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1021702 B.C Ltd
as general partner for and behalf of FWRN LP
2659 Industrial park road
Smithville, Ontario
L0R 2A0

Attn: Niagara Region Wind Farm

Re: Niagara Region Wind Farm - Acoustic Audit – Emission Summary

Aercoustics Engineering Limited ("Aercoustics") was retained by the 1021702 B.C. Ltd as a general partner for and on behalf of FWRN LP to verify the noise emission of two (2) turbines at the Niagara Region Wind Farm ("FRWN").

The purpose of the audit was to confirm whether equipment is operating as per manufacturer's specifications. The reporting has been prepared to facilitate submission to Ontario's Ministry of Environment and Climate Change (MOECC), in compliance with acoustic audit conditions outlined in the facility's REA (#4353-9HMP2R). Specifically, section F (Wind Turbine Acoustic Audit – Emission).

The facility wind turbines were audited utilizing International Standard IEC 61400-11 (Edition 3.0, released 2012-11), "Wind turbine generator systems – Part 11: Acoustic noise measurement techniques". The following turbines were chosen for the acoustic audit.

Table 1 Summary of Wind Turbine Noise Emission Audit

Turbine ID	Turbine Model	Audit Status
T35	Enercon E101 - 3.0 MW	Completed
T46	Enercon E101- 2.9 MW	Completed

Results of the acoustic audit are summarized in Table 2. Detailed measurement report for T35 (Report ID 16227.00. T35.RP1) and T46 (Report ID 16227.00.T46.RP1) is attached with this letter and outline the apparent sound power level, measurement uncertainties and tonal audibilities.

Table 2 Summary of Wind Turbine Nosie Emission Results – Sound Power

Description		T35	T46
Turbine Model		Enercon E101 - 3.0 MW	Enercon E101- 2.9 MW
Manufacturer's Performance Specification		104.8 dBA ± 1 dB	102.9 dBA ± 1 dB
Permitted Maximum sound power level (dBA)		104.8 dBA +0.5dB	102.9 +0.5dB
Max PWL Audit Result	Measured	105.3 dBA	103.4
	Uncertainty	0.9 dB	0.9 dB

Table 3 Sound Power Levels (overall A-weighted levels and octave bands for each wind speed)

Turbine ID	Wind Speed (m/s)	Octave Band (Hz), dBA								Overall dBA
		31.5	63	125	250	500	1000	2000	4000	
T35	8.5	74	83	91	96	95	93	93	92	101.6
	9	77	84	91	97	96	93	91	86	101.5
	9.5	76	86	91	97	97	94	93	90	102.5
	10	75	85	92	98	98	95	93	90	103.1
	10.5	74	83	91	96	95	93	93	92	101.6
	11	79	86	94	99	99	96	94	92	104.1
	11.5	84	87	93	99	99	96	93	90	104.0
	12	81	88	91	99	100	99	96	93	105.3
	12.5	80	87	91	98	100	98	95	91	104.8
	13	82	84	90	98	100	98	95	91	104.6
	13.5	84	87	91	98	100	99	96	92	105.1
T46	8.5	76	83	91	95	93	90	89	82	99.5
	9	78	86	93	97	93	91	92	92	101.6
	9.5	77	86	94	98	94	92	93	92	102.2
	10	76	88	94	97	94	92	91	91	101.8
	10.5	79	87	94	97	95	92	92	94	102.4
	11	79	87	94	98	96	93	93	92	102.7
	11.5	80	87	94	98	96	94	93	91	102.5
	12	79	87	93	97	96	95	94	91	102.7
	12.5	78	87	93	97	98	96	95	92	103.4
	13	78	86	93	97	98	97	94	91	103.4
	13.5	77	87	92	97	97	96	93	90	102.7
	14	78	87	92	97	97	97	95	92	103.2

Table 4 Tonality Assessment Summary

Turbine ID	Wind Speed (m/s)	Frequency (Hz)	Tonality, ΔL_{tn} (dB)	Tonal audibility, ΔL_a (dB)
T35	10.5	116	-4.9	-2.9
	11	116	-4.4	-2.4
	11.5	116	-5.0	-3.0
T46	No Reportable Tones			

Results of the IEC test at T35 and T46 indicate that the 3.0MW and 2.9MW name plate turbine at CPWPP is compliant with the sound power levels contained within the Manufacturer's Performance Specification.

The Acoustic Assessment Report for the facility stipulates a maximum sound power level of 104.8 dBA for the 3.0MW turbines and 102.9 dBA for the 2.9MW turbines at the FRWN. It is our professional opinion that the results of the noise testing completed at the T35 and T46 demonstrates that the turbine generator's overall A-weighted sound power levels do not exceed the maximum sound power level specified in Acoustic Assessment Report when considering the manufacturer tolerance and the measurement uncertainties outlined above. The measured tonal audibility values of Wind Turbine Generator T35 and T46 comply with the maximum tonal audibility value noted in the Acoustic Assessment Report.

Sincerely,

Aercoustics Engineering Limited

A. Munro

Allan Munro, B.A.Sc.

Payam Ashtiani, B.A.Sc., P.Eng.