

Wocawson Energy Project Environmental Impact Assessment
Wocawson Energy Limited Partnership
September 2018

Appendix B

Noise Impact Assessment

**Wocawson Energy Project
Preliminary Noise Assessment
September 2018**



CONFIDENTIALITY

This document contains proprietary and confidential information, which is provided on a commercial in confidence basis. It may not be reproduced or provided in any manner to any third party without the consent of Natural Forces Wind Inc.

© **Copyright Natural Forces Wind Inc. 2018**

This work and the information contained in it are the copyright of Natural Forces Wind Inc. No part of this document may be reprinted or reproduced without the consent of Natural Forces Inc.

Disclaimer

Whilst every effort has been made to ensure the accuracy of this information, the publisher accepts no responsibility for any discrepancies and omissions that may be contained herein.

Natural Forces Wind Inc.
1801 Hollis Street Suite 1205
Halifax, NS B3J 3N4
P +1 (902) 422 9663
F +1 (902) 422 9780

Table of Contents

Introduction 3
Noise guidelines 3
Receptors 3
Turbine..... 3
Impact Assessment Methodology 3
Results of Noise Predictions 4
Conclusions and Recommendations 5
References..... 5

List of Tables

Table 1: Recommended Sound Criteria for Wind Turbines (*Additional Information Requirements for Wind Turbines*) 3
Table 2: Wind turbine noise impact assessment summary of the 20 receptors predicted to receive the highest impact for any wind speed modelled between and including 4 to 12 m/s..... 4

List of Appendix

Appendix A: Site Layout Map
Appendix B: WindPRO v3.1, Decibel Module Calculation Results

Introduction

Natural Forces Wind Inc. has undertaken a noise impact assessment for the proposed Wocawson Energy Project site to assess the impact of the turbine's sound emissions on the surrounding dwellings, seasonal homes and local businesses to the project. A map of the project area with the proposed WTG layout is illustrated in Appendix A.

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 3.1.

Noise guidelines

New Brunswick has set recommended sound criteria for wind turbines in the *Additional Information Requirements for Wind Turbines* document created to outline additional requirements to the *Environmental Impact Assessment Regulation*. The recommendations are outlined below in Table 1. These sound criteria have been used for this assessment.

Table 1: Recommended Sound Criteria for Wind Turbines (*Additional Information Requirements for Wind Turbines*)

| Wind Speed (m/s) | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|-----------------------------------|----|----|----|----|----|----|----|----|
| Wind Turbine Noise Criteria [dBA] | 40 | 40 | 40 | 43 | 45 | 49 | 51 | 53 |

Receptors

There are 43 receptors located within 2km of the turbine locations that consist of year-long dwellings, seasonal dwellings and local businesses. They have been identified based on online geographical data from the Data Catalogue available on the Services New Brunswick website and cross referenced with aerial photography of the site and site visits. Their exact locations are found in Appendix B. A map of the project area with the receptors is illustrated in Appendix A.

Turbine

The turbine model used for the assessment is the Enercon E-141 EP4 4,200kW machine. The turbine will have a maximum hub height of 135m and a rotor diameter of 141m. The turbine coordinates are located in Appendix B. There are no existing or proposed wind farms within 5 kilometers of the project; therefore, it is unlikely any cumulative noise effects will occur and it was not considered in this assessment.

Impact Assessment Methodology

The sound pressure level was calculated at each point of reception using the Decibel module of WindPRO v.3.1 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-141 EP4 4,200kW wind turbine generators with a hub height of 135 m.

The model uses a conservative approach to calculating noise levels by assuming downwind propagation is occurring simultaneously in all directions of the wind turbine. However, in actuality, noise propagation in an upwind direction would result in a significant reduction of noise levels at any receptor located upwind from the turbine.

As another conservative measure, no attenuation has been considered from topographical shielding for objects (such as barns, trees, other buildings, etc.) located between the turbines and receptors. A global ground attenuation of 0 was used to represent an area that is covered in grass to produce the worst-case scenario for noise impacts.

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 wind turbine generators (WTG) in a well-designed wind farm. It is habitual that WTG manufacturers guarantee the absence of tonal noise produced by the WTG. Furthermore, 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.

Results of Noise Predictions

The results of the noise prediction model for the 20 receptors that are predicted to receive the highest sound levels are summarized in Table 2, while all receptor sound levels are provided in Appendix B. The table below proves that the wind farm is compliance with the *Additional Information Requirements for Wind Turbines* document created to outline additional requirements to the *Environmental Impact Assessment Regulation* specifically for wind turbines as the highest sound level predicted under a worst-case scenario at a receptor within 2km of the project is 37.7 dB(A).

Table 2: Wind turbine noise impact assessment summary of the 20 receptors predicted to receive the highest impact for any wind speed modelled between and including 4 to 12 m/s.

| Point of Reception ID | Max Sound Level from WTG [dB(A)] | Compliance with New Brunswick's Requirements |
|-----------------------|----------------------------------|--|
| AL | 37.7 | Yes |
| AK | 34.4 | Yes |
| H | 33.9 | Yes |
| B | 33.8 | Yes |
| G | 33.8 | Yes |
| E | 33.4 | Yes |
| F | 33.4 | Yes |
| D | 33.3 | Yes |
| AB | 33.3 | Yes |
| AD | 33.3 | Yes |
| I | 33.2 | Yes |
| N | 33.2 | Yes |
| A | 33.1 | Yes |
| C | 33.1 | Yes |
| W | 33.1 | Yes |

| Point of Reception ID | Max Sound Level from WTG [dB(A)] | Compliance with New Brunswick's Requirements |
|-----------------------|----------------------------------|--|
| AM | 33.1 | Yes |
| AP | 33.1 | Yes |
| T | 33 | Yes |
| S | 32.9 | Yes |
| AN | 32.9 | Yes |

Conclusions and Recommendations

Natural Forces Wind Inc. has completed a noise assessment to evaluate the noise impact of the turbine proposed as part of the Wocawson Energy Project on the identified noise receptors located within 2 km of the proposed WTG.

Based on the parameters used to run the WindPRO noise prediction model, it has been shown that the predicted Sound Pressure Levels emitted by the proposed WTG are less than 40 dB(A), thus demonstrating exceeding compliance with the *Additional Information Requirements for Wind Turbines* document created to support the New Brunswick *Environmental Impact Assessment Regulation*.

References

New Brunswick Ministry of Environment and Local Government. *Environmental Impact Assessment Regulation – Clean Environment Act*. New Brunswick.

New Brunswick Ministry of Environment and Local Government. *Additional Information Requirements For Wind Turbines– Clean Environment Act*. New Brunswick.

Enercon GmbH ed. (2017). *Data Sheet – Enercon Wind Energy Converter E-141 EP4*. Germany.

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






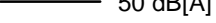
Ontario Ministry of the Environment (2008). *Noise guidelines for wind farms*. Ontario

APPENDIX A

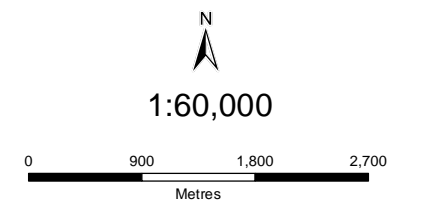
Site Layout Map

Preliminary Noise Impact Assessment

Legend

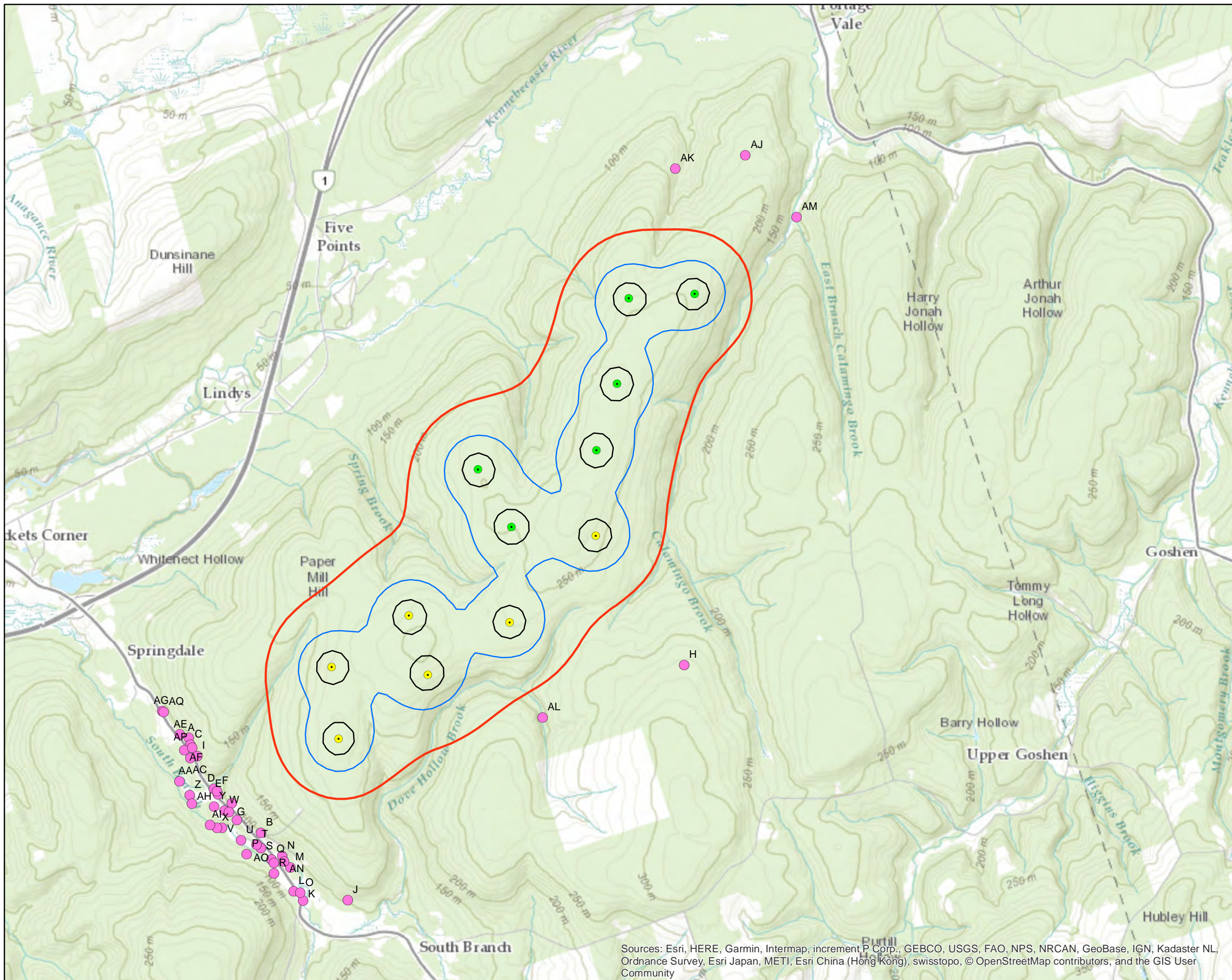
-  Proposed Turbines
-  Proposed Alternate/Expansion Turbines
-  Receptors
-  40 dB[A]
-  45 dB[A]
-  50 dB[A]

Notes



WGS 1984 Web Mercator Auxiliary Sphere

Production Date: Sep 6, 2018



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

APPENDIX B

WindPRO v3.1, Decible Module Calculation Results

DECIBEL - Main Result

Calculation: Wocawson Sept 06

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, CO:

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:

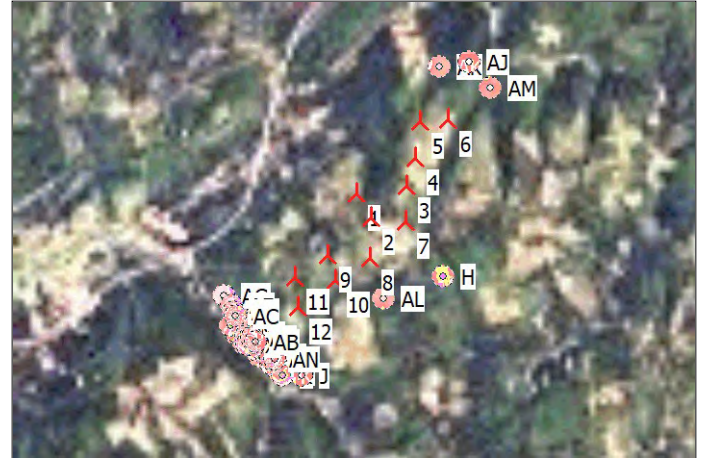
Fixed penalty added to source noise of WTGs with pure tones: 0.0 dB(A)

Height above ground level, when no value in NSA object:

4.5 m 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 1:200,000
 🚩 New WTG 🏠 Noise sensitive area

WTGs

| | Easting | Northing | Z | Row data/Description | WTG type | | Power, rated | Rotor diameter | Hub height | Noise data | | First wind speed [m/s] | LwaRef [dB(A)] | Last wind speed [m/s] | LwaRef [dB(A)] | Pure tones | |
|----|---------|-----------|-------|----------------------------|----------|-----------|-----------------|----------------|------------|----------------|---------|--|----------------|-----------------------|----------------|------------|------|
| | | | | | Valid | Manufact. | | | | Type-generator | Creator | | | | | | Name |
| 1 | 323,390 | 5,073,700 | 248.0 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 2 | 323,747 | 5,073,046 | 248.0 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 3 | 324,721 | 5,073,876 | 263.2 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 4 | 324,974 | 5,074,613 | 264.0 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 5 | 325,132 | 5,075,563 | 240.6 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 6 | 325,871 | 5,075,590 | 240.3 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 7 | 324,689 | 5,072,925 | 257.3 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 8 | 323,695 | 5,071,983 | 244.9 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 9 | 322,570 | 5,072,091 | 246.9 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 10 | 322,762 | 5,071,426 | 241.6 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 11 | 321,686 | 5,071,543 | 224.5 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |
| 12 | 321,742 | 5,070,736 | 232.0 | ENERCON E-141 EP4 4200 ... | Yes | ENERCON | E-141 EP4-4,200 | 4,200 | 141.0 | 135.0 | USER | Level 0 - official - 0 s - 42000kW - 04/2016 | 4.0 | 103.7 | 12.0 | 105.5 | No h |

h) Generic octave distribution used

Calculation Results

Sound level

| No. | Name | Easting | Northing | Z | Immission height [m] | Demands | | Sound level Max From WTGs [dB(A)] |
|-----|----------|---------|-----------|-------|----------------------|-------------------|------|-----------------------------------|
| | | | | | | Min Noise [dB(A)] | Max | |
| A | Receptor | 320,064 | 5,070,797 | 104.2 | 4.5 | 40.0 | 33.1 | |
| B | Receptor | 320,844 | 5,069,716 | 101.0 | 4.5 | 40.0 | 33.8 | |
| C | Receptor | 320,081 | 5,070,721 | 99.3 | 4.5 | 40.0 | 33.1 | |
| D | Receptor | 320,329 | 5,070,222 | 85.9 | 4.5 | 40.0 | 33.3 | |
| E | Receptor | 320,371 | 5,070,159 | 91.5 | 4.5 | 40.0 | 33.4 | |
| F | Receptor | 320,362 | 5,070,192 | 89.6 | 4.5 | 40.0 | 33.4 | |
| G | Receptor | 320,526 | 5,070,054 | 104.6 | 4.5 | 40.0 | 33.8 | |
| H | Receptor | 325,639 | 5,071,452 | 271.5 | 4.5 | 40.0 | 33.9 | |
| I | Receptor | 320,153 | 5,070,590 | 100.9 | 4.5 | 40.0 | 33.2 | |
| J | Receptor | 321,793 | 5,068,934 | 114.6 | 4.5 | 40.0 | 31.6 | |
| K | Receptor | 321,293 | 5,068,944 | 89.4 | 4.5 | 40.0 | 31.1 | |
| L | Receptor | 321,188 | 5,069,050 | 90.3 | 4.5 | 40.0 | 31.4 | |
| M | Receptor | 321,160 | 5,069,316 | 88.0 | 4.5 | 40.0 | 32.7 | |
| N | Receptor | 321,073 | 5,069,448 | 88.9 | 4.5 | 40.0 | 33.2 | |
| O | Receptor | 321,263 | 5,069,031 | 87.9 | 4.5 | 40.0 | 31.5 | |
| P | Receptor | 320,676 | 5,069,482 | 94.0 | 4.5 | 40.0 | 32.1 | |
| Q | Receptor | 320,953 | 5,069,412 | 85.9 | 4.5 | 40.0 | 32.7 | |
| R | Receptor | 320,976 | 5,069,254 | 93.5 | 4.5 | 40.0 | 32.0 | |
| S | Receptor | 320,838 | 5,069,545 | 86.3 | 4.5 | 40.0 | 32.9 | |
| T | Receptor | 320,790 | 5,069,584 | 85.2 | 4.5 | 40.0 | 33.0 | |
| U | Receptor | 320,618 | 5,069,635 | 84.3 | 4.5 | 40.0 | 32.5 | |
| V | Receptor | 320,406 | 5,069,782 | 81.0 | 4.5 | 40.0 | 32.3 | |

To be continued on next page...

DECI BEL - Main Result

Calculation: Wocawson Sept 06

...continued from previous page

| No. | Name | Easting | Northing | Z [m] | Imission height [m] | Demands | | Sound level | |
|-----|-------------|---------|-----------|----------|------------------------|----------------------|--------------------------|-------------|--|
| | | | | | | Min Noise [dB(A)] | Max From WTGs [dB(A)] | | |
| | W Receptor | 320,440 | 5,069,973 | 97.2 | 4.5 | 40.0 | 33.1 | | |
| | X Receptor | 320,351 | 5,069,786 | 83.3 | 4.5 | 40.0 | 32.1 | | |
| | Y Receptor | 320,327 | 5,070,020 | 90.3 | 4.5 | 40.0 | 32.7 | | |
| | Z Receptor | 320,055 | 5,070,156 | 73.5 | 4.5 | 40.0 | 31.8 | | |
| | AA Receptor | 319,948 | 5,070,314 | 71.8 | 4.5 | 40.0 | 31.7 | | |
| | AB Receptor | 320,578 | 5,069,863 | 95.8 | 4.5 | 40.0 | 33.3 | | |
| | AC Receptor | 320,075 | 5,070,570 | 81.2 | 4.5 | 40.0 | 32.8 | | |
| | AD Receptor | 320,490 | 5,069,955 | 97.9 | 4.5 | 40.0 | 33.3 | | |
| | AE Receptor | 319,966 | 5,070,836 | 90.9 | 4.5 | 40.0 | 32.6 | | |
| | AF Receptor | 320,010 | 5,070,661 | 81.3 | 4.5 | 40.0 | 32.6 | | |
| | AG Receptor | 319,775 | 5,071,106 | 86.6 | 4.5 | 40.0 | 31.8 | | |
| | AH Receptor | 320,078 | 5,070,063 | 76.7 | 4.5 | 40.0 | 31.7 | | |
| | AI Receptor | 320,274 | 5,069,819 | 86.0 | 4.5 | 40.0 | 31.8 | | |
| | AJ Receptor | 326,482 | 5,077,125 | 177.2 | 4.5 | 40.0 | 32.2 | | |
| | AK Receptor | 325,694 | 5,076,997 | 126.6 | 4.5 | 40.0 | 34.4 | | |
| | AL Receptor | 324,033 | 5,070,911 | 198.6 | 4.5 | 40.0 | 37.7 | | |
| | AM Receptor | 327,038 | 5,076,416 | 99.0 | 4.5 | 40.0 | 33.1 | | |
| | AN Receptor | 321,094 | 5,069,385 | 87.3 | 4.5 | 40.0 | 32.9 | | |
| | AO Receptor | 320,978 | 5,069,373 | 85.7 | 4.5 | 40.0 | 32.5 | | |
| | AP Receptor | 320,100 | 5,070,686 | 100.6 | 4.5 | 40.0 | 33.1 | | |
| | AQ Receptor | 319,792 | 5,071,092 | 88.9 | 4.5 | 40.0 | 31.9 | | |

Distances (m)

| NSA | WTG | | | | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| A | 4415 | 4316 | 5583 | 6219 | 6957 | 7530 | 5091 | 3820 | 2820 | 2770 | 1785 | 1679 |
| B | 4728 | 4418 | 5686 | 6406 | 7251 | 7731 | 5008 | 3642 | 2936 | 2570 | 2012 | 1359 |
| C | 4452 | 4341 | 5611 | 6252 | 6997 | 7565 | 5108 | 3828 | 2841 | 2772 | 1803 | 1661 |
| D | 4633 | 4434 | 5713 | 6392 | 7183 | 7716 | 5130 | 3799 | 2918 | 2715 | 1894 | 1504 |
| E | 4653 | 4442 | 5722 | 6405 | 7202 | 7730 | 5128 | 3792 | 2927 | 2706 | 1909 | 1487 |
| F | 4634 | 4428 | 5707 | 6389 | 7183 | 7713 | 5118 | 3784 | 2912 | 2699 | 1892 | 1483 |
| G | 4636 | 4397 | 5675 | 6369 | 7181 | 7695 | 5057 | 3710 | 2886 | 2623 | 1888 | 1394 |
| H | 3180 | 2474 | 2592 | 3230 | 4142 | 4144 | 1753 | 2015 | 3135 | 2877 | 3954 | 3962 |
| I | 4489 | 4353 | 5627 | 6279 | 7037 | 7596 | 5102 | 3806 | 2845 | 2740 | 1805 | 1596 |
| J | 5026 | 4553 | 5744 | 6509 | 7422 | 7806 | 4931 | 3594 | 3251 | 2674 | 2611 | 1803 |
| K | 5198 | 4780 | 6006 | 6759 | 7652 | 8070 | 5233 | 3874 | 3396 | 2884 | 2629 | 1847 |
| L | 5145 | 4745 | 5981 | 6729 | 7614 | 8044 | 5222 | 3858 | 3340 | 2850 | 2542 | 1775 |
| M | 4918 | 4540 | 5786 | 6527 | 7403 | 7846 | 5048 | 3680 | 3113 | 2649 | 2288 | 1535 |
| N | 4842 | 4483 | 5737 | 6473 | 7340 | 7794 | 5016 | 3647 | 3038 | 2601 | 2183 | 1451 |
| O | 5130 | 4722 | 5952 | 6703 | 7592 | 8016 | 5187 | 3825 | 3327 | 2825 | 2547 | 1771 |
| P | 5016 | 4705 | 5972 | 6693 | 7539 | 8018 | 5288 | 3920 | 3224 | 2851 | 2295 | 1646 |
| Q | 4932 | 4584 | 5842 | 6574 | 7436 | 7896 | 5128 | 3759 | 3129 | 2707 | 2254 | 1541 |
| R | 5059 | 4697 | 5949 | 6686 | 7555 | 8007 | 5221 | 3852 | 3254 | 2812 | 2397 | 1668 |
| S | 4876 | 4552 | 5817 | 6541 | 7393 | 7866 | 5124 | 3756 | 3079 | 2691 | 2171 | 1495 |
| T | 4868 | 4553 | 5820 | 6542 | 7389 | 7867 | 5135 | 3768 | 3075 | 2698 | 2154 | 1494 |
| U | 4920 | 4629 | 5901 | 6615 | 7451 | 7941 | 5234 | 3871 | 3137 | 2794 | 2187 | 1573 |
| V | 4925 | 4671 | 5948 | 6649 | 7467 | 7975 | 5312 | 3958 | 3165 | 2873 | 2177 | 1642 |
| W | 4753 | 4515 | 5793 | 6487 | 7298 | 7813 | 5174 | 3826 | 3004 | 2739 | 2004 | 1509 |
| X | 4955 | 4708 | 5985 | 6684 | 7499 | 8010 | 5355 | 4001 | 3200 | 2916 | 2207 | 1684 |
| Y | 4788 | 4567 | 5846 | 6534 | 7336 | 7859 | 5241 | 3898 | 3053 | 2812 | 2041 | 1586 |
| Z | 4866 | 4689 | 5967 | 6638 | 7417 | 7960 | 5398 | 4073 | 3173 | 2990 | 2141 | 1784 |
| AA | 4828 | 4680 | 5956 | 6614 | 7377 | 7932 | 5412 | 4102 | 3167 | 3026 | 2129 | 1843 |
| AB | 4757 | 4492 | 5768 | 6472 | 7296 | 7798 | 5126 | 3770 | 2989 | 2686 | 2012 | 1455 |
| AC | 4559 | 4429 | 5702 | 6352 | 7107 | 7668 | 5180 | 3886 | 2922 | 2820 | 1882 | 1675 |
| AD | 4736 | 4491 | 5768 | 6466 | 7280 | 7792 | 5143 | 3793 | 2981 | 2707 | 1988 | 1476 |
| AE | 4464 | 4380 | 5644 | 6273 | 7002 | 7581 | 5164 | 3901 | 2891 | 2858 | 1860 | 1779 |
| AF | 4545 | 4434 | 5703 | 6345 | 7090 | 7658 | 5198 | 3915 | 2932 | 2856 | 1894 | 1734 |
| AG | 4449 | 4421 | 5669 | 6271 | 6969 | 7568 | 5240 | 4017 | 2963 | 3004 | 1960 | 2001 |
| AH | 4919 | 4729 | 6008 | 6684 | 7469 | 8007 | 5427 | 4095 | 3213 | 3010 | 2185 | 1795 |
| AI | 4977 | 4741 | 6019 | 6714 | 7523 | 8039 | 5398 | 4048 | 3230 | 2962 | 2228 | 1731 |
| AJ | 4614 | 4911 | 3696 | 2930 | 2065 | 1652 | 4567 | 5849 | 6375 | 6806 | 7359 | 7955 |
| AK | 4022 | 4404 | 3269 | 2490 | 1540 | 1418 | 4194 | 5398 | 5816 | 6295 | 6768 | 7404 |
| AL | 2862 | 2154 | 3044 | 3820 | 4780 | 5027 | 2118 | 1124 | 1880 | 1371 | 2431 | 2298 |
| AM | 4548 | 4710 | 3438 | 2741 | 2088 | 1430 | 4208 | 5552 | 6218 | 6571 | 7238 | 7766 |

To be continued on next page...

Project:

Sussex East August 2018

Licensed user:

Natural Forces Wind Inc
1801 Hollis Street, Suite 1205
CA-HALIFAX, Nova Scotia B3J 3N4
902 422 9663
kdorey / kdorey@naturalforges.ca
Calculated:
2018-09-06 9:46 AM/3.1.633

DECIBEL - Main Result

Calculation: Wocawson Sept 06

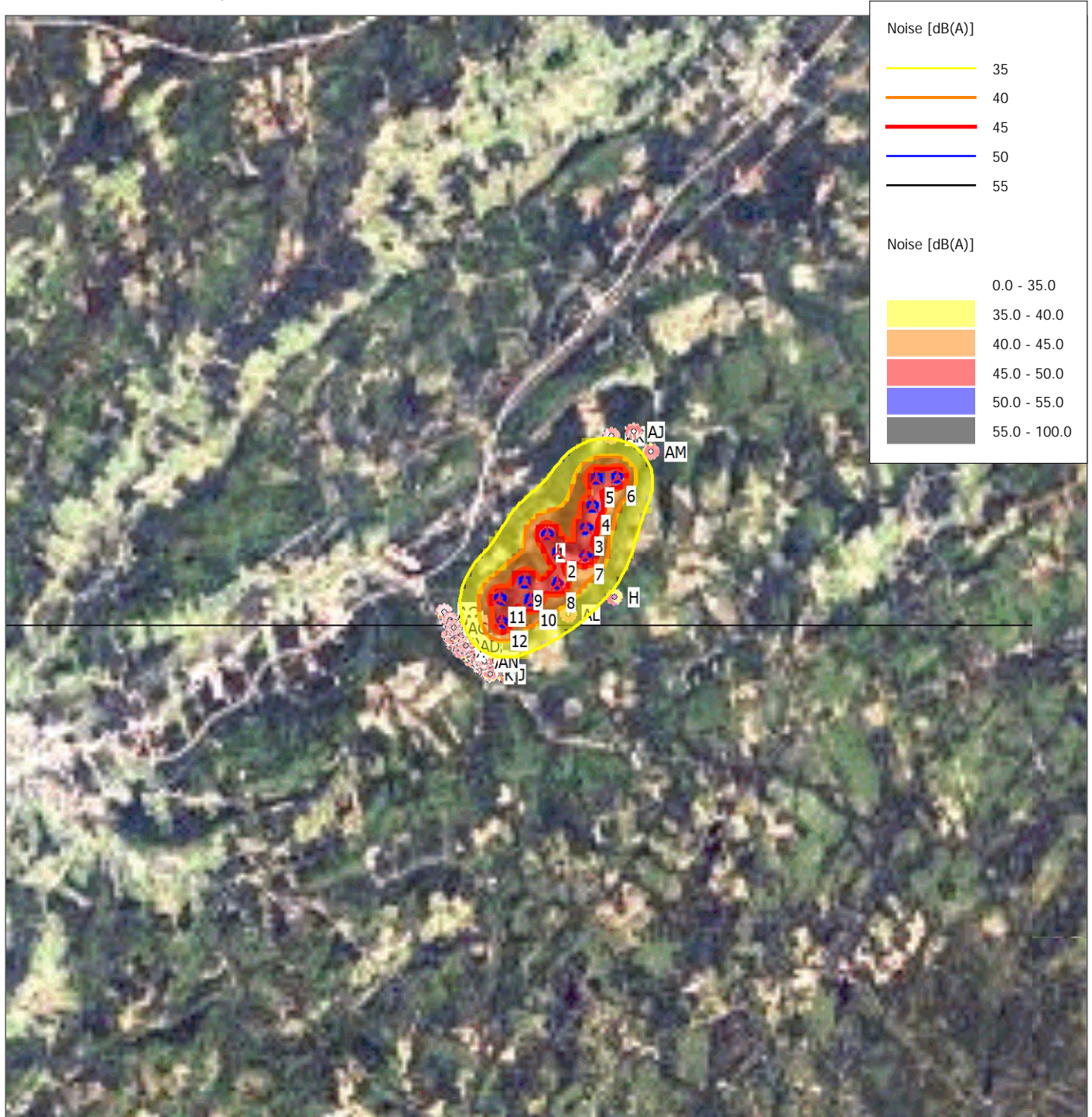
...continued from previous page

WTG

| NSA | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|
| AN | 4888 | 4522 | 5773 | 6510 | 7381 | 7831 | 5045 | 3676 | 3082 | 2636 | 2238 | 1498 |
| AO | 4954 | 4600 | 5855 | 6590 | 7455 | 7912 | 5137 | 3768 | 3150 | 2720 | 2283 | 1563 |
| AP | 4462 | 4344 | 5615 | 6259 | 7008 | 7573 | 5106 | 3822 | 2842 | 2763 | 1803 | 1643 |
| AQ | 4444 | 4412 | 5661 | 6265 | 6965 | 7562 | 5229 | 4003 | 2952 | 2989 | 1947 | 1982 |

DECIBEL - Map 10.0 m/s

Calculation: Wocawson Sept 06



0 2.5 5 7.5 10km

Map: Google Earth overlay Map 001 , Print scale 1:200,000, Map center UTM (north)-NAD83 (US+CA) Zone: 20 East: 323,778 North: 5,073,163

New WTG

Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: 10.0 m/s
Height above sea level from active line object