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Subject: North Kent Wind Power Project Acoustic Audit – Immission –
Phase 2 Report Submission
REA# 5272-A9FHRL
Aercoustics Project #: 17283.01

Date: February 28, 2020

Aercoustics Engineering Limited (“Aercoustics”) has been retained by North Kent Wind 1 L.P. to complete the immission audit (“I-audit”) requirement outlined in Section E of the Renewable Energy Approval (“REA”) for the North Kent 1 Wind Power Project (“NKWPP”). NKWPP operates under REA #5272-A9FHRL, issued on June 29, 2016 [1]. Measurements were conducted per the Compliance Protocol for Wind Turbine Noise (the “Protocol”) [2]. As per the REA, five (5) measurement locations are required. Individual reports have been issued for each of the five measurement locations.

Documents for Submission

Individual reports and data packages have been prepared for each measurement location. The following table summarizes the documents that accompany this submission.

Table 1: Documents for Submission

Receptor	Document	File Name	File Type
All	Summary Memo	Aerc017- NKWPP Phase 2 I-Audit Summary Memo 17283.01 (2020.02.28)	PDF
R3408	Report	Aerc012 - NKWPP Phase 2 I-Audit R3408 17283.01 (2020.02.25)	PDF
	Data Package: All Data	Aerc012 - NKWPP Phase 2 I-Audit R3408 MECP Summary (2020.02.26)	Excel
	Data Package: Narrowband Spectra	Aerc012 - NKWPP Phase 2 I-Audit R3408 MECP Narrowband Summary (2020.02.26)	Excel
R3099	Report	Aerc013 - NKWPP Phase 2 I-Audit R3099 17283.01 (2020.02.24)	PDF
	Data Package: All Data	Aerc013 - NKWPP Phase 2 I-Audit R3099 MECP Summary (2020.02.26)	Excel
	Data Package: Narrowband Spectra	Aerc013 - NKWPP Phase 2 I-Audit R3099 MECP Narrowband Summary (2020.02.26)	Excel
R3214	Report	Aerc014 - NKWPP Phase 2 I-Audit R3214 17283.01 (2020.02.24)	PDF
	Data Package: All Data	Aerc014 - NKWPP Phase 2 I-Audit R3214 MECP Summary (2020.02.26)	Excel
	Data Package: Narrowband Spectra	Aerc014 - NKWPP Phase 2 I-Audit R3214 MECP Narrowband Summary (2020.02.26)	Excel
V6202	Report	Aerc015 - NKWPP Phase 2 I-Audit V6202 17283.01 (2020.02.24)	PDF
	Data Package: All Data	Aerc015 - NKWPP Phase 2 I-Audit V6202 MECP Summary (2020.02.26)	Excel
	Data Package: Narrowband Spectra	Aerc015 - NKWPP Phase 2 I-Audit V6202 MECP Narrowband Summary (2020.02.26)	Excel
R3281	Report	Aerc016 - NKWPP Phase 2 I-Audit R3281 17283.01 (2020.02.25)	PDF
	Data Package: All Data	Aerc016 - NKWPP Phase 2 I-Audit R3281 MECP Summary (2020.02.26)	Excel
	Data Package: Narrowband Spectra	Aerc016 - NKWPP Phase 2 I-Audit R3281 MECP Narrowband Summary (2020.02.26)	Excel

Audit Results

The audit has been completed as per the methodology outlined in Parts D and E5.5 RAM-I (Revised Assessment Methodology) of the “*MECP Compliance Protocol for Wind Turbine Noise*” (Updated: April 21, 2017) [2].

The Phase 2 noise monitoring campaign spanned the following dates:

Table 2: Monitoring start and end dates at each receptor

Location	Monitoring Start Date	Monitoring End Date	Monitoring Duration (weeks)
R3408	September 25, 2019	February 01, 2020	18.4
R3099	October 9, 2019	January 25, 2020	15.3
R3214	October 9, 2019	January 4, 2020	12.3
V6202	November 26, 2019	January 13, 2020	6.6
R3281	September 25, 2019	January 25, 2020	17.5

Based on discussions with North Kent Wind 1 LP, it was determined that to be consistent with Sections 3.8.3 and Section 5.1 of the Compliance protocol, the tonal assessment should be completed using IEC 61400-11 Ed. 3.0, with modifications to adapt the method to immission measurements and the tonal penalty structure taken from ISO 1996-2:2007 Annex C.

Based on the results presented in Section 10.2 of each report, the cumulative sound impact calculated at receptors R3099, R3214, V6202 and R3281 complies with the MECP sound level limits at all wind bins having sufficient data for assessment. No tonal penalty was found to be applicable at R3099, R3214, V6202 or R3281 based on the detailed tonal audibility analysis.

Based on the results presented in Section 10.2 of the R3408 report, the cumulative sound impact calculated at R3408 exceeds the applicable sound level limits by 1 dB due to a tonal penalty in the 4 m/s wind bin during Downwind conditions. The majority of the data points in this wind bin came from a single night (November 16, 2019) and it is worth noting that no tonal penalty was found to be applicable at R3099, who’s closest turbine, T51, is the same type as T03 and T04 near R3408 (SWT-2.772-113). At all other wind bins having sufficient data for assessment, the cumulative sound impact calculated at R3408 complies with the MECP sound level limits during both Downwind and Crosswind conditions.

It is Aercoustics understanding that North Kent Wind 1 LP, in partnership with Siemens Gamesa, is currently investigating the turbines closest to R3408 to determine the cause of the non-compliance measured during downwind conditions.

The following tables and figures summarize the results at each receptor.

Table 3: R3408 Assessment Table – Cumulative **Downwind** Turbine-only Sound Impact

Audited Receptor	Wind speed at 10-m AGL [m/s]	1	2	3	4	5	6	7
R3408	Tonal Adjustment [dB]	0	1.8	1.2	0	0	0	0
	Cumulative Sound Impact - Receptor Location [dBA]	-	-	41*	40 [†]	39	38 [×]	-
	Signal-to-noise [dB]	-	-	11.9	(10.6)	8.7	3.6	-
Background Sound Level [dBA]		27	25	28	(30)	31	37	-
MECP Exclusion Limit [dBA]		40	40	40	40	40	40	43
Compliance? (Y/N)		-	-	No*	Yes [†]	Yes	Yes [×]	-

* Tonal Adjustment is included in the reported Cumulative Sound Impact

- Significantly fewer than the minimum data counts outlined in Section 6.7 of the report were attained in this wind bin.

[†] Per Table 6 of the main report, Background data counts are significantly deficient from the required count of 30 in the 4 m/s bin. In accordance with Section E5.5(6b) of the Protocol, an assumed background level of 30 dBA has been used in the assessment of compliance in this wind bin.

[×] Per Table 6 of the main report, Background data counts are deficient from the required count of 30 by 1. A significant amount of data is available in this wind bin, however, so it has been included in this assessment of compliance

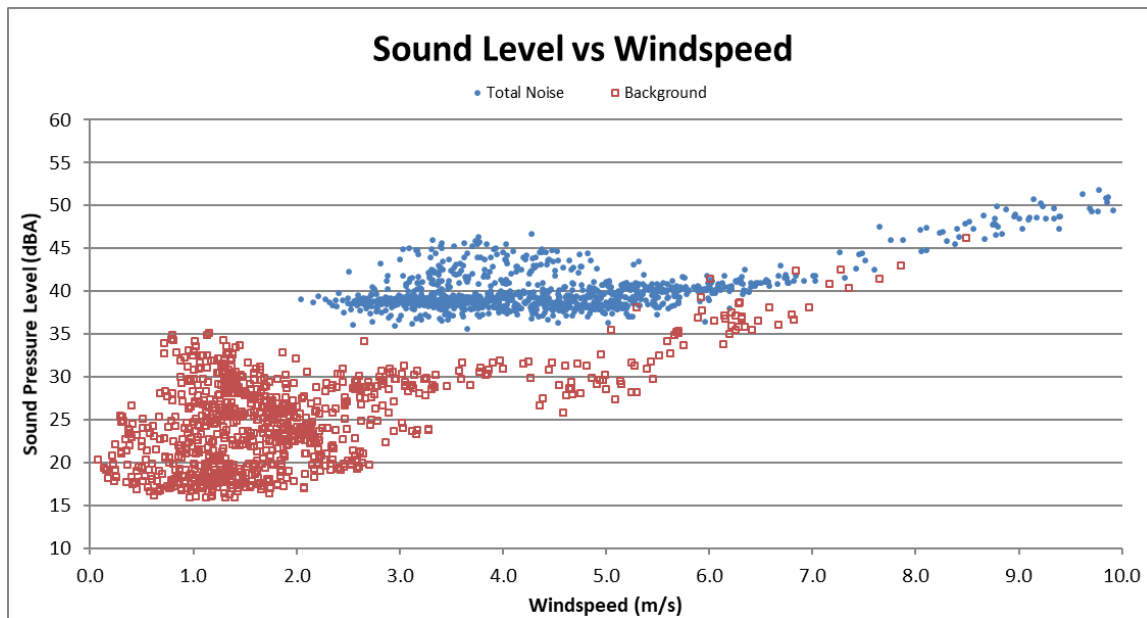


Figure 1: R3408 - Measured Downwind Sound Levels for Turbine ON and Background vs Wind Speed

Table 4: R3408 Assessment Table – Cumulative **Crosswind** Turbine-only Sound Impact

Audited Receptor	Wind speed at 10-m AGL [m/s]	1	2	3	4	5	6	7
R3408	Tonal Adjustment [dB]	0	0	0	0	0	0	0
	Cumulative Sound Impact - Receptor Location [dBA]	-	37	38	37 [†]	38	37 [×]	-
	Signal-to-noise [dB]	-	12.1	10.3	(8.2)	8.0	3.2	-
Background Sound Level [dBA]		27	25	28	(30)	31	37	-
MECP Exclusion Limit [dBA]		40	40	40	40	40	40	43
Compliance? (Y/N)		-	Yes	Yes	Yes [†]	Yes	Yes [×]	-

- Significantly fewer than the minimum data counts outlined in Section 6.6 of the report were attained in this wind bin.

[†] Per Table 6 of the main report, Background data counts are significantly deficient from the required count of 30 in the 4 m/s bin. In accordance with Section E5.5(6b) of the Protocol, an assumed background level of 30 dBA has been used in the assessment of compliance in this wind bin.

[×] Per Table 6 of the main report, Background data counts are deficient from the required count of 30 by 1. A significant amount of data is available in this wind bin, however, so it has been included in this assessment of compliance.

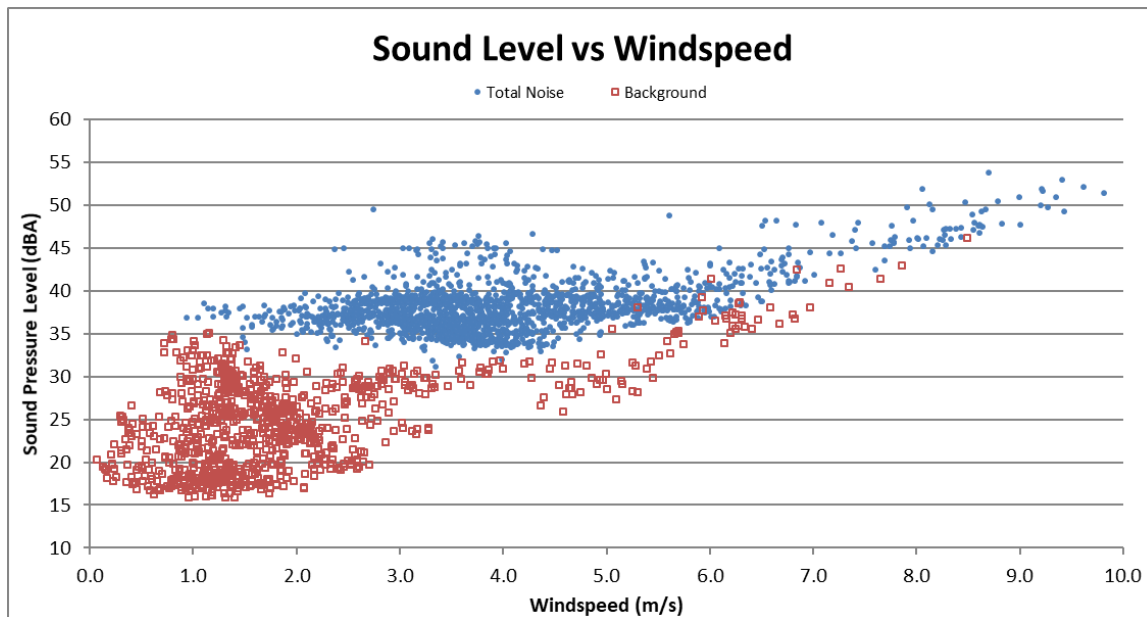


Figure 2: R3408 - Measured Crosswind Sound Levels for Turbine ON and Background vs Wind Speed

Table 5: R3099 Assessment Table – Cumulative Turbine-only Sound Impact

Audited Receptor	Wind speed at 10-m AGL [m/s]	1	2	3	4	5	6	7
R3099	Cumulative Sound Impact - Receptor Location [dBA]	-	-	-	40	40	40 [‡]	35
	Signal-to-noise [dB]	-	-	-	7.1	5.13	2.4 [‡]	0.3 [‡]
Background Sound Level [dBA]		43	48	33	34	36	41 [*]	47 [‡]
MECP Exclusion Limit [dBA]		40	40	40	40	40	40	43
Compliance? (Y/N)		-	-	-	Yes	Yes	Yes ^{‡*}	Yes ^{‡*}

- Significantly fewer than the minimum data counts outlined in Section 6.5 of the report were attained in this wind bin.

[‡] Signal-to-noise level less than 3 dB (see Table 6 of the report). Increased uncertainty in the determination of the Cumulative Sound Impact.

* Background sound level is greater than the applicable exclusion limit.

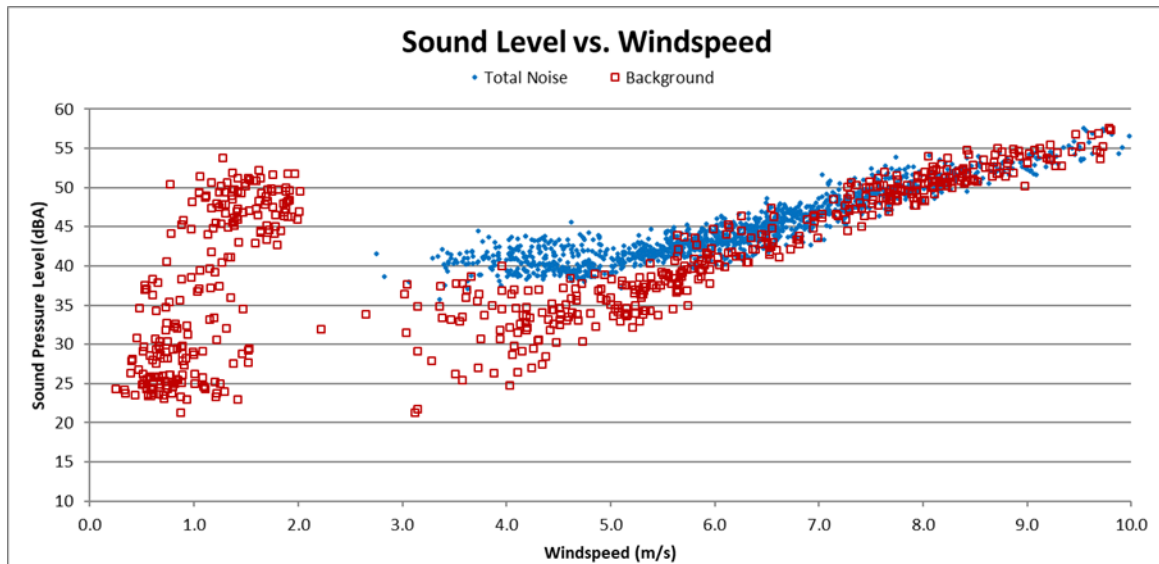


Figure 3: R3099 - Measured Sound Levels for Turbine ON and Background vs Wind Speed

Table 6: R3214 Assessment Table – Cumulative Turbine-only Sound Impact

Audited Receptor	Wind speed at 10-m AGL [m/s]	1	2	3	4	5	6	7
R3214	Cumulative Sound Impact - Receptor Location [dBA]	-	-	-	39	40	40	43 [‡]
	Signal-to-noise [dB]	-	-	-	5.9	4.4	3.0	1.8
Background Sound Level [dBA]		39	-	-	34	38	40	46
MECP Exclusion Limit [dBA]		40	40	40	40	40	40	43
Compliance? (Y/N)		-	-	-	Yes	Yes	Yes	Yes [‡]

- Significantly fewer than the minimum data counts outlined in Section 6.6 of the report were attained in this wind bin.

[‡] Signal-to-noise level less than 3 dB (see Table 6 of the report). Increased uncertainty in the determination of the Cumulative Sound Impact.

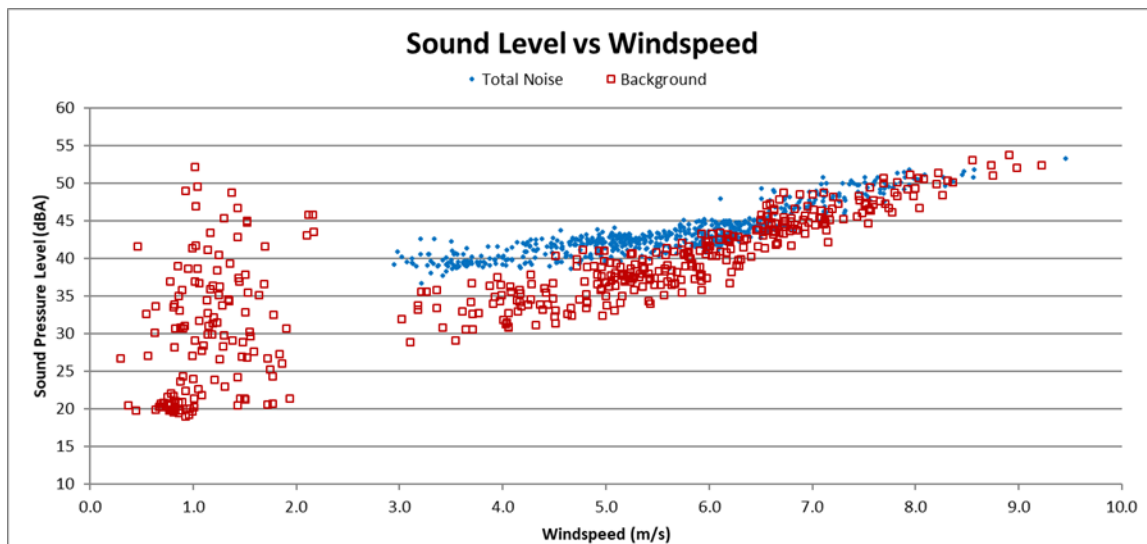


Figure 4: R3214 - Measured Sound Levels for Turbine ON and Background vs Wind Speed

Table 7: V6202 Assessment Table – Cumulative Turbine-only Sound Impact

Audited Receptor	Wind speed at 10-m AGL [m/s]	1	2	3	4	5	6	7
V6202	Cumulative Sound Impact - Receptor Location [dBA]	-	-	-	39 [†]	40	39 [‡]	42 [‡] ×
	Signal-to-noise [dB]	-	-	-	(6.8)	6.7	2.9	2.1
Background Sound Level [dBA]		-	-	-	(30)	34	40	44
MECP Exclusion Limit [dBA]		40	40	40	40	40	40	43
Compliance? (Y/N)		-	-	-	Yes	Yes	Yes [‡]	Yes [‡] ×

- Significantly fewer than the minimum data counts outlined in Section 6.5 of report were attained in this wind bin.
- † Per Table 6 in the report, Background data counts are significantly deficient from the required count of 30 in the 4 m/s bin. In accordance with Section E5.5(6b) of the Protocol, an assumed background level of 30 dBA has been used in the assessment of compliance in this wind bin.
- ‡ Signal-to-noise level less than 3 dB (see Table 6 of report). Increased uncertainty in the determination of the Cumulative Sound Impact.
- × Per Table 6 of the report, Background data counts are deficient from the required count of 30 by 10. A significant amount of data is available in this wind bin, however, so it has been included in this assessment of compliance

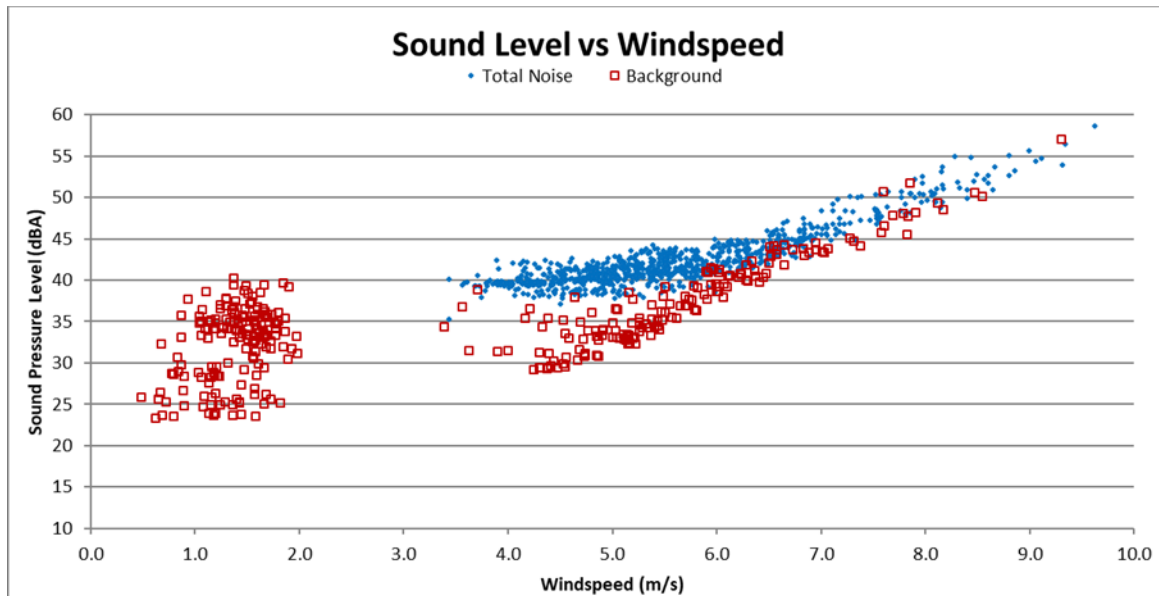


Figure 5: V6202 - Measured Sound Levels for Turbine ON and Background vs Wind Speed

Table 8: R3281 Assessment Table – Cumulative Turbine-only Sound Impact

Audited Receptor	Wind speed at 10-m AGL [m/s]	1	2	3	4	5	6	7
R3281	Cumulative Sound Impact - Receptor Location [dBA]	-	-	40	40	39	39	40
	Signal-to-noise [dB]	-	-	9.4	7.2	3.8	1.9 [‡]	0.9 [‡]
Background Sound Level [dBA]		27	30	31	33	37	42*	46*
MECP Exclusion Limit [dBA]		40	40	40	40	40	40	43
Compliance? (Y/N)		-	-	Yes	Yes	Yes	Yes [‡]	Yes [‡]

- Significantly fewer than the minimum data counts outlined in Section 6.6 of the report were attained in this wind bin.

* Background sound level is greater than the applicable exclusion limit.

‡ Signal-to-noise level less than 3 dB (see Table 6 of the report). Increased uncertainty in the determination of the Cumulative Sound Impact.

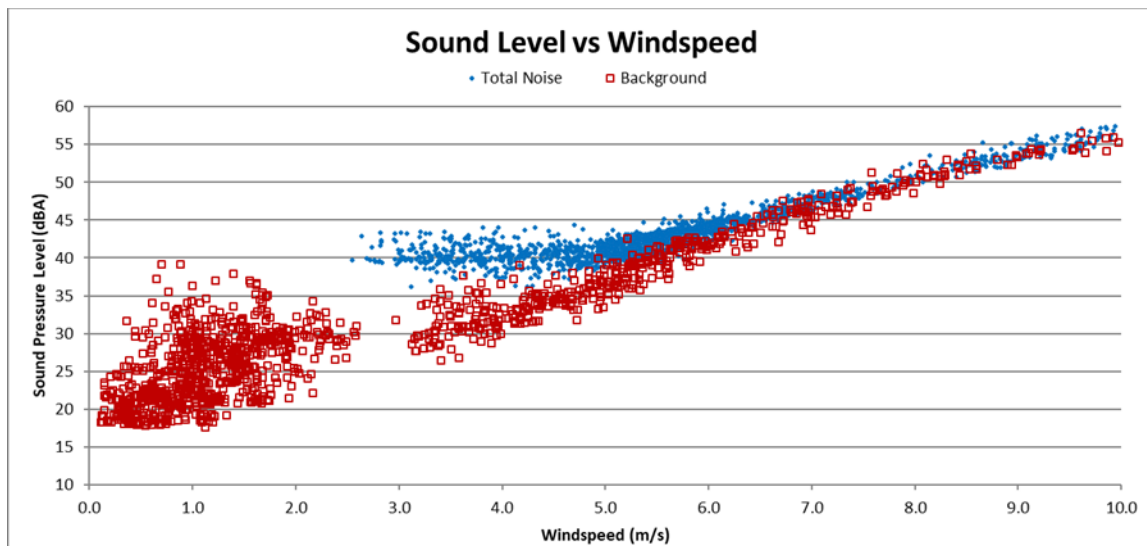


Figure 6: R3281 - Measured Sound Levels for Turbine ON and Background vs Wind Speed

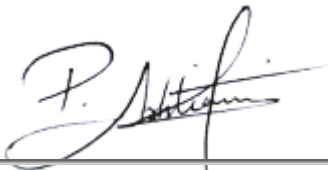
Please see the specific test reports for a detailed account of each measurement campaign and the associated data analysis and conclusions.

Sincerely,

AERCOUSTICS ENGINEERING LIMITED



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