs. Furthermore, the absence of tonal noise is normally guaranteed by WTG manufacturers and impulses and modulation of sound levels from the wind farm under normal conditions would not be of a level to necessitate the application of any penalty.

A full list of parameters assumed for the predictions is provided in Annex B and Annex C for the Enercon E-92 2.3 and E-82 2.0 respectively.

7.2. Results of Noise Predictions

The results of the noise prediction model at each point of reception, as summarized in Table 8, prove compliance with the Ontario *Noise Guidelines for Wind Farms* and the 40 dB(A) conservative SPL emission limit. As the guideline requirements have been exceeded, it was deemed unnecessary to conduct noise monitoring to establish background noise levels.

The receptor with the highest perceived noise was receptor H for both the Enercon E-92 2.3 and Enercon E-82 2.0 MW, which received a maximum of 37.0 dB(A) and 35.1 dB(A) respectively.

The modelled noise results for a wind speed of 8 m/s, approximately the 'noisiest' operational speed of a WTG, in the form of a noise area plot is mapped in Annex B and Annex C for the Enercon E-92 2.3 and E-82 2.0 respectively. The receptor ID labels on the contour plot correspond with the WindPRO ID listed in Table 2.

Table 8 - Wind turbine noise impact assessment summary.

Receptor	Distance from WTG 1	Distance from WTG 2	Max Sound Pressure Level dB(A)	Max Sound Pressure Level dB(A)
A	2,008	2,209	28.7	27.8
B	1,967	2,184	28.9	28.0
C	1,957	2,138	29.1	28.1
D	1,844	2,082	29.6	28.6
E	1,809	2,046	29.8	28.8
F	1,895	2,068	29.5	28.5
G	1,838	2,031	29.8	28.8
H	1,879	2,053	29.6	28.6
I	1,817	2,006	29.9	28.9
J	1,782	1,985	30.1	29.1
K	1,801	1,977	30.0	29.0
L	1,789	1,969	30.1	29.1
M	1,740	1,938	30.4	29.4
N	1,761	1,939	30.3	29.3
O	1,632	1,831	31.1	30.1
P	1,656	1,839	31.0	30.0
Q	1,634	1,813	31.1	30.1
R	1,584	1,784	31.4	30.4
S	1,518	1,751	31.8	30.8
T	1,524	1,746	31.8	30.8
U	1,491	1,713	32.0	31.0
V	1,451	1,673	32.3	31.3
W	1,491	1,686	32.1	31.1
X	1,463	1,666	32.3	31.3
Y	1,454	1,652	32.3	31.3
Z	1,520	1,673	32.0	31.0
AA	1,418	1,607	32.6	31.6
AB	1,371	1,534	33.1	32.1
AC	1,051	1,229	35.8	34.8
AD	1,174	1,276	34.9	33.9
AE	1,099	1,209	35.6	34.6
AF	1,064	1,166	35.9	34.9
AG	1,104	1,090	36.1	35.1
AH	1,005	1,003	37.0	36.0
AI	1,140	1,085	35.9	34.9

Receptor	Distance from WTG 1	Distance from WTG 2	Max Sound Pressure Level dB(A)	Max Sound Pressure Level dB(A)
AJ	1,285	1,118	35.2	34.2
AK	1,247	1,061	35.7	34.7
AL	1,441	1,241	34.0	33.0
AM	1,563	1,354	33.0	32.0
AN	1,600	1,387	32.8	31.8
AO	1,635	1,417	32.5	31.5
AP	1,332	1,127	35.0	34.0
AQ	1,537	1,319	33.3	32.3
AR	1,646	1,422	32.5	31.5
AS	1,338	1,126	34.9	33.9
AT	1,641	1,412	32.5	31.5
AU	1,340	1,122	35.0	34.0
AV	1,576	1,347	33.0	32.0
AW	1,428	1,190	34.3	33.3
AX	1,439	1,189	34.3	33.3
AY	1,442	1,179	34.3	33.3
AZ	1,537	1,269	33.5	32.5
BA	1,559	1,273	33.5	32.5
BB	1,638	1,337	32.9	31.9
BC	1,743	1,413	32.3	31.3
BD	1,826	2,031	29.8	28.8
BE	1846	1514	31.5	30.5
BF	1816	1476	31.8	30.8
BG	1873	1523	31.4	30.5
BH	1954	1597	30.9	29.9
BI	2001	1641	30.6	29.6
BJ	2237	1866	29.2	28.2
BK	2087	1709	30.1	29.1
BL	2043	1664	30.4	29.4
BM	2140	1763	29.8	28.8
BN	2256	1879	29.1	28.1
BO	2106	1726	30.0	29.0
BP	2164	1785	29.7	28.7
BQ	1985	1609	30.8	29.8
BR	2167	1791	29.6	28.6
BS	2156	1782	29.7	28.7

8. Conclusions and Recommendations

Natural Forces Wind Inc. has completed a thorough assessment to evaluate the noise impact of the proposed Hillside Boularderie Wind Farm at receptors representing residential locations within 2,000 m of the proposed wind turbine generators. Based on the parameters used to run the WindPRO noise prediction model, it has been shown that the predicted sound pressure levels emitted by any of the proposed wind turbine generators are less than 40 dB(A) at the receptors, thus demonstrating compliance with the Ontario *Noise Guidelines for Wind Farms*. As a result of this study, no noise mitigation strategies are recommended.

9. References

Cape Breton Regional Municipality (2009). Land Use By-Law of the Cape Breton Regional Municipality. CBRM.

Enercon Canada (2012). *Enercon E-92 2.3 MW Wind Turbine Generator data sheet.*

Enercon Canada (2012). *Enercon E-92 2.3 MW Wind Turbine Generator data sheet.*

International Organization for Standardization (1996). *ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*. WindPRO.

Ministry of the Environment (2008). *Noise guidelines for wind farms*. Ontario.

ANNEX A

Site Layout Map

Project:
HIL_noise assessment_2km receptors_130326

Description:
Hillside Boularderie Wind Farm
2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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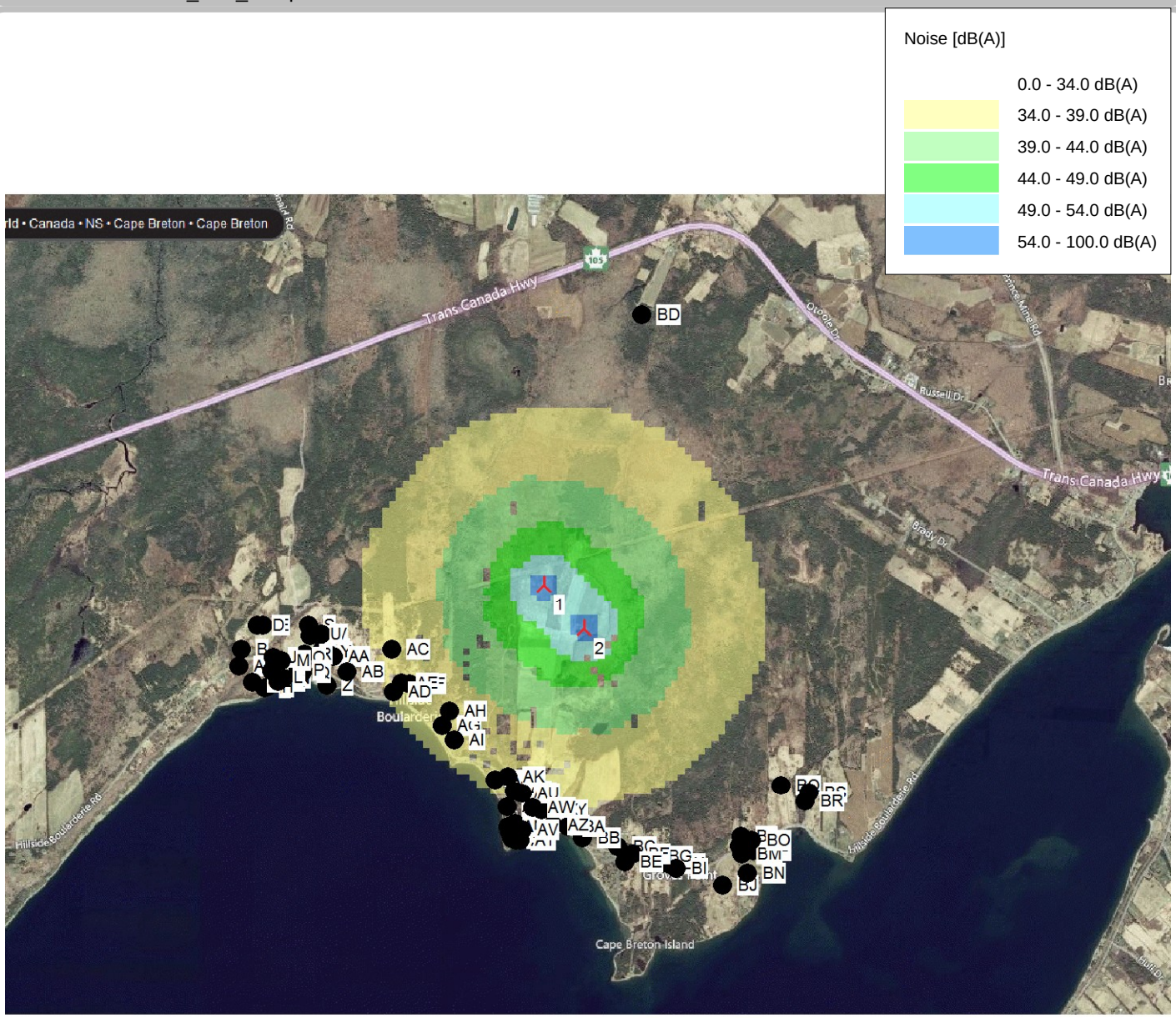
Licensed user:
Natural Forces Wind Inc
1791 Barrington Street Suite 1030
CA-HALIFAX, Nova Scotia B3J 3L1

Amy / apellerin@naturalforces.ca

Calculated:
26/03/2013 10:51 AM/2.8.579

DECIBEL - Map 8.0 m/s

Calculation: Hillside_E92_receptors within 2km



0 500 1000 1500 2000 m

Map: test map , Print scale 1:40,000, Map center UTM (north)-NAD83 (US+CA) Zone: 20 East: 704,286 North: 5,124,782

New WTG Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: 8.0 m/s

ANNEX B

WindPRO v2.8, Decibel Module Calculation Results

Enercon E-92 2.3 MW @ 98m Hub Height

Project:
HIL_noise assessment_2km receptors_130326

Description:
Hillside Boularderie Wind Farm
2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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CA-HALIFAX, Nova Scotia B3J 3L1

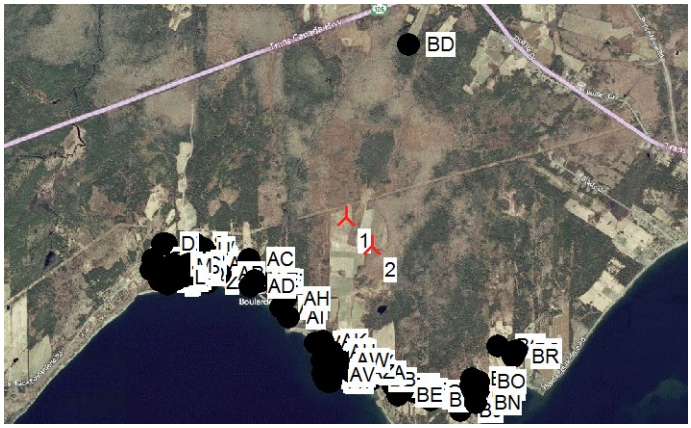
Amy / apellerin@naturalforces.ca

Calculated:
26/03/2013 10:51 AM/2.8.579

DECIBEL - Main Result

Calculation: Hillside_E92_receptors within 2km

Noise calculation model:
ISO 9613-2 General
Wind speed:
4.0 m/s - 12.0 m/s, step 1.0 m/s
Ground attenuation:
None
Meteorological coefficient, C0:
0.0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
4.5 m Don't allow override of model height with height from NSA object
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0.0 dB(A)



Scale 1:75,000
New WTG
Noise sensitive area

WTGs

	UTM (north)-NAD83 (US+CA) Zone: 20 East	North	Z	Row data/Description	WTG type Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Noise data Creator	Name	First wind speed	LwaRef	Last wind speed	LwaRef	Pure tones
			[m]					[kW]	[m]	[m]			[m/s]	[dB(A)]	[m/s]	[dB(A)]	
1	704,153	5,124,918	84.3	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode I - 03/2012	4.0	97.6	12.0	105.0	0 dB g
2	704,419	5,124,646	90.6	ENERCON E-92 2,3 MW 2300 ...	Yes	ENERCON	E-92 2,3 MW-2,300	2,300	92.0	98.0	EMD	Level 0 - calculated - Op.Mode I - 03/2012	4.0	97.6	12.0	105.0	0 dB g

h) Generic octave distribution used
g) Data calculated from data for other wind speed (uncertain)

Calculation Results

Sound Level

Noise sensitive area No.	Name	UTM (north)-NAD83 (US+CA) Zone: 20 East	North	Z	Imission height	Demands Max Noise	Distance	Sound Level Max From WTGs	Demands fulfilled ? Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
A	Noise sensitive point: User defined (43)	702,233	5,124,332	28.5	4.5	40.0	1000	28.7	Yes	Yes	Yes
B	Noise sensitive point: User defined (44)	702,245	5,124,439	35.4	4.5	40.0	1000	28.9	Yes	Yes	Yes
C	Noise sensitive point: User defined (45)	702,322	5,124,229	23.5	4.5	40.0	1000	29.1	Yes	Yes	Yes
D	Noise sensitive point: User defined (46)	702,338	5,124,594	41.8	4.5	40.0	1000	29.6	Yes	Yes	Yes
E	Noise sensitive point: User defined (47)	702,373	5,124,595	37.4	4.5	40.0	1000	29.8	Yes	Yes	Yes
F	Noise sensitive point: User defined (48)	702,401	5,124,196	13.7	4.5	40.0	1000	29.5	Yes	Yes	Yes
G	Noise sensitive point: User defined (49)	702,413	5,124,325	25.0	4.5	40.0	1000	29.8	Yes	Yes	Yes
H	Noise sensitive point: User defined (50)	702,415	5,124,204	13.5	4.5	40.0	1000	29.6	Yes	Yes	Yes
I	Noise sensitive point: User defined (51)	702,442	5,124,309	23.3	4.5	40.0	1000	29.9	Yes	Yes	Yes
J	Noise sensitive point: User defined (52)	702,450	5,124,392	25.3	4.5	40.0	1000	30.1	Yes	Yes	Yes
K	Noise sensitive point: User defined (53)	702,483	5,124,244	13.2	4.5	40.0	1000	30.0	Yes	Yes	Yes
L	Noise sensitive point: User defined (54)	702,487	5,124,266	17.0	4.5	40.0	1000	30.1	Yes	Yes	Yes
M	Noise sensitive point: User defined (55)	702,501	5,124,373	24.3	4.5	40.0	1000	30.4	Yes	Yes	Yes
N	Noise sensitive point: User defined (56)	702,519	5,124,262	13.8	4.5	40.0	1000	30.3	Yes	Yes	Yes
O	Noise sensitive point: User defined (57)	702,605	5,124,401	22.9	4.5	40.0	1000	31.1	Yes	Yes	Yes
P	Noise sensitive point: User defined (58)	702,611	5,124,315	12.6	4.5	40.0	1000	31.0	Yes	Yes	Yes
Q	Noise sensitive point: User defined (59)	702,639	5,124,305	10.3	4.5	40.0	1000	31.1	Yes	Yes	Yes
R	Noise sensitive point: User defined (60)	702,649	5,124,422	22.9	4.5	40.0	1000	31.4	Yes	Yes	Yes
S	Noise sensitive point: User defined (61)	702,668	5,124,603	34.0	4.5	40.0	1000	31.8	Yes	Yes	Yes
T	Noise sensitive point: User defined (62)	702,677	5,124,540	33.2	4.5	40.0	1000	31.8	Yes	Yes	Yes
U	Noise sensitive point: User defined (63)	702,708	5,124,552	33.8	4.5	40.0	1000	32.0	Yes	Yes	Yes
V	Noise sensitive point: User defined (64)	702,749	5,124,554	33.7	4.5	40.0	1000	32.3	Yes	Yes	Yes

To be continued on next page...

Project:
HIL_noise assessment_2km receptors_130326

Description:
Hillside Boularderie Wind Farm
2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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Natural Forces Wind Inc
1791 Barrington Street Suite 1030
CA-HALIFAX, Nova Scotia B3J 3L1

Amy / apellerin@naturalforces.ca
Calculated:
26/03/2013 10:51 AM/2.8.579

DECIBEL - Main Result

Calculation: Hillside_E92_receptors within 2km

...continued from previous page

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level	Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
W	Noise sensitive point: User defined (65)	702,749	5,124,416	23.4	4.5	40.0	1000	32.1	Yes	Yes	Yes
X	Noise sensitive point: User defined (66)	702,763	5,124,463	29.1	4.5	40.0	1000	32.3	Yes	Yes	Yes
Y	Noise sensitive point: User defined (67)	702,779	5,124,440	28.9	4.5	40.0	1000	32.3	Yes	Yes	Yes
Z	Noise sensitive point: User defined (68)	702,800	5,124,224	8.7	4.5	40.0	1000	32.0	Yes	Yes	Yes
AA	Noise sensitive point: User defined (69)	702,829	5,124,411	31.3	4.5	40.0	1000	32.6	Yes	Yes	Yes
AB	Noise sensitive point: User defined (70)	702,921	5,124,318	25.1	4.5	40.0	1000	33.1	Yes	Yes	Yes
AC	Noise sensitive point: User defined (71)	703,203	5,124,469	42.5	4.5	40.0	1000	35.8	Yes	Yes	Yes
AD	Noise sensitive point: User defined (72)	703,223	5,124,201	7.1	4.5	40.0	1000	34.9	Yes	Yes	Yes
AE	Noise sensitive point: User defined (73)	703,273	5,124,261	10.8	4.5	40.0	1000	35.6	Yes	Yes	Yes
AF	Noise sensitive point: User defined (74)	703,321	5,124,255	9.8	4.5	40.0	1000	35.9	Yes	Yes	Yes
AG	Noise sensitive point: User defined (75)	703,543	5,123,998	12.8	4.5	40.0	1000	36.1	Yes	Yes	Yes
AH	Noise sensitive point: User defined (76)	703,586	5,124,088	24.7	4.5	40.0	1000	37.0	Yes	Yes	Yes
AI	Noise sensitive point: User defined (77)	703,623	5,123,909	16.9	4.5	40.0	1000	35.9	Yes	Yes	Yes
AJ	Noise sensitive point: User defined (78)	703,893	5,123,660	9.1	4.5	40.0	1000	35.2	Yes	Yes	Yes
AK	Noise sensitive point: User defined (79)	703,970	5,123,685	26.2	4.5	40.0	1000	35.7	Yes	Yes	Yes
AL	Noise sensitive point: User defined (80)	703,972	5,123,489	5.1	4.5	40.0	1000	34.0	Yes	Yes	Yes
AM	Noise sensitive point: User defined (81)	703,982	5,123,364	4.2	4.5	40.0	1000	33.0	Yes	Yes	Yes
AN	Noise sensitive point: User defined (82)	703,993	5,123,326	3.3	4.5	40.0	1000	32.8	Yes	Yes	Yes
AO	Noise sensitive point: User defined (83)	704,013	5,123,289	2.3	4.5	40.0	1000	32.5	Yes	Yes	Yes
AP	Noise sensitive point: User defined (84)	704,016	5,123,593	17.0	4.5	40.0	1000	35.0	Yes	Yes	Yes
AQ	Noise sensitive point: User defined (85)	704,028	5,123,386	7.2	4.5	40.0	1000	33.3	Yes	Yes	Yes
AR	Noise sensitive point: User defined (86)	704,038	5,123,276	2.0	4.5	40.0	1000	32.5	Yes	Yes	Yes
AS	Noise sensitive point: (87)	704,045	5,123,584	2.0	4.5	40.0	1000	34.9	Yes	Yes	Yes
AT	Noise sensitive point: User defined (88)	704,062	5,123,279	2.0	4.5	40.0	1000	32.5	Yes	Yes	Yes
AU	Noise sensitive point: User defined (89)	704,066	5,123,581	21.3	4.5	40.0	1000	35.0	Yes	Yes	Yes
AV	Noise sensitive point: User defined (90)	704,075	5,123,344	4.9	4.5	40.0	1000	33.0	Yes	Yes	Yes
AW	Noise sensitive point: User defined (91)	704,135	5,123,490	15.8	4.5	40.0	1000	34.3	Yes	Yes	Yes
AX	Noise sensitive point: User defined (92)	704,191	5,123,479	15.7	4.5	40.0	1000	34.3	Yes	Yes	Yes
AY	Noise sensitive point: User defined (93)	704,251	5,123,479	16.6	4.5	40.0	1000	34.3	Yes	Yes	Yes
AZ	Noise sensitive point: User defined (94)	704,269	5,123,386	5.7	4.5	40.0	1000	33.5	Yes	Yes	Yes
BA	Noise sensitive point: User defined (95)	704,368	5,123,374	7.7	4.5	40.0	1000	33.5	Yes	Yes	Yes
BB	Noise sensitive point: User defined (96)	704,462	5,123,310	12.5	4.5	40.0	1000	32.9	Yes	Yes	Yes
BC	Noise sensitive point: User defined (97)	704,688	5,123,259	20.9	4.5	40.0	1000	32.3	Yes	Yes	Yes
BD	Noise sensitive point: User defined (98)	704,712	5,126,656	76.1	4.5	40.0	1000	29.8	Yes	Yes	Yes
BE	Noise sensitive point: User defined (99)	704,735	5,123,166	13.9	4.5	40.0	1000	31.5	Yes	Yes	Yes
BF	Noise sensitive point: User defined (100)	704,788	5,123,217	21.7	4.5	40.0	1000	31.8	Yes	Yes	Yes
BG	Noise sensitive point: User defined (101)	704,911	5,123,205	28.4	4.5	40.0	1000	31.4	Yes	Yes	Yes
BH	Noise sensitive point: User defined (102)	705,007	5,123,161	25.9	4.5	40.0	1000	30.9	Yes	Yes	Yes
BI	Noise sensitive point: User defined (103)	705,062	5,123,136	22.3	4.5	40.0	1000	30.6	Yes	Yes	Yes
BJ	Noise sensitive point: User defined (104)	705,365	5,123,038	12.2	4.5	40.0	1000	29.2	Yes	Yes	Yes
BK	Noise sensitive point: User defined (105)	705,461	5,123,291	14.7	4.5	40.0	1000	30.1	Yes	Yes	Yes
BL	Noise sensitive point: User defined (106)	705,468	5,123,354	19.4	4.5	40.0	1000	30.4	Yes	Yes	Yes
BM	Noise sensitive point: User defined (107)	705,480	5,123,239	11.5	4.5	40.0	1000	29.8	Yes	Yes	Yes
BN	Noise sensitive point: User defined (108)	705,517	5,123,121	6.5	4.5	40.0	1000	29.1	Yes	Yes	Yes
BO	Noise sensitive point: User defined (109)	705,536	5,123,330	11.3	4.5	40.0	1000	30.0	Yes	Yes	Yes
BP	Noise sensitive point: User defined (110)	705,549	5,123,264	7.6	4.5	40.0	1000	29.7	Yes	Yes	Yes
BQ	Noise sensitive point: User defined (111)	705,713	5,123,690	18.4	4.5	40.0	1000	30.8	Yes	Yes	Yes
BR	Noise sensitive point: User defined (112)	705,867	5,123,593	11.3	4.5	40.0	1000	29.6	Yes	Yes	Yes
BS	Noise sensitive point: User defined (113)	705,894	5,123,646	13.8	4.5	40.0	1000	29.7	Yes	Yes	Yes

Project:
HIL_noise assessment_2km receptors_130326

Description:
Hillside Boularderie Wind Farm
2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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DECIBEL - Main Result

Calculation: Hillside_E92_receptors within 2km

Distances (m)

	WTG	
NSA	1	2
A	2008	2209
B	1967	2184
C	1957	2138
D	1844	2082
E	1809	2046
F	1895	2068
G	1838	2031
H	1879	2053
I	1817	2006
J	1782	1985
K	1801	1977
L	1789	1969
M	1740	1938
N	1761	1939
O	1632	1831
P	1656	1839
Q	1634	1813
R	1584	1784
S	1518	1751
T	1524	1746
U	1491	1713
V	1451	1673
W	1491	1686
X	1463	1666
Y	1454	1652
Z	1520	1673
AA	1418	1607
AB	1371	1534
AC	1051	1229
AD	1174	1276
AE	1099	1209
AF	1064	1166
AG	1104	1090
AH	1005	1003
AI	1140	1085
AJ	1285	1118
AK	1247	1061
AL	1441	1241
AM	1563	1354
AN	1600	1387
AO	1635	1417
AP	1332	1127
AQ	1537	1319
AR	1646	1422
AS	1338	1126
AT	1641	1412
AU	1340	1122
AV	1576	1347
AW	1428	1190
AX	1439	1189
AY	1442	1179
AZ	1537	1269
BA	1559	1273
BB	1638	1337
BC	1743	1413
BD	1826	2031

To be continued on next page...

Project:
HIL_noise assessment_2km receptors_130326

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DECIBEL - Main Result

Calculation: Hillside_E92_receptors within 2km

...continued from previous page

	WTG	
NSA	1	2
BE	1846	1514
BF	1816	1476
BG	1873	1523
BH	1954	1597
BI	2001	1641
BJ	2237	1866
BK	2087	1709
BL	2043	1664
BM	2140	1763
BN	2256	1879
BO	2106	1726
BP	2164	1785
BQ	1985	1609
BR	2167	1791
BS	2156	1782

ANNEX C

WindPRO v2.8, Decibel Module Calculation Results

Enercon E-82 2.0 MW @ 98m Hub Height

Project:
HIL_noise assessment_2km receptors_130326

Description:
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2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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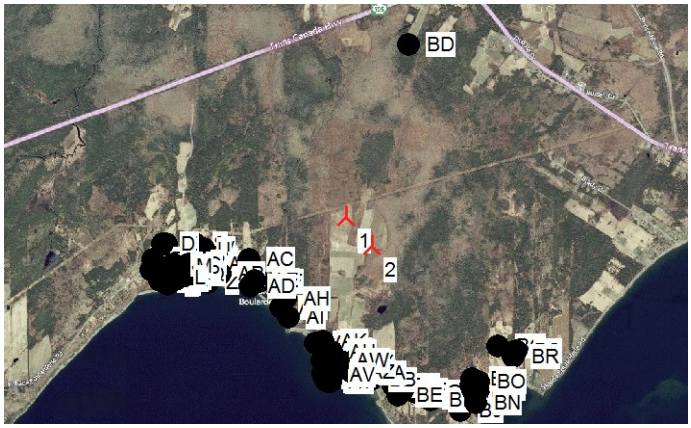
Calculated:
26/03/2013 11:08 AM/2.8.579

DECIBEL - Main Result

Calculation: Hillside_E82_receptors within 2km

Noise calculation model:
ISO 9613-2 General
Wind speed:
4.0 m/s - 12.0 m/s, step 1.0 m/s
Ground attenuation:
None
Meteorological coefficient, C0:
0.0 dB
Type of demand in calculation:
1: WTG noise is compared to demand (DK, DE, SE, NL etc.)
Noise values in calculation:
All noise values are mean values (Lwa) (Normal)
Pure tones:
Pure and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
4.5 m Don't allow override of model height with height from NSA object
Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:
0.0 dB(A)



Scale 1:75,000
New WTG
Noise sensitive area

WTGs

	UTM (north)-NAD83 (US+CA) Zone: 20				WTG type						Noise data							
	East	North	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name	First wind speed	LwaRef	Last wind speed	LwaRef	Pure tones	
			[m]					[kW]	[m]	[m]			[m/s]	[dB(A)]	[m/s]	[dB(A)]		
1	704,153	5,124,918	84.3	ENERCON E-82 2000 82.0 !O! ...	Yes	ENERCON	E-82-2,000	2,000	82.0	98.3	EMD	Level 0 - guaranteed - OM I/ Rev. 2.1 - 04/2006	4.0	97.6	12.0	104.0	0 dB	g
2	704,419	5,124,646	90.6	ENERCON E-82 2000 82.0 !O! ...	Yes	ENERCON	E-82-2,000	2,000	82.0	98.3	EMD	Level 0 - guaranteed - OM I/ Rev. 2.1 - 04/2006	4.0	97.6	12.0	104.0	0 dB	g

h) Generic octave distribution used
g) Data calculated from data for other wind speed (uncertain)

Calculation Results

Sound Level

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20			Demands			Sound Level	Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
A	Noise sensitive point: User defined (43)	702,233	5,124,332	28.5	4.5	40.0	1000	27.8	Yes	Yes	Yes
B	Noise sensitive point: User defined (44)	702,245	5,124,439	35.4	4.5	40.0	1000	28.0	Yes	Yes	Yes
C	Noise sensitive point: User defined (45)	702,322	5,124,229	23.5	4.5	40.0	1000	28.1	Yes	Yes	Yes
D	Noise sensitive point: User defined (46)	702,338	5,124,594	41.8	4.5	40.0	1000	28.6	Yes	Yes	Yes
E	Noise sensitive point: User defined (47)	702,373	5,124,595	37.4	4.5	40.0	1000	28.8	Yes	Yes	Yes
F	Noise sensitive point: User defined (48)	702,401	5,124,196	13.7	4.5	40.0	1000	28.5	Yes	Yes	Yes
G	Noise sensitive point: User defined (49)	702,413	5,124,325	25.0	4.5	40.0	1000	28.8	Yes	Yes	Yes
H	Noise sensitive point: User defined (50)	702,415	5,124,204	13.5	4.5	40.0	1000	28.6	Yes	Yes	Yes
I	Noise sensitive point: User defined (51)	702,442	5,124,309	23.3	4.5	40.0	1000	28.9	Yes	Yes	Yes
J	Noise sensitive point: User defined (52)	702,450	5,124,392	25.3	4.5	40.0	1000	29.1	Yes	Yes	Yes
K	Noise sensitive point: User defined (53)	702,483	5,124,244	13.2	4.5	40.0	1000	29.0	Yes	Yes	Yes
L	Noise sensitive point: User defined (54)	702,487	5,124,266	17.0	4.5	40.0	1000	29.1	Yes	Yes	Yes
M	Noise sensitive point: User defined (55)	702,501	5,124,373	24.3	4.5	40.0	1000	29.4	Yes	Yes	Yes
N	Noise sensitive point: User defined (56)	702,519	5,124,262	13.8	4.5	40.0	1000	29.3	Yes	Yes	Yes
O	Noise sensitive point: User defined (57)	702,605	5,124,401	22.9	4.5	40.0	1000	30.1	Yes	Yes	Yes
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R	Noise sensitive point: User defined (60)	702,649	5,124,422	22.9	4.5	40.0	1000	30.4	Yes	Yes	Yes
S	Noise sensitive point: User defined (61)	702,668	5,124,603	34.0	4.5	40.0	1000	30.8	Yes	Yes	Yes
T	Noise sensitive point: User defined (62)	702,677	5,124,540	33.2	4.5	40.0	1000	30.8	Yes	Yes	Yes
U	Noise sensitive point: User defined (63)	702,708	5,124,552	33.8	4.5	40.0	1000	31.0	Yes	Yes	Yes
V	Noise sensitive point: User defined (64)	702,749	5,124,554	33.7	4.5	40.0	1000	31.3	Yes	Yes	Yes

To be continued on next page...

Project:
HIL_noise assessment_2km receptors_130326

Description:
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2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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Calculated:
26/03/2013 11:08 AM/2.8.579

DECIBEL - Main Result

Calculation: Hillside_E82_receptors within 2km

...continued from previous page

Noise sensitive area		UTM (north)-NAD83 (US+CA) Zone: 20				Demands		Sound Level	Demands fulfilled ?		
No.	Name	East	North	Z	Imission height	Max Noise	Distance	Max From WTGs	Noise	Distance	All
				[m]	[m]	[dB(A)]	[m]	[dB(A)]			
W	Noise sensitive point: User defined (65)	702,749	5,124,416	23.4	4.5	40.0	1000	31.1	Yes	Yes	Yes
X	Noise sensitive point: User defined (66)	702,763	5,124,463	29.1	4.5	40.0	1000	31.3	Yes	Yes	Yes
Y	Noise sensitive point: User defined (67)	702,779	5,124,440	28.9	4.5	40.0	1000	31.3	Yes	Yes	Yes
Z	Noise sensitive point: User defined (68)	702,800	5,124,224	8.7	4.5	40.0	1000	31.0	Yes	Yes	Yes
AA	Noise sensitive point: User defined (69)	702,829	5,124,411	31.3	4.5	40.0	1000	31.6	Yes	Yes	Yes
AB	Noise sensitive point: User defined (70)	702,921	5,124,318	25.1	4.5	40.0	1000	32.1	Yes	Yes	Yes
AC	Noise sensitive point: User defined (71)	703,203	5,124,469	42.5	4.5	40.0	1000	34.8	Yes	Yes	Yes
AD	Noise sensitive point: User defined (72)	703,223	5,124,201	7.1	4.5	40.0	1000	33.9	Yes	Yes	Yes
AE	Noise sensitive point: User defined (73)	703,273	5,124,261	10.8	4.5	40.0	1000	34.6	Yes	Yes	Yes
AF	Noise sensitive point: User defined (74)	703,321	5,124,255	9.8	4.5	40.0	1000	34.9	Yes	Yes	Yes
AG	Noise sensitive point: User defined (75)	703,543	5,123,998	12.8	4.5	40.0	1000	35.1	Yes	Yes	Yes
AH	Noise sensitive point: User defined (76)	703,586	5,124,088	24.7	4.5	40.0	1000	36.0	Yes	Yes	Yes
AI	Noise sensitive point: User defined (77)	703,623	5,123,909	16.9	4.5	40.0	1000	34.9	Yes	Yes	Yes
AJ	Noise sensitive point: User defined (78)	703,893	5,123,660	9.1	4.5	40.0	1000	34.2	Yes	Yes	Yes
AK	Noise sensitive point: User defined (79)	703,970	5,123,685	26.2	4.5	40.0	1000	34.7	Yes	Yes	Yes
AL	Noise sensitive point: User defined (80)	703,972	5,123,489	5.1	4.5	40.0	1000	33.0	Yes	Yes	Yes
AM	Noise sensitive point: User defined (81)	703,982	5,123,364	4.2	4.5	40.0	1000	32.0	Yes	Yes	Yes
AN	Noise sensitive point: User defined (82)	703,993	5,123,326	3.3	4.5	40.0	1000	31.8	Yes	Yes	Yes
AO	Noise sensitive point: User defined (83)	704,013	5,123,289	2.3	4.5	40.0	1000	31.5	Yes	Yes	Yes
AP	Noise sensitive point: User defined (84)	704,016	5,123,593	17.0	4.5	40.0	1000	34.0	Yes	Yes	Yes
AQ	Noise sensitive point: User defined (85)	704,028	5,123,386	7.2	4.5	40.0	1000	32.3	Yes	Yes	Yes
AR	Noise sensitive point: User defined (86)	704,038	5,123,276	2.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
AS	Noise sensitive point: (87)	704,045	5,123,584	2.0	4.5	40.0	1000	33.9	Yes	Yes	Yes
AT	Noise sensitive point: User defined (88)	704,062	5,123,279	2.0	4.5	40.0	1000	31.5	Yes	Yes	Yes
AU	Noise sensitive point: User defined (89)	704,066	5,123,581	21.3	4.5	40.0	1000	34.0	Yes	Yes	Yes
AV	Noise sensitive point: User defined (90)	704,075	5,123,344	4.9	4.5	40.0	1000	32.0	Yes	Yes	Yes
AW	Noise sensitive point: User defined (91)	704,135	5,123,490	15.8	4.5	40.0	1000	33.3	Yes	Yes	Yes
AX	Noise sensitive point: User defined (92)	704,191	5,123,479	15.7	4.5	40.0	1000	33.3	Yes	Yes	Yes
AY	Noise sensitive point: User defined (93)	704,251	5,123,479	16.6	4.5	40.0	1000	33.3	Yes	Yes	Yes
AZ	Noise sensitive point: User defined (94)	704,269	5,123,386	5.7	4.5	40.0	1000	32.5	Yes	Yes	Yes
BA	Noise sensitive point: User defined (95)	704,368	5,123,374	7.7	4.5	40.0	1000	32.5	Yes	Yes	Yes
BB	Noise sensitive point: User defined (96)	704,462	5,123,310	12.5	4.5	40.0	1000	31.9	Yes	Yes	Yes
BC	Noise sensitive point: User defined (97)	704,688	5,123,259	20.9	4.5	40.0	1000	31.3	Yes	Yes	Yes
BD	Noise sensitive point: User defined (98)	704,712	5,126,656	76.1	4.5	40.0	1000	28.8	Yes	Yes	Yes
BE	Noise sensitive point: User defined (99)	704,735	5,123,166	13.9	4.5	40.0	1000	30.5	Yes	Yes	Yes
BF	Noise sensitive point: User defined (100)	704,788	5,123,217	21.7	4.5	40.0	1000	30.8	Yes	Yes	Yes
BG	Noise sensitive point: User defined (101)	704,911	5,123,205	28.4	4.5	40.0	1000	30.5	Yes	Yes	Yes
BH	Noise sensitive point: User defined (102)	705,007	5,123,161	25.9	4.5	40.0	1000	29.9	Yes	Yes	Yes
BI	Noise sensitive point: User defined (103)	705,062	5,123,136	22.3	4.5	40.0	1000	29.6	Yes	Yes	Yes
BJ	Noise sensitive point: User defined (104)	705,365	5,123,038	12.2	4.5	40.0	1000	28.2	Yes	Yes	Yes
BK	Noise sensitive point: User defined (105)	705,461	5,123,291	14.7	4.5	40.0	1000	29.1	Yes	Yes	Yes
BL	Noise sensitive point: User defined (106)	705,468	5,123,354	19.4	4.5	40.0	1000	29.4	Yes	Yes	Yes
BM	Noise sensitive point: User defined (107)	705,480	5,123,239	11.5	4.5	40.0	1000	28.8	Yes	Yes	Yes
BN	Noise sensitive point: User defined (108)	705,517	5,123,121	6.5	4.5	40.0	1000	28.1	Yes	Yes	Yes
BO	Noise sensitive point: User defined (109)	705,536	5,123,330	11.3	4.5	40.0	1000	29.0	Yes	Yes	Yes
BP	Noise sensitive point: User defined (110)	705,549	5,123,264	7.6	4.5	40.0	1000	28.7	Yes	Yes	Yes
BQ	Noise sensitive point: User defined (111)	705,713	5,123,690	18.4	4.5	40.0	1000	29.8	Yes	Yes	Yes
BR	Noise sensitive point: User defined (112)	705,867	5,123,593	11.3	4.5	40.0	1000	28.6	Yes	Yes	Yes
BS	Noise sensitive point: User defined (113)	705,894	5,123,646	13.8	4.5	40.0	1000	28.7	Yes	Yes	Yes

Project:
HIL_noise assessment_2km receptors_130326

Description:
Hillside Boularderie Wind Farm
2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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Licensed user:
Natural Forces Wind Inc
1791 Barrington Street Suite 1030
CA-HALIFAX, Nova Scotia B3J 3L1

Amy / apellerin@naturalforces.ca

Calculated:
26/03/2013 11:08 AM/2.8.579

DECIBEL - Main Result

Calculation: Hillside_E82_receptors within 2km

Distances (m)

	WTG	
NSA	1	2
A	2008	2209
B	1967	2184
C	1957	2138
D	1844	2082
E	1809	2046
F	1895	2068
G	1838	2031
H	1879	2053
I	1817	2006
J	1782	1985
K	1801	1977
L	1789	1969
M	1740	1938
N	1761	1939
O	1632	1831
P	1656	1839
Q	1634	1813
R	1584	1784
S	1518	1751
T	1524	1746
U	1491	1713
V	1451	1673
W	1491	1686
X	1463	1666
Y	1454	1652
Z	1520	1673
AA	1418	1607
AB	1371	1534
AC	1051	1229
AD	1174	1276
AE	1099	1209
AF	1064	1166
AG	1104	1090
AH	1005	1003
AI	1140	1085
AJ	1285	1118
AK	1247	1061
AL	1441	1241
AM	1563	1354
AN	1600	1387
AO	1635	1417
AP	1332	1127
AQ	1537	1319
AR	1646	1422
AS	1338	1126
AT	1641	1412
AU	1340	1122
AV	1576	1347
AW	1428	1190
AX	1439	1189
AY	1442	1179
AZ	1537	1269
BA	1559	1273
BB	1638	1337
BC	1743	1413
BD	1826	2031

To be continued on next page...

Project:
HIL_noise assessment_2km receptors_130326

Description:
Hillside Boularderie Wind Farm
2 turbines with total max rated capacity 4.0 MW
Boularderie Island, Cape Breton, NS

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Licensed user:
Natural Forces Wind Inc
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CA-HALIFAX, Nova Scotia B3J 3L1

Amy / apellerin@naturalforces.ca

Calculated:
26/03/2013 11:08 AM/2.8.579

DECIBEL - Main Result

Calculation: Hillside_E82_receptors within 2km

...continued from previous page

	WTG	
NSA	1	2
BE	1846	1514
BF	1816	1476
BG	1873	1523
BH	1954	1597
BI	2001	1641
BJ	2237	1866
BK	2087	1709
BL	2043	1664
BM	2140	1763
BN	2256	1879
BO	2106	1726
BP	2164	1785
BQ	1985	1609
BR	2167	1791
BS	2156	1782