

REPORT ID: 14215.01.T05.RP6

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## Adelaide Wind Power Project – Turbine T05 (AD117) IEC 61400-11 Edition 3.0 Measurement Report

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Prepared for:

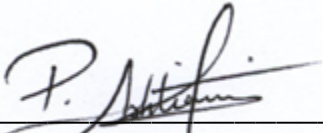
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13 July 2018 – Revision #6



## Revision History

Revision Number	Description	Date
1	Issued Edition 2.1 test report [May Data]	17/09/2015
2	Issued Edition 2.1 test report [May and October Data] Draft	20/10/2015
3	Issued Edition 2.1 test report [May and October Data] Final	28/10/2015
4	Issued Edition 3.0 test report [October Data]	19/09/2017
5	Updates to report to fix typographical errors in Table T10 and Table E.02, Added Appendix F - Calibration Certificates	15/06/2018
6	Updates to section 3.2.1, Added Table 9, Table B.01 and E-Audit Checklist	13/07/2018

**This report in its entirety, including appendices contains 102 pages.**

## Statement Qualifications and Limitations

This report was prepared by Aercoustics Engineering Limited in accordance with International Standard IEC 61400-11 (Edition 3.0, released 2012-11), “Wind turbine generator systems – Part 11: Acoustic noise measurement techniques”. This report is specific only to the Wind Turbine identified in this report.

Aercoustics Engineering Limited shall not be responsible for any events or circumstances that may have occurred since the date on which the Wind Turbine was tested and/or this report was prepared, or for any inaccuracies contained in information that was provided to Aercoustics Engineering Limited. Further, Aercoustics Engineering Limited agrees that this report represents test data analysed as per the above described standard for the specific Wind Turbine described in this report, but Aercoustics Engineering Limited makes no other representations with respect to this report or any part thereof.

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This Statement of Qualifications and Limitations is attached to and forms part of this report.

## Table of Contents

<b>Revision History</b>	<b>2</b>
<b>Statement Qualifications and Limitations</b>	<b>2</b>
<b>List of Appendices</b>	<b>6</b>
<b>1 Introduction</b>	<b>8</b>
<b>2 Wind Turbine Information</b>	<b>8</b>
2.1 Wind turbine equipment specific information.....	8
2.2 Wind Turbine Location.....	9
<b>3 Measurement Details</b>	<b>10</b>
3.1 Measurement Equipment.....	10
3.1.1 Acoustic Measurement Equipment.....	10
3.1.2 Meteorological Equipment.....	10
3.2 Measurement Setup .....	10
3.2.1 Microphone Placement.....	10
3.2.2 Double Windscreen Setup.....	11
3.3 Measurement Schedule.....	11
3.4 Meteorological Conditions.....	11
3.5 Turbine operational information .....	11
<b>4 Measurement Results</b>	<b>12</b>
4.1 Deviations from IEC-61400-11 Edition 3.0.....	12
4.2 Special Notes & Considerations .....	12
4.3 Analysis Details .....	12
4.3.1 Double Windscreen Adjustment .....	12
4.3.2 Wind Speed Correction .....	12
4.4 Type B uncertainties .....	12
4.5 Sound Pressure Level Measurements .....	13
4.6 Sound Power Level of Turbine.....	14
4.7 Tonality Analysis.....	14
<b>5 Closure</b>	<b>15</b>
<b>6 References</b>	<b>15</b>

## List of Figures

Figure A.01 – Site plan.....	Appendix A
Figure A.02 – Site photos .....	Appendix A
Figure B.01 – Power Curve.....	Appendix B
Figure B.02 – Rotor RPM vs. Wind Speed.....	Appendix B
Figure C.01 – Plot of overall measurement data pairs at Position 1 (Turbine ON & Background).....	Appendix C
Figure C.02 – Plot of measured total noise vs electrical power output.....	Appendix C
Figure C.03 - Plot of power curve relative to nacelle anemometer and 10m anemometer.....	Appendix C
Figure C.04 - Plot of rotor RPM vs. electrical power output.....	Appendix C
Figure C.05 – Plot of sound pressure spectrum in 1/3 Octave at 7 m/s.....	Appendix C
Figure C.06 – Plot of sound pressure spectrum in 1/3 Octave at 7.5 m/s.....	Appendix C
Figure C.07 – Plot of sound pressure spectrum in 1/3 Octave at 8 m/s.....	Appendix C
Figure C.08 – Plot of sound pressure spectrum in 1/3 Octave at 8.5 m/s.....	Appendix C
Figure C.09 – Plot of sound pressure spectrum in 1/3 Octave at 9 m/s.....	Appendix C
Figure C.10 – Plot of sound pressure spectrum in 1/3 Octave at 9.5 m/s.....	Appendix C
Figure C.11 – Plot of sound pressure spectrum in 1/3 Octave at 10 m/s.....	Appendix C
Figure C.12 – Plot of sound pressure spectrum in 1/3 Octave at 10.5 m/s.....	Appendix C
Figure C.13 – Plot of sound pressure spectrum in 1/3 Octave at 11 m/s.....	Appendix C
Figure C.14 – Plot of sound pressure spectrum in 1/3 Octave at 11.5 m/s.....	Appendix C
Figure D.01 – Plot of narrow band spectra – Turbine ON vs. Background at 7 m/s...Appendix D	Appendix D
Figure D.02 – Plot of narrow band spectra – Turbine ON vs. Background at 7.5 m/s...Appendix D	Appendix D
Figure D.03 – Plot of narrow band spectra – Turbine ON vs. Background at 8 m/s.....Appendix D	Appendix D
Figure D.04 – Plot of narrow band spectra – Turbine ON vs. Background at 8.5 m/s...Appendix D	Appendix D
Figure D.05 – Plot of narrow band spectra – Turbine ON vs. Background at 9 m/s....Appendix D	Appendix D
Figure D.06 – Plot of narrow band spectra – Turbine ON vs. Background at 9.5 m/s...Appendix D	Appendix D
Figure D.07 – Plot of narrow band spectra – Turbine ON vs. Background at 10 m/s.....Appendix D	Appendix D
Figure D.08 – Plot of narrow band spectra – Turbine ON vs. Background at 10.5 m/s...Appendix D	Appendix D
Figure D.09 – Plot of narrow band spectra – Turbine ON vs. Background at 11 m/s.....Appendix D	Appendix D
Figure D.10 – Plot of narrow band spectra – Turbine ON vs. Background at 11.5 m/s...Appendix D	Appendix D

## List of Tables

Table 1 - Wind Turbine Details .....	8
Table 2 - Operating Details.....	8
Table 3 - Rotor Details.....	9
Table 4 - Gearbox Details.....	9
Table 5 - Generator Details .....	9
Table 6 - Acoustic Measurement Equipment.....	10
Table 7 – Meteorological Measurement Equipment.....	10
Table 8 - Measurement Schedule Summary .....	11
Table 9 - Calculated nacelle anemometer ( $k_{nac}$ ) and 10m ( $k_Z$ ) wind speed k-factor.....	12
Table 10 - Summary of Type B uncertainties .....	13
Table 11 - Summary of Sound Pressure Level Measurements.....	13
Table 12 - $L_{WA, K}$ at each integer wind speed .....	14
Table 13 - $L_{WA 10m, K}$ at each integer wind speed .....	14
Table 14 - Tonality Assessment Summary.....	14
Table B.01 – Allowed range of power curve and required wind speeds .....	Appendix B
Table C.01 – Detailed apparent sound power level data at hub height.....	Appendix C
Table C.02 – Detailed apparent sound power level data at 10m height.....	Appendix C
Table C.03 – Type B measurement uncertainty summary.....	Appendix C
Table C.04 – Detailed measurement uncertainty at hub height.....	Appendix C
Table E.01 – Measurement data –Turbine ON.....	Appendix E
Table E.02 – Measurement data – Background.....	Appendix E

## List of Appendices

### Appendix A – Site Details

- Figure A.01 – Site plan
- Figure A.02 – Site photos

### Appendix B – Turbine Information

- Figure B.01 – Power curve
- Figure B.02 – Rotor RPM vs. wind speed
- Table B.01 – Allowed range of power curve and required wind speeds

### Appendix C – Apparent Sound Power Level

- Figure C.01 – Plot of overall measurement data pairs at Position 1 (Turbine ON & Background)
- Figure C.02 – Plot of measured total noise vs electrical power output
- Figure C.03 - Plot of power curve relative to nacelle anemometer and 10m anemometer
- Figure C.04 - Plot of rotor RPM vs. electrical power output
- Figure C.05 – Plot of sound pressure spectrum in 1/3 Octave at 7 m/s
- Figure C.06 – Plot of sound pressure spectrum in 1/3 Octave at 7.5 m/s
- Figure C.07 – Plot of sound pressure spectrum in 1/3 Octave at 8 m/s
- Figure C.08 – Plot of sound pressure spectrum in 1/3 Octave at 8.5 m/s
- Figure C.09 – Plot of sound pressure spectrum in 1/3 Octave at 9 m/s
- Figure C.10 – Plot of sound pressure spectrum in 1/3 Octave at 9.5 m/s
- Figure C.11 – Plot of sound pressure spectrum in 1/3 Octave at 10 m/s
- Figure C.12 – Plot of sound pressure spectrum in 1/3 Octave at 10.5 m/s
- Figure C.13 – Plot of sound pressure spectrum in 1/3 Octave at 11 m/s
- Figure C.14 – Plot of sound pressure spectrum in 1/3 Octave at 11.5 m/s
- Table C.01 – Detailed apparent sound power level data at hub height
- Table C.02 – Detailed apparent sound power level data at 10m height
- Table C.03 – Type B measurement uncertainty summary
- Table C.04 – Detailed measurement uncertainty at hub height

### Appendix D – Tonality Assessment

- Figure D.01 – Plot of narrow band spectra – Turbine ON vs. Background at 7 m/s
- Figure D.02 – Plot of narrow band spectra – Turbine ON vs. Background at 7.5 m/s
- Figure D.03 – Plot of narrow band spectra – Turbine ON vs. Background at 8 m/s
- Figure D.04 – Plot of narrow band spectra – Turbine ON vs. Background at 8.5 m/s
- Figure D.05 – Plot of narrow band spectra – Turbine ON vs. Background at 9 m/s
- Figure D.06 – Plot of narrow band spectra – Turbine ON vs. Background at 9.5 m/s
- Figure D.07 – Plot of narrow band spectra – Turbine ON vs. Background at 10 m/s
- Figure D.08 – Plot of narrow band spectra – Turbine ON vs. Background at 10.5 m/s
- Figure D.09 – Plot of narrow band spectra – Turbine ON vs. Background at 11 m/s
- Figure D.10 – Plot of narrow band spectra – Turbine ON vs. Background at 11.5 m/s

### Appendix E – Measurement Data

- Table E.01 – Measurement data –Turbine ON
- Table E.02 – Measurement data – Background

Appendix F – Calibration Certificates

Appendix G – E-Audit Checklist

## 1 Introduction

Aercoustics Engineering Limited (Aercoustics) was retained by Suncor Adelaide Wind LP (“Suncor Adelaide”) to conduct an acoustic measurement of turbine T05 at the Suncor Adelaide Wind Farm. The purpose of the measurement was to provide verification of the maximum noise emission of the turbine. The measurement was carried out in accordance with International Standard IEC 61400-11 (Edition 3.0, released 2012-11), “Wind turbine generator systems – Part 11: Acoustic noise measurement techniques”. This report is specific only to Turbine T05.

## 2 Wind Turbine Information

### 2.1 Wind turbine equipment specific information

Wind turbine specific equipment information for turbine T05 was provided by Suncor Adelaide and is summarized in Tables 1 – 5.

Table 1 - Wind Turbine Details

Wind Turbine Details	
Manufacturer	Siemens
Model Number	SWT2.3-113
Turbine ID	2308445

Table 2 - Operating Details

Operating Details	
Vertical or Horizontal axis wind turbine	Horizontal
Upwind or downwind rotor	Upwind rotor
Hub height	99.5 m
Horizontal distance from rotor centre to tower axis	5.5 m
Diameter of rotor	113 m
Tower type (lattice or tube)	Tubular
Passive stall, active stall, or pitch controlled turbine	Pitch controlled turbine
Constant or variable speed	Variable speed
Power curve	Rev 1
Rotational speed at each integer standardised wind speed	13.0
Rated power output	2221 kW
Control software version	121.3.0.1



Table 3 - Rotor Details

Rotor Details	
Rotor control devices	Pitch control
Presence of vortex generators, stall strips, serrated trailing edges	Vortex generators and dino tails
Blade type	B55
Serial number	Blade A: 550308701 Blade B: 550313201 Blade C: 550313001
Number of blades	3

Table 4 - Gearbox Details

Gearbox Details	
Manufacturer	n/a a direct drive turbine
Model number	n/a a direct drive turbine
Serial number	n/a a direct drive turbine

Table 5 - Generator Details

Generator Details	
Manufacturer	Siemens
Model number	DD22_02
Serial number	5970749

## 2.2 Wind Turbine Location

Turbine T05 is located in the municipality of Adelaide Metcalfe, Ontario approximately 860m North of Egremont Drive, and 750m East of Newell Road. The area surrounding T05 is flat and consists primarily of farmland.

A general layout of the area in which the turbine is located is provided in the site plan (Figure A.01).

### 3 Measurement Details

#### 3.1 Measurement Equipment

##### 3.1.1 Acoustic Measurement Equipment

A summary of acoustic equipment utilized by Aercoustics for the measurement of turbine T05 is summarized in Table 6.

Table 6 - Acoustic Measurement Equipment

Equipment	Manufacturer Name & Model	Serial Number
Acoustic Data acquisition system	LMS SCADA Mobile	53103922
Microphone	B&K 4189	2625197
Pre-amplifier	B&K 2671	2614901
Acoustic calibrator	B&K 4231	2513184

Calibration of the measurement setup was carried out before and after Aercoustics set of measurements.

##### 3.1.2 Meteorological Equipment

Wind speed for Turbine ON was derived from the power curve (as per procedures outlined in IEC 61400-11). Wind direction for turbine ON measurements was utilized from the nacelle anemometer located at hub height (100m high) from turbine T05. Data for background measurements was obtained from a 10m high anemometer, which was placed as per guidelines outlined in IEC-61400-11.

The meteorological equipment is summarized in Table 7

Table 7 – Meteorological Measurement Equipment

Equipment	Manufacturer Name & Model	Serial Number
Anemometer	VAISALA WXT520	G4420002
Serial to Analog Converter	NOKEVAL 7470	A159784

#### 3.2 Measurement Setup

##### 3.2.1 Microphone Placement

The measurement microphone was setup 156m from the base of the turbine in ‘Position 1’, (i.e. downwind of the turbine, as per IEC 61400-11) at an elevation of 0m relative to the base of T05. The slant distance ( $R_1$ ) from microphone location to rotor centre includes the distance from rotor center (hub) to tower axis ( $R_1 = 191.7m$ ). The microphone was placed in the centre of a circular, acoustically reflective board.

During the measurement period only data points for which the microphone was within 15 degrees of downwind from the turbine were used. The microphone position relative to

downwind of the turbine was monitoring via the yaw angle output provided from the turbine system (discussed further in Section 3.5). During placement of the microphone the turbine was parked and the reference yaw angle for that measurement logged.

When measurements of T05 were taken, the surrounding land was bare farm land. There were no nearby reflecting surfaces (houses, barns etc.); as such the influence from reflecting surfaces was considered to be negligible

Photos of the measurement setup are provided in Figure A.02, Appendix A.

### 3.2.2 Double Windscreen Setup

A double windscreen setup was not utilized.

### 3.3 Measurement Schedule

Table 8 provides a summary of the test date and times. Data was logged in 10 second intervals for post-processing (as per the measurement standard).

Table 8 - Measurement Schedule Summary

Date	Test Type	Start Time	Finish time
October 9, 2015	Turbine ON	1:45pm	2:22pm
	Turbine ON	2:28pm	2:32pm
	Background	2:33pm	3:02pm
	Turbine ON	3:02pm	3:42pm
	Turbine ON	3:58pm	4:36pm
October 13, 2015	Turbine ON	12:05pm	1:05pm
	Turbine ON	1:13pm	2:13pm
	Background	2:28pm	2:58pm

### 3.4 Meteorological Conditions

Detailed meteorological data relevant to the measurement is provided in Appendix E.

As previously mentioned, wind speed for Turbine ON was derived from T05’s power curve (as per the standard), while wind direction was provided by T05’s nacelle anemometer (located at hub height). Background data was obtained from an anemometer located 10m above ground level near T05.

Temperature and pressure readings during the measurement period were provided by the 10m anemometer, located near turbine T05 for the duration of Aeroacoustics measurements.

### 3.5 Turbine operational information

Output data from the turbine (Power, yaw, RPM, pitch angle, and nacelle wind speed) were obtained as analog output signals that were simultaneously acquired with the acoustic and anemometer measurement data using Aeroacoustics data acquisition system.

## 4 Measurement Results

### 4.1 Deviations from IEC-61400-11 Edition 3.0

No deviations.

### 4.2 Special Notes & Considerations

T06 was turned off for the duration of testing at T05.

### 4.3 Analysis Details

The following section outlines analysis of the measurement data acquired for T05. The data presented is exclusive of transient events such as vehicle traffic, wildlife, air traffic etc. The site has been assessed to have a roughness length of 0.05m, representative of farmland with some vegetation.

#### 4.3.1 Double Windscreen Adjustment

As previously mentioned, no double wind screen was used, as such the measurement data did not require adjustment.

#### 4.3.2 Wind Speed Correction

The wind speed for each measurement data point for Turbine ON was derived through the power curve (as per Section 8.2.1.1 of IEC-61400-11). For data points during Turbine ON that were outside the allowed range of the power curve, the wind speed was derived from the nacelle anemometer wind speed (as specified in Section 8.2.1.2 of IEC-61400-11).

Background wind speed was derived utilizing data acquired with the 10m anemometer and normalizing the wind speed (as per Section 8.2.2 of IEC-61400-11).

Table 9 - Calculated nacelle anemometer ( $k_{nac}$ ) and 10m ( $k_Z$ ) wind speed k-factor

$k_{nac}$	$k_Z$
0.99	1.94

### 4.4 Type B uncertainties

Type B uncertainties were obtained through interpretation of information provided in Annex C of IEC-61400-11, and instrument uncertainties obtained from the calibration certificate. A summary of Type B uncertainties is provided in Table 10, while detailed information (including data in 1/3 octave) is provided in Appendix C.

Table 10 - Summary of Type B uncertainties

Component	Typical (dB)	Used (dB)
Calibration	0.2	0.2
Board	0.3	0.3
Distance & direction	0.1	0.1
Air absorption	0	0
Weather conditions	0.5	0.5
Wind speed measured	0.7	0.7
Wind speed derived	0.2	0.2
Wind speed from power curve	0.2	0.2

#### 4.5 Sound Pressure Level Measurements

Sound pressure level measurements are summarized in Table 11. Detailed 1/3 Octave band spectrum data, respective uncertainties, and analysis plots are provided in Appendix C. A copy of the measurement data used for analysis is provided in Appendix E and includes meteorological and turbine operational data.

The purpose of this measurement was to verify turbine noise emission, and testing was conducted in conformity with IEC 61400-11-Ed 3.0 Section 5, Paragraph 3. The wind speed range for documentation is related to the specific wind turbine. As a minimum, it is defined as the hub height wind speed from 0,8 to 1,3 times the wind speed at 85% of maximum power rounded to bin centres. For Turbine T05 this corresponds to a hub height wind speed of 7 m/s to 11.5 m/s.

Table 11 - Summary of Sound Pressure Level Measurements

Wind Speed (m/s)	Turbine ON		Background		Turbine ON, Background adjusted $L_{eq}$ (dBA)
	$L_{eq}$ (dBA)	# of data pts	$L_{eq}$ (dBA)	# of data pts	
7	51.6	18	42.0	13	51.1
7.5	52.9	52	42.3	14	52.5
8	53.8	132	42.4	30	53.5
8.5	54.0	153	43.7	23	53.6
9	54.0	179	43.5	24	53.6
9.5	53.8	100	42.6	21	53.5
10	53.4	133	42.3	17	53.0
10.5	53.5	121	42.6	23	53.1
11	53.4	111	42.8	15	53.0
11.5	53.4	108	42.7	19	53.0

#### 4.6 Sound Power Level of Turbine

The calculated sound power level of the turbine T05 (as per IEC 61400-11) is summarized in Table 12 (hub height) and Table 13 (10m height). Detailed 1/3 Octave band spectrum data and respective uncertainties are provided in Appendix C.

Table 12 -  $L_{WA, K}$  at each integer wind speed

Wind Speed (m/s)	Apparent $L_{WA}$ , (dBA)	Uncertainty (dB)
7	101.7	0.8
7.5	103.1	0.7
8	104.1	0.8
8.5	104.2	0.8
9	104.2	0.8
9.5	104.1	0.7
10	103.7	0.7
10.5	103.8	0.8
11	103.6	0.8
11.5	103.6	0.8

Table 13 -  $L_{WA 10m, K}$  at each integer wind speed

Wind Speed (m/s)	Apparent $L_{WA}$ , (dBA)	Uncertainty (dB)
5	102.9	1.2
6	104.2	0.8
7	103.8	0.8
8	103.6	0.8
9	103.5	0.9

#### 4.7 Tonality Analysis

The tonality analysis for Turbine T05 is summarized in Table 14, while plots of narrow band spectra at each wind speed are provided in Appendix D. The  $\Delta L_{tn}$  and  $\Delta L_a$  values reported represent the energy average of all data points with an identified tone that falls within the same frequency origin (as specified in Section 9.5.8 in IEC-61400-11).

The narrow band spectra provided in the plots represents an energy average of all data points in the given wind speed bin for both Turbine ON and Background. No relevant tones were measured.

Table 14 - Tonality Assessment Summary

Wind Speed (m/s)	Frequency (Hz)	Tonality, $\Delta L_{tn}$ (dB)	Tonal audibility, $\Delta L_a$ (dB)	FFT's with tones	Total # of FFT's	Presence (%)
No Reportable Tones Detected						

## 5 Closure

Measurements and analysis were carried on Turbine T05 of the Suncor Adelaide Wind Farm, located in the municipality of Adelaide Metcalfe as per International IEC 61400-11 (Edition 3.0, released 2012-11), “Wind turbine generator systems – Part 11: Acoustic noise measurement techniques”.

Should you have any questions or comments please do not hesitate to contact the authors of this report.

## 6 References

1. International Standard IEC 61400-11 (Edition 3.0, released 2012-11), “Wind turbine generator systems – Part 11: Acoustic noise measurement techniques”.

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## Appendix A Site Details

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14215.01.T05.RP6

Project Name

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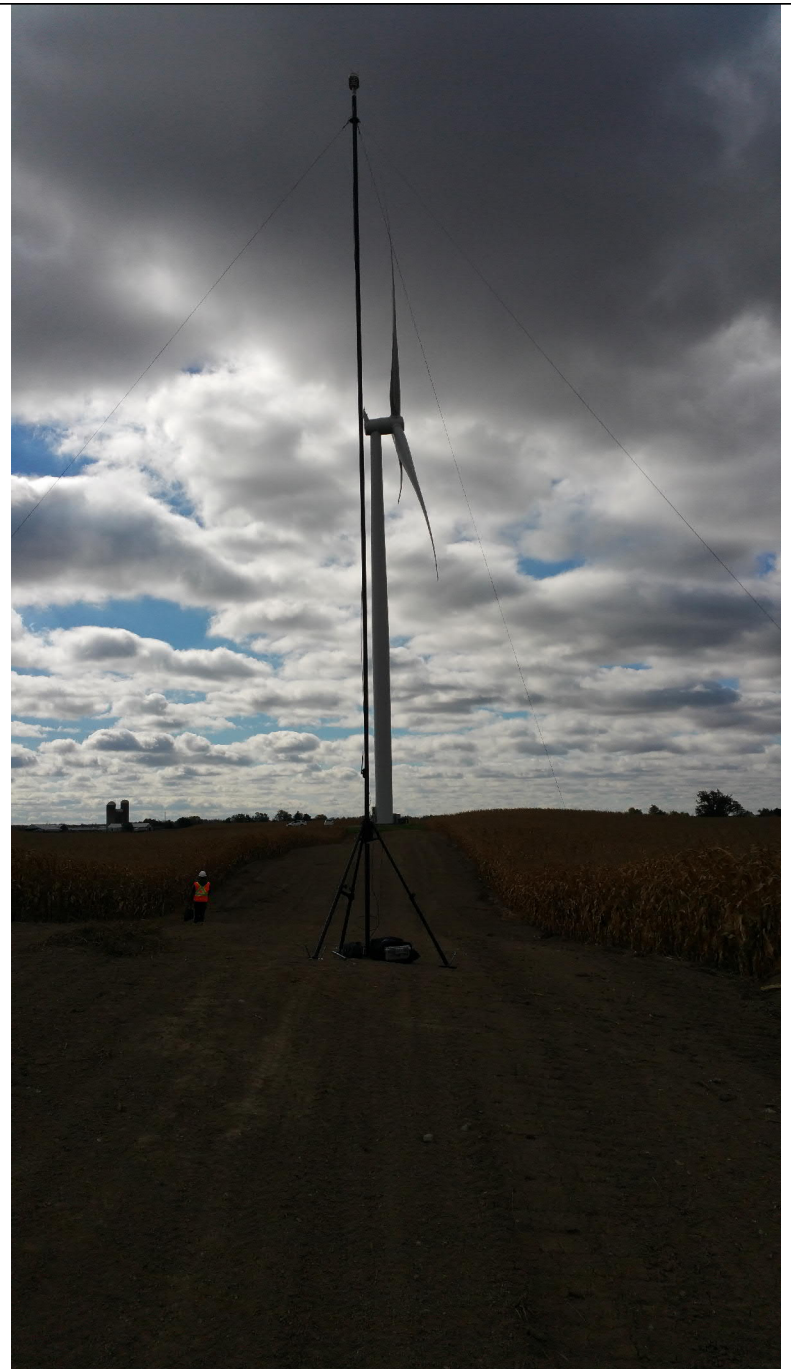


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Figure Title

Site Plan

**Figure A.01**



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**Project Name**

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**Figure Title**

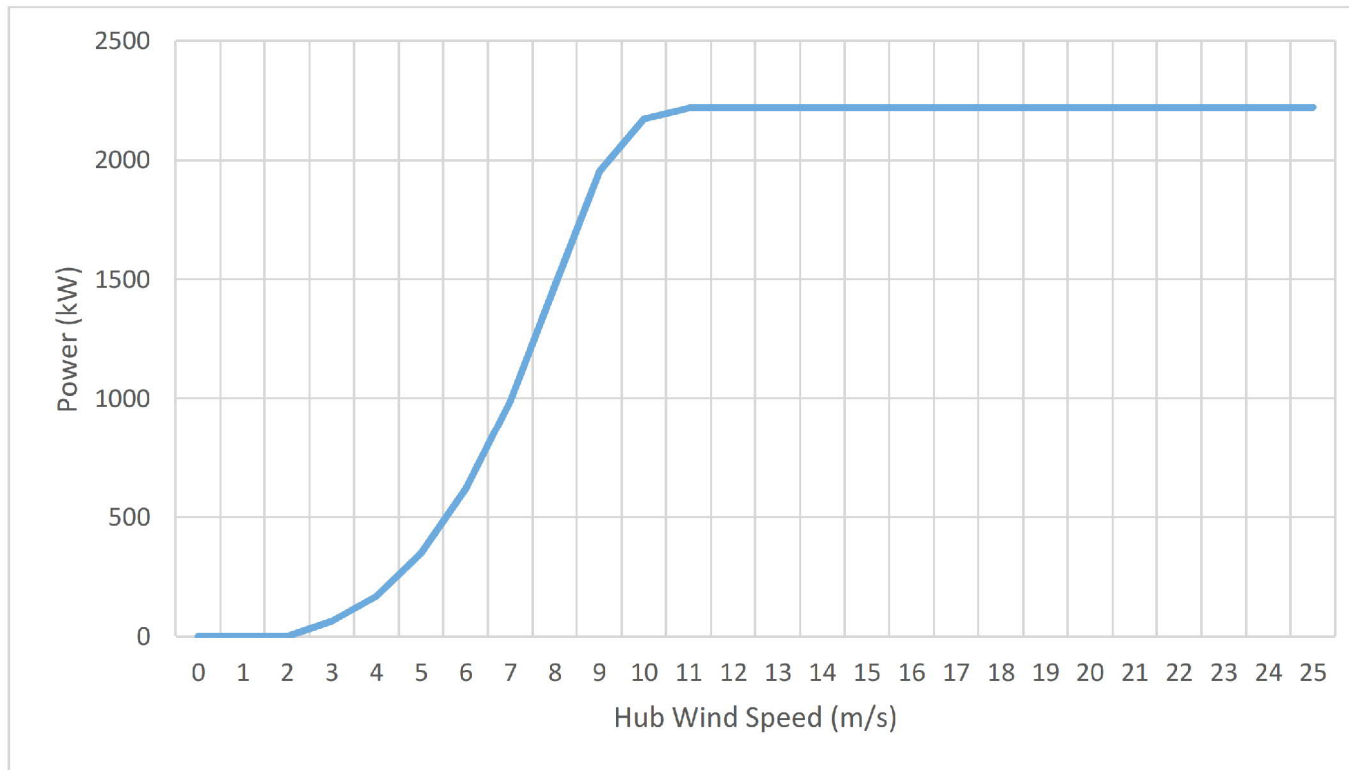
Site photos

**Figure A.02**

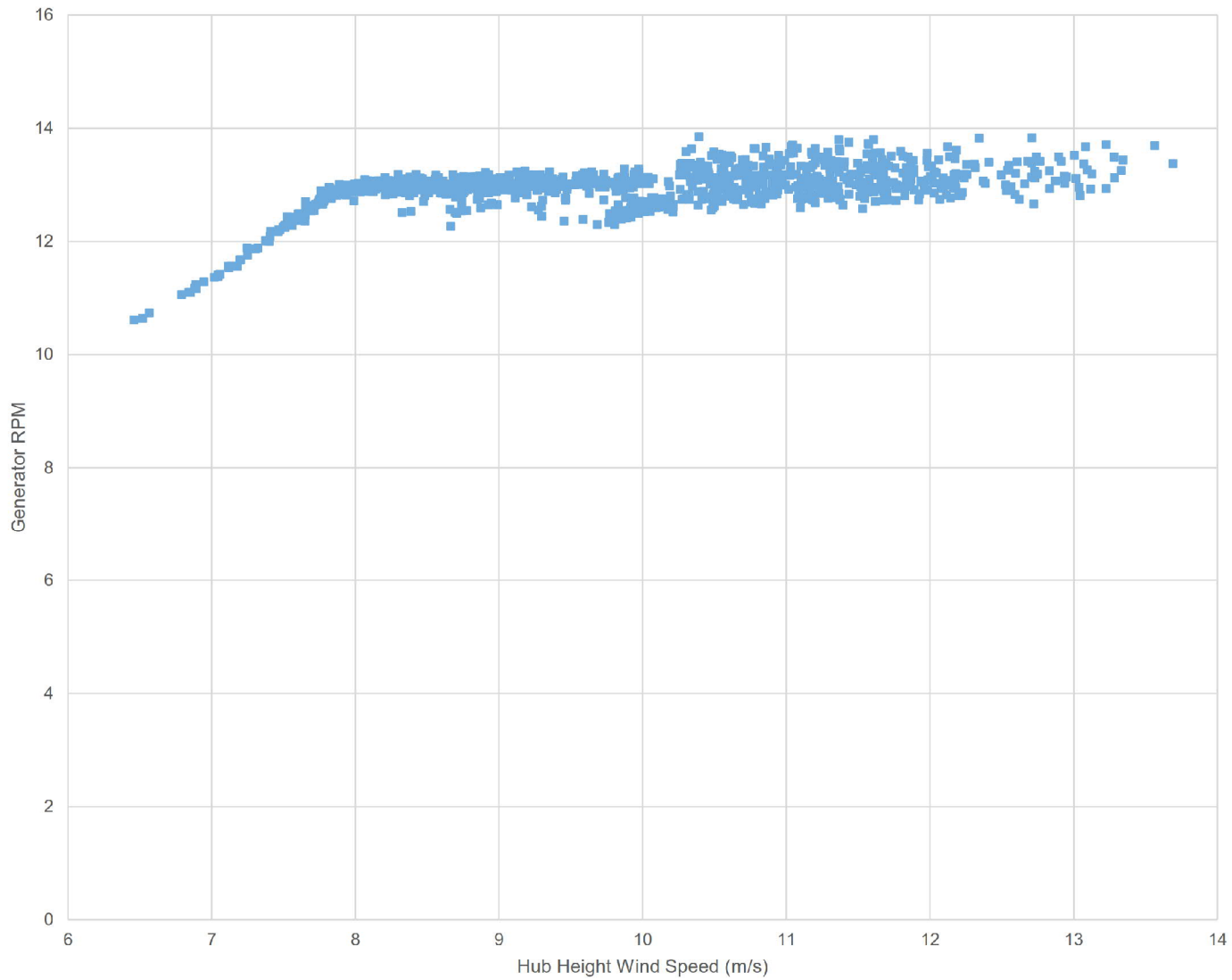
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## Appendix B Turbine Information

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Power Curve	
Hub Wind Speed (m/s)	Power [kW]
0	0
1	0
2	0
3	65
4	169
5	347
6	615
7	989
8	1471
9	1951
10	2172
11	2217
12	2221
13	2221
14	2221
15	2221
16	2221
17	2221
18	2221
19	2221
20	2221
21	2221
22	2221
23	2221
24	2221
25	2221



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**Figure Title**

Rotor RPM vs. wind speed

**Figure B.02**

## Table B.01 Allowed range of power curve and required wind speeds

Project: Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 1 of 1  
 Created on: 7/11/2018

Power Curve & Required Wind Speeds		
Power Curve Tolerance	1%	
Min allowable range	2	m/s
Max allowable range	10	m/s
Power Output	2221	kW
85% Power	1887.85	kW
Corresponding wind speed	8.87	m/s
Minimum bin	7.0	m/s
Maximum bin	11.5	m/s

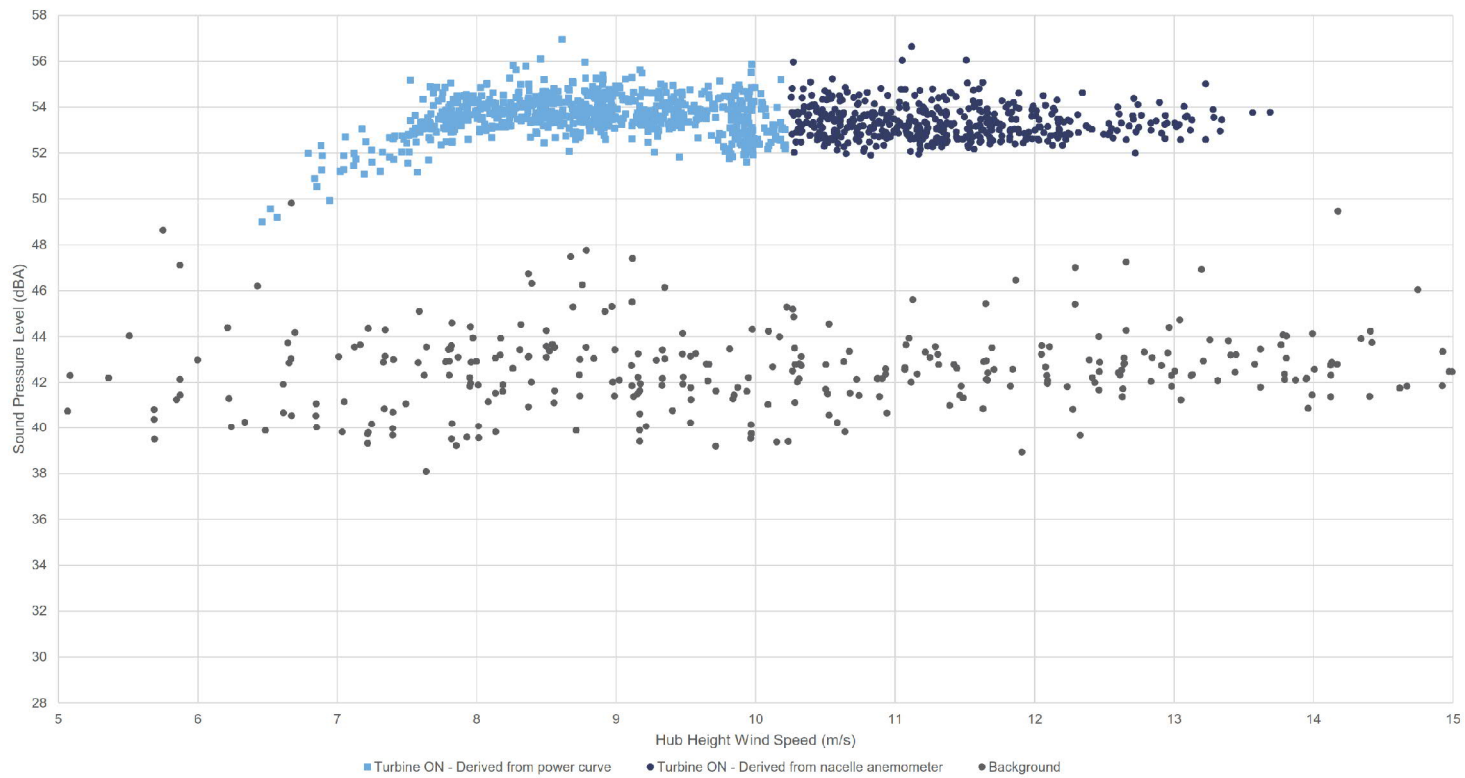
Hub Wind Speed (m/s)	Power [kW]	+ value = acceptable slope of power curve
0	0	-44.42
1	0	-44.42
2	0	20.58
3	65	59.58
4	169	133.58
5	347	223.58
6	615	329.58
7	989	437.58
8	1471	435.58
9	1951	176.58
10	2172	0.58
11	2217	-40.42
12	2221	-44.42
13	2221	-44.42
14	2221	-44.42
15	2221	-44.42
16	2221	-44.42
17	2221	-44.42
18	2221	-44.42
19	2221	-44.42
20	2221	-44.42
21	2221	-44.42
22	2221	-44.42
23	2221	-44.42
24	2221	-44.42
25	2221	

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## Appendix C

### Apparent Sound Power Level

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**Project Name**

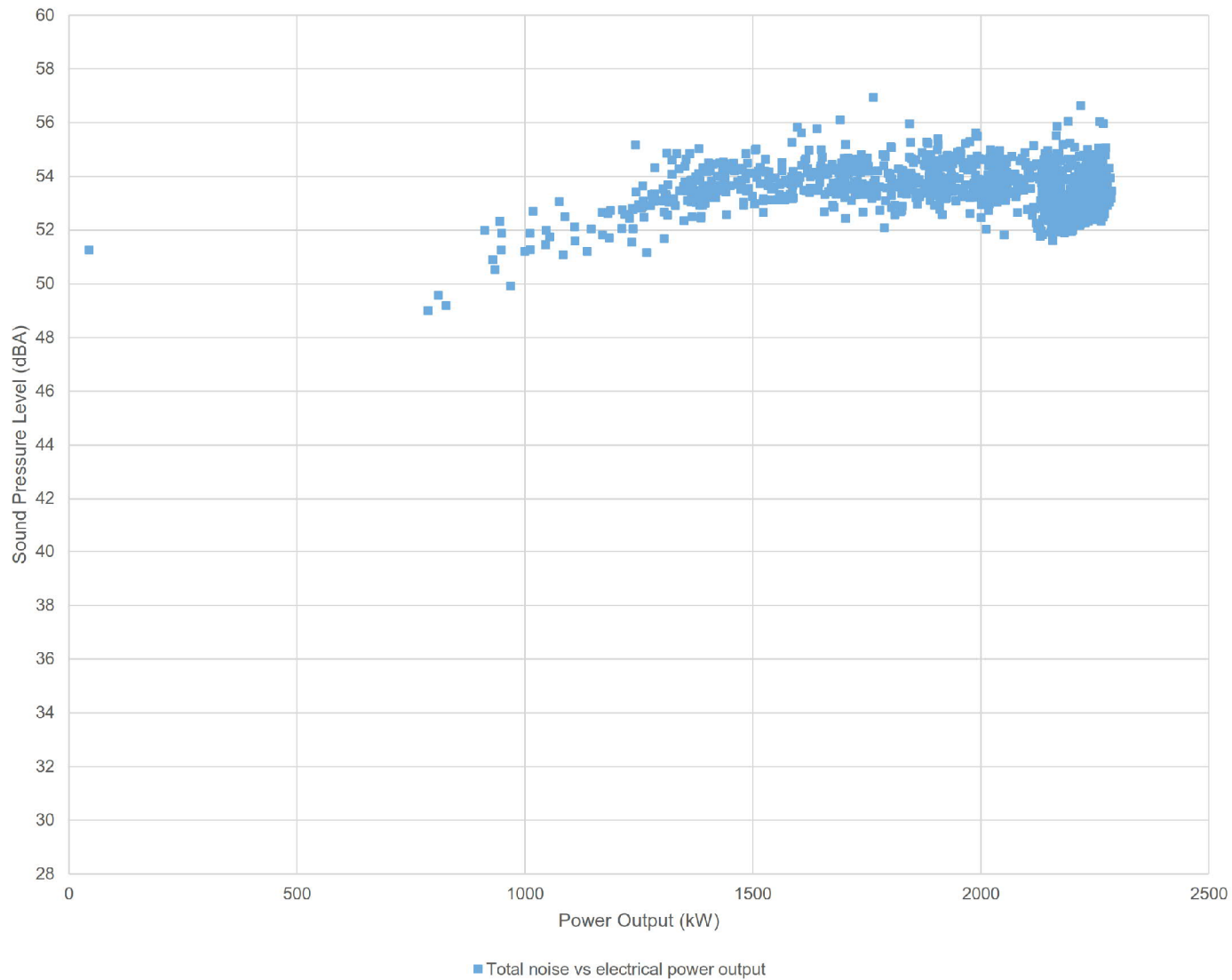
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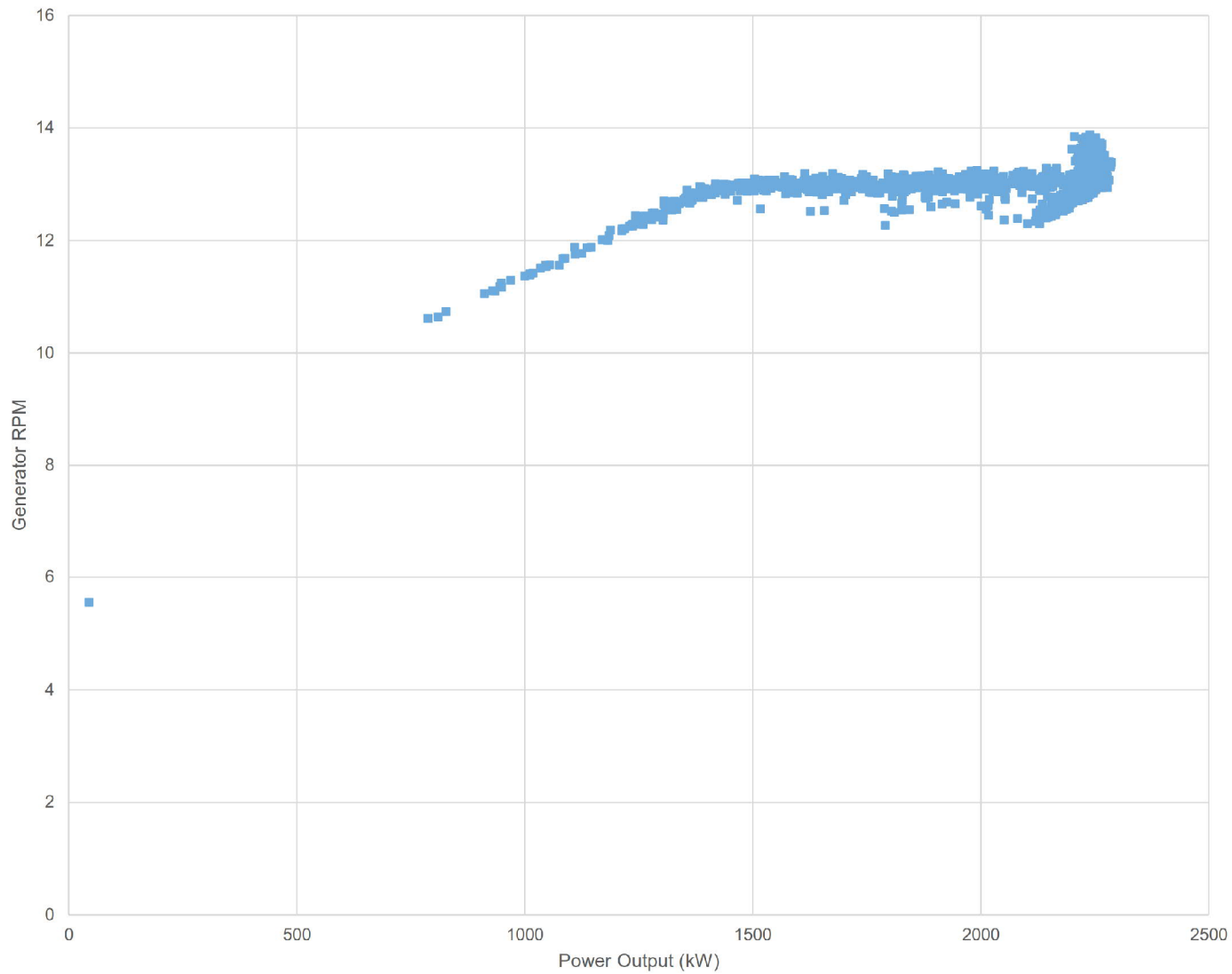
**Figure Title**

Plot of overall measurement data pairs at Position 1 (Turbine ON & Background)

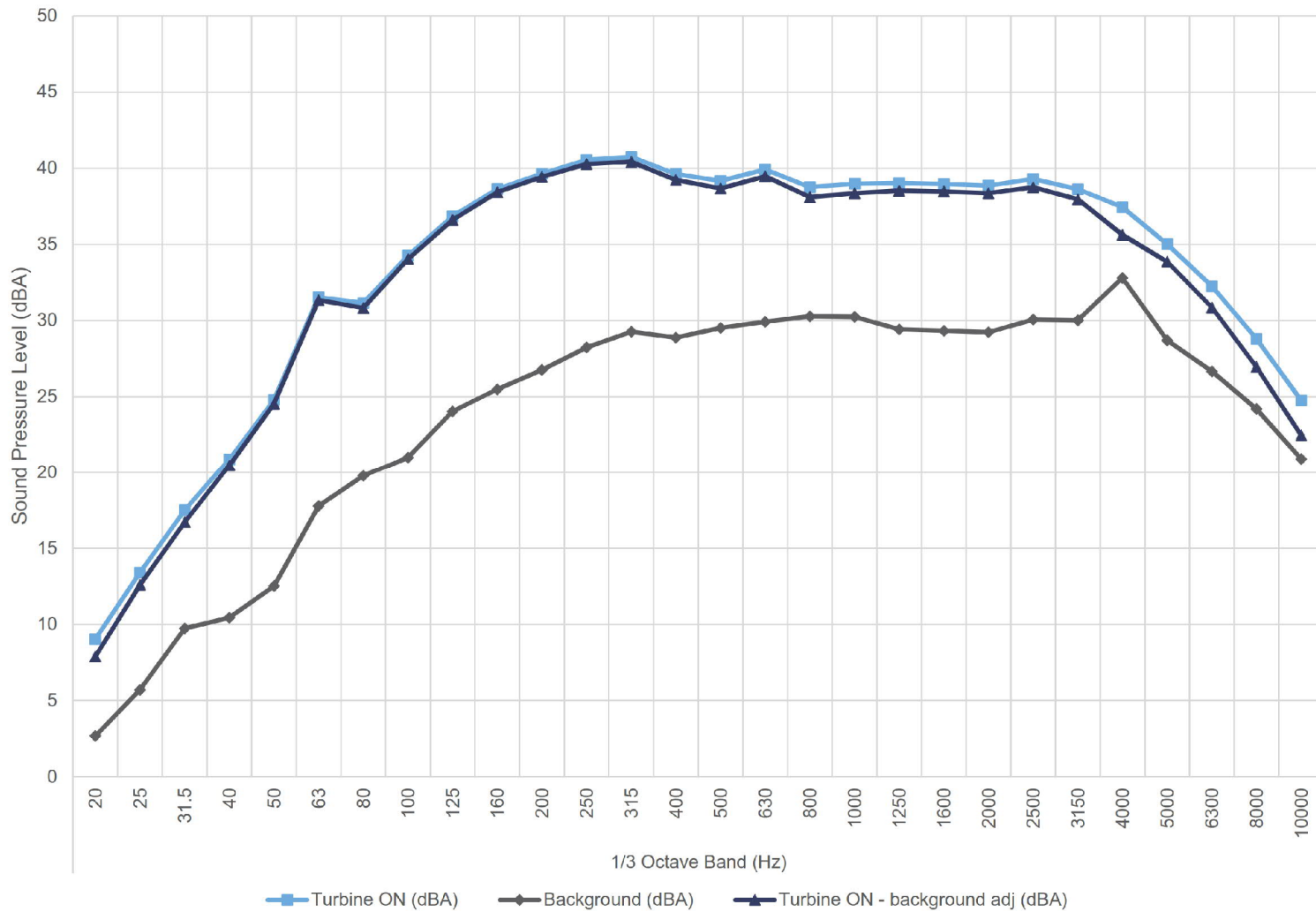
**Figure C.01**







7.0 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

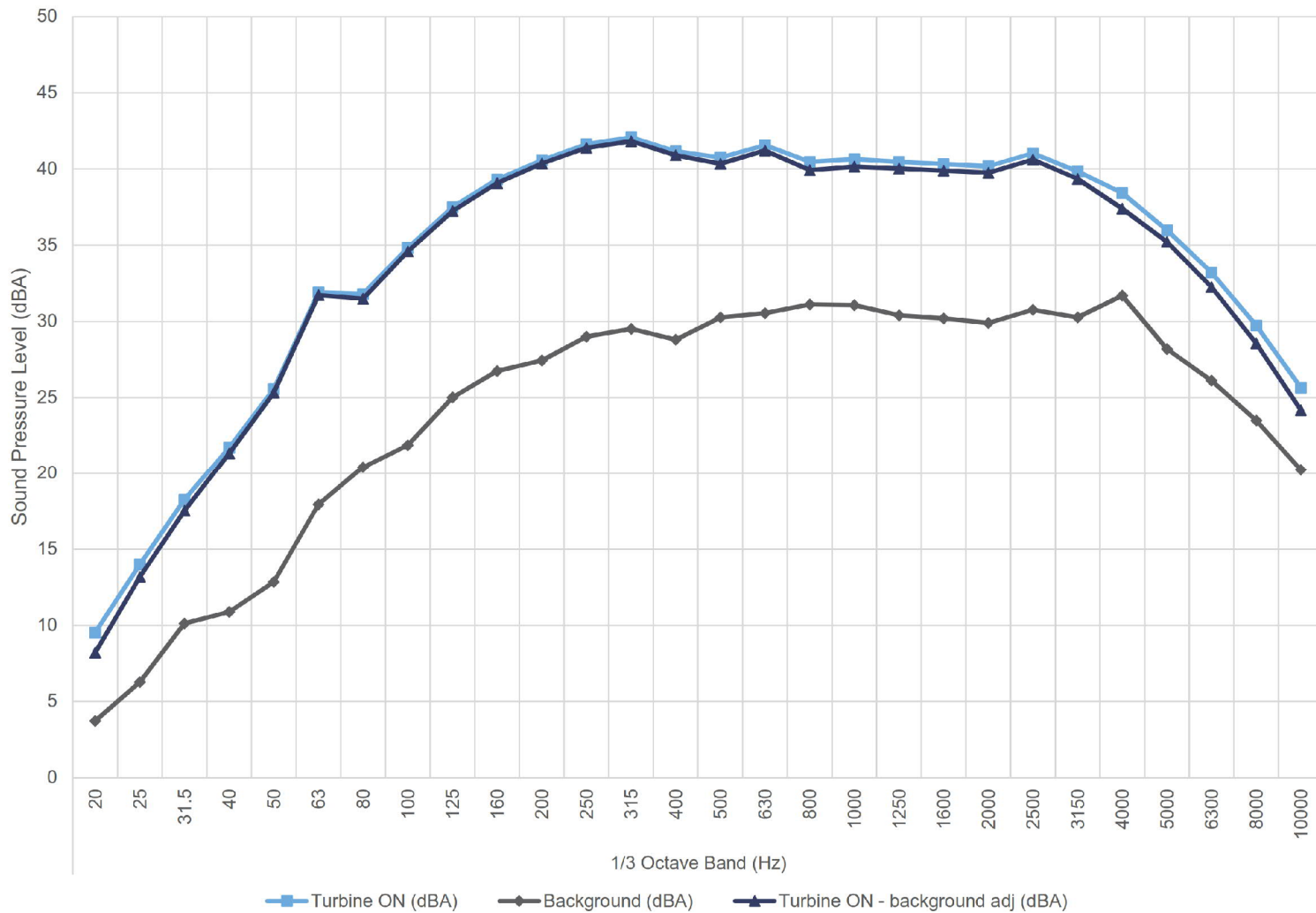
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 7 m/s

**Figure C.05**

7.5 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

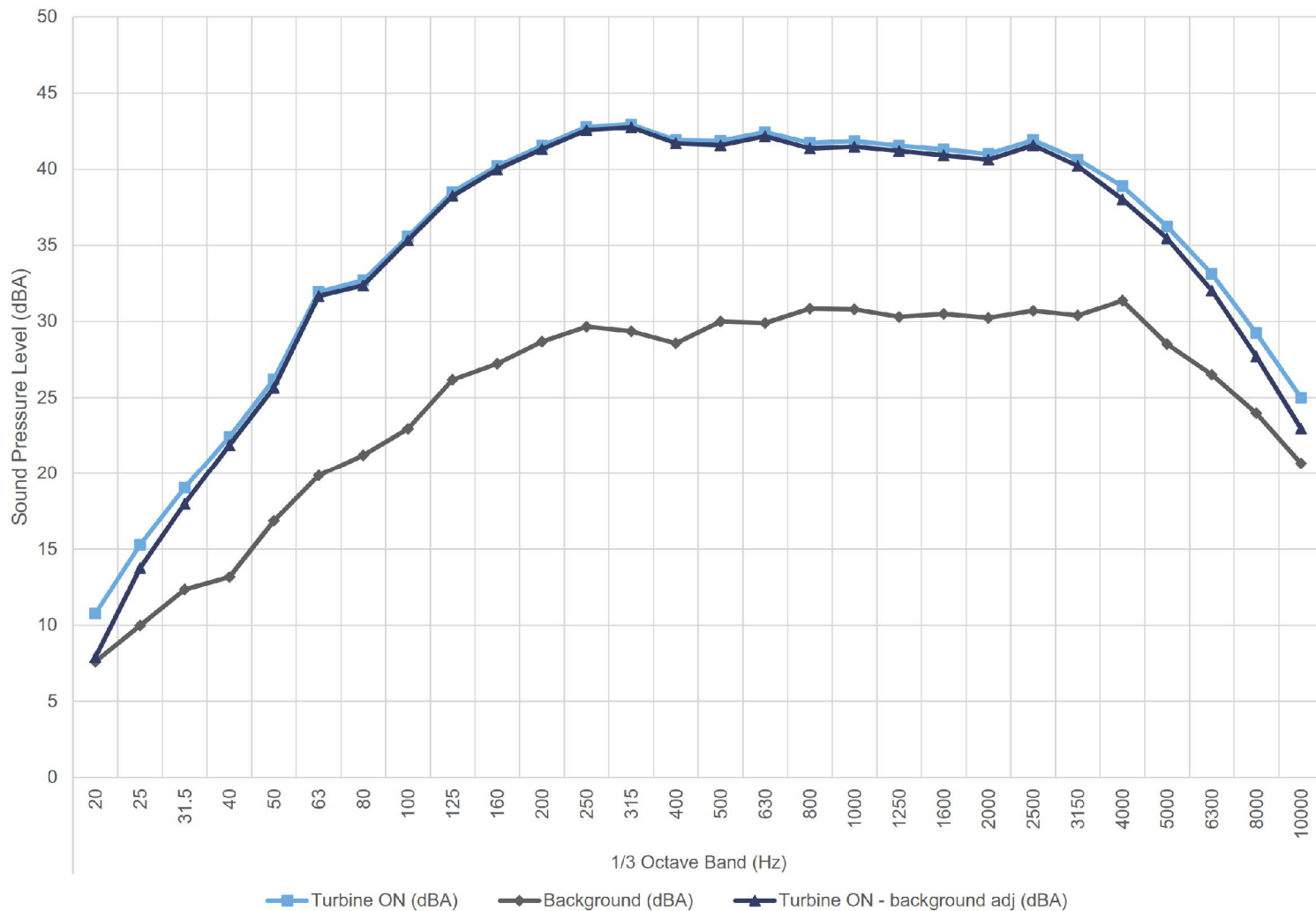
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 7.5 m/s

Figure C.06

8.0 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

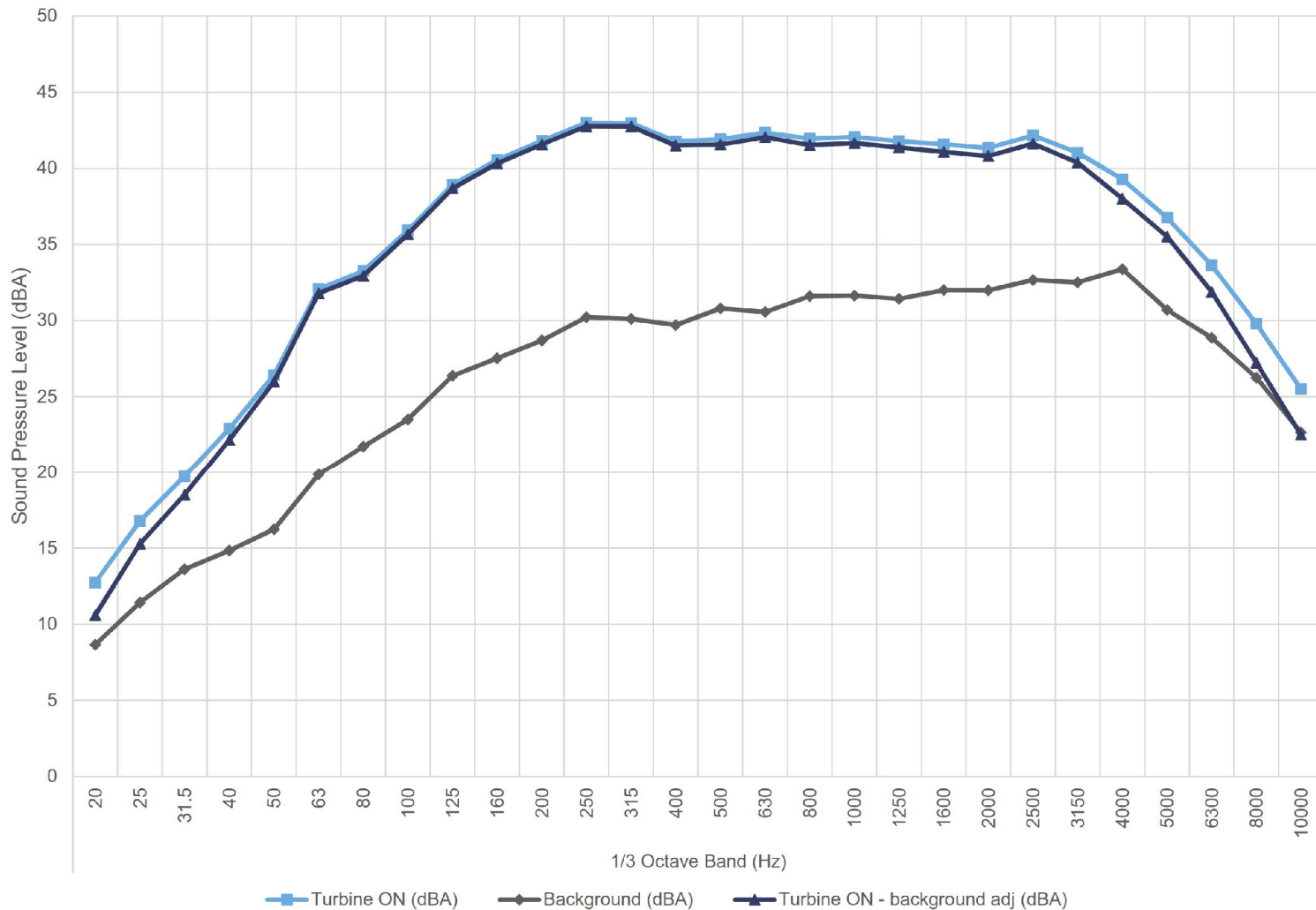
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 8.0 m/s

**Figure C.07**

8.5 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

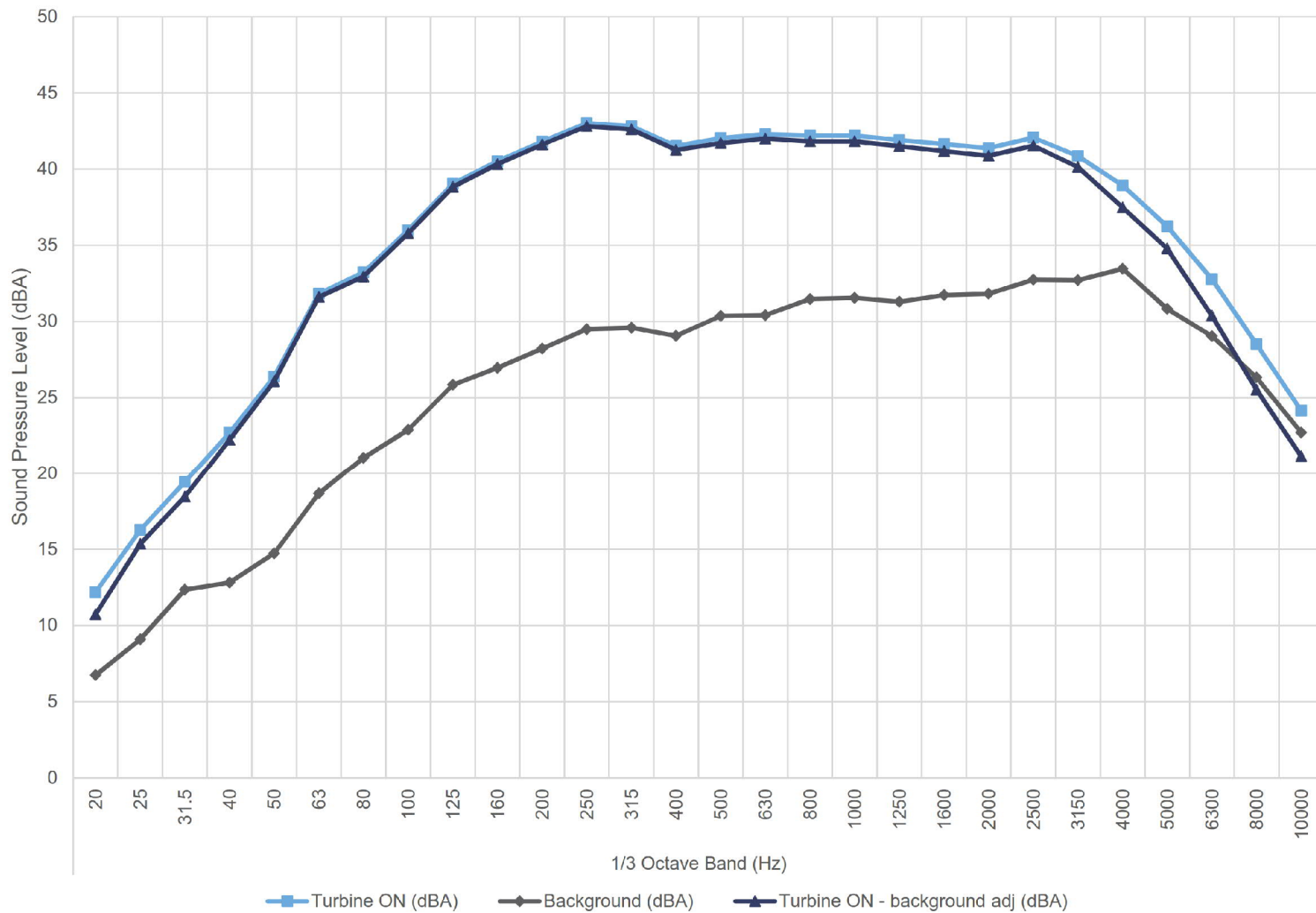
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 8.5 m/s

Figure C.08

9.0 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

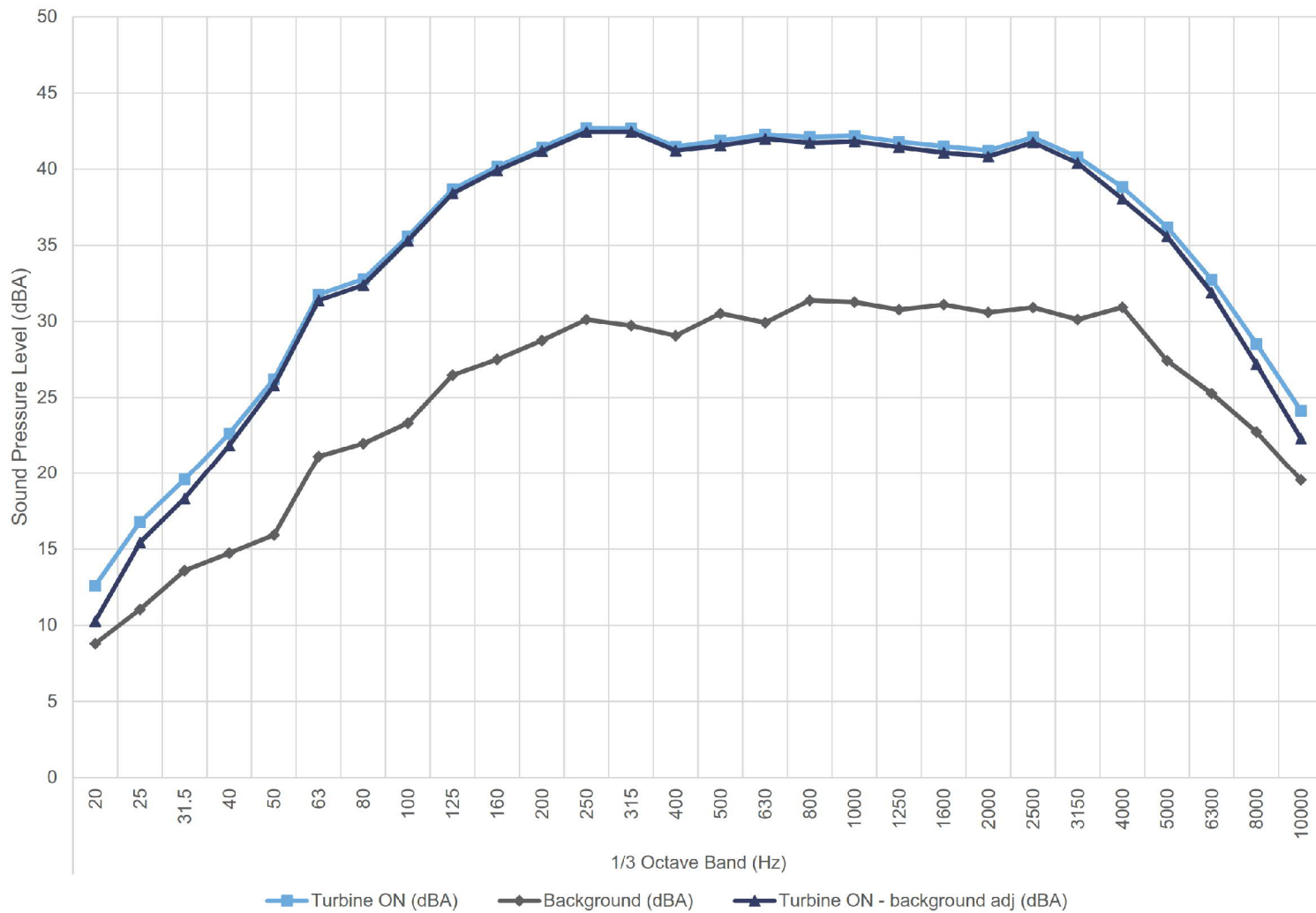
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 9.0 m/s

Figure C.09

9.5 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

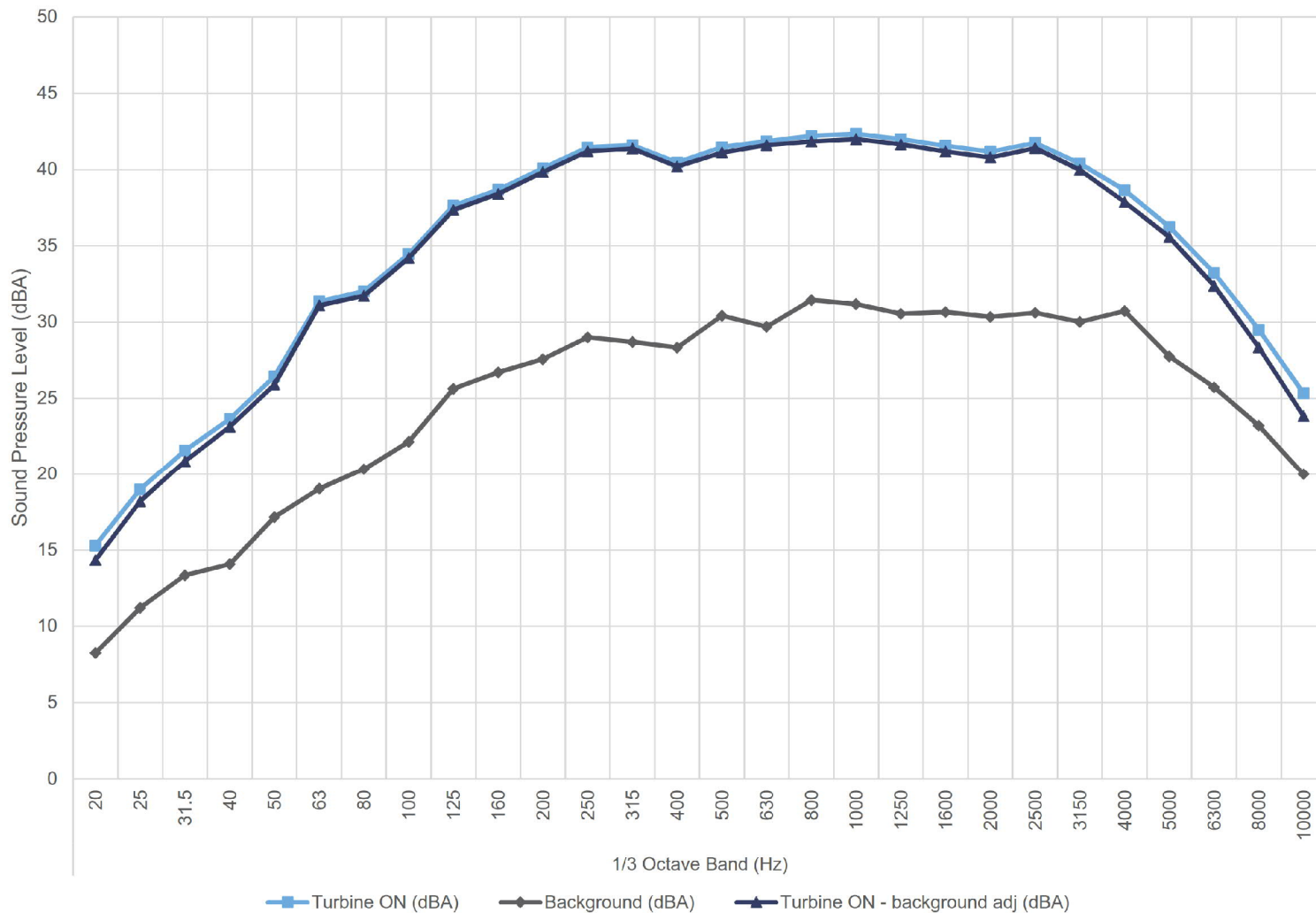
Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 9.5 m/s

**Figure C.10**



10.0 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

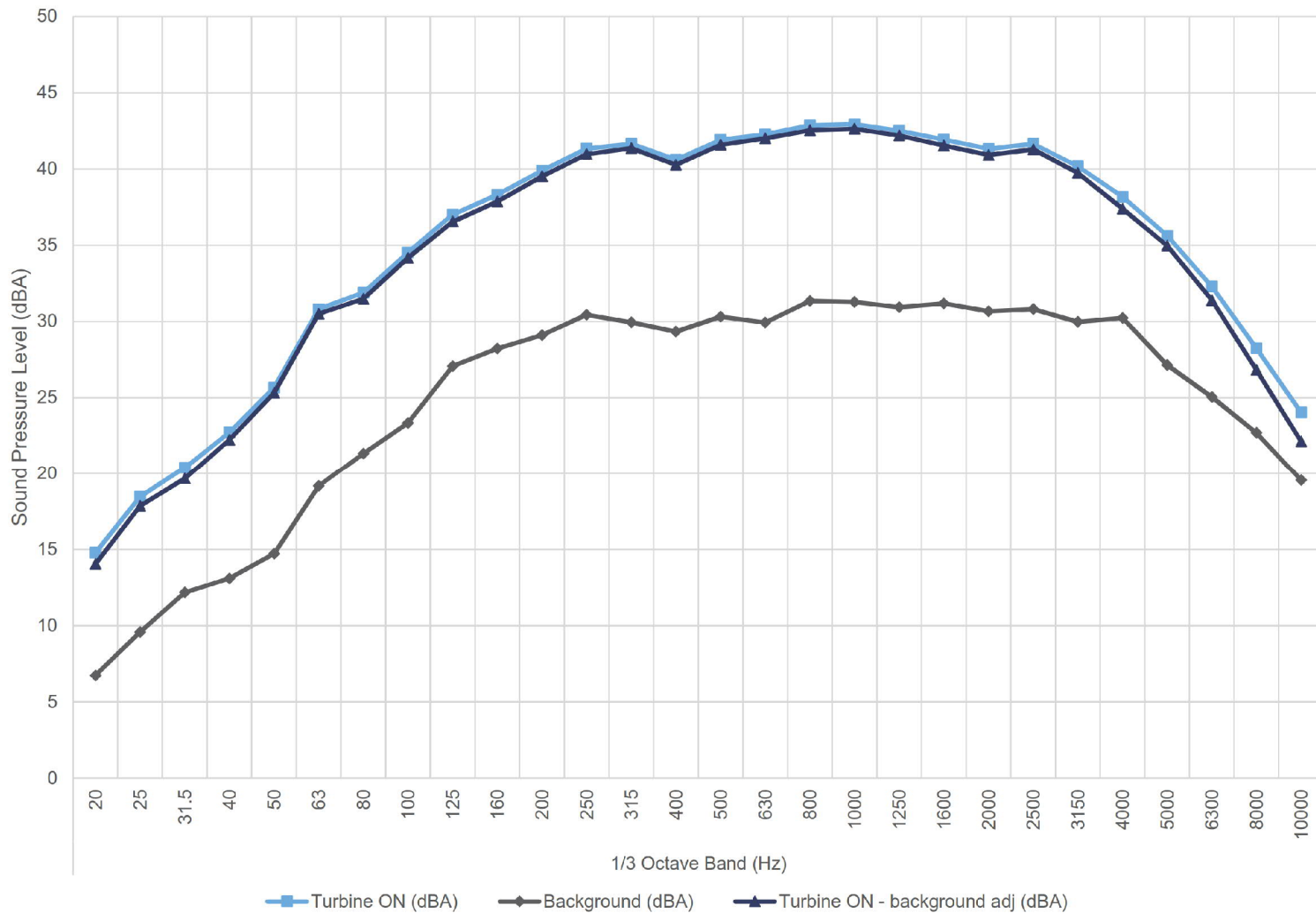
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 10.0 m/s

Figure C.11

10.5 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

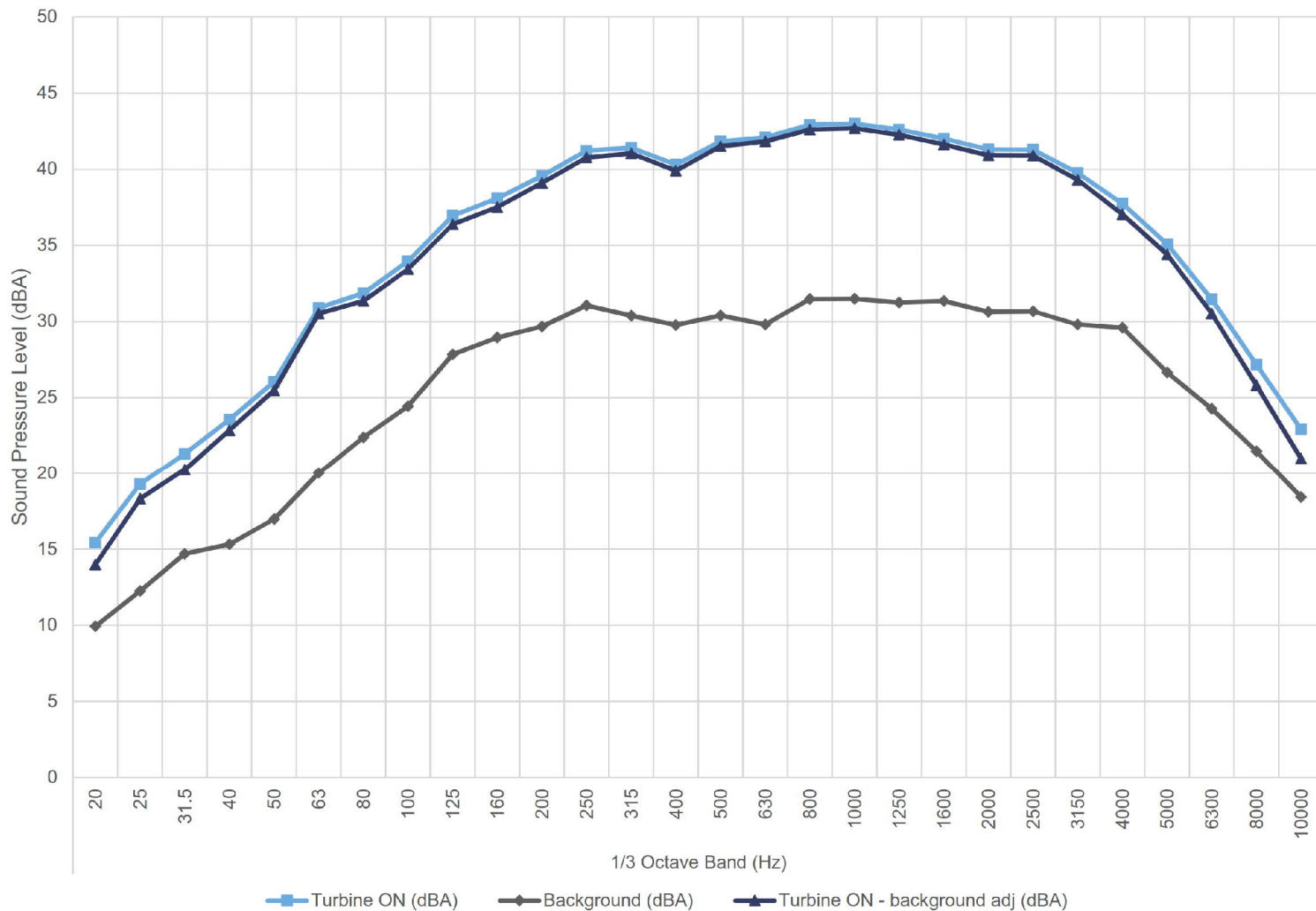
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 10.5 m/s

Figure C.12

11.0 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

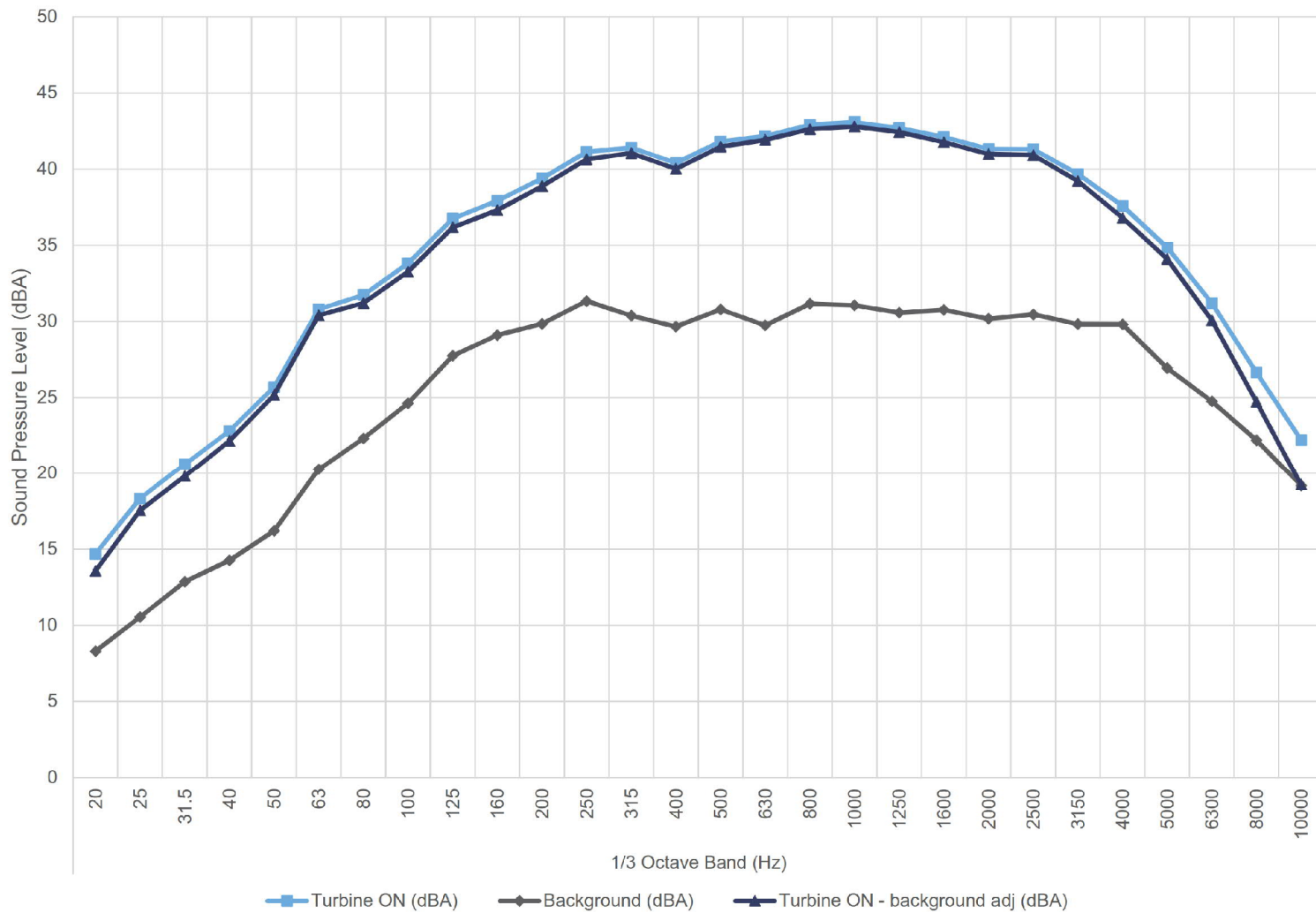
Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 11 m/s

Figure C.13

11.5 m/s - Hub Height



14215.01.T05.RP6

Scale: NTS  
 Drawn by: AM  
 Reviewed by: PA  
 Date: Sept 15, 2017  
 Revision: 1

Project Name

Suncor Adelaide Wind Power Project - Turbine T05 - IEC61400-11 Edition 3.0

Figure Title

Plot of sound pressure spectrum in 1/3 Octave at 11.5 m/s

Figure C.14

Table C.01 Detailed apparent sound power level data at hub height  
 Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

1/3 Octave values marked with brackets [ ] denote less than 3 dB difference between Turbine ON and Background

Overall levels marked with an asterisk \* denote 3 to 6 dB difference between Turbine ON and Background, while Overall values with less than 3 dB difference between Turbine ON and Background are not reported

Wind Bin (m/s)	Parameter	1/3 Octave Band (Hz)																		Overall										
		20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000		1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
7.0	Turbine ON (dBA)	9.0	13.4	17.5	20.9	24.8	31.5	31.1	34.3	36.9	38.6	39.6	40.5	40.7	39.6	39.2	39.9	38.8	39.0	39.0	39.0	38.9	39.3	38.6	37.5	35.0	32.3	28.8	24.8	51.6
	Background (dBA)	2.7	5.7	9.7	10.4	12.5	17.8	19.8	21.0	24.0	25.5	26.8	28.2	29.3	28.9	29.5	29.9	30.3	30.3	29.4	29.3	29.2	30.1	30.0	32.8	28.7	26.7	24.2	20.9	42.0
	Turbine ON - background adj (dBA)	7.9	12.6	16.7	20.5	24.5	31.3	30.8	34.0	36.6	38.4	39.4	40.3	40.4	39.2	38.7	39.5	38.1	38.4	38.5	38.5	38.4	38.7	38.0	35.6	33.9	30.9	27.0	22.5	51.1
	Signal to noise (dB)	6.4	7.7	7.8	10.4	12.3	13.8	11.4	13.3	12.8	13.2	12.9	12.3	11.5	10.7	9.7	10.0	8.5	8.7	9.6	9.6	9.6	9.2	8.6	4.6	6.3	5.6	4.6	3.9	9.6
	Uncertainty (dB)	1.4	1.3	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.4	1.3	1.5	2.0	3.1	0.8
7.5	PWL (dBA)	58.5	63.2	67.4	71.1	75.2	82.0	81.5	84.7	87.3	89.1	90.9	91.1	89.9	89.3	90.1	88.8	89.0	89.2	89.1	89.0	89.4	88.6	86.3	84.5	81.5	77.6	73.1	101.7	
	Turbine ON (dBA)	9.5	14.0	18.2	21.7	25.6	31.9	31.8	34.8	37.5	39.3	40.6	41.6	42.1	41.2	40.7	41.6	40.5	40.7	40.5	40.3	40.2	41.0	39.9	38.4	36.0	33.2	29.7	25.7	52.9
	Background (dBA)	3.7	6.3	10.1	10.9	12.8	17.9	20.4	21.9	25.0	26.7	27.4	29.0	29.5	28.8	30.3	30.5	31.1	31.1	30.4	30.2	29.9	30.8	30.3	31.7	28.2	26.1	23.5	20.2	42.3
	Turbine ON - background adj (dBA)	8.2	13.2	17.5	21.3	25.3	31.7	31.5	34.6	37.2	39.1	40.4	41.4	41.8	40.9	40.3	41.2	39.9	40.1	40.0	39.9	39.7	40.6	39.3	37.4	35.2	32.3	28.6	24.2	52.5
	Signal to noise (dB)	5.8	7.7	8.1	10.8	12.7	14.0	11.4	12.9	12.5	12.6	13.1	12.6	12.6	12.4	10.5	11.0	9.3	9.6	10.1	10.1	10.3	10.3	9.6	6.7	7.8	7.1	6.2	5.4	10.5
8.0	Uncertainty (dB)	1.4	1.2	0.9	0.8	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	1.0	1.0	1.1	1.2	2.1	0.7
	PWL (dBA)	58.9	63.8	68.2	72.0	76.0	82.4	82.1	85.2	87.9	89.7	91.0	92.0	92.5	91.6	91.0	91.9	90.6	90.8	90.7	90.5	90.4	91.3	90.0	88.0	85.9	82.9	79.2	74.8	103.1
	Turbine ON (dBA)	10.8	15.3	19.0	22.4	26.2	31.9	32.7	35.6	38.5	40.2	41.5	42.8	42.9	41.9	41.9	42.4	41.7	41.8	41.5	41.3	41.0	41.9	40.6	38.9	36.3	33.1	29.2	25.0	53.8
	Background (dBA)	7.6	10.0	12.3	13.2	16.9	19.8	21.2	23.0	26.2	27.2	28.7	29.7	29.4	28.6	30.0	29.9	30.9	30.8	30.3	30.5	30.2	30.7	30.4	31.4	28.5	26.5	24.0	20.7	42.4
	Turbine ON - background adj (dBA)	7.9	13.8	18.0	21.9	25.7	31.7	32.4	35.3	38.2	40.0	41.3	42.6	42.7	41.7	41.6	42.2	41.4	41.5	41.2	40.9	40.6	41.6	40.2	38.0	35.5	32.0	27.7	23.0	53.5
8.5	Signal to noise (dB)	3.2	5.3	6.7	9.3	9.3	12.1	11.5	12.6	12.3	13.0	12.9	13.1	13.6	13.3	11.9	12.5	10.9	11.0	11.2	10.8	10.8	11.2	10.2	7.5	7.7	6.6	5.3	4.3	11.4
	Uncertainty (dB)	2.5	1.5	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.4	2.5	0.8
	PWL (dBA)	58.5	64.4	68.6	72.5	76.3	82.3	83.0	86.0	88.9	90.6	92.0	93.2	93.4	92.3	92.2	92.8	92.0	92.1	91.8	91.6	91.3	92.2	90.9	88.7	86.1	82.7	78.3	73.6	104.1
	Turbine ON (dBA)	12.7	16.8	19.7	22.9	26.4	32.1	33.3	35.9	38.9	40.5	41.8	43.0	43.0	41.8	41.9	42.3	41.9	42.1	41.8	41.6	41.3	42.1	41.0	39.3	36.7	33.6	29.8	25.5	54.0
	Background (dBA)	8.7	11.4	13.6	14.8	16.2	19.9	21.7	23.5	26.4	27.5	28.7	30.2	30.1	29.7	30.8	30.6	31.6	31.6	31.4	32.0	32.0	32.7	32.5	33.4	30.7	28.9	26.3	22.6	43.7
9.0	Turbine ON - background adj (dBA)	10.6	15.3	18.5	22.2	26.0	31.8	32.9	35.7	38.7	40.3	41.6	42.8	42.7	41.5	41.6	42.0	41.5	41.6	41.4	41.1	40.8	41.6	40.4	38.0	35.5	31.9	27.2	[22.5]	53.6
	Signal to noise (dB)	4.1	5.4	6.1	8.1	10.2	12.2	11.5	12.4	12.5	13.0	13.1	12.8	12.9	12.1	11.1	11.8	10.3	10.4	10.4	9.6	9.3	9.5	8.5	5.9	6.0	4.8	3.5	2.9	10.3
	Uncertainty (dB)	2.1	1.6	1.1	1.0	0.9	0.8	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.2	1.2	1.5	2.2	3.6	0.8
	PWL (dBA)	61.2	65.9	69.1	72.8	76.6	82.4	83.6	86.3	89.3	91.0	92.2	93.4	93.4	92.1	92.2	92.7	92.2	92.3	92.0	91.7	91.4	92.3	91.0	88.6	86.2	82.5	77.9	[73.1]	104.2
	Turbine ON (dBA)	12.2	16.3	19.4	22.7	26.4	31.8	33.2	36.0	39.0	40.5	41.8	43.0	42.8	41.5	42.0	42.3	42.2	42.2	41.9	41.6	41.4	42.1	40.9	38.9	36.2	32.8	28.5	24.2	54.0
9.5	Background (dBA)	6.7	9.1	12.4	12.8	14.7	18.7	21.0	22.9	25.9	27.0	28.2	29.5	29.6	29.1	30.4	30.4	31.5	31.6	31.3	31.7	31.8	32.7	32.7	33.5	30.8	29.0	26.3	22.7	43.5
	Turbine ON - background adj (dBA)	10.7	15.4	18.5	22.2	26.1	31.6	32.9	35.8	38.8	40.3	41.6	42.8	42.6	41.3	41.7	42.0	41.8	41.8	41.5	41.2	40.9	41.5	40.1	37.5	34.8	30.4	[25.5]	[21.2]	53.6
	Signal to noise (dB)	5.5	7.2	7.1	9.9	11.6	13.2	12.2	13.1	13.2	13.6	13.6	13.5	13.2	12.4	11.7	11.9	10.7	10.7	10.6	9.9	9.6	9.3	8.2	5.5	5.4	3.7	2.2	1.4	10.4
	Uncertainty (dB)	1.5	1.2	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.9	0.9	1.2	1.2	1.8	2.3	3.3	0.8
	PWL (dBA)	61.4	66.0	69.1	72.9	76.7	82.3	83.6	86.4	89.5	91.0	92.2	93.5	93.2	91.9	92.4	92.6	92.5	92.5	92.1	91.8	91.5	92.2	90.8	88.1	85.4	81.0	[76.2]	[71.8]	104.2
10.0	Turbine ON (dBA)	12.6	16.8	19.6	22.6	26.2	31.8	32.8	35.6	38.7	40.2	41.4	42.7	42.7	41.5	41.9	42.3	42.1	42.2	41.8	41.5	41.2	42.1	40.8	38.8	36.2	32.8	28.5	24.1	53.8
	Background (dBA)	8.8	11.0	13.6	14.7	15.9	21.1	22.0	23.3	26.5	27.5	28.7	30.1	29.7	29.1	30.5	29.9	31.4	31.3	30.8	31.1	30.6	30.9	30.1	30.9	27.4	25.3	22.7	19.5	42.6
	Turbine ON - background adj (dBA)	10.3	15.4	18.3	21.9	25.8	31.4	32.4	35.3	38.4	39.9	41.2	42.4	42.4	41.2	41.5	42.0	41.7	41.8	41.4	41.1	40.8	41.7	40.4	38.1	35.6	31.9	27.2	22.3	53.5
	Signal to noise (dB)	3.8	5.7	6.0	7.9	10.3	10.6	10.8	12.2	12.2	12.7	12.6	12.9	12.4	11.4	12.3	10.7	10.9	11.0	10.4	10.6	11.2	10.7	7.9	8.8	7.5	5.8	4.6	11.2	
	Uncertainty (dB)	2.1	1.5	1.1	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.3	2.4	0.7
10.5	PWL (dBA)	60.9	66.1	69.0	72.5	76.4	82.0	83.0	85.9	89.0	90.6	91.8	93.1	93.1	91.9	92.2	92.6	92.4	92.5	92.1	91.7	91.5	92.4	91.0	88.7	86.2	82.5	77.9	72.9	104.1
	Turbine ON (dBA)	15.3	19.0	21.6	23.7	26.4	31.4	32.0	34.5	37.6	38.7	40.1	41.5	41.6	40.5	41.5	41.9	42.2	42.3	42.0	41.6	41.2	41.8	40.4	38.6	36.2	33.2	29.5	25.3	53.4
	Background (dBA)	8.3	11.2	13.4	14.1	17.2	19.0	20.3	22.1	25.6	26.7	27.6	29.0	28.7	28.3	30.4	29.7	31.4	31.2	32.6	30.7	30.3	30.6	30.0	30.7	27.8	25.7	23.2	20.0	42.3
	Turbine ON - background adj (dBA)	14.3	18.2	20.9	23.2	25.9	31.1	31.7	34.2	37.4	38.4	39.8	41.2	41.4	40.2	41.1	41.6	41.8	42.0	41.7	41.2	40.8	41.4	40.0	37.9	35.6	32.4	28.3	23.8	53.0
	Signal to noise (dB)	7.0	7.8	8.2	9.6	9.3	12.3	11.7	12.3	12.0	12.0	12.5	12.9	12.1	11.1	12.2	10.8	11.2	11.4	10.9	10.8	11.4	11.4	10.4	7.9	8.5	7.5	6.3	5.3	11.1
11.0	Uncertainty (dB)	1.4	1.3	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.1	1.3	2.2	0.7
	PWL (dBA)	65.0	68.8	71.5	73.8	76.5	81.7	82.4	84.9	88.0	89.0	90.5	91.8	92.0	90.9	91.8	92.2	92.5	92.6	92.3	91.8	91.4	92.0	90.6	88.5	86.2	83.0	79.0	74.5	103.7
	Turbine ON (dBA)	14.8	18.5	20.4	22.7	25.7	30.8	31.9	34.5	37.0	38.3	39.9	41.3	41.7	40.6	41.4	42.3	42.9	42.9	42.5	41.9	41.3	41.7	40.2	38.2	35.6	32.3	28.2	24.0	53.5
	Background (dBA)	6.7	9.6	12.2	13.1	14.7	19.2</																							

1/3 Octave values marked with brackets [ ] denote less than 3 dB difference between Turbine ON and Background

Overall levels marked with an asterisk \* denote 3 to 6 dB difference between Turbine ON and Background, while Overall values with less than 3 dB difference between Turbine ON and Background are not reported

Wind Bin (m/s)	Parameter	1/3 Octave Band (Hz)																			Overall									
		20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250		1600	2000	2500	3150	4000	5000	6300	8000	10000
11.0	Turbine ON (dBA)	15.4	19.3	21.3	23.6	26.0	30.9	31.9	33.9	36.9	38.1	39.6	41.2	41.4	40.3	41.8	42.1	42.9	43.0	42.6	42.0	41.3	41.3	39.8	37.8	35.1	31.5	27.2	22.9	53.4
	Background (dBA)	9.9	12.2	14.7	15.3	17.0	20.0	22.4	24.4	27.8	28.9	29.7	31.1	30.4	29.8	30.4	29.8	31.5	31.5	31.2	31.3	30.6	30.7	29.8	29.6	26.7	24.3	21.5	18.4	42.8
	Turbine ON - background adj (dBA)	14.0	18.3	20.2	22.9	25.5	30.5	31.3	33.4	36.4	37.5	39.1	40.8	41.0	39.9	41.5	41.8	42.6	42.7	42.3	41.6	40.9	40.9	39.3	37.0	34.4	30.5	25.8	21.0	53.0
	Signal to noise (dB)	5.5	7.0	6.6	8.2	9.1	10.9	9.5	9.5	9.1	9.1	9.9	10.2	11.0	10.5	11.4	12.3	11.4	11.5	11.4	10.7	10.7	10.6	10.0	8.2	8.4	7.2	5.7	4.5	10.6
	Uncertainty (dB)	1.6	1.4	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.9	0.9	1.0	1.0	1.1	1.4	2.5	0.8
	PWL (dBA)	64.6	69.0	70.9	73.5	76.1	81.2	82.0	84.1	87.0	88.1	89.7	91.4	91.7	90.5	92.1	92.5	93.2	93.3	92.9	92.3	91.5	91.5	89.9	87.7	85.0	81.2	76.5	71.6	103.6
11.5	Turbine ON (dBA)	14.7	18.3	20.6	22.8	25.7	30.8	31.7	33.8	36.8	37.9	39.4	41.1	41.4	40.4	41.8	42.2	42.9	43.1	42.7	42.1	41.3	41.3	39.7	37.6	34.9	31.2	26.7	22.2	53.4
	Background (dBA)	8.3	10.5	12.9	14.3	16.2	20.3	22.3	24.6	27.7	29.1	29.8	31.3	30.4	29.7	30.8	29.7	31.2	31.1	30.6	30.7	30.2	30.5	29.8	29.8	26.9	24.8	22.2	19.2	42.7
	Turbine ON - background adj (dBA)	13.6	17.5	19.8	22.2	25.2	30.4	31.2	33.3	36.2	37.3	38.9	40.6	41.0	40.0	41.5	41.9	42.6	42.8	42.4	41.8	41.0	40.9	39.2	36.8	34.1	30.1	24.7	19.2	53.0
	Signal to noise (dB)	6.4	7.8	7.7	8.6	9.5	10.5	9.4	9.2	9.0	8.8	9.6	9.8	11.0	10.7	11.0	12.4	11.8	12.0	12.1	11.4	11.2	10.8	9.9	7.8	7.9	6.4	4.5	3.0	10.7
	Uncertainty (dB)	1.5	1.3	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.9	0.9	1.0	1.0	1.2	1.7	3.4	0.8
	PWL (dBA)	64.2	68.2	70.5	72.8	75.8	81.0	81.8	83.9	86.8	87.9	89.5	91.3	91.7	90.7	92.1	92.6	93.3	93.4	93.1	92.4	91.6	91.6	89.8	87.4	84.7	80.7	75.4	69.9	103.6

1/3 Octave values marked with brackets [ ] denote less than 3 dB difference between Turbine ON and Background

Overall levels marked with an asterisk \* denote 3 to 6 dB difference between Turbine ON and Background, while Overall values with less than 3 dB difference between Turbine ON and Background are not reported

Wind Bin (m/s)	Parameter	1/3 Octave Band (Hz)																	Overall											
		20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630	800		1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000
5.0	Turbine ON (dBA)	8.9	13.5	18.0	21.5	25.5	31.9	31.6	34.6	37.3	39.1	40.4	41.5	42.0	41.2	40.7	41.5	40.3	40.5	40.3	40.1	40.0	40.9	39.7	38.3	35.9	33.2	29.8	25.7	52.7
	Background (dBA)	5.6	8.7	11.1	12.0	13.5	18.0	20.2	21.7	24.6	26.1	27.2	28.7	29.3	28.9	29.9	30.3	30.9	31.0	30.5	30.5	30.4	31.3	31.2	32.8	29.6	27.7	25.1	21.7	42.6
	Turbine ON - background adj (dBA)	6.2	11.8	17.0	21.0	25.2	31.7	31.3	34.4	37.0	38.9	40.2	41.2	41.8	40.9	40.3	41.2	39.8	40.0	39.8	39.6	39.4	40.4	39.0	36.9	34.7	31.7	28.0	23.5	52.3
	Signal to noise (dB)	3.3	4.8	6.9	9.6	12.0	13.9	11.4	12.9	12.7	13.0	13.2	12.7	12.7	12.3	10.7	11.2	9.4	9.5	9.8	9.7	9.6	9.6	8.5	5.5	6.3	5.5	4.7	4.0	10.1
	Uncertainty (dB)	2.9	2.2	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.3	1.3	1.6	1.6	1.7	2.0	3.7	1.2
6.0	PWL (dBA)	56.8	62.4	67.7	71.7	75.9	82.3	81.9	85.0	87.7	89.5	90.8	91.9	92.4	91.5	90.9	91.8	90.4	90.6	90.5	90.3	90.1	91.1	89.7	87.5	85.3	82.4	78.6	74.2	102.9
	Turbine ON (dBA)	12.1	16.3	19.4	22.7	26.3	31.9	33.1	35.9	38.9	40.5	41.7	42.9	42.9	41.7	41.9	42.3	42.0	42.1	41.8	41.5	41.3	42.0	40.8	39.0	36.4	33.1	29.1	24.8	53.9
	Background (dBA)	7.6	10.3	12.8	13.7	16.3	19.7	21.4	23.2	26.3	27.4	28.7	29.9	29.7	29.1	30.4	30.3	31.3	31.3	31.0	31.4	31.4	32.1	31.9	32.7	30.1	28.2	25.6	22.0	43.3
	Turbine ON - background adj (dBA)	10.2	15.0	18.4	22.1	25.9	31.7	32.8	35.6	38.6	40.2	41.5	42.7	42.7	41.4	41.6	42.0	41.6	41.7	41.4	41.1	40.8	41.6	40.2	37.8	35.2	31.4	26.5	[21.8]	53.5
	Signal to noise (dB)	4.5	6.0	6.6	9.0	10.0	12.3	11.7	12.7	12.6	13.1	13.1	13.2	12.6	11.5	12.0	10.7	10.7	10.8	10.1	9.8	9.9	9.9	8.9	6.3	6.3	4.9	3.5	2.7	10.7
7.0	Uncertainty (dB)	1.7	1.4	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	0.9	1.1	1.1	1.3	1.7	3.3	0.8
	PWL (dBA)	60.9	65.6	69.0	72.7	76.5	82.3	83.4	86.3	89.3	90.9	92.2	93.4	93.3	92.1	92.3	92.7	92.2	92.3	92.0	91.7	91.4	92.2	90.9	88.5	85.9	82.0	77.2	[72.4]	104.2
	Turbine ON (dBA)	14.6	18.3	20.8	23.1	26.2	31.3	32.2	34.8	37.8	39.0	40.4	41.8	41.9	40.8	41.7	42.1	42.4	42.5	42.1	41.7	41.2	41.8	40.5	38.6	36.1	32.9	28.9	24.7	53.5
	Background (dBA)	7.9	10.5	12.9	13.9	15.9	19.9	21.3	23.0	26.5	27.5	28.5	29.9	29.5	28.9	30.4	29.8	31.4	31.2	30.8	31.0	30.5	30.8	30.1	30.7	27.5	25.4	23.0	19.8	42.5
	Turbine ON - background adj (dBA)	13.5	17.6	20.0	22.6	25.7	31.0	31.8	34.5	37.4	38.7	40.1	41.5	41.7	40.5	41.4	41.8	42.1	42.2	41.8	41.3	40.9	41.5	40.0	37.8	35.4	32.0	27.7	23.0	53.2
8.0	Signal to noise (dB)	6.7	7.9	7.8	9.2	10.3	11.4	10.9	11.9	11.3	11.5	11.9	11.9	12.4	11.9	11.4	12.3	11.0	11.3	11.4	10.7	10.7	11.0	10.4	7.9	8.6	7.5	6.0	4.9	11.0
	Uncertainty (dB)	1.4	1.2	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.9	0.9	1.0	0.9	1.0	1.2	2.3	0.8
	PWL (dBA)	64.2	68.2	70.6	73.2	76.4	81.6	82.5	85.2	88.1	89.3	90.8	92.1	92.3	91.2	92.0	92.5	92.7	92.8	92.4	91.9	91.5	92.1	90.7	88.4	86.1	82.6	78.3	73.7	103.8
	Turbine ON (dBA)	15.0	18.7	20.8	23.1	25.8	30.8	31.8	33.7	36.7	37.9	39.3	41.0	41.3	40.3	41.8	42.1	42.9	43.1	42.8	42.1	41.4	41.3	39.7	37.7	35.0	31.4	27.0	22.7	53.3
	Background (dBA)	8.8	11.0	13.4	14.6	16.7	20.2	22.6	24.4	27.7	28.9	29.7	31.2	30.4	29.7	30.8	29.8	31.3	31.3	30.9	31.1	30.5	30.8	30.1	30.0	27.1	24.9	22.2	19.1	42.8
9.0	Turbine ON - background adj (dBA)	13.8	17.9	20.0	22.4	25.2	30.4	31.2	33.2	36.1	37.3	38.7	40.5	40.9	39.9	41.4	41.9	42.6	42.8	42.5	41.8	41.0	40.9	39.2	36.8	34.2	30.2	25.3	20.2	52.9
	Signal to noise (dB)	6.2	7.7	7.5	8.5	9.1	10.5	9.2	9.3	9.0	8.9	9.5	9.8	10.9	10.6	11.0	12.4	11.6	11.8	11.9	11.1	10.9	10.5	9.6	7.7	7.9	6.4	4.8	3.6	10.5
	Uncertainty (dB)	1.4	1.2	1.0	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.4	2.8	0.8	
	PWL (dBA)	64.4	68.5	70.6	73.1	75.9	81.0	81.9	83.8	86.8	87.9	89.4	91.1	91.6	90.5	92.1	92.5	93.3	93.4	93.1	92.4	91.6	91.6	89.9	87.5	84.8	80.9	75.9	70.8	103.6
	Turbine ON (dBA)	15.0	19.0	21.2	23.1	25.8	30.8	31.8	33.2	36.1	37.1	38.4	40.1	40.9	40.1	41.6	42.2	43.0	43.3	43.1	42.5	41.6	41.4	39.7	37.5	34.7	31.1	26.7	22.3	53.3
9.0	Background (dBA)	8.9	11.3	14.1	15.2	16.9	20.4	22.5	24.6	27.9	28.9	30.1	31.4	30.7	30.0	31.4	30.2	31.9	31.7	31.1	31.4	31.0	31.3	30.8	30.5	28.2	26.1	23.4	20.2	43.3
	Turbine ON - background adj (dBA)	13.7	18.1	20.3	22.3	25.2	30.4	31.3	32.6	35.3	36.4	37.7	39.5	40.5	39.7	41.2	41.9	42.7	43.0	42.8	42.1	41.2	41.0	39.1	36.6	33.7	29.4	23.9	[19.3]	52.8
	Signal to noise (dB)	6.1	7.7	7.1	7.8	8.9	10.4	9.3	8.6	8.1	8.2	8.3	8.7	10.3	10.2	10.2	12.0	11.1	11.6	12.0	11.0	10.6	10.1	8.9	7.0	6.6	4.9	3.2	2.1	10.0
	Uncertainty (dB)	1.8	1.5	1.3	1.2	1.1	1.0	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.9	1.0	1.1	1.2	1.3	1.6	2.5	4.0	0.9
	PWL (dBA)	64.4	68.8	70.9	72.9	75.8	81.0	81.9	83.2	86.0	87.1	88.3	90.1	91.1	90.4	91.9	92.6	93.3	93.7	93.5	92.7	91.8	91.6	89.8	87.2	84.3	80.0	74.5	[69.9]	103.5

Table C.03 Type B measurement uncertainty summary

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement

Report ID: 14215.01.T05.RP6

Overall Equipment Uncertainties		
	Typical values	Used values
Calibration	0.2 dB	0.2 dB
Board	0.3 dB	0.3 dB
Distance	0.1 dB	0.1 dB
Air absorption	0 dB	0 dB
Weather	0.5 dB	0.5 dB

1/3 Octave Band Uncertainties		
Frequency (Hz)	Microphone Uncertainty	Overall (including overall equipment Uncertainties)
20	0.8 dB	1 dB
25	0.8 dB	1 dB
31.5	0.5 dB	0.8 dB
40	0.5 dB	0.8 dB
50	0.5 dB	0.8 dB
63	0.5 dB	0.8 dB
80	0.5 dB	0.8 dB
100	0.5 dB	0.8 dB
125	0.5 dB	0.8 dB
160	0.5 dB	0.8 dB
200	0.3 dB	0.7 dB
250	0.3 dB	0.7 dB
315	0.3 dB	0.7 dB
400	0.3 dB	0.7 dB
500	0.3 dB	0.7 dB
630	0.3 dB	0.7 dB
800	0.3 dB	0.7 dB
1000	0.3 dB	0.7 dB
1250	0.3 dB	0.7 dB
1600	0.3 dB	0.7 dB
2000	0.3 dB	0.7 dB
2500	0.5 dB	0.8 dB
3150	0.5 dB	0.8 dB
4000	0.5 dB	0.8 dB
5000	0.5 dB	0.8 dB
6300	0.5 dB	0.8 dB
8000	0.5 dB	0.8 dB
10000	1.3 dB	1.4 dB



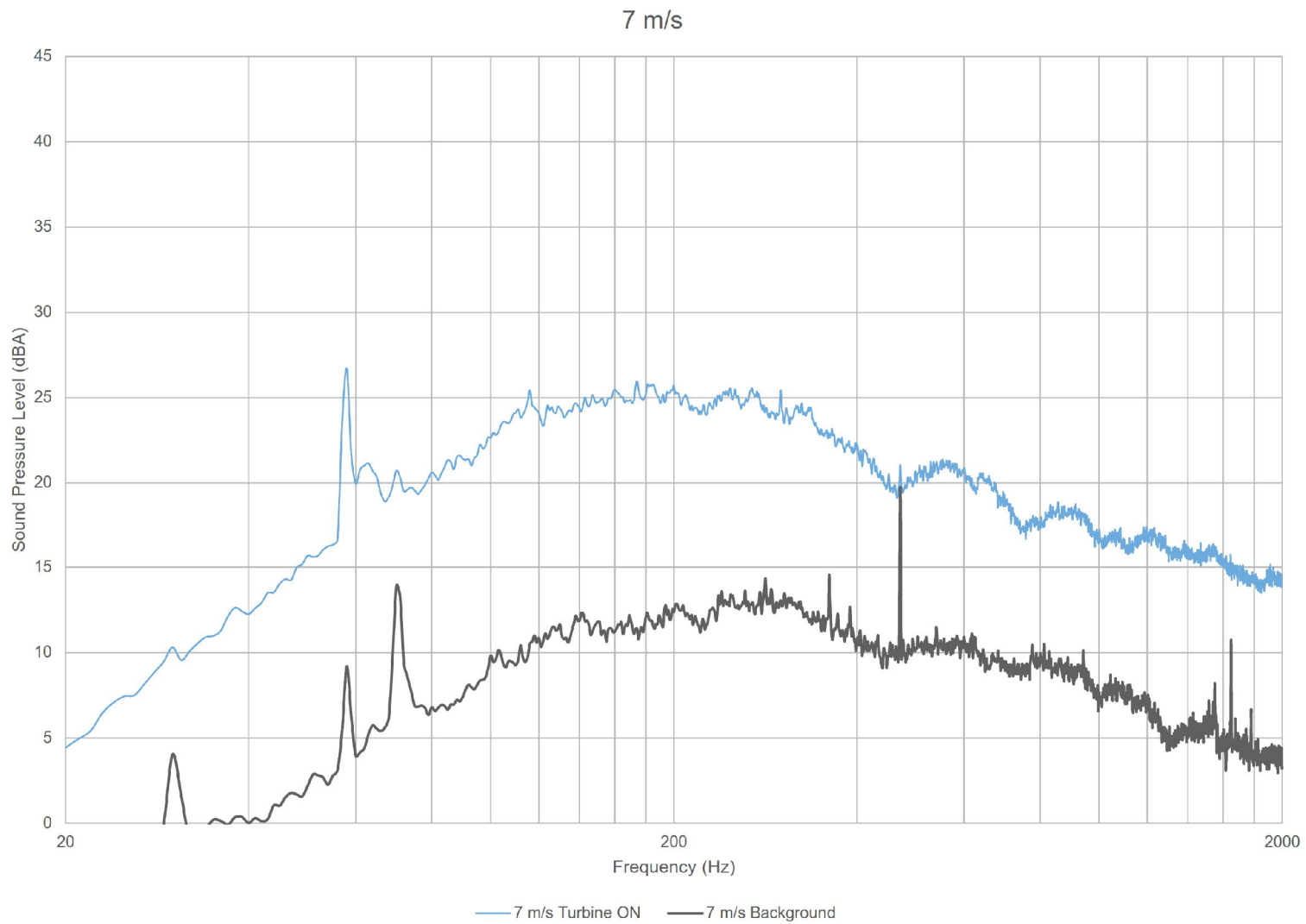


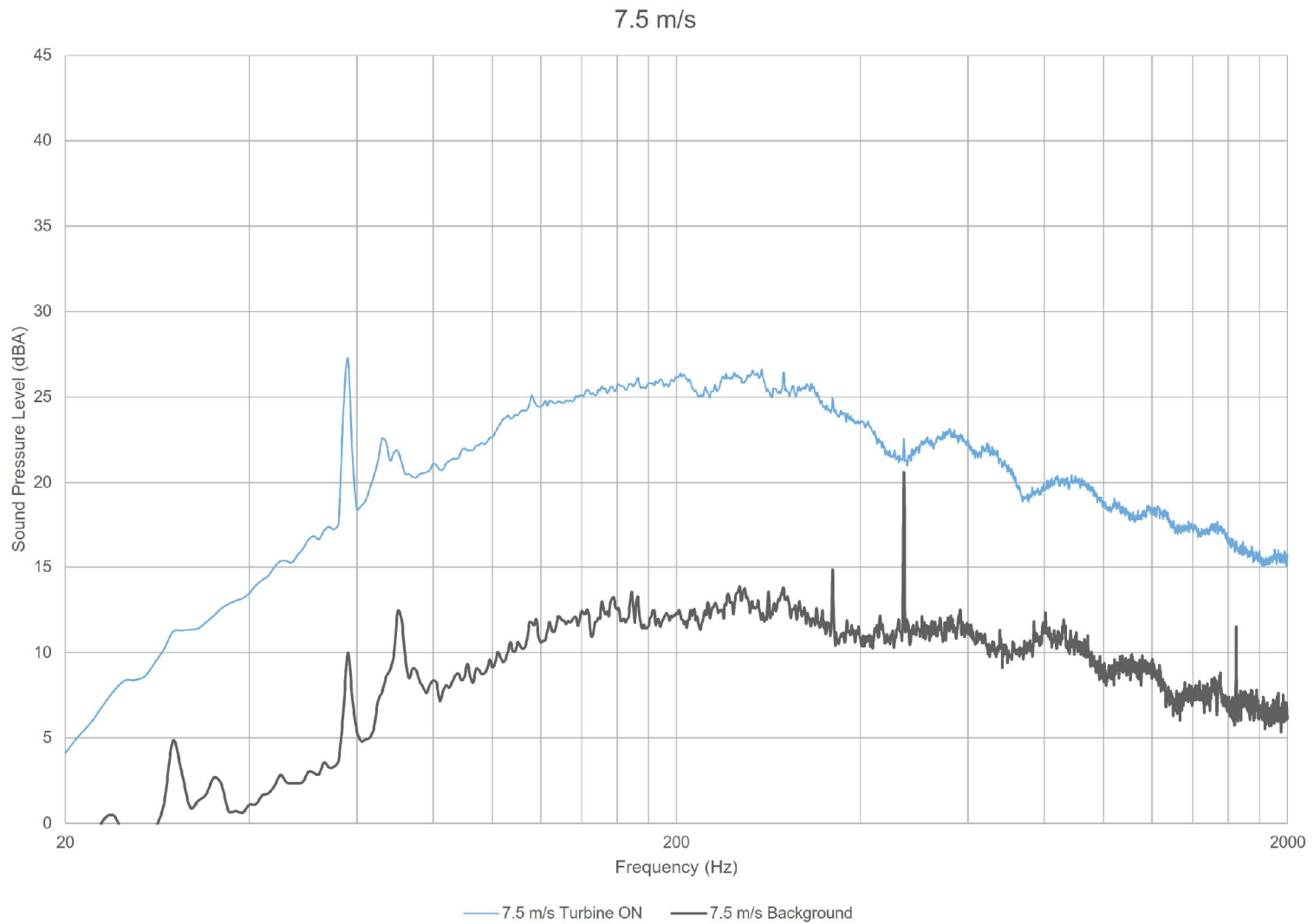
Wind Bin (m/s)	Parameter	Average Wind Speed (m/s)	# of data points	Parameter	1/3 Octave Band (Hz)																Overall													
					20	25	31.5	40	50	63	80	100	125	160	200	250	315	400	500	630		800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	
10.0	Turbine ON	9.97	133	Average (dBA)	15.4	19.0	21.7	23.7	26.5	31.4	32.0	34.5	37.7	38.7	40.1	41.5	41.6	40.5	41.4	41.8	42.2	42.3	41.9	41.5	41.2	41.8	40.4	38.7	36.3	33.3	29.6	25.5	53.4	
				Uncertainty A (dB)	0.4	0.4	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.7
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.0	1.6
Background	10.01	17	Average (dBA)	8.2	11.2	13.4	14.1	17.2	19.0	20.3	22.1	25.6	26.7	27.5	29.0	28.7	28.3	30.4	29.7	31.4	31.2	30.5	30.6	30.3	30.6	30.0	30.7	27.8	25.7	23.2	20.0	42.3		
			Uncertainty A (dB)	2.2	2.0	1.2	1.5	1.5	0.7	0.7	0.7	0.8	0.8	0.7	0.6	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.3	1.5	1.5	1.2			
			Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
			Combined Uncertainty (dB)	2.4	2.2	1.4	1.7	1.7	1.0	1.0	1.1	1.2	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.4	1.5	1.7	1.7	1.9		
10.5	Turbine ON	10.46	121	Average (dBA)	14.8	18.4	20.4	22.7	25.7	30.8	31.9	34.5	37.0	38.3	39.9	41.3	41.7	40.6	41.9	42.3	42.9	43.0	42.5	41.9	41.3	41.7	40.2	38.2	35.6	32.3	28.2	24.0	53.5	
				Uncertainty A (dB)	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.4	0.6	0.7
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4
				Combined Uncertainty (dB)	1.1	1.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.0	1.6
Background	10.46	23	Average (dBA)	6.5	9.3	12.0	12.9	14.5	19.1	21.2	23.3	27.0	28.2	29.1	30.4	29.9	29.3	30.3	29.9	31.3	31.3	30.9	31.2	30.7	30.8	30.0	30.3	27.2	25.1	22.8	19.6	42.6		
			Uncertainty A (dB)	1.3	1.1	0.8	0.9	0.7	0.4	0.4	0.6	0.7	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.6	0.9	1.0	1.2	1.2	0.9			
			Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	1.4		
			Combined Uncertainty (dB)	1.7	1.5	1.1	1.2	1.0	0.9	0.9	1.0	1.1	1.1	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	1.0	1.2	1.3	1.4	1.5	1.7		
11.0	Turbine ON	10.99	111	Average (dBA)	15.4	19.3	21.3	23.6	26.1	30.9	31.9	33.9	36.9	38.1	39.5	41.2	41.4	40.3	41.8	42.1	42.9	43.0	42.6	42.0	41.3	41.3	39.7	37.7	35.1	31.4	27.1	22.9	53.4	
				Uncertainty A (dB)	0.4	0.3	0.3	0.3	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.6	
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.0	1.6
Background	11.02	15	Average (dBA)	10.1	12.3	14.8	15.4	17.1	20.0	22.4	24.5	27.9	29.0	29.7	31.1	30.4	29.8	30.4	29.8	31.5	31.5	31.3	31.4	30.6	30.7	29.8	29.6	26.6	24.2	21.4	18.4	42.8		
			Uncertainty A (dB)	1.7	1.6	1.3	1.1	1.0	0.4	0.4	0.7	0.7	0.7	0.6	0.6	0.4	0.5	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.7	1.2	1.3	1.5	1.4	1.0			
			Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	1.4		
			Combined Uncertainty (dB)	2.0	1.9	1.5	1.4	1.3	0.9	0.9	1.0	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.0	1.1	1.4	1.5	1.7	1.6	1.8	
11.5	Turbine ON	11.46	108	Average (dBA)	14.7	18.3	20.6	22.8	25.7	30.8	31.7	33.8	36.8	37.9	39.4	41.1	41.4	40.4	41.8	42.2	42.9	43.1	42.7	42.1	41.3	41.3	39.7	37.6	34.9	31.2	26.6	22.2	53.4	
				Uncertainty A (dB)	0.4	0.3	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.5	0.6	
				Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	1.5
Background	11.52	19	Average (dBA)	8.2	10.5	12.8	14.2	16.2	20.3	22.3	24.6	27.7	29.1	29.8	31.3	30.4	29.7	30.8	29.7	31.1	31.0	30.5	30.7	30.2	30.5	29.8	29.8	26.9	24.8	22.2	19.2	42.7		
			Uncertainty A (dB)	1.6	1.4	0.9	1.0	0.8	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.4	0.3	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.7	1.1	1.2	1.4	1.4	1.0		
			Uncertainty B (dB)	1.0	1.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
			Combined Uncertainty (dB)	1.9	1.7	1.2	1.3	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.9	1.0	1.4	1.4	1.6	1.6	1.8	

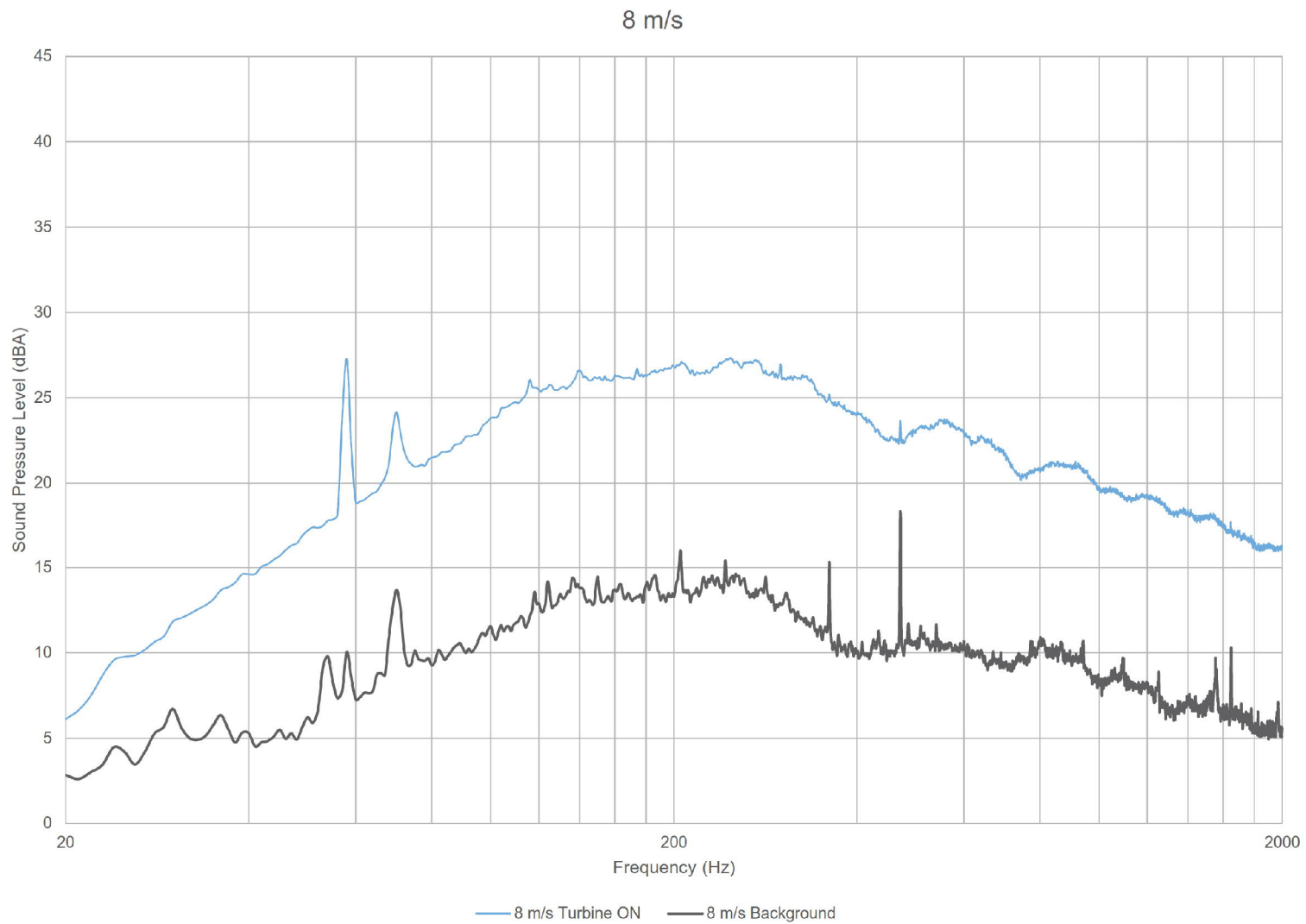
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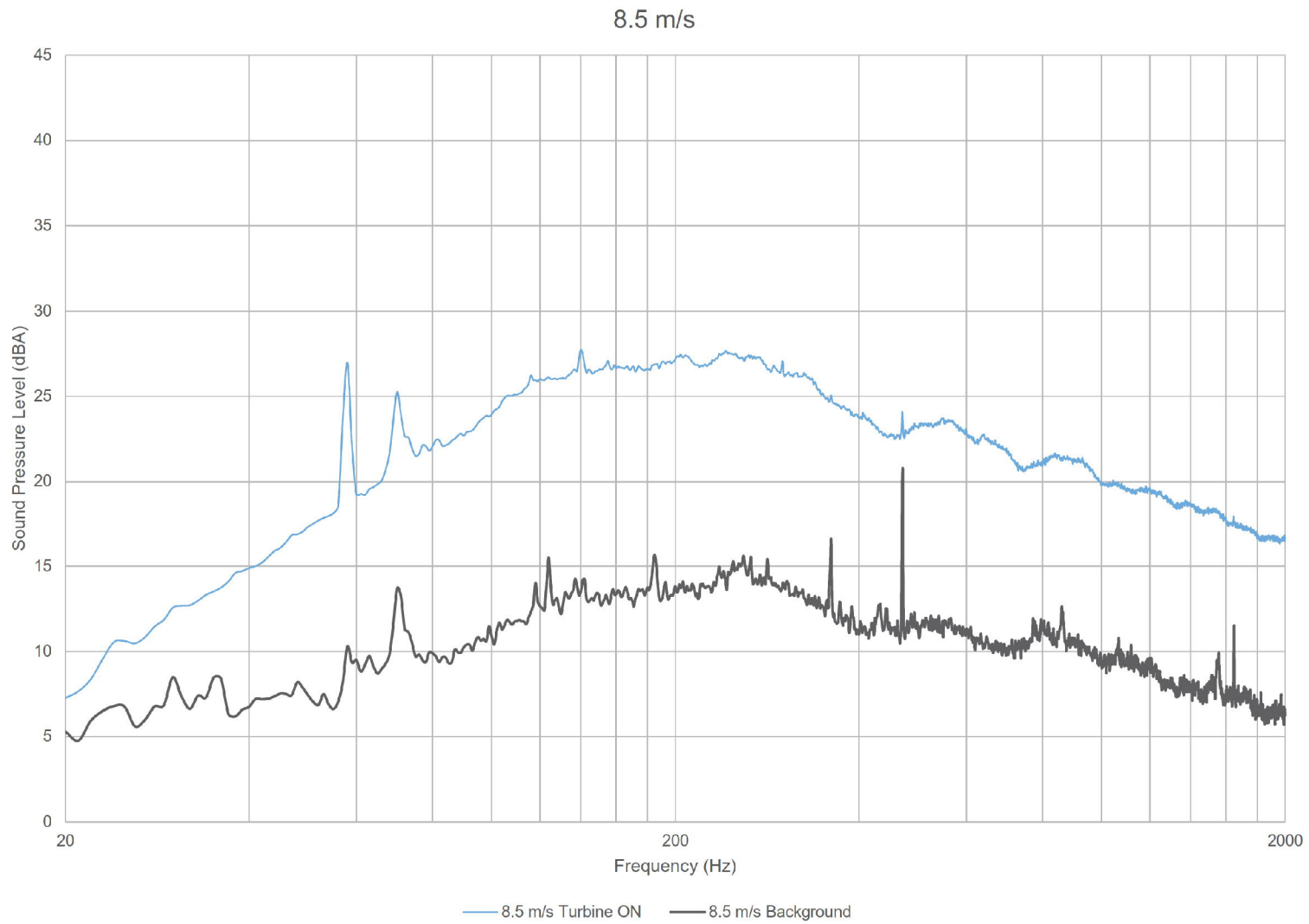
## Appendix D Tonality Assessment

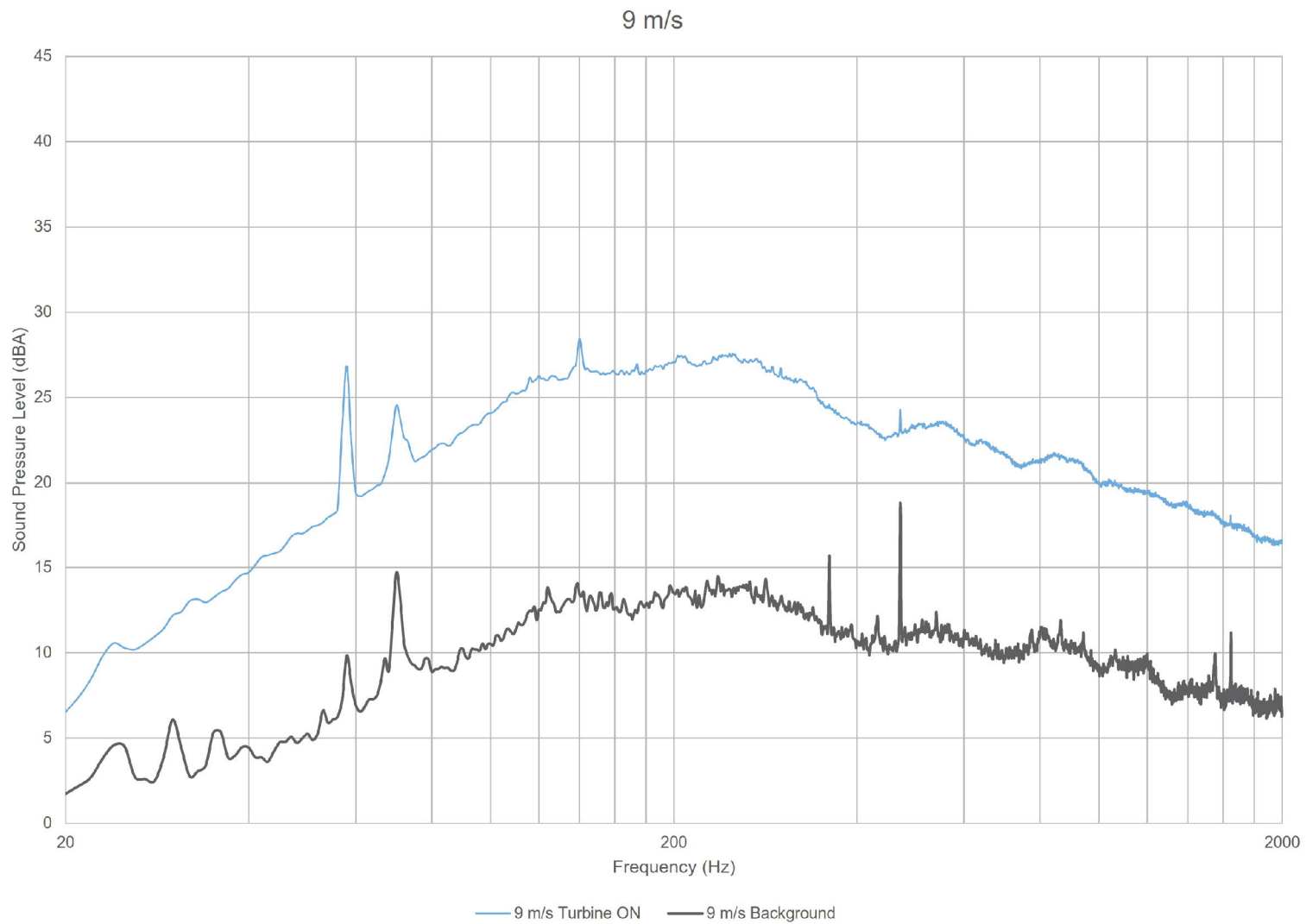
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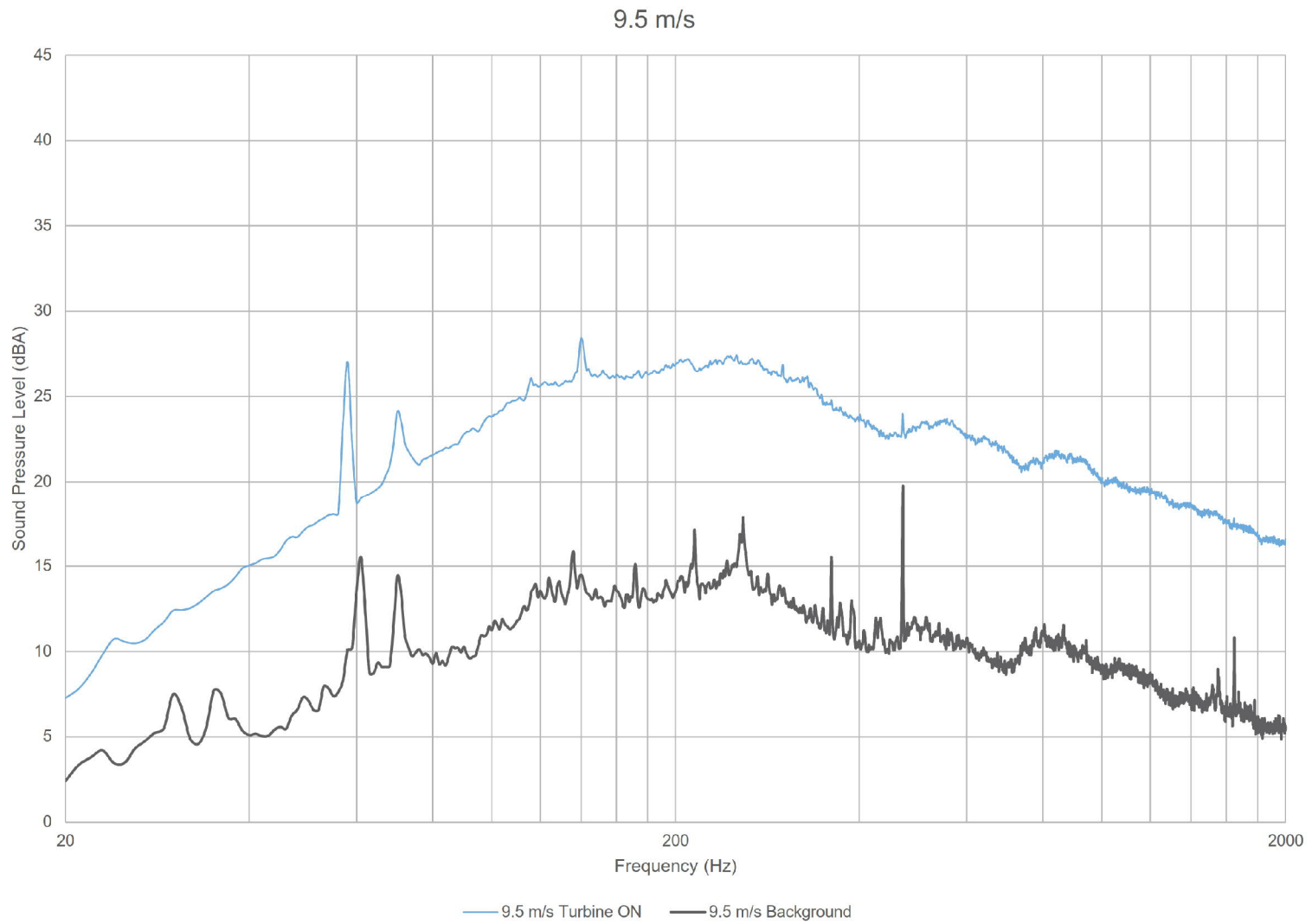


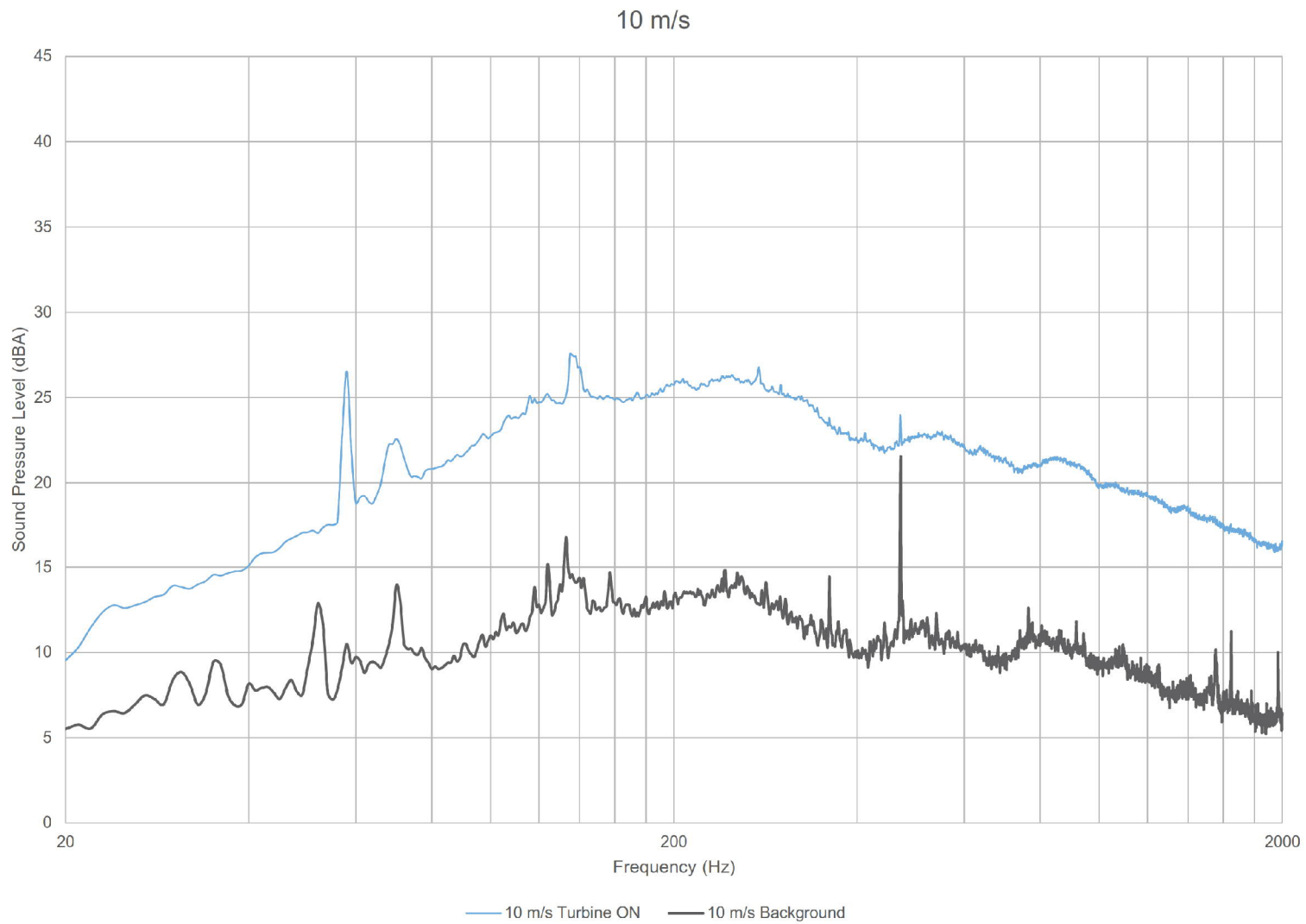


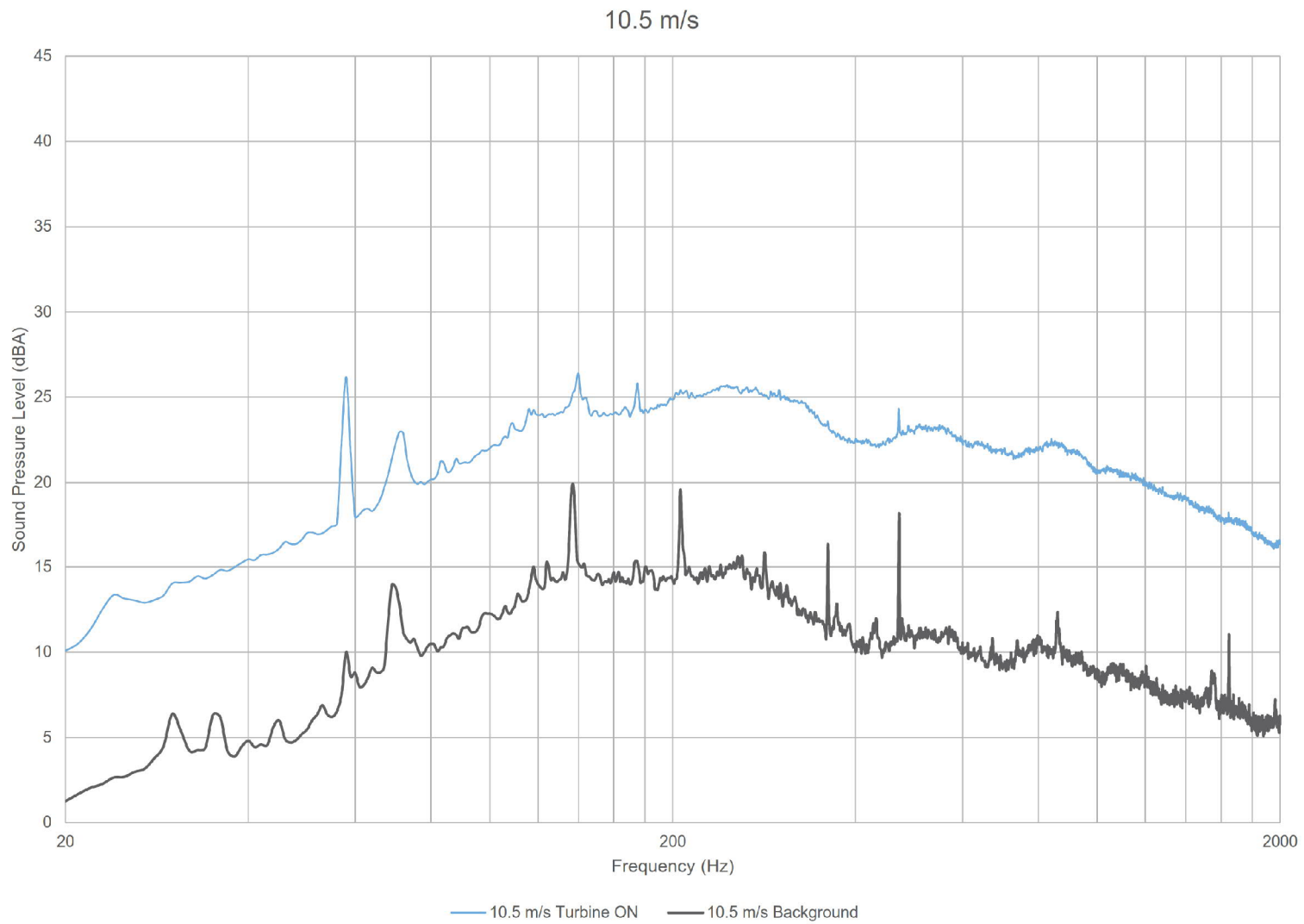


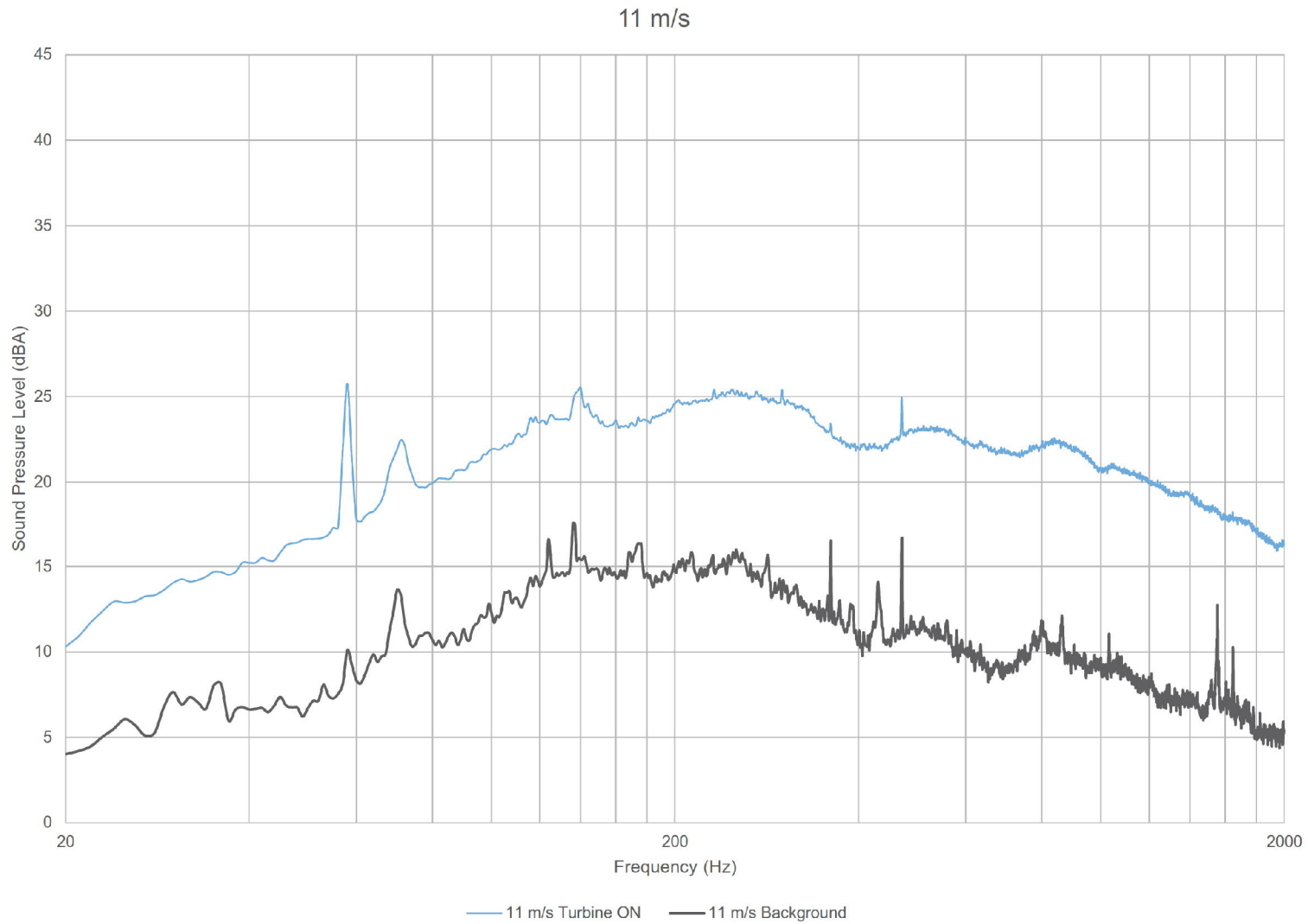


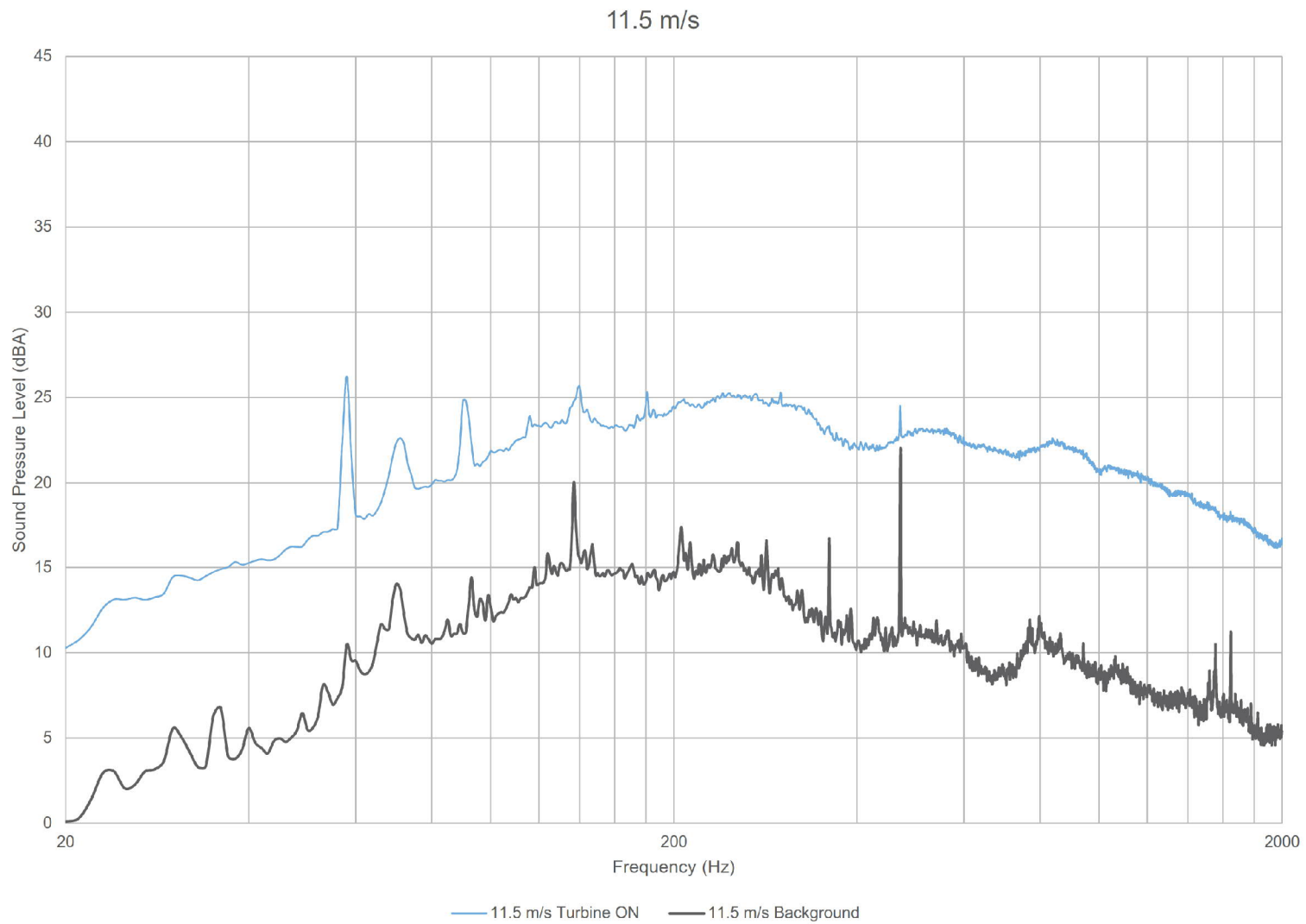












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## Appendix E Measurement Data

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# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 1 of 9  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Wind	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
1			1578	346.0	2.0	4.8	13.0	9.5	3.0	11.8	98.5	-
2	8.8	54.6	1857	346.0	354.6	4.8	13.1	9.0	3.8	11.8	98.5	-
3			2246	346.0	354.7	4.8	13.6	9.8	5.6	11.8	98.5	-
4			2236	346.0	354.6	4.8	13.4	9.1	5.5	11.8	98.5	-
5	10.6	53.7	2202	346.0	354.6	4.8	12.8	10.8	6.3	11.8	98.5	-
6			2238	346.0	354.6	4.8	12.9	9.2	3.3	11.8	98.5	-
7	11.7	53.6	2259	346.0	354.6	4.8	13.6	11.8	4.5	11.8	98.5	-
8			2257	346.0	354.6	4.8	13.2	10.2	4.8	11.8	98.5	-
9	10.2	53.1	2181	346.0	354.6	4.8	12.8	11.2	4.8	11.8	98.5	-
10	10.1	53.0	2177	346.0	354.6	4.8	12.7	10.9	4.1	11.7	98.5	-
11	11.1	53.2	2202	346.0	354.6	4.8	12.8	11.3	5.4	11.7	98.5	-
12	13.6	53.8	2256	346.0	354.6	4.8	13.7	13.8	4.4	11.7	98.5	-
13	11.6	54.8	2256	346.0	356.1	4.8	13.4	11.8	5.8	11.7	98.5	-
14			2241	346.0	0.1	4.8	12.9	11.9	7.6	11.7	98.5	-
15			2222	346.0	0.1	4.8	13.0	12.6	7.3	11.7	98.5	-
16			2237	346.0	0.1	4.8	13.1	12.4	4.3	11.7	98.5	-
17			2258	346.0	0.1	4.8	13.2	13.3	5.2	11.7	98.5	-
18			2251	346.0	0.1	4.8	13.2	11.4	5.5	11.7	98.5	-
19			2270	346.0	0.1	4.8	13.2	12.5	6.8	11.7	98.5	-
20			2180	346.0	0.1	4.8	12.8	12.4	7.8	11.7	98.5	-
21			2189	346.0	0.1	4.8	12.7	12.4	4.6	11.7	98.5	-
22	11.5	52.7	2242	346.0	359.0	4.8	13.1	11.7	4.1	11.6	98.5	-
23	11.7	52.6	2218	346.0	359.0	4.8	12.9	11.9	6.8	11.6	98.5	-
24	10.7	52.6	2271	346.0	359.0	4.8	13.1	10.9	4.4	11.6	98.5	-
25	12.1	52.3	2236	346.0	359.0	4.8	13.0	12.3	5.5	11.6	98.5	-
26	9.9	51.9	2153	346.0	354.6	4.8	12.5	12.1	3.3	11.6	98.5	-
27	9.8	51.8	2222	346.0	352.7	4.8	12.5	11.0	3.4	11.6	98.5	-
28	11.6	53.0	2252	346.0	352.7	4.8	13.3	11.8	3.1	11.6	98.5	-
29	12.1	53.7	2228	346.0	352.7	4.8	13.7	12.3	5.6	11.6	98.5	-
30	10.8	53.2	2286	346.0	352.7	4.8	13.3	10.9	2.5	11.6	98.5	-
31	10.0	53.0	2240	346.0	352.7	4.8	13.0	11.2	4.1	11.6	98.5	-
32	11.2	52.2	2190	346.0	352.7	4.8	12.7	11.3	3.5	11.6	98.5	-
33	10.6	52.9	2222	346.0	352.7	4.8	13.0	10.8	5.6	11.6	98.5	-
34	12.6	53.1	2221	346.0	352.7	4.8	13.3	12.7	5.4	11.6	98.5	-
35	11.4	52.7	2246	346.0	352.7	4.8	13.1	11.6	4.6	11.6	98.5	-
36	11.7	52.4	2205	346.0	352.7	4.8	12.7	11.8	3.9	11.6	98.5	-
37	10.3	52.5	2217	346.0	352.7	4.8	12.7	10.5	3.9	11.6	98.5	-
38	11.5	52.2	2218	346.0	352.7	4.8	12.9	11.7	2.9	11.6	98.5	-
39			2231	346.0	352.7	4.8	13.1	9.8	6.6	11.6	98.5	-
40	9.8	51.8	2138	346.0	352.7	4.8	12.5	10.7	7.4	11.6	98.5	-
41	12.2	53.3	2249	346.0	352.7	4.8	13.2	12.4	4.1	11.6	98.5	-
42	11.6	53.9	2247	346.0	352.7	4.8	13.8	11.8	5.5	11.6	98.5	-
43	12.7	53.5	2287	346.0	352.7	4.8	13.4	12.9	5.9	11.6	98.5	-
44	12.2	53.4	2222	346.0	352.7	4.8	13.1	12.4	6.7	11.6	98.5	-
45	10.1	52.7	2179	346.0	352.7	4.8	12.7	11.8	6.4	11.6	98.5	-
46	11.2	51.9	2198	346.0	352.7	4.8	12.8	11.3	7.2	11.6	98.5	-
47	11.2	52.4	2251	346.0	352.7	4.8	13.0	11.3	5.4	11.6	98.5	-
48	11.2	53.2	2246	346.0	354.1	4.8	13.1	11.3	5.4	11.6	98.5	-
49	11.5	52.6	2195	346.0	354.1	4.8	12.6	11.7	5.4	11.6	98.5	-
50	11.8	52.6	2212	346.0	354.1	4.8	13.0	12.0	5.1	11.6	98.5	-
51	11.4	52.6	2241	346.0	354.1	4.8	13.2	11.6	4.6	11.6	98.5	-
52	11.7	52.5	2212	346.0	354.1	4.8	12.9	11.9	5.8	11.6	98.5	-
53	11.6	52.7	2227	346.0	354.1	4.8	12.9	11.8	4.9	11.6	98.5	-
54			2237	346.0	354.1	4.8	12.9	10.2	4.7	11.6	98.5	-
55	9.9	52.4	2154	346.0	354.1	4.8	12.4	10.1	3.9	11.6	98.5	-
56	11.9	53.1	2256	346.0	354.1	4.8	13.2	12.0	5.0	11.6	98.5	-
57	11.0	53.4	2229	346.0	354.1	4.8	13.6	11.2	6.4	11.6	98.5	-
58	12.2	53.5	2227	346.0	354.1	4.8	13.6	12.4	7.0	11.6	98.5	-
59	13.3	53.5	2267	346.0	354.1	4.8	13.1	13.5	6.3	11.6	98.5	-
60	11.9	53.0	2271	346.0	354.1	4.8	13.1	12.0	2.3	11.6	98.5	-
61	13.1	53.6	2244	346.0	354.1	4.8	13.3	13.3	6.5	11.6	98.5	-
62	12.9	53.4	2225	346.0	354.1	4.8	13.1	13.1	9.7	11.6	98.5	-
63	12.2	52.8	2192	346.0	354.1	4.8	12.8	12.4	8.4	11.6	98.5	-
64	9.9	53.7	2139	346.0	354.1	4.8	12.4	10.4	6.8	11.6	98.5	-
65	12.2	52.8	2244	346.0	354.1	4.8	13.1	12.3	4.4	11.6	98.5	-
66	11.6	53.0	2215	346.0	354.1	4.8	12.7	11.8	4.9	11.6	98.5	-
67			2200	346.0	357.2	4.8	12.7	10.3	5.7	11.6	98.5	-
68	10.1	54.1	2174	346.0	359.1	4.8	12.5	11.3	8.3	11.6	98.5	-
69	9.9	53.9	2142	346.0	359.0	4.8	12.5	9.9	15.7	11.1	98.5	-
70	9.5	53.1	2054	346.0	356.3	4.8	12.8	8.9	5.5	11.6	98.5	-
71	13.1	53.6	2258	346.0	354.5	4.8	13.7	13.3	4.4	11.6	98.5	-
72	12.0	53.6	2259	346.0	354.5	4.8	13.4	12.2	6.6	11.6	98.5	-
73	10.9	52.8	2255	346.0	357.4	4.8	13.0	11.1	4.5	11.6	98.5	-
74			2256	346.0	1.4	4.8	12.5	10.6	5.4	11.6	98.5	-
75			2198	346.0	1.4	4.8	12.8	9.5	7.0	11.6	98.5	-
76			2177	346.0	1.4	4.8	12.7	9.3	5.9	11.6	98.5	-
77			1981	346.0	1.4	4.8	12.9	9.3	4.2	11.6	98.5	-
78			1926	346.0	1.4	4.8	12.9	10.9	3.6	11.6	98.5	-
79			1825	346.0	1.4	4.8	12.9	12.2	4.2	11.6	98.5	-
80			1709	346.0	1.4	4.8	12.9	8.6	6.0	11.6	98.5	-
81			1540	346.0	1.4	4.8	12.9	8.4	4.4	11.6	98.5	-
82	8.2	53.7	1559	346.0	357.7	4.8	13.0	8.0	5.4	11.6	98.5	-
83	7.8	53.2	1375	346.0	357.7	4.8	12.8	9.1	5.5	11.6	98.5	-
84	9.6	53.8	2083	346.0	357.7	4.8	13.2	9.6	5.6	11.6	98.5	-
85	9.9	54.1	2143	346.0	357.7	4.8	13.1	9.6	7.2	11.6	98.5	-
86	9.0	54.6	1947	346.0	357.7	4.8	13.0	10.5	5.3	11.6	98.5	-
87			2240	346.0	357.7	4.8	13.2	9.6	5.0	11.6	98.5	-
88			2240	346.0	357.7	4.8	13.9	10.1	7.0	11.5	98.5	-

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Wind	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
89	10.5	53.5	2224	346.0	357.7	4.8	13.5	10.7	6.5	11.5	98.5	-
90	11.3	52.9	2278	346.0	357.7	4.8	12.9	11.5	5.7	11.5	98.5	-
91	12.3	53.4	2243	346.0	357.6	4.8	13.4	12.4	3.7	11.5	98.5	-
92	11.8	54.3	2251	346.0	357.6	4.8	13.0	11.9	6.3	11.5	98.5	-
93	9.9	53.6	2140	346.0	357.6	4.8	12.5	10.4	6.9	11.5	98.5	-
94	13.0	53.1	2253	346.0	357.6	4.8	13.1	13.2	6.9	11.5	98.5	-
95	12.0	53.4	2232	346.0	357.6	4.8	13.2	12.2	5.1	11.5	98.5	-
96	12.4	53.0	2282	346.0	357.6	4.8	13.4	12.6	7.7	11.5	98.5	-
97			2256	346.0	357.6	4.8	13.2	10.3	6.2	11.5	98.5	-
98			2180	346.0	357.6	4.8	12.7	12.7	5.2	11.5	98.5	-
99	10.2	52.6	2175	346.0	283.3	4.8	12.7	11.4	4.3	11.5	98.5	-
100			2227	346.0	0.1	4.8	13.0	11.5	6.7	11.5	98.5	-
101			2233	346.0	0.1	4.8	12.9	11.5	6.0	11.5	98.5	-
102			2212	346.0	0.1	4.8	12.7	12.3	4.0	11.5	98.5	-
103			2143	346.0	0.1	4.8	12.4	10.7	3.5	11.5	98.5	-
104			2210	346.0	0.1	4.8	12.7	10.8	5.1	11.5	98.5	-
105	11.0	53.5										

# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
Report ID: 14215.01.T05.RP6

Page 2 of 9  
Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Wind	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
177	9.4	54.0	2034	346.0	349.2	4.8	13.1	10.1	2.9	11.1	98.5	-
178	9.0	53.9	1931	346.0	349.2	4.8	12.9	10.0	2.8	11.1	98.5	-
179	8.9	53.8	1909	346.0	349.2	4.8	13.0	9.2	3.3	11.1	98.5	-
180	8.9	53.7	1886	346.0	349.2	4.8	13.0	10.0	4.7	11.1	98.5	-
181	8.7	53.7	1804	346.0	349.2	4.8	13.0	9.2	3.8	11.1	98.5	-
182	9.3	53.6	2007	346.0	349.2	4.8	13.1	8.8	3.3	11.1	98.5	-
183	8.9	53.7	1925	346.0	349.2	4.8	13.0	9.4	1.1	11.1	98.5	-
184	9.4	53.9	2044	346.0	349.2	4.8	13.1	6.6	2.6	11.1	98.5	-
185	9.5	54.1	2061	346.0	349.2	4.8	13.0	11.4	4.6	11.1	98.5	-
186	10.0	54.1	2167	346.0	349.2	4.8	13.0	10.9	2.3	11.1	98.5	-
187	9.3	53.6	2024	346.0	349.2	4.8	13.0	9.5	3.8	11.1	98.5	-
188	9.2	53.9	1995	346.0	349.2	4.8	13.0	9.0	5.2	11.1	98.5	-
189	9.0	53.7	1936	346.0	349.2	4.8	13.0	10.2	4.7	11.1	98.5	-
190	8.7	53.6	1823	346.0	349.2	4.8	12.9	8.7	3.4	11.1	98.5	-
191	9.1	53.6	1963	346.0	349.2	4.8	13.0	8.4	5.1	11.1	98.5	-
192	8.5	53.8	1700	346.0	349.2	4.8	12.9	8.8	5.7	11.1	98.5	-
193	8.0	53.0	1480	346.0	349.2	4.8	12.9	9.4	3.4	11.1	98.5	-
194	7.9	53.4	1416	346.0	353.6	4.8	12.9	7.1	3.8	11.1	98.5	-
195	7.7	53.2	1326	346.0	353.9	4.8	12.6	7.5	5.2	11.1	98.5	-
196	7.5	52.4	1230	346.0	353.9	4.8	12.3	6.7	5.7	11.1	98.5	-
197	8.6	52.7	1741	346.0	353.9	4.8	13.2	9.0	4.9	11.1	98.5	-
198	8.7	53.3	1804	346.0	353.9	4.8	13.0	11.5	4.4	11.1	98.5	-
199	8.4	53.6	1644	346.0	351.5	4.8	13.0	7.6	2.3	11.1	98.5	-
200	8.4	53.7	1685	346.0	351.5	4.8	12.9	8.2	4.2	11.1	98.5	-
201	7.8	53.0	1376	346.0	351.5	4.8	12.8	6.3	4.0	11.1	98.5	-
202	7.6	52.8	1256	346.0	351.5	4.8	12.3	6.3	3.8	11.1	98.5	-
203	7.1	52.5	1085	346.0	351.5	4.8	11.6	6.7	5.7	11.1	98.5	-
204	6.9	50.5	935	346.0	351.5	4.8	11.1	4.1	3.2	11.1	98.5	-
205	6.5	49.6	810	346.0	351.5	4.8	10.6	5.5	2.7	11.1	98.5	-
206	6.5	49.0	788	346.0	348.3	4.8	10.6	4.4	3.4	11.1	98.5	-
207	49.2	62.8	347.8	346.0	347.8	4.8	11.7	6.6	2.6	11.1	98.5	-
208	6.9	49.9	969	346.0	347.8	4.8	11.3	6.9	4.0	11.0	98.5	-
209	7.7	51.7	1306	346.0	348.8	4.8	12.6	8.7	4.2	11.0	98.5	-
210	8.2	53.8	1563	346.0	350.3	4.8	13.0	9.0	4.3	11.0	98.5	-
211	8.2	53.2	1583	346.0	350.3	4.8	13.0	5.6	2.9	11.1	98.5	-
212	7.8	53.6	1391	346.0	350.2	4.8	12.8	7.0	3.2	11.0	98.5	-
213	7.4	52.7	1170	346.0	345.1	4.8	12.0	7.4	3.2	11.1	98.5	-
214	7.7	53.3	1308	346.0	345.2	4.8	12.6	8.9	2.5	11.1	98.5	-
215	8.7	54.0	1800	346.0	345.2	4.8	13.1	7.1	4.0	11.1	98.5	-
216	8.5	54.1	1765	346.0	350.2	4.8	12.9	9.0	3.8	11.1	98.5	-
217	8.4	53.5	1643	346.0	351.6	4.8	13.0	6.7	3.3	11.1	98.5	-
218	8.5	53.7	1702	346.0	351.6	4.8	13.0	7.6	4.0	11.1	98.5	-
219	8.3	54.0	1639	346.0	351.6	4.8	13.0	7.6	3.9	11.1	98.5	-
220	8.4	54.2	1682	346.0	351.6	4.8	13.1	6.0	2.4	11.1	98.5	-
221	8.9	54.3	1887	346.0	351.6	4.8	13.1	6.0	1.0	11.1	98.5	-
222	7.8	54.1	1381	346.0	351.6	4.8	12.8	6.5	2.2	11.1	98.5	-
223	7.8	53.6	1367	346.0	351.6	4.8	12.7	6.5	3.0	11.1	98.5	-
224	7.4	52.6	1182	346.0	351.6	4.8	12.0	7.3	4.5	11.1	98.5	-
225	7.0	51.2	999	346.0	351.6	4.8	11.4	5.2	4.0	11.1	98.5	-
226	7.2	51.1	1084	346.0	351.6	4.8	11.7	8.2	3.9	11.1	98.5	-
227	7.5	51.5	1234	346.0	349.3	4.8	12.3	9.4	3.8	11.1	98.5	-
228	7.8	52.9	1390	346.0	349.2	4.8	12.8	8.2	2.6	11.1	98.5	-
229	7.9	53.5	1439	346.0	350.0	4.8	13.0	8.1	2.4	11.1	98.5	-
230	7.8	53.5	1353	346.0	355.7	4.8	12.7	5.8	3.3	11.1	98.5	-
231	7.9	53.2	1403	346.0	355.7	4.8	12.9	9.4	1.8	11.1	98.5	-
232	8.0	53.6	1491	346.0	355.9	4.8	13.0	8.2	2.2	11.1	98.5	-
233	7.7	53.5	1303	346.0	352.0	97.0	12.4	7.7	3.2	11.2	98.5	-
234			44	346.0	349.9	97.0	5.6	5.5	4.0	11.2	98.5	-
235	7.6	51.2	1267	346.0	355.9	40.0	13.2	8.2	3.3	11.4	98.5	-
236	9.2	53.9	2001	346.0	355.9	40.0	13.2	7.4	2.8	11.4	98.5	-
237	8.9	53.8	1906	346.0	349.7	40.0	12.0	9.4	3.0	11.4	98.5	-
238	8.0	54.3	1473	346.0	349.4	40.0	12.9	8.5	6.5	11.4	98.5	-
239	7.7	54.6	1322	346.0	349.4	40.0	12.6	6.1	3.2	11.4	98.5	-
240	7.8	55.0	1382	346.0	349.4	40.0	12.8	5.5	5.5	11.4	98.5	-
241	8.4	54.1	1684	346.0	349.4	40.0	13.1	9.1	4.3	11.4	98.5	-
242	8.5	54.3	1710	346.0	349.4	40.0	13.0	6.8	7.0	11.4	98.5	-
243	8.8	54.5	1853	346.0	349.4	40.0	13.0	10.2	5.2	11.4	98.5	-
244	9.4	54.0	2048	346.0	349.4	40.0	13.1	11.2	3.5	11.4	98.5	-
245	9.4	53.9	2150	346.0	349.4	40.0	13.0	9.2	3.7	11.4	98.5	-
246	10.6	54.5	2249	346.0	349.4	40.0	13.1	10.8	7.2	11.4	98.5	-
247	9.0	54.3	1934	346.0	349.4	40.0	12.9	10.6	7.4	11.4	98.5	-
248	9.7	54.5	2099	346.0	349.4	40.0	13.0	8.1	4.5	11.4	98.5	-
249	9.1	54.3	1970	346.0	349.4	40.0	12.9	8.8	4.5	11.4	98.5	-
250	9.8	54.5	2123	346.0	349.4	40.0	13.0	7.7	4.3	11.4	98.5	-
251	9.6	54.6	2087	346.0	349.4	40.0	13.1	8.6	3.2	11.5	98.5	-
252	9.2	53.7	1985	346.0	349.4	40.0	13.0	10.6	2.9	11.5	98.5	-
253	9.0	53.8	1928	346.0	349.4	40.0	13.0	8.1	5.9	11.5	98.5	-
254	9.4	54.0	2035	346.0	349.4	40.0	13.0	6.8	6.0	11.5	98.5	-
255	8.8	53.7	1867	346.0	349.4	40.0	12.9	9.9	4.0	11.5	98.5	-
256	8.8	53.9	1845	346.0	349.4	40.0	12.9	8.3	3.7	11.5	98.5	-
257	7.9	53.3	1710	346.0	352.9	40.0	12.8	9.5	1.9	11.5	98.5	-
258	8.5	53.3	1811	346.0	359.3	40.0	12.6	7.3	4.6	11.5	98.5	-
259		11.25	346.0		4.3	40.0	11.8	5.8	4.7	11.5	98.5	-
260		10.35	346.0		3.5	40.0	11.5	7.5	4.5	11.5	98.5	-
261		1.0	346.0		1.0	40.0	12.7	9.1	5.8	11.5	98.5	-
262	8.3	53.9	1599	346.0	354.8	40.0	13.0	8.2	7.7	11.5	98.5	-
263	7.9	54.2	1434	346.0	352.1	40.0	12.9	9.5	4.9	11.6	98.5	-
264	8.7	54.3	1820	346.0	352.1	40.0	13.1	9.6	4.1	11.6	98.5	-

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Wind	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
265	8.5	54.2	1722	346.0	352.1	40.0	13.0	7.1	5.4	11.6	98.5	-
266	8.4	54.1	1660	346.0	352.1	40.0	13.0	10.0	4.7	11.6	98.5	-
267	7.9	54.5	1428	346.0	354.2	40.0	12.9	6.1	7.9	11.6	98.5	-
268	7.7	54.1	1323	346.0	359.9	40.0	12.5	8.7	4.6	11.6	98.5	-
269	7.6	53.1	1297	346.0	359.9	40.0	12.5	7.5	5.5	11.6	98.5	-
270	7.9	54.0	1437	346.0	359.9	40.0	13.0	7.6	5.2	11.6	98.5	-
271	10.8	54.6	2200	346.0	359.9	40.0	13.2	11.0	5.2	11.6	98.5	-
272	9.3	54.6	2009	346.0	354.7	40.0	13.0	10.3	5.3	11.6	98.5	-
273	10.0	55.5	2165	346.0	349.5	40.0	13.1	11.3	6.3	11.6	98.5	-
274	11.5	55.1	2257	346.0	349.5	40.0	13.2	11.7	11.7	11.7	98.5	-
275			2249	346.0	355.5	40.0	13.2	9.9	6.3	11.5	98.5	-
276			2203	346.0	355.9	40.0	12.8	8.7	5.6	11.5	98.5	-
277	9.9	54.9	2141	346.0	355.9	40.0	13.0	9.9	7.3	11.5	98.5	-
278	9.5	54.7	2068	346.0	355.9	40.0	13.0	10.3	4.9	11.5	98.5	-
279	9.1	54.3	1985	346.0	355.9	40.0	13.0	9.8	4.1	11.5	98.5	-
280												



# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 3 of 9  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Wind	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
353			2241	346.0	347.8	40.0	13.6	10.2	4.2	11.5	98.6	-
354	11.9	54.6	2256	346.0	347.3	40.0	13.3	12.1	3.0	11.5	98.6	-
355	12.9	54.2	2234	346.0	347.8	40.0	13.5	13.1	4.5	11.5	98.6	-
356	11.9	54.0	2206	346.0	347.9	40.0	13.1	12.0	1.3	11.5	98.6	-
357	12.1	54.1	2231	346.0	350.1	40.0	13.0	12.2	6.6	11.5	98.6	-
358	11.3	53.2	2236	346.0	350.0	40.0	12.9	11.5	5.6	11.5	98.6	-
359	12.2	53.5	2240	346.0	350.1	40.0	12.9	12.3	5.8	11.5	98.6	-
360	10.0	54.5	2162	346.0	350.1	40.0	12.6	10.8	8.0	11.5	98.6	-
361	9.9	52.5	2150	346.0	351.2	40.0	12.5	12.0	6.2	11.5	98.6	-
362	10.1	53.1	2175	346.0	354.3	40.0	12.8	12.2	6.3	11.5	98.6	-
363	9.9	53.4	2143	346.0	354.3	40.0	12.5	9.1	5.7	11.5	98.6	-
364	10.0	54.1	2165	346.0	354.3	40.0	12.6	10.2	4.8	11.5	98.6	-
365	12.7	54.4	2230	346.0	354.3	40.0	13.8	12.9	7.7	11.5	98.6	-
366	11.7	53.9	2284	346.0	354.2	40.0	13.3	11.8	6.3	11.5	98.5	-
367	12.6	54.0	2249	346.0	354.2	40.0	13.2	12.8	6.4	11.5	98.5	-
368	12.1	53.8	2196	346.0	354.2	40.0	12.8	12.3	6.5	11.5	98.5	-
369	9.8	52.8	2120	346.0	354.3	40.0	12.3	10.5	7.9	11.5	98.5	-
370	10.8	53.5	2196	346.0	354.3	40.0	12.8	10.9	6.3	11.5	98.5	-
371	10.8	53.8	2243	346.0	354.3	40.0	13.0	11.0	5.0	11.5	98.6	-
372	10.3	54.8	2270	346.0	354.3	40.0	13.3	10.4	7.5	11.5	98.6	-
373			2257	346.0	354.3	40.0	13.4	9.4	6.6	11.5	98.6	-
374	10.6	55.2	2195	346.0	354.3	40.0	12.8	10.7	4.6	11.5	98.6	-
375	9.9	51.6	2154	346.0	354.3	40.0	12.6	10.4	4.5	11.5	98.6	-
376	9.5	54.2	2053	346.0	354.3	40.0	12.8	10.5	5.2	11.5	98.6	-
377	9.4	54.9	2041	346.0	354.3	40.0	13.0	9.4	5.5	11.5	98.6	-
378	10.3	56.0	2288	346.0	349.7	40.0	13.2	10.4	6.5	11.5	98.6	-
379	10.7	54.5	2247	346.0	349.7	40.0	13.1	10.9	4.6	11.5	98.6	-
380	9.2	54.6	1994	346.0	349.7	40.0	12.8	8.7	4.1	11.5	98.6	-
381	8.8	54.7	1843	346.0	349.7	40.0	12.9	9.9	3.9	11.5	98.6	-
382	8.6	54.2	1739	346.0	349.7	40.0	13.0	10.5	5.9	11.5	98.6	-
383	8.7	178.7	1846	346.0	349.7	40.0	13.0	8.6	3.1	11.5	98.6	-
384	8.1	54.2	1530	346.0	349.7	40.0	12.9	10.0	4.9	11.5	98.6	-
385	8.0	54.5	1458	346.0	349.7	40.0	13.0	5.9	4.5	11.5	98.6	-
386	7.9	54.5	1403	346.0	349.7	40.0	12.9	7.3	3.9	11.5	98.6	-
387	7.9	143.0	1460	346.0	350.3	40.0	12.9	7.8	4.5	11.5	98.6	-
388	8.2	53.9	1572	346.0	352.6	40.0	13.0	6.5	4.6	11.5	98.6	-
389	8.0	53.9	1485	346.0	352.0	40.0	13.0	10.5	3.1	11.5	98.6	-
390	8.0	53.8	1473	346.0	352.0	40.0	13.0	7.3	4.2	11.6	98.6	-
391	7.8	53.9	1385	346.0	352.0	40.0	12.7	8.4	4.2	11.6	98.6	-
392	7.6	53.6	1269	346.0	352.0	40.0	12.6	10.5	2.6	11.6	98.6	-
393	7.9	53.5	1424	346.0	352.0	40.0	12.9	6.8	4.0	11.6	98.5	-
394	8.9	54.5	1887	346.0	352.0	40.0	13.2	10.5	3.4	11.6	98.5	-
395	8.8	54.4	1877	346.0	352.0	40.0	13.1	8.2	3.2	11.6	98.5	-
396	10.0	54.8	2261	346.0	351.3	40.0	13.3	8.3	3.8	11.6	98.5	-
397			2251	346.0	347.1	40.0	13.7	9.5	4.9	11.6	98.5	-
398	10.5	54.6	2285	346.0	347.1	40.0	12.9	10.7	2.4	11.6	98.5	-
399	10.2	54.0	2179	346.0	347.0	40.0	12.7	9.6	3.3	11.6	98.5	-
400	10.0	53.9	2174	346.0	347.0	40.0	12.7	10.3	4.8	11.6	98.5	-
401	8.9	53.3	1891	346.0	353.4	40.0	12.6	10.3	4.0	11.6	98.5	-
402	9.0	54.8	1957	346.0	358.4	40.0	12.9	9.3	4.4	11.6	98.5	-
403	7.8	54.3	1391	346.0	358.4	40.0	12.8	7.6	5.1	11.6	98.5	-
404	7.8	54.4	1351	346.0	353.7	40.0	12.7	11.5	6.4	11.6	98.5	-
405	7.8	54.8	1382	346.0	353.4	40.0	12.7	6.3	3.2	11.6	98.5	-
406	7.5	55.2	1243	346.0	352.4	40.0	12.4	5.2	3.0	11.6	98.5	-
407	8.9	55.2	1907	346.0	346.9	40.0	13.2	8.1	2.6	11.6	98.5	-
408	9.7	54.9	2097	346.0	346.9	40.0	13.2	9.2	3.4	11.6	98.5	-
409	10.6	54.8	2281	346.0	346.8	40.0	13.3	10.8	4.1	11.6	98.5	-
410	10.7	54.7	2252	346.0	346.8	40.0	13.2	10.8	2.7	11.6	98.5	-
411	11.3	54.4	2257	346.0	346.8	40.0	13.0	11.5	4.2	11.6	98.5	-
412			2206	346.0	349.3	40.0	12.9	9.3	5.1	11.6	98.5	-
413	11.5	56.0	2192	346.0	349.9	40.0	12.8	11.7	4.9	11.6	98.5	-
414	9.9	54.7	2153	346.0	349.9	40.0	12.9	10.6	5.1	11.6	98.5	-
415	9.5	54.5	2056	346.0	349.9	40.0	13.0	12.2	2.8	11.6	98.5	-
416	9.4	54.4	2038	346.0	350.0	40.0	12.9	8.4	2.8	11.6	98.5	-
417	9.6	54.7	2091	346.0	349.9	40.0	13.1	7.9	2.7	11.6	98.5	-
418			2254	346.0	349.9	40.0	13.3	9.9	4.9	11.6	98.5	-
419			2280	346.0	348.5	40.0	13.1	8.2	4.0	11.5	98.5	-
420	11.6	54.7	2216	346.0	348.6	40.0	13.3	11.7	6.0	11.5	98.5	-
421	11.6	54.2	2280	346.0	348.6	40.0	13.3	11.8	4.1	11.5	98.5	-
422	11.3	54.8	2225	346.0	348.6	40.0	12.8	11.4	3.4	11.5	98.6	-
423	9.9	54.8	2147	346.0	348.5	40.0	12.5	10.8	4.0	11.7	98.6	-
424	10.4	54.1	2227	346.0	348.5	40.0	12.9	10.6	3.2	11.5	98.6	-
425	10.4	54.0	2210	346.0	348.6	40.0	12.9	10.5	2.9	11.5	98.6	-
426	9.8	54.0	2121	346.0	348.6	40.0	13.0	12.9	5.6	11.5	98.6	-
427	9.3	55.0	2022	346.0	348.5	40.0	13.0	10.5	4.8	11.5	98.6	-
428	8.9	54.5	1886	346.0	348.6	40.0	13.0	7.3	3.2	11.5	98.6	-
429	9.4	203.6	2046	346.0	348.6	40.0	13.1	10.8	5.1	11.5	98.6	-
430	9.0	54.5	1939	346.0	348.6	40.0	13.1	9.1	3.6	11.5	98.6	-
431	9.9	54.5	2140	346.0	348.6	40.0	13.1	9.5	4.5	11.5	98.6	-
432	9.7	54.4	2099	346.0	348.6	40.0	13.0	7.9	2.8	11.5	98.6	-
433	9.0	198.0	1985	346.0	348.5	40.0	12.9	9.9	2.6	11.5	98.6	-
434	8.6	54.4	1753	346.0	348.5	40.0	12.9	8.9	3.5	11.5	98.6	-
435	9.4	54.1	2050	346.0	348.5	40.0	13.1	9.3	2.5	11.5	98.6	-
436	9.1	54.2	1971	346.0	348.5	40.0	13.0	10.4	2.6	11.5	98.6	-
437	8.9	54.0	1906	346.0	348.5	40.0	13.0	10.1	5.5	11.5	98.6	-
438	8.6	53.7	1740	346.0	348.5	40.0	12.9	9.9	3.9	11.5	98.6	-
439	8.6	53.6	1741	346.0	348.5	40.0	13.0	8.0	3.0	11.5	98.6	-
440	7.9	54.0	1422	346.0	348.5	40.0	12.9	8.7	3.9	11.5	98.6	-

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Wind	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
441	7.8	53.7	1391	346.0	348.5	40.0	12.9	8.8	3.8	11.5	98.6	-
442	7.9	53.8	1410	346.0	351.7	40.0	12.8	6.7	2.1	11.5	98.6	-
443	7.6	53.1	1283	346.0	351.7	40.0	12.5	6.7	4.4	11.5	98.6	-
444	7.5	52.1	1212	346.0	348.8	40.0	12.2	9.7	5.2	11.5	98.6	-
445	7.8	52.5	1366	346.0	348.8	40.0	12.8	11.2	3.5	11.5	98.6	-
446	7.8	53.8	1384	346.0	348.9	40.0	12.8	8.6	2.9	11.5	98.6	-
447	7.6	52.9	1275	346.0	348.8	40.0	12.4	7.7	2.8	11.5	98.6	-
448	7.5	52.0	1237	346.0	348.8	40.0	12.3	7.4	2.8	11.5	98.6	-
449	7.8	52.5	1386	346.0	348.8	40.0	12.8	7.5	3.9	11.5	98.6	-
450	8.0	53.7	1468	346.0	348.8	40.0	13.0	8.2	3.4	11.5	98.6	-
451	8.5	54.5	1695	346.0	347.0	40.0	13.1	7.2	3.7	11.5	98.6	-
452	8.4	54.3	1684	346.0	347.0	40.0	13.0	8.0	4.0	11.5	98.6	-
453	8.6	53.6	1738	346.0	34							

# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 4 of 9  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
529	8.3	54.0	1604	346.0	350.8	40.0	13.0	8.8	5.1	11.3	98.6	-
530	8.4	54.3	1648	346.0	350.8	40.0	13.0	6.2	3.9	11.3	98.6	-
531	9.1	54.6	1979	346.0	350.8	40.0	13.2	10.8	3.2	11.3	98.6	-
532	11.3	54.3	2280	346.0	350.8	40.0	13.4	11.4	2.2	11.3	98.6	-
533	11.6	54.1	2245	346.0	350.8	40.0	13.0	11.7	3.2	11.3	98.6	-
534			2199	346.0	350.8	40.0	13.1	10.3	4.2	11.3	98.6	-
535	10.5	54.7	2241	346.0	350.8	40.0	13.6	10.6	6.9	11.3	98.6	-
536	8.0	53.8	1467	346.0	350.8	40.0	12.7	10.0	6.3	11.3	98.6	-
537	9.6	53.7	2090	346.0	350.8	40.0	12.8	10.5	5.7	11.3	98.6	-
538			2287	346.0	350.8	40.0	13.0	9.5	5.5	11.3	98.6	-
539			2231	346.0	350.8	40.0	13.2	10.3	4.9	11.3	98.6	-
540	10.4	53.3	2200	346.0	350.8	40.0	12.7	10.6	4.4	11.3	98.6	-
541	9.9	55.0	2146	346.0	350.8	40.0	12.5	10.9	6.6	11.3	98.6	-
542	8.4	54.7	1653	346.0	350.8	40.0	12.8	9.7	5.4	11.3	98.6	-
543	7.9	54.9	1406	346.0	350.8	40.0	12.8	6.8	4.9	11.3	98.6	-
544	7.9	53.5	1418	346.0	350.8	40.0	12.8	6.6	4.4	11.3	98.6	-
545	7.7	53.0	1317	346.0	350.8	40.0	12.6	8.2	6.6	11.3	98.6	-
546	7.6	52.9	1258	346.0	350.8	40.0	12.4	6.2	5.1	11.3	98.6	-
547	8.1	53.0	1504	346.0	350.8	40.0	13.1	7.2	4.4	11.3	98.6	-
548	9.1	54.3	1982	346.0	350.8	40.0	13.1	9.1	3.6	11.3	98.6	-
549	10.9	54.8	2249	346.0	350.8	40.0	13.4	11.1	6.5	11.3	98.6	-
550	12.3	54.6	2241	346.0	350.8	40.0	13.8	12.5	5.4	11.3	98.6	-
551	11.3	54.2	2216	346.0	350.8	40.0	13.2	11.2	4.9	11.3	98.6	-
552	10.2	55.2	2102	346.0	350.8	40.0	12.7	12.1	6.2	11.3	98.6	-
553	9.8	53.9	2129	346.0	350.8	40.0	12.3	9.3	5.6	11.3	98.6	-
554	9.5	53.7	2054	346.0	350.8	40.0	12.7	11.4	5.2	11.3	98.6	-
555	10.7	54.2	2237	346.0	350.8	40.0	13.0	10.9	6.3	11.3	98.6	-
556			2242	346.0	350.8	40.0	13.1	10.2	5.0	11.3	98.6	-
557			2235	346.0	350.8	40.0	12.8	10.2	5.4	11.3	98.6	-
558	9.9	54.3	2147	346.0	350.8	40.0	13.0	8.8	4.4	11.3	98.6	-
559	11.0	53.8	2211	346.0	350.8	40.0	13.1	11.1	4.9	11.3	98.6	-
560	9.5	54.7	2056	346.0	350.8	40.0	12.9	10.5	4.9	11.3	98.6	-
561	9.2	53.7	1992	346.0	350.8	40.0	13.0	9.6	3.9	11.3	98.6	-
562	9.8	54.0	2120	346.0	350.8	40.0	13.0	11.3	4.3	11.3	98.6	-
563	9.6	54.1	2075	346.0	350.8	40.0	13.0	9.1	3.6	11.3	98.6	-
564	8.9	54.4	1879	346.0	350.8	40.0	12.9	10.4	3.4	11.3	98.6	-
565	9.2	54.0	1989	346.0	350.8	40.0	13.0	8.2	3.2	11.3	98.6	-
566	8.9	54.3	1888	346.0	350.1	40.0	12.9	8.4	3.9	11.3	98.6	-
567	8.6	54.7	1751	346.0	350.1	40.0	13.0	10.1	3.6	11.3	98.6	-
568	11.0	54.8	2238	346.0	350.1	40.0	13.7	11.2	4.3	11.3	98.6	-
569			2281	346.0	350.1	40.0	13.4	9.9	7.0	11.3	98.6	-
570	10.1	53.2	2147	346.0	350.1	40.0	12.6	9.9	5.7	11.3	98.6	-
571	8.8	56.0	1943	346.0	350.0	40.0	12.5	9.5	5.1	11.3	98.6	-
572	8.4	54.6	1773	346.0	349.9	40.0	12.8	10.2	3.2	11.3	98.6	-
573	7.9	54.5	1440	346.0	349.9	40.0	12.8	10.0	3.0	11.3	98.7	-
574	8.0	54.3	1452	346.0	349.9	40.0	13.0	8.5	3.2	11.3	98.6	-
575	8.1	54.2	1513	346.0	349.9	40.0	13.1	5.9	4.1	11.3	98.6	-
576	11.3	54.5	2269	346.0	349.9	40.0	13.3	11.5	2.0	11.3	98.6	-
577	9.3	54.4	2017	346.0	349.9	40.0	12.9	10.6	4.4	11.3	98.6	-
578	9.4	54.2	2045	346.0	347.3	40.0	13.0	9.8	3.3	11.3	98.6	-
579	8.7	53.9	1905	346.0	347.4	40.0	12.9	9.5	3.1	11.3	98.6	-
580	9.0	54.9	1949	346.0	347.4	40.0	13.0	8.3	4.5	11.3	98.6	-
581	8.7	54.7	1790	346.0	347.4	40.0	12.9	8.4	6.1	11.3	98.6	-
582	8.3	54.7	1616	346.0	347.4	40.0	12.9	9.2	4.4	11.3	98.6	-
583	8.0	54.8	1485	346.0	350.9	40.0	12.9	5.5	5.0	11.3	98.6	-
584	7.6	54.6	1354	346.0	351.0	40.0	12.7	7.1	4.8	11.3	98.6	-
585	8.2	53.8	1570	346.0	351.0	40.0	13.1	8.3	4.0	11.3	98.6	-
586			2205	346.0	351.0	40.0	13.2	8.9	5.3	11.3	98.6	-
587	9.8	54.5	2130	346.0	351.0	40.0	13.0	11.6	5.0	11.3	98.7	-
588	11.1	54.8	2252	346.0	351.0	40.0	13.2	11.2	3.2	11.3	98.6	-
589	8.9	55.2	1883	346.0	351.0	40.0	12.8	10.8	6.1	11.3	98.7	-
590	8.4	54.4	1674	346.0	354.2	40.0	13.0	11.1	6.0	11.3	98.7	-
591	8.9	54.7	1916	346.0	357.3	40.0	13.0	7.2	4.3	11.3	98.6	-
592	8.3	54.4	1607	346.0	357.3	40.0	12.9	8.8	3.9	11.3	98.6	-
593	8.1	54.1	1503	346.0	357.3	40.0	12.9	7.7	6.1	11.3	98.7	-
594	8.1	54.3	1516	346.0	357.3	40.0	13.0	8.8	4.8	11.3	98.7	-
595	7.9	54.5	1445	346.0	355.2	40.0	13.0	8.1	5.2	11.3	98.6	-
596	8.7	54.1	1797	346.0	348.8	40.0	13.2	6.5	4.6	11.3	98.7	-
597			2232	346.0	348.8	40.0	13.2	10.2	4.8	11.3	98.7	-
598	11.1	56.0	2281	346.0	346.9	40.0	13.6	11.2	3.7	11.3	98.7	-
599	11.6	55.1	2274	346.0	346.9	40.0	13.2	11.8	4.5	11.3	98.6	-
600	10.5	54.3	2190	346.0	346.9	40.0	12.8	10.7	3.0	11.3	98.7	-
601			2186	346.0	346.9	40.0	12.6	11.0	4.2	11.3	98.7	-
602	9.9	53.6	2160	346.0	346.9	40.0	13.1	7.3	7.3	11.3	98.7	-
603	11.2	53.7	2255	346.0	348.3	40.0	13.0	11.4	4.9	11.3	98.7	-
604	10.6	54.5	2243	346.0	348.8	40.0	13.5	10.7	5.1	11.3	98.7	-
605	12.2	55.1	2291	346.0	348.8	40.0	13.1	12.3	3.1	11.2	98.7	-
606	11.1	56.6	2219	346.0	348.6	40.0	13.0	11.3	7.4	11.3	98.6	-
607	10.0	54.7	2162	346.0	348.6	40.0	12.6	9.6	6.0	11.3	98.6	-
608	9.9	53.5	2146	346.0	348.6	40.0	12.5	9.0	6.0	11.3	98.7	-
609	8.6	54.2	1745	346.0	348.6	40.0	12.9	10.2	9.3	11.2	98.7	-
610	8.5	55.2	1703	346.0	348.6	40.0	13.0	10.1	9.1	11.2	98.7	-
611	8.9	55.0	1905	346.0	348.6	40.0	13.1	9.6	7.2	11.2	98.6	-
612	8.2	55.3	1586	346.0	348.6	40.0	12.9	8.2	4.1	11.2	98.7	-
613	8.1	55.0	1507	346.0	348.6	40.0	13.0	10.4	6.2	11.2	98.7	-
614	9.2	55.1	1904	346.0	348.7	40.0	13.1	8.6	3.7	11.2	98.7	-
615	9.2	54.6	2000	346.0	348.7	40.0	13.1	10.0	5.7	11.2	98.7	-
616	9.1	55.2	1966	346.0	348.6	40.0	13.0	9.1	3.3	11.2	98.7	-

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
617	9.1	55.3	1976	346.0	348.6	40.0	13.0	10.1	3.3	11.2	98.7	-
618	11.4	54.6	2246	346.0	348.6	40.0	13.3	11.6	3.9	11.2	98.6	-
619	13.2	55.0	2234	346.0	348.6	40.0	13.7	13.4	2.1	11.2	98.7	-
620			2206	346.0	348.9	40.0	13.2	10.3	4.1	11.2	98.7	-
621	12.7	53.6	2277	346.0	352.4	40.0	13.1	12.9	6.6	11.2	98.7	-
622	10.9	53.9	2216	346.0	352.4	40.0	12.8	11.1	6.1	11.2	98.6	-
623	11.7	53.5	2214	346.0	352.4	40.0	12.7	11.9	6.4	11.2	98.7	-
624	9.9	53.5	2157	346.0	352.4	40.0	12.6	10.6	6.2	11.2	98.7	-
625	9.2	53.5	1987	346.0	352.4	40.0	12.9	10.9	3.7	11.2	98.7	-
626	8.5	54.7	1708	346.0	352.4	40.0	12.9	10.6	4.5	11.2	98.7	-
627	8.9	54.8	1927	346.0	352.4	40.0	13.1	8.1	5.9	11.2	98.7	-
628	9.2	55.6	1989	346.0	352.3	40.0	13.0	9.0	5.6	11.2	98.7	-
629	8.0	54.5	1488	346.0	352.3	40.0	12.9	8.0	5.4			

# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 5 of 9  
 Created on: 6/15/2018

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Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
705	10.7	53.2	2241	277.0	268.2	35.0	13.3	10.9	7.5	12.5	96.9	61
706	12.6	53.7	2238	277.0	269.8	35.0	13.0	12.8	7.3	12.5	96.9	61
707	13.3	53.4	2232	277.0	264.3	35.0	13.4	13.5	7.4	12.5	96.9	61
708	10.5	53.4	2255	277.0	264.3	35.0	13.2	10.6	6.8	12.5	96.9	61
709	11.1	52.9	2194	277.0	264.3	35.0	12.8	11.2	10.4	12.5	96.9	62
710	11.2	52.4	2198	277.0	267.2	35.0	12.7	11.3	10.3	12.5	96.9	62
711	10.8	52.9	2196	277.0	272.3	35.0	12.8	11.0	10.9	12.5	96.9	62
712	10.5	52.7	2225	277.0	272.3	35.0	12.9	10.7	8.7	12.5	96.9	62
713	11.4	53.2	2223	277.0	272.3	35.0	13.4	11.6	7.5	12.5	96.9	62
714	11.7	53.7	2263	277.0	272.3	35.0	13.3	11.8	9.5	12.5	96.9	62
715	12.4	53.1	2226	277.0	272.3	35.0	13.0	12.6	11.0	12.5	96.9	61
716	9.9	52.4	2155	277.0	272.3	35.0	12.6	12.2	7.3	12.5	96.9	61
717	10.2	52.4	2182	277.0	272.3	35.0	12.6	11.2	8.8	12.5	96.9	62
718	9.8	52.3	2121	277.0	272.3	35.0	12.5	9.6	5.9	12.5	96.9	61
719	9.3	52.0	2012	277.0	272.3	35.0	12.6	9.9	6.4	12.5	96.9	62
720	9.1	52.6	1977	277.0	272.3	35.0	12.9	10.2	4.7	12.4	96.9	61
721	9.5	53.2	2055	277.0	272.3	35.0	13.0	10.4	8.9	12.6	96.9	62
722	9.6	53.2	2077	277.0	275.7	35.0	13.0	10.3	7.3	12.6	96.9	62
723	8.8	53.2	1859	277.0	278.5	35.0	13.0	9.0	7.1	12.6	96.9	62
724	9.4	53.0	2035	277.0	278.6	35.0	13.1	10.2	7.1	12.6	96.9	62
725	9.2	53.5	2003	277.0	277.6	35.0	13.0	9.4	9.1	12.6	96.9	62
726	11.8	53.7	2259	277.0	275.8	35.0	13.5	12.0	7.4	12.6	96.9	62
727	13.6	53.5	2246	277.0	275.8	35.0	13.5	10.7	7.0	12.6	96.9	61
728	11.5	53.6	2273	277.0	275.8	35.0	13.4	11.7	8.2	12.6	96.9	61
729	9.9	52.9	2158	277.0	275.8	35.0	12.6	11.0	8.0	12.6	96.9	61
730	10.1	52.2	2176	277.0	274.3	35.0	12.7	11.6	8.2	12.6	96.9	61
731	9.9	53.0	2167	277.0	269.5	35.0	12.5	10.7	7.3	12.5	96.9	61
732	8.8	53.6	1835	277.0	268.5	35.0	12.9	10.5	6.3	12.6	96.9	61
733	11.9	54.2	2252	277.0	268.5	35.0	13.5	12.0	5.3	12.6	96.9	61
734			2262	277.0	268.5	35.0	13.1	9.7	7.9	12.6	96.9	61
735			2184	277.0	268.8	35.0	12.7	7.9	8.6	12.6	96.9	61
736	9.5	54.1	2056	277.0	268.8	35.0	13.0	11.9	8.9	12.6	96.9	61
737			2229	277.0	268.8	35.0	13.5	9.4	8.9	12.6	96.9	61
738	10.4	54.0	2250	277.0	268.8	35.0	13.4	10.6	9.5	12.6	96.9	61
739			2261	277.0	268.8	35.0	13.0	10.9	7.9	12.6	96.9	61
740	10.6	52.9	2239	277.0	268.8	35.0	13.1	10.7	6.4	12.6	96.9	62
741	10.3	52.9	2215	277.0	268.8	35.0	12.8	10.5	10.0	12.6	96.9	62
742	9.6	52.7	2081	277.0	268.8	35.0	12.4	11.1	7.9	12.6	96.9	62
743	9.0	53.1	1945	277.0	268.8	35.0	13.1	10.6	8.7	12.6	96.9	62
744	9.1	53.3	1950	277.0	268.8	35.0	13.0	7.7	8.8	12.6	96.9	62
745	9.3	53.1	2008	277.0	268.8	35.0	13.0	10.6	9.2	12.5	96.9	62
746	8.9	53.2	1920	277.0	269.5	35.0	13.0	11.2	8.7	12.5	96.9	62
747	8.9	53.4	1902	277.0	275.9	35.0	13.0	11.2	7.9	12.5	96.9	62
748	8.6	53.6	1767	277.0	269.8	35.0	13.0	9.6	6.3	12.6	96.9	62
749	8.4	53.3	1682	277.0	278.9	35.0	13.0	8.3	5.8	12.5	96.9	62
750	9.0	54.0	1936	277.0	278.8	35.0	13.0	8.8	7.1	12.5	96.9	62
751	8.6	53.3	1758	277.0	277.9	35.0	12.9	9.0	9.5	12.5	96.9	62
752	8.1	53.3	1489	277.0	274.3	35.0	12.9	7.8	5.9	12.5	96.9	62
753	8.3	53.4	1624	277.0	274.2	35.0	13.1	8.3	8.1	12.5	96.9	62
754	9.1	53.7	1967	277.0	274.3	35.0	13.2	9.3	9.9	12.5	96.9	62
755			2243	277.0	274.3	35.0	13.2	9.3	6.8	12.5	96.9	62
756			2246	277.0	274.3	35.0	13.1	10.4	7.1	12.5	96.9	62
757			2249	277.0	274.3	35.0	13.6	9.4	6.9	12.4	96.9	62
758			2277	277.0	274.3	35.0	12.6	11.3	5.7	12.6	96.9	62
759	11.1	53.3	2227	277.0	274.3	35.0	12.9	10.2	10.8	12.6	96.9	62
760			2236	277.0	274.3	35.0	13.2	10.4	8.0	12.6	96.9	62
761			2226	277.0	274.3	35.0	13.5	10.0	8.2	12.6	96.9	62
762			2286	277.0	274.3	35.0	13.4	10.3	8.9	12.6	96.9	62
763	11.1	52.8	2217	277.0	274.3	35.0	12.8	11.3	10.4	12.6	96.9	62
764	12.0	52.6	2232	277.0	274.3	35.0	13.0	12.2	9.8	12.6	96.9	62
765	10.9	52.7	2217	277.0	274.3	35.0	12.8	11.1	9.1	12.6	96.9	62
766	10.6	52.4	2205	277.0	274.3	35.0	12.9	10.7	7.2	12.6	96.9	62
767	11.7	52.9	2230	277.0	274.3	35.0	12.9	11.8	7.9	12.6	96.9	62
768			2245	277.0	276.7	35.0	13.0	9.8	7.7	12.6	96.9	62
769	10.2	53.0	2182	277.0	276.7	35.0	12.5	11.6	8.1	12.6	96.9	62
770	10.7	53.2	2247	277.0	276.7	35.0	13.2	10.9	7.7	12.6	96.9	62
771			2244	277.0	272.4	35.0	12.9	10.3	6.9	12.6	96.9	62
772	8.7	52.7	1827	277.0	271.0	35.0	12.7	10.8	8.4	12.6	96.9	62
773			2264	277.0	271.0	35.0	13.1	10.1	7.3	12.6	96.9	62
774	10.4	53.7	2236	277.0	271.0	35.0	13.1	10.5	10.2	12.6	96.9	62
775	9.0	53.6	1945	277.0	271.0	35.0	12.6	9.8	7.5	12.6	96.9	62
776	8.5	53.8	1688	277.0	268.7	35.0	12.9	7.3	8.4	12.5	96.9	62
777	8.3	53.6	1626	277.0	268.7	35.0	13.0	10.5	6.5	12.5	96.9	62
778	8.1	53.5	1541	277.0	268.7	35.0	13.0	7.7	9.0	12.5	96.9	62
779	8.5	53.6	1724	277.0	268.7	35.0	13.0	8.6	7.1	12.5	96.9	62
780	8.9	54.3	1902	277.0	268.7	35.0	13.0	7.9	9.3	12.5	96.9	62
781	8.4	52.7	1626	277.0	268.7	35.0	13.0	9.3	6.8	12.6	96.9	62
782	12.0	53.9	2202	277.0	268.7	35.0	13.1	12.2	5.8	12.5	96.9	62
783	9.0	53.5	1955	277.0	268.7	35.0	12.9	9.0	7.9	12.5	96.9	62
784	9.2	53.4	1997	277.0	274.4	35.0	13.0	8.8	7.7	12.5	96.9	62
785	9.3	53.3	2022	277.0	274.4	35.0	13.0	11.0	7.8	12.5	96.9	62
786			2244	277.0	274.4	35.0	13.2	10.7	6.9	12.5	96.9	62
787	11.1	53.6	2267	277.0	274.4	35.0	13.1	11.3	7.3	12.6	96.9	62
788	11.2	53.7	2241	277.0	274.4	35.0	13.5	11.4	8.5	12.6	96.9	62
789	11.4	53.3	2229	277.0	274.4	35.0	13.1	11.6	8.4	12.6	96.9	62
790	8.4	52.7	1657	277.0	278.6	35.0	12.5	10.7	7.4	12.6	96.9	62
791	10.2	53.3	2180	277.0	283.1	35.0	13.1	10.4	7.4	12.6	96.9	62
792	9.6	53.4	2078	277.0	285.9	35.0	13.0	9.4	7.7	12.6	96.9	62

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
793			2268	277.0	285.9	35.0	13.2	9.1	4.7	12.6	96.9	62
794	9.9	53.3	2158	277.0	283.7	35.0	13.0	10.6	6.0	12.6	96.9	62
795	9.2	53.3	1990	277.0	279.1	35.0	13.0	11.3	6.1	12.6	96.9	62
796	10.3	53.8	2228	277.0	279.1	35.0	13.4	10.4	7.1	12.6	96.9	62
797	11.6	54.0	2233	277.0	279.1	35.0	13.7	11.7	7.3	12.6	96.9	62
798	11.2	53.8	2263	277.0	279.1	35.0	13.4	11.4	7.7	12.6	96.9	62
799	12.7	52.9	2253	277.0	279.1	35.0	13.2	12.9	8.7	12.6	96.9	62
800	10.8	53.1	2202	277.0	276.2	35.0	13.1	11.0	6.3	12.6	96.9	62
801	10.5	52.6	2231	277.0	270.9	35.0	13.0	10.7	8.2	12.6	96.9	62
802	10.0	52.5	2169	277.0	270.9	35.0	12.7	10.9	8.0	12.6	96.9	62
803	11.7	52.4	2213	277.0	270.9	35.0	12.7	11.8	6.1	12.6	96.9	62
804	10.2	5										

# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 6 of 9  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (kPa)	Relative Humidity (%)
881	11.8	53.2	2246	277.0	263.1	35.0	13.0	11.9	6.1	13.0	96.9	62
882	9.7	52.8	2210	277.0	263.0	35.0	12.3	13.2	6.0	13.0	96.9	61
883			2214	277.0	270.9	35.0	12.8	9.0	8.2	13.0	96.9	61
884	11.1	53.4	2234	277.0	270.9	35.0	13.1	11.3	6.8	13.0	96.9	61
885	10.9	53.8	2224	277.0	270.9	35.0	13.0	11.1	6.4	13.0	96.9	61
886	9.9	53.9	2159	277.0	270.9	35.0	12.8	10.9	6.1	13.0	96.9	61
887			2239	277.0	270.9	35.0	13.3	10.2	6.7	13.0	96.9	61
888			2248	277.0	270.9	35.0	12.9	7.7	7.5	13.0	96.9	61
889			1878	277.0	270.9	35.0	12.8	11.7	6.3	13.1	96.9	61
890			2258	277.0	270.9	35.0	13.5	11.7	5.2	13.1	96.9	61
891			2174	277.0	270.9	35.0	12.8	10.1	5.2	13.1	96.9	61
892	9.4	53.4	2038	277.0	270.9	35.0	12.9	10.1	7.4	13.1	96.9	61
893	11.4	54.4	2237	277.0	270.9	35.0	13.7	11.6	4.5	13.2	96.9	61
894	10.4	54.1	2268	277.0	270.9	35.0	13.2	10.6	4.9	13.1	96.9	61
895	10.3	53.1	2191	277.0	271.0	35.0	12.8	10.5	6.0	13.1	96.9	61
896	11.3	52.6	2192	277.0	271.0	35.0	12.8	11.5	6.0	13.1	96.9	61
897	11.4	53.8	2222	277.0	271.0	35.0	13.3	11.5	6.8	13.1	96.9	61
898	11.3	53.7	2247	277.0	271.0	35.0	13.8	11.4	3.8	13.1	96.9	61
899	12.0	52.9	2285	277.0	271.0	35.0	13.0	12.1	9.5	13.1	96.9	61
900	12.6	53.0	2197	277.0	271.0	35.0	12.8	12.8	10.1	13.1	96.9	61
901	11.2	52.9	2240	277.0	271.0	35.0	13.0	11.4	8.8	13.1	96.9	61
902	11.1	52.6	2221	277.0	271.0	35.0	13.1	11.3	8.4	13.1	96.9	61
903	10.0	52.7	2162	277.0	271.0	35.0	12.6	12.0	5.9	13.1	96.9	61
904			2214	277.0	271.0	35.0	12.8	10.3	7.1	13.1	96.9	61
905			2232	277.0	271.0	35.0	12.8	10.0	5.7	13.1	96.9	61
906			2227	277.0	271.0	35.0	12.8	10.2	7.7	13.1	96.9	61
907	10.6	52.7	2210	277.0	271.0	35.0	12.9	10.8	9.9	13.1	96.9	61
908	10.3	53.2	2225	277.0	271.0	35.0	13.1	10.5	9.7	13.1	96.9	61
909	10.0	52.5	2167	277.0	271.0	35.0	12.6	10.4	5.7	13.1	96.9	61
910	9.9	52.8	2146	277.0	271.0	35.0	12.8	11.6	8.9	13.1	96.9	61
911			2250	277.0	271.0	35.0	13.1	9.9	6.9	13.0	96.9	61
912	11.3	53.5	2230	277.0	270.6	35.0	13.6	11.4	8.0	13.1	96.9	61
913	11.2	53.3	2249	277.0	266.0	35.0	13.2	11.4	5.2	13.1	96.9	61
914	10.1	52.9	2176	277.0	266.0	35.0	12.7	10.8	7.2	13.1	96.9	61
915			2191	277.0	266.0	35.0	12.7	10.4	6.0	13.0	96.9	61
916	11.3	53.3	2195	277.0	266.0	35.0	12.8	11.5	7.5	13.1	96.9	61
917			2233	277.0	266.4	35.0	13.5	10.3	6.8	13.1	96.9	61
918			2256	277.0	268.7	35.0	13.3	9.1	6.4	13.1	96.9	61
919	9.9	53.0	2159	277.0	268.7	35.0	12.4	11.6	5.5	13.1	96.9	62
920			2236	277.0	268.7	35.0	13.3	9.1	8.2	13.0	96.9	61
921	12.3	53.7	2227	277.0	268.7	35.0	13.4	12.5	9.0	13.1	96.9	62
922	11.1	53.4	2203	277.0	268.7	35.0	12.7	11.3	8.4	13.1	96.9	62
923	10.5	52.8	2186	277.0	268.7	35.0	12.6	10.6	8.9	13.1	96.9	62
924	10.0	53.0	2188	277.0	268.7	35.0	12.5	11.2	8.0	13.1	96.9	62
925	10.2	53.0	2180	277.0	268.7	35.0	13.0	10.8	8.4	13.1	96.9	61
926	9.4	53.4	2048	277.0	268.7	35.0	13.0	9.3	7.5	13.1	96.9	61
927	9.2	53.7	2003	277.0	268.7	35.0	13.0	9.6	6.7	13.1	96.9	61
928	8.6	53.4	1766	277.0	265.1	35.0	12.9	8.6	8.1	13.1	96.9	61
929			1661	277.0	260.5	35.0	12.9	8.7	6.8	13.1	96.9	61
930			1388	277.0	260.4	35.0	12.9	7.3	8.2	13.1	96.9	61
931			1321	277.0	260.4	35.0	12.7	7.8	8.2	13.1	96.9	61
932	7.8	53.5	1356	277.0	260.0	35.0	12.9	9.9	4.7	13.1	96.9	61
933	8.7	54.2	1829	277.0	272.5	35.0	13.1	8.7	8.2	13.1	96.9	61
934	8.0	53.8	1475	277.0	273.8	35.0	12.9	8.9	8.2	13.1	96.9	61
935	7.8	52.9	1384	277.0	270.8	35.0	13.0	9.7	6.8	13.1	96.9	61
936	8.3	53.5	1638	277.0	270.8	35.0	13.1	8.2	6.4	13.1	96.9	61
937	8.9	54.3	1917	277.0	270.8	35.0	13.1	10.2	7.1	13.0	96.9	61
938	8.9	54.3	1907	277.0	270.8	35.0	13.0	8.2	6.9	13.0	96.9	61
939	9.8	54.2	2134	277.0	270.8	35.0	13.0	9.7	6.0	13.0	96.9	61
940	8.9	54.5	1922	277.0	267.8	35.0	12.9	7.4	6.2	13.0	96.9	61
941	8.6	54.2	1736	277.0	267.0	35.0	12.9	8.0	6.1	13.0	96.9	61
942			1701	277.0	260.4	35.0	13.0	8.7	5.6	13.0	96.9	61
943			2249	277.0	259.3	35.0	13.3	10.3	6.0	13.0	96.9	62
944			2253	277.0	259.3	35.0	13.8	9.3	7.2	13.0	96.9	62
945			2214	277.0	259.3	35.0	13.6	12.5	6.8	13.0	96.9	62
946			2254	277.0	259.3	35.0	13.3	10.8	4.9	13.0	96.9	62
947			2238	277.0	259.3	35.0	12.8	12.4	4.7	13.0	96.9	62
948	10.0	52.1	2168	277.0	264.3	35.0	12.7	12.9	6.1	13.0	96.9	62
949	11.3	52.6	2285	277.0	265.6	35.0	13.0	11.5	6.0	13.0	96.9	62
950	11.7	53.0	2210	277.0	265.6	35.0	12.9	11.9	4.8	13.1	96.9	62
951	10.9	52.7	2236	277.0	265.6	35.0	12.9	11.1	7.1	13.1	96.9	62
952	11.4	52.9	2207	277.0	265.6	35.0	12.8	11.6	6.5	13.1	96.9	62
953	10.5	52.4	2104	277.0	265.6	35.0	12.6	10.6	4.3	13.1	96.9	62
954	10.5	52.5	2215	277.0	265.6	35.0	12.9	10.6	4.3	13.1	96.9	62
955	11.5	53.3	2286	277.0	265.6	35.0	13.3	11.7	8.0	13.2	96.9	62
956	10.6	53.2	2237	277.0	265.6	35.0	13.1	10.8	7.0	13.2	96.9	62
957	11.2	53.0	2227	277.0	265.6	35.0	13.1	11.3	7.4	13.2	96.9	62
958	10.3	52.9	2205	277.0	265.6	35.0	12.8	10.4	8.5	13.2	96.9	62
959	13.3	53.0	2236	277.0	265.6	35.0	13.2	13.5	7.0	13.2	96.9	62
960	11.7	53.3	2272	277.0	265.6	35.0	13.5	11.9	7.0	13.2	96.9	62
961	12.0	53.6	2247	277.0	265.6	35.0	13.3	12.3	5.4	13.2	97.0	62
962	12.4	53.2	2224	277.0	265.6	35.0	13.1	12.5	7.2	13.2	97.0	62
963	12.9	53.2	2238	277.0	265.6	35.0	13.2	13.1	6.5	13.2	97.0	62
964	10.1	52.6	2178	277.0	265.6	35.0	12.6	11.8	5.7	13.2	97.0	62
965	12.2	52.3	2225	277.0	265.6	35.0	12.8	12.4	6.8	13.2	97.0	62
966	11.4	52.6	2251	277.0	265.7	35.0	13.0	11.5	6.9	13.2	97.0	62
967	11.2	52.6	2204	277.0	265.6	35.0	12.7	11.4	6.5	13.1	97.0	61
968	11.3	52.3	2229	277.0	265.8	35.0	13.1	11.4	7.8	13.1	97.0	61

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (kPa)	Relative Humidity (%)
969	11.5	53.1	2224	277.0	265.7	35.0	13.0	11.7	6.6	13.1	97.0	61
970			2202	277.0	265.8	35.0	12.8	9.9	5.5	13.1	97.0	61
971	9.9	52.3	2150	277.0	265.8	35.0	12.4	8.8	5.9	13.1	97.0	61
972	11.9	52.8	2251	277.0	265.7	35.0	13.1	12.1	7.4	13.1	97.0	61
973	11.6	53.5	2259	277.0	265.6	35.0	13.2	11.8	9.4	13.1	97.0	61
974	12.5	52.8	2235	277.0	265.6	35.0	13.0	12.7	10.2	13.1	97.0	61
975	10.7	52.5	2196	277.0	265.7	35.0	12.8	10.9	6.9	13.1	97.0	61
976			1804	277.0	269.0	35.0	12.5	10.2	8.7	13.1	97.0	61
977	9.6	53.8	2094	277.0	269.3	35.0	13.0	9.7	9.0	13.1	97.0	61
978	9.0	53.4	1959	277.0	269.3	35.0	13.0	9.7	9.1	13.1	97.0	61
979	8.5	53.2	1701	277.0	269.3	35.0	13.0	8.4	8.1	13.1	97.0	62
980	8.3	53.7	1599	277.0	269.3	35.0	12.9	8.8	7.0	13.1		

# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 7 of 9  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (kPa)	Relative Humidity (%)
1057	11.1	52.7	2244	277.0	278.5	35.0	13.0	11.3	7.3	13.1	97.0	62
1058	10.7	52.7	2227	277.0	278.5	35.0	13.0	10.9	9.1	13.1	97.0	62
1059	11.5	52.6	2223	277.0	278.5	35.0	13.0	11.6	7.0	13.1	97.0	62
1060	10.8	53.1	2238	277.0	278.5	35.0	13.1	11.0	8.2	13.1	97.0	62
1061	10.0	52.6	2173	277.0	278.5	35.0	12.5	11.3	7.7	13.1	97.0	62
1062	11.2	53.0	2254	277.0	278.5	35.0	13.3	11.3	6.9	13.1	97.0	62
1063	10.8	53.8	2255	277.0	278.5	35.0	13.3	11.0	8.6	13.1	97.0	62
1064	11.1	52.7	2220	277.0	278.5	35.0	13.0	11.3	9.9	13.1	97.0	62
1065	10.8	51.9	2211	277.0	278.5	35.0	12.8	9.8	9.1	13.1	97.0	62
1066	10.8	51.9	2194	277.0	278.5	35.0	12.7	11.0	9.0	13.1	97.0	62
1067			2206	277.0	278.5	35.0	12.8	10.2	7.7	13.1	97.0	62
1068			2261	277.0	278.5	35.0	13.0	10.3	7.8	13.1	97.0	62
1069			2217	277.0	278.5	35.0	12.8	10.1	6.4	13.1	97.0	62
1070			2210	277.0	278.5	35.0	12.8	10.3	6.1	13.1	97.0	62
1071			2198	277.0	278.5	35.0	13.0	9.7	5.0	13.1	97.0	62
1072	9.3	53.1	2010	277.0	278.5	35.0	12.9	9.9	8.6	13.1	97.0	62
1073	8.9	52.9	1899	277.0	278.5	35.0	13.0	8.2	6.0	13.1	97.0	62
1074	8.8	53.4	1838	277.0	278.5	35.0	12.9	8.0	5.1	13.1	97.0	62
1075	9.1	53.6	1984	277.0	278.5	35.0	13.1	10.4	5.0	13.1	97.0	62
1076	8.8	53.4	1836	277.0	278.5	35.0	12.9	8.6	3.0	13.1	97.0	62
1077	8.8	54.5	1876	277.0	278.3	35.0	13.0	8.6	7.0	13.3	97.0	62
1078	8.4	53.6	1684	277.0	278.3	35.0	13.1	8.5	5.3	13.3	97.0	62
1079	8.0	54.0	1848	277.0	278.3	35.0	13.0	8.7	6.7	13.3	97.0	62
1080	8.4	53.8	1676	277.0	278.3	35.0	12.9	9.3	7.5	13.3	97.0	62
1081	8.2	53.6	1546	277.0	278.3	35.0	13.0	5.9	6.4	13.3	97.0	62
1082	9.6	53.5	2094	277.0	278.1	35.0	13.2	9.7	7.2	13.3	97.0	62
1083	10.2	53.2	2248	277.0	278.1	35.0	13.2	9.3	5.6	13.3	97.0	62
1084	10.6	53.2	2193	277.0	278.1	35.0	12.8	10.8	8.2	13.4	96.9	62
1085	9.0	53.2	1980	277.0	278.1	35.0	13.0	9.1	7.4	13.4	96.9	62
1086	10.6	53.4	2248	277.0	278.1	35.0	13.5	10.8	6.3	13.4	96.9	62
1087	11.9	53.9	2263	277.0	278.1	35.0	12.7	12.1	7.9	13.4	96.9	62
1088	10.7	53.7	2211	277.0	278.1	35.0	13.4	10.9	7.0	13.4	96.9	62
1089	10.4	53.2	2232	277.0	278.1	35.0	13.3	10.5	5.7	13.4	96.9	62
1090	10.4	52.8	2196	277.0	278.1	35.0	12.6	10.5	7.7	13.4	96.9	62
1091	10.8	53.5	2195	277.0	278.1	35.0	12.7	10.9	6.4	13.4	96.9	62
1092	11.4	52.4	2238	277.0	278.1	35.0	12.8	11.5	5.1	13.4	96.9	62
1093	9.3	53.0	2018	277.0	278.1	35.0	12.7	12.3	4.6	13.4	96.9	62
1094	10.6	54.1	2245	277.0	277.4	35.0	13.4	10.7	3.8	13.4	96.9	62
1095	11.1	53.4	2224	277.0	281.4	35.0	13.7	11.2	4.3	13.4	96.9	62
1096	11.6	53.2	2252	277.0	281.4	35.0	13.1	11.7	5.0	13.4	96.9	62
1097	10.3	52.5	2268	277.0	281.4	35.0	13.2	10.4	6.4	13.4	97.0	62
1098	12.2	53.0	2237	277.0	277.4	35.0	13.5	12.3	6.3	13.4	97.0	62
1099	12.7	53.1	2245	277.0	278.4	35.0	13.2	12.9	4.4	13.4	97.0	62
1100	12.0	53.2	2230	277.0	278.4	35.0	12.9	13.4	5.3	13.4	97.0	62
1101	13.0	52.6	2237	277.0	278.4	35.0	12.8	13.2	5.4	13.4	97.0	62
1102	11.5	52.5	2201	277.0	278.4	35.0	12.8	11.7	5.8	13.5	97.0	62
1103	12.7	52.0	2202	277.0	278.4	35.0	12.7	12.9	8.3	13.5	97.0	62
1104	11.3	52.5	2205	277.0	278.4	35.0	12.8	11.5	8.6	13.5	97.0	62
1105	11.8	52.5	2240	277.0	278.4	35.0	13.0	11.9	9.3	13.5	97.0	62
1106	12.5	52.9	2223	277.0	278.4	35.0	13.3	12.7	8.0	13.5	97.0	62
1107			2244	277.0	278.4	35.0	13.4	10.0	6.1	13.5	97.0	62
1108	13.0	53.2	2239	277.0	278.4	35.0	13.0	13.2	9.9	13.6	97.0	61
1109	12.7	52.9	2266	277.0	280.6	35.0	13.1	12.9	6.1	13.6	97.0	61
1110	11.1	52.6	2216	277.0	282.4	35.0	13.0	11.3	8.6	13.6	97.0	61
1111	11.8	52.9	2243	277.0	282.3	35.0	13.0	12.0	8.0	13.6	97.0	61
1112	11.3	52.7	2195	277.0	282.4	35.0	12.8	11.5	9.9	13.6	97.0	61
1113	11.8	52.7	2245	277.0	282.4	35.0	13.0	12.0	8.4	13.6	97.0	61
1114	11.0	52.7	2250	277.0	282.4	35.0	13.0	11.1	7.4	13.6	97.0	61
1115	11.9	52.6	2255	277.0	282.4	35.0	13.1	12.1	5.9	13.5	97.0	61
1116	11.2	53.2	2226	277.0	278.8	35.0	12.9	11.3	6.9	13.5	97.0	61
1117	12.1	52.5	2218	277.0	272.5	35.0	12.9	12.3	6.9	13.5	97.0	61
1118	12.2	52.8	2214	277.0	272.5	35.0	13.2	12.4	9.5	13.5	97.0	61
1119	11.2	52.8	2244	277.0	272.5	35.0	13.1	11.3	6.8	13.5	97.0	61
1120	10.5	52.3	2221	277.0	272.5	35.0	12.8	10.6	6.2	13.5	97.0	62
1121	12.5	52.8	2258	277.0	272.5	35.0	13.2	12.7	5.4	13.5	96.9	62
1122	12.0	52.6	2255	277.0	272.6	35.0	13.0	12.2	8.6	13.5	96.9	62
1123	12.2	52.8	2235	277.0	276.0	35.0	13.1	12.4	6.3	13.5	96.9	62
1124	10.9	52.9	2210	277.0	276.3	35.0	13.0	11.1	5.7	13.5	96.9	62
1125	11.8	52.7	2242	277.0	276.3	35.0	12.9	11.9	6.4	13.5	96.9	62
1126	10.5	52.7	2246	277.0	276.3	35.0	13.0	10.6	5.4	13.5	97.0	62
1127	11.2	53.1	2258	277.0	276.3	35.0	13.1	11.4	9.5	13.5	97.0	62
1128	11.2	53.1	2240	277.0	276.3	35.0	13.0	11.4	6.6	13.5	97.0	62
1129	10.0	52.3	2167	277.0	276.3	35.0	12.7	10.7	5.9	13.5	97.0	62
1130	9.9	52.2	2155	277.0	276.3	35.0	12.7	11.0	5.6	13.5	97.0	62
1131	12.3	52.8	2233	277.0	276.3	35.0	13.2	12.4	7.1	13.5	97.0	62
1132	9.9	52.6	2157	277.0	276.1	35.0	12.6	9.2	5.2	13.6	97.0	62
1133	10.6	52.6	2169	277.0	276.2	35.0	12.6	10.5	6.2	13.6	97.0	62
1134	11.4	53.3	2262	277.0	272.3	35.0	13.6	11.5	4.2	13.6	97.0	62
1135	11.8	53.5	2235	277.0	272.3	35.0	13.3	12.0	8.7	13.6	97.0	62
1136	11.0	52.9	2223	277.0	272.3	35.0	13.2	11.2	9.1	13.6	97.0	62
1137	11.3	52.4	2190	277.0	272.3	35.0	12.8	11.5	6.5	13.6	97.0	62
1138	9.9	52.2	2160	277.0	272.3	35.0	12.5	12.5	6.2	13.6	96.9	61
1139	8.7	52.1	1789	277.0	273.3	35.0	12.6	10.9	8.2	13.6	96.9	61
1140	8.8	53.4	1876	277.0	279.7	35.0	13.0	10.7	6.9	13.6	96.9	61
1141	8.6	53.7	1765	277.0	279.9	35.0	13.0	8.9	3.3	13.6	96.9	61
1142	9.5	53.8	2070	277.0	279.9	35.0	13.2	9.1	5.8	13.6	96.9	61
1143	10.8	53.7	2228	277.0	279.9	35.0	13.1	11.0	6.3	13.6	96.9	61
1144	11.0	53.3	2239	277.0	279.9	35.0	13.7	11.2	5.6	13.6	97.0	61

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (kPa)	Relative Humidity (%)
1145	10.7	53.4	2265	277.0	279.9	35.0	13.3	10.8	8.6	13.6	97.0	61
1146	10.3	53.4	2252	277.0	279.9	35.0	13.2	10.5	7.7	13.6	97.0	61
1147	11.4	52.8	2188	277.0	279.9	35.0	12.7	11.5	7.1	13.6	97.0	61
1148	9.5	51.8	2051	277.0	279.9	35.0	12.4	10.2	8.3	13.6	97.0	61
1149	10.0	52.6	2236	277.0	279.9	35.0	13.0	9.3	7.3	13.6	97.0	61
1150	12.0	53.1	2238	277.0	279.9	35.0	12.9	12.2	6.5	13.6	97.0	61
1151	8.9	53.7	1886	277.0	279.9	35.0	12.8	12.5	8.4	13.6	97.0	61
1152			2248	277.0	279.9	35.0	13.1	9.9	7.0	13.6	97.0	61
1153			2186	277.0	279.9	35.0	13.0	8.5	7.9	13.6	97.0	61
1154			2222	277.0	279.9	35.0	13.0					

# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 8 of 9  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
1233	10.9	53.4	2243	277.0	264.5	35.0	13.5	11.0	7.7	13.5	97.0	61
1234	10.9	53.6	2246	277.0	270.8	35.0	12.9	11.0	6.5	13.6	97.0	62
1235	12.6	53.3	2190	277.0	264.4	35.0	12.7	12.8	7.1	13.6	97.0	62
1236	10.1	53.0	2178	277.0	265.2	35.0	12.6	11.3	5.4	13.6	97.0	62
1237	10.9	53.3	2210	277.0	270.8	35.0	13.1	11.1	4.3	13.6	97.0	62
1238	11.6	53.8	2246	277.0	270.8	35.0	13.6	11.8	4.8	13.6	97.0	61
1239	12.8	53.6	2257	277.0	270.8	35.0	13.4	12.9	5.3	13.6	97.0	61
1240	12.2	53.3	2264	277.0	270.8	35.0	13.1	12.3	7.9	13.6	97.0	62
1241	9.8	52.0	2133	277.0	270.8	35.0	12.5	11.1	10.3	13.6	96.9	62
1242	11.2	52.6	2212	277.0	270.8	35.0	12.9	11.3	9.4	13.6	96.9	62
1243	11.2	52.7	2186	277.0	270.8	35.0	12.8	11.3	8.8	13.6	96.9	62
1244	10.5	52.6	2225	277.0	268.6	35.0	13.0	10.7	9.0	13.6	96.9	62
1245	10.4	53.2	2237	277.0	264.0	35.0	13.2	10.6	6.7	13.6	96.9	62
1246	11.3	53.7	2261	277.0	264.0	35.0	13.1	11.4	6.3	13.6	96.9	61
1247	9.9	52.8	2206	277.0	264.0	35.0	12.8	8.5	6.2	13.6	96.9	61
1248	9.9	52.8	2155	277.0	264.0	35.0	12.5	10.9	4.8	13.6	96.9	61
1249	9.9	53.3	2136	277.0	264.0	35.0	12.9	10.6	5.1	13.6	96.9	61
1250	9.8	53.7	2153	277.0	268.5	35.0	13.0	12.0	11.2	13.6	96.9	61
1251	10.9	53.4	2232	277.0	275.1	35.0	13.2	11.1	9.4	13.6	96.9	61
1252	10.5	53.2	2224	277.0	275.8	35.0	12.8	10.6	7.2	13.7	96.9	61
1253	8.3	54.0	1597	277.0	275.8	35.0	12.8	7.7	7.1	13.7	96.9	61
1254	9.2	54.8	1992	277.0	275.8	35.0	13.1	11.0	6.8	13.7	96.9	61
1255	9.3	53.8	2219	277.0	275.8	35.0	13.0	11.2	5.4	13.7	96.9	61
1256	9.3	53.5	2026	277.0	275.9	35.0	13.0	8.2	6.8	13.7	96.9	61
1257	9.4	53.5	2048	277.0	275.7	35.0	13.0	7.3	4.5	13.7	96.9	61
1258	8.8	53.8	1835	277.0	270.0	35.0	13.0	10.2	7.3	13.7	96.9	61
1259	10.8	54.3	2264	277.0	270.0	35.0	13.6	10.9	5.9	13.7	96.9	61
1260	10.1	53.2	2238	277.0	270.0	35.0	13.2	9.6	4.8	13.7	96.9	61
1261	10.1	54.3	2178	277.0	270.0	35.0	12.8	10.3	5.4	13.7	96.9	61
1262	10.1	54.3	2240	277.0	270.0	35.0	13.0	10.4	6.5	13.7	96.9	61
1263	10.1	53.6	2251	277.0	265.1	35.0	13.0	8.4	6.1	13.7	96.9	61
1264	10.5	52.9	2271	277.0	265.2	35.0	13.2	10.6	5.7	13.7	96.9	61
1265	10.6	53.4	2231	277.0	265.2	35.0	13.2	10.7	8.0	13.8	96.9	61
1266	10.6	53.4	2228	277.0	266.2	35.0	12.9	10.1	6.4	13.8	96.9	61
1267	9.3	53.8	2186	277.0	265.0	35.0	12.8	10.4	6.4	13.8	96.9	61
1268	9.3	52.7	2017	277.0	265.0	35.0	12.5	10.9	5.5	13.8	97.0	61
1269	9.3	53.9	2013	277.0	264.9	35.0	13.0	9.6	8.6	13.8	97.0	61
1270	8.5	53.5	1706	277.0	264.9	35.0	12.9	9.0	9.5	13.8	97.0	61
1271	10.0	53.9	2166	277.0	265.5	35.0	13.2	11.5	8.7	13.8	97.0	61
1272	10.5	53.7	2237	277.0	265.7	35.0	13.2	10.7	8.0	13.8	97.0	61
1273	8.6	53.2	1761	277.0	265.7	35.0	12.8	10.0	5.7	13.8	97.0	61
1274	8.6	53.3	1771	277.0	265.6	35.0	13.0	9.5	7.1	13.8	97.0	61
1275	9.4	53.9	2050	277.0	265.6	35.0	13.0	9.8	7.4	13.8	97.0	61
1276	8.5	53.7	1689	277.0	265.6	35.0	13.0	9.4	6.0	13.8	97.0	61
1277	9.2	53.6	1985	277.0	267.4	35.0	13.0	7.9	6.4	13.8	97.0	61
1278	8.9	53.8	1906	277.0	274.0	35.0	13.0	11.5	4.7	13.8	97.0	61
1279	8.2	53.2	1587	277.0	274.8	35.0	12.8	8.5	6.0	13.8	97.0	61
1280	8.0	52.9	1480	277.0	274.8	35.0	13.0	10.1	4.1	13.8	97.0	61
1281	9.6	53.5	2082	277.0	274.8	35.0	13.2	9.1	7.4	13.8	97.0	61
1282	8.6	53.6	1778	277.0	279.0	35.0	12.9	7.9	7.0	13.8	97.0	61
1283	8.4	53.3	1657	277.0	279.0	35.0	13.0	7.5	7.1	13.8	97.0	61
1284	8.8	53.6	1835	277.0	274.7	35.0	13.1	8.2	7.7	13.8	97.0	61
1285	9.9	54.0	2145	277.0	268.8	35.0	13.1	10.1	7.2	13.8	97.0	61
1286	9.3	53.5	2025	277.0	268.8	35.0	13.0	7.4	5.3	13.8	97.0	61
1287	8.8	53.4	1958	277.0	268.8	35.0	13.0	8.9	5.0	13.8	97.0	61
1288	8.6	53.7	1750	277.0	269.1	35.0	13.0	9.4	6.0	13.8	97.0	61
1289	8.5	53.5	1688	277.0	268.8	35.0	12.9	9.9	8.7	13.8	97.0	61
1290	8.5	53.5	1692	277.0	268.8	35.0	13.0	11.5	7.4	13.8	97.0	61
1291	8.7	53.6	1793	277.0	268.8	35.0	13.0	9.7	6.2	13.8	97.0	61
1292	8.5	53.6	1713	277.0	268.8	35.0	13.0	11.1	6.2	13.8	97.0	61
1293	10.5	54.3	2227	277.0	268.8	35.0	13.5	10.6	5.9	13.8	97.0	61
1294	10.9	54.5	2267	277.0	268.8	35.0	13.5	11.1	5.3	13.8	97.0	61
1295	11.8	53.8	2246	277.0	268.8	35.0	13.1	12.0	8.6	13.8	97.0	61
1296	10.0	52.5	2168	277.0	268.8	35.0	12.7	10.0	8.0	13.8	97.0	61
1297	10.0	52.4	2173	277.0	268.8	35.0	12.6	10.4	6.6	13.8	97.0	61
1298	11.2	53.3	2209	277.0	268.8	35.0	12.9	11.4	7.6	13.8	97.0	61
1299	10.8	53.6	2237	277.0	271.2	35.0	13.0	10.9	5.7	13.8	97.0	61
1300	10.0	52.9	2229	277.0	272.2	35.0	12.8	10.0	5.1	13.8	97.0	61
1301	8.5	54.7	1702	277.0	272.2	35.0	12.7	9.5	6.2	13.9	97.0	61
1302	8.8	53.8	1856	277.0	272.2	35.0	13.0	10.0	7.2	13.8	97.0	61
1303	10.7	53.5	2221	277.0	272.2	35.0	13.1	10.9	6.9	13.8	97.0	61
1304	10.0	53.4	2212	277.0	268.3	35.0	13.0	8.3	5.9	13.8	97.0	61
1305	8.9	53.4	1930	277.0	263.9	35.0	12.9	11.0	7.1	13.8	97.0	61
1306	9.8	53.4	2134	277.0	263.9	35.0	13.1	9.5	7.4	13.8	97.0	61
1307	11.0	54.0	2259	277.0	263.9	35.0	13.3	11.2	8.3	13.8	97.0	61
1308	10.0	52.9	2235	277.0	263.9	35.0	13.2	8.1	9.2	13.8	97.0	61
1309	8.7	52.9	1811	277.0	263.9	35.0	12.5	10.0	6.3	13.9	97.0	61
1310	9.9	53.5	2149	277.0	263.9	35.0	13.1	7.3	9.1	13.8	97.0	61
1311	8.9	53.5	1903	277.0	263.9	35.0	12.9	12.4	7.8	13.8	97.0	61
1312	8.7	53.7	1820	277.0	263.9	35.0	12.9	9.7	7.9	13.7	97.0	61
1313	9.0	53.0	1963	277.0	263.9	35.0	13.1	10.8	8.0	13.7	97.0	61
1314	10.1	53.6	2175	277.0	269.5	35.0	13.1	10.4	8.9	13.7	97.0	61
1315	10.6	53.9	2188	277.0	268.3	35.0	13.0	10.7	7.1	13.7	97.0	61
1316	11.7	53.7	2254	277.0	268.3	35.0	13.3	11.9	7.3	13.7	97.0	61
1317	9.1	53.2	1977	277.0	268.3	35.0	12.8	9.5	8.0	13.7	97.0	61
1318	8.9	52.8	1910	277.0	268.3	35.0	12.9	10.3	7.8	13.7	97.0	61
1319	9.3	53.5	2018	277.0	268.3	35.0	13.0	10.7	6.4	13.7	97.0	61
1320	11.6	54.3	2242	277.0	268.3	35.0	13.3	11.7	6.4	13.7	97.0	61

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	Ureq	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (hPa)	Relative Humidity (%)
1321	8.5	53.6	2189	277.0	268.3	35.0	12.9	8.9	6.8	13.7	97.0	61
1322	9.0	53.8	1929	277.0	271.3	35.0	12.9	9.0	7.8	13.7	97.0	61
1323	9.2	53.8	1999	277.0	275.2	35.0	13.0	10.7	6.3	13.7	97.0	61
1324	9.6	53.5	2082	277.0	275.2	35.0	13.0	12.2	6.4	13.7	97.0	61
1325	8.9	53.4	1880	277.0	275.2	35.0	12.9	6.6	7.3	13.7	97.0	61
1326	9.0	53.8	1929	277.0	275.2	35.0	13.1	8.2	6.5	13.7	97.0	61
1327	9.0	53.9	1930	277.0	275.2	35.0	13.0	11.2	5.5	13.7	97.0	61
1328	8.2	53.7	1587	277.0	275.2	35.0	12.9	10.4	8.7	13.7	97.0	61
1329	11.2	54.2	2221	277.0	275.2	35.0	13.3	11.3	10.1	13.7	97.0	61
1330	11.6	53.2										

# Table E.01 Measurement data - Turbine ON

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 9 of 9  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LWd	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (kPa)	Relative Humidity (%)
1409	9.9	52.9	2155	277.0	281.3	35.0	12.7	11.3	9.2	13.7	97.0	62
1410	9.9	52.1	2158	277.0	283.2	35.0	12.5	12.9	7.6	13.7	97.0	62
1411	11.1	52.1	2200	277.0	283.2	35.0	12.8	11.3	7.8	13.7	97.0	62
1412	10.1	52.5	2177	277.0	283.2	35.0	12.6	11.9	7.2	13.7	97.0	62
1413	10.9	52.3	2264	277.0	283.2	35.0	13.0	11.1	6.8	13.7	97.0	62
1414	10.6	52.8	2248	277.0	283.2	35.0	13.0	10.7	6.9	13.7	97.0	62
1415	11.3	52.4	2221	277.0	283.2	35.0	12.9	11.4	4.8	13.7	97.0	62
1416			2214	277.0	283.2	35.0	12.9	10.0	5.1	13.7	97.0	62
1417	10.8	52.5	2202	277.0	279.6	35.0	12.8	11.0	7.0	13.7	97.0	62
1418	10.1	52.3	2176	277.0	279.6	35.0	12.6	10.6	7.2	13.7	97.0	62
1419	8.7	52.6	1811	277.0	279.6	35.0	12.9	11.6	7.2	13.7	97.0	62
1420	9.8	52.9	2136	277.0	282.9	35.0	13.1	10.0	5.7	13.7	97.0	62
1421			2184	277.0	283.1	35.0	13.1	10.3	5.9	13.7	97.0	62
1422	11.4	53.3	2258	277.0	283.2	35.0	13.1	11.6	4.6	13.7	97.0	62
1423	8.6	52.7	1778	277.0	283.2	35.0	12.8	9.9	4.3	13.7	97.0	62
1424	8.9	53.7	1905	277.0	288.5	35.0	13.1	7.6	5.1	13.7	97.0	62
1425	8.2	53.3	1572	277.0	290.3	35.0	12.8	8.4	7.8	13.7	97.0	62
1426	7.9	52.6	1442	277.0	290.3	35.0	12.9	9.1	3.7	13.7	97.0	62
1427	8.2	53.3	1558	277.0	290.3	35.0	13.0	7.1	4.6	13.7	97.0	62
1428	8.2	53.1	1570	277.0	290.3	35.0	13.0	8.9	4.9	13.7	97.0	62
1429	9.2	53.2	1991	277.0	290.5	35.0	13.2	9.4	7.8	13.7	97.0	62
1430			2241	277.0	290.5	35.0	13.4	9.8	7.6	13.7	97.0	62
1431	10.6	53.0	2258	277.0	290.5	35.0	13.2	10.7	5.6	13.7	97.0	62
1432			2227	277.0	290.5	35.0	12.8	8.9	4.8	13.7	97.0	62
1433			2239	277.0	292.1	35.0	13.1	10.4	7.5	13.7	97.0	62
1434			2217	277.0	292.1	35.0	12.9	10.8	4.7	13.7	97.0	62
1435			1518	277.0	292.1	35.0	12.6	10.7	3.4	13.7	97.0	62
1436			1831	277.0	292.1	35.0	13.2	7.7	7.1	13.7	97.0	62
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\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LWd	Turbine Power Output (kW)	Reference Yaw Angle (°)	Yaw Angle (°)	Pitch Angle (°)	Rotor RPM	Nacelle Anemometer Wind Speed (m/s)	10m Anemometer Wind Speed (m/s)	Air Temperature (°C)	Pressure (kPa)	Relative Humidity (%)
1497												
1498												
1499												
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# Table E.02 Measurement data - Background

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 1 of 4  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	L <sub>Aeq</sub>	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
1			0.4	6.2	11	98.7	62
2			0.4	6.2	11	98.7	62
3			0.5	5.7	11	98.7	62
4			0.5	6.5	11	98.7	62
5			0.5	4.7	11	98.7	62
6			0.4	5.9	11	98.7	62
7			0.3	5.7	11	98.7	62
8			0.3	6.2	11	98.7	62
9			0.3	4.8	11	98.7	62
10			0.3	5.3	11	98.7	62
11			0.4	5.9	11	98.7	62
12			0.4	5.9	11	98.7	62
13			0.2	4.8	11	98.7	62
14			0.2	6.8	11	98.7	62
15			0.3	7.3	11	98.7	62
16			0.3	5.7	11	98.7	62
17			0.3	4.1	11	98.7	62
18			0.3	4.8	12	98.7	61
19			0.4	6.0	12	98.7	61
20			0.2	5.1	12	98.7	61
21			0.3	3.3	12	98.7	61
22			0.3	4.5	12	98.7	61
23			0.1	5.0	12	98.7	61
24			0.3	2.7	12	98.7	61
25			0.4	3.6	12	98.7	61
26			0.2	4.8	12	98.7	61
27			0.3	3.5	12	98.7	61
28			0.4	4.2	12	98.7	61
29			0.4	4.8	12	98.7	61
30			0.2	2.7	12	98.7	61
31			0.1	5.1	12	98.7	61
32			0.2	4.5	12	98.7	61
33			0.2	5.3	12	98.7	61
34			0.2	4.7	12	98.7	61
35			0.3	5.0	12	98.7	61
36			0.4	4.8	12	98.7	61
37			0.4	6.5	12	98.7	61
38			0.3	5.7	12	98.7	61
39			0.4	5.4	12	98.7	61
40			0.4	5.4	12	98.7	61
41			0.3	4.8	12	98.7	61
42			0.3	5.6	12	98.7	59
43			0.2	6.0	12	98.7	59
44			0.3	5.0	12	98.7	59
45			0.3	3.5	12	98.7	59
46			0.3	3.8	12	98.7	59
47			0.3	5.1	12	98.7	59
48			0.3	7.0	12	98.7	60
49			0.3	6.2	12	98.7	60
50			0.3	5.3	12	98.7	60
51			0.3	5.0	12	98.7	60
52			0.4	5.3	12	98.7	60
53			0.3	4.2	12	98.7	60
54			0.3	3.6	12	98.7	60
55			0.3	3.2	12	98.7	60
56			0.3	5.0	12	98.7	60
57			0.3	3.5	12	98.7	60
58			0.3	2.6	12	98.7	60
59			0.2	3.0	12	98.7	60
60			0.2	3.6	12	98.7	61
61			0.2	3.8	12	98.7	61
62			0.4	3.5	12	98.7	61
63			0.5	3.2	12	98.7	61
64			0.2	6.8	12	98.7	61
65			0.1	6.2	12	98.7	61
66			0.3	5.9	12	98.7	59
67			0.4	6.2	12	98.7	59
68			0.4	5.7	12	98.7	59
69			0.3	8.3	12	98.7	59
70			0.2	6.5	12	98.7	59
71			0.2	5.9	12	98.7	59
72			0.3	5.4	12	98.7	58
73			0.2	5.7	12	98.7	58
74			0.3	3.8	12	98.7	58
75			0.4	4.2	12	98.7	58
76			0.4	5.7	12	98.7	58
77			0.1	2.1	12	98.7	58
78			0.2	3.0	12	98.7	61
79			0.2	5.4	12	98.7	61
80			0.3	6.9	12	98.7	61
81			0.2	5.0	12	98.7	61
82			0.3	5.4	12	98.7	61
83			0.4	5.7	12	98.7	61

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	L <sub>Aeq</sub>	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
84			0.3	5.0	12	98.7	59
85			0.2	3.9	12	98.7	59
86			0.2	2.9	12	98.7	59
87			0.2	5.0	12	98.7	59
88			0.3	4.2	12	98.7	59
89			0.2	3.6	12	98.7	59
90			0.2	3.5	12	98.7	59
91			0.3	3.9	12	98.7	59
92			0.4	5.4	12	98.7	59
93			0.2	5.1	12	98.7	59
94			0.2	4.1	12	98.7	59
95			0.3	4.8	12	98.7	59
96			0.2	5.4	12	98.7	59
97			0.4	3.8	12	98.7	59
98			0.4	4.5	12	98.7	59
99			0.4	5.0	12	98.7	59
100			0.3	6.0	12	98.7	59
101			0.3	5.9	12	98.7	59
102			0.3	5.7	12	98.7	59
103			0.3	4.5	12	98.7	59
104			0.6	4.8	12	98.7	59
105			0.5	5.3	12	98.7	59
106			0.6	3.0	12	98.7	59
107			0.5	5.0	12	98.7	59
108			0.5	5.9	12	98.7	59
109			0.4	7.0	12	98.7	59
110			0.3	6.0	12	98.7	59
111			0.2	6.5	12	98.7	59
112			0.3	4.1	12	98.7	59
113			0.4	3.2	12	98.7	59
114			0.2	5.9	12	98.7	59
115			0.2	6.9	12	98.7	59
116			0.1	6.6	12	98.7	59
117			0.2	5.0	12	98.7	59
118			0.2	5.0	12	98.7	59
119			0.2	6.0	12	98.7	59
120			0.2	4.8	12	98.7	58
121			0.3	5.1	12	98.7	58
122			0.4	5.7	12	98.7	58
123			0.5	4.7	12	98.7	58
124			0.4	2.7	12	98.7	58
125			0.4	4.8	12	98.7	58
126			0.4	4.2	12	98.7	58
127			0.4	4.1	12	98.7	58
128			0.3	6.5	12	98.7	58
129			0.3	5.9	12	98.7	58
130			0.3	5.4	12	98.7	58
131			0.3	5.4	12	98.7	58
132			0.4	6.5	12	98.7	58
133			0.3	6.6	12	98.7	58
134			0.3	5.7	12	98.7	58
135			0.3	5.9	12	98.7	58
136			0.4	5.0	12	98.7	58
137			0.5	4.2	12	98.7	58
138			0.4	4.5	12	98.7	58
139			0.4	5.1	12	98.7	59
140			0.3	4.8	12	98.7	59
141			0.4	4.8	12	98.7	59
142			0.5	5.0	12	98.7	59
143			0.4	4.2	12	98.7	59
144			0.4	3.2	12	98.7	59
145			0.3	3.6	12	98.7	59
146			0.2	4.1	12	98.7	59
147			0.3	4.5	12	98.7	59
148			0.2	4.5	12	98.7	59
149			0.2	4.5	12	98.7	59
150			0.3	3.6	12	98.7	59
151			0.3	4.1	12	98.7	59
152			0.4	4.4	12	98.7	59
153			0.3	4.5	12	98.7	59
154			0.3	3.9	12	98.7	59
155			0.3	5.7	12	98.7	59
156			0.3	4.8	12	98.7	58
157			0.3	5.4	12	98.7	58
158			0.3	5.4	12	98.7	58
159			0.3	7.1	12	98.7	58
160			0.4	6.2	12	98.7	58
161			0.3	5.0	12	98.7	58
162			0.3	3.2	12	98.6	58
163			0.3	3.2	12	98.6	58
164			0.2	2.6	12	98.6	58
165			0.2	4.5	12	98.6	58
166			0.3	5.6	12	98.6	58

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	L <sub>Aeq</sub>	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
167			0.2	5.6	12	98.6	58
168			0.3	4.5	12	98.6	58
169			0.3	5.3	12	98.6	58
170			0.3	4.8	12	98.6	58
171			0.3	5.0	12	98.6	58
172			0.3	5.4	12	98.6	58
173			0.2	5.6	12	98.6	58
174			0.2	1.7	12	98.6	58
175			0.2	1.2	12	98.6	58
176			0.5	3.0	12	98.6	58
177			0.3	4.4	12	98.6	58
178			0.3	5.6	12	98.6	58
179			0.3	6.8	12	98.6	58
180			0.3	7.9	12	98.6	57
181			0.3	5.9	12	98.6	57
182			0.4	5.7	12	98.6	57
183			0.5	7.0	12	98.6	57
184			0.5	6.2	12	98.6	57
185			0.4	5.9	12	98.6	57
186			0.4	4.8	12	98.6	57
187			0.4	5.7	12	98.6	57
188			0.4	6.5	12	98.6	57
189			0.4	5.3	12	98.6	57
190			0.3	4.7	12	98.6	57
191			0.2	3.9	12	98.6	57
192			0.1	4.5	12	98.6	58
193			0.0	3.0	12	98.6	58
194			0.2	3.9	12	98.6	58
195			0.3	3.9	12	98.6	58



# Table E.02 Measurement data - Background

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 2 of 4  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAEq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
250			0.6	9.8	11	99.1	32
251			0.7	11.7	11	99.1	32
252			0.7	6.0	11	99.1	32
253			0.9	10.1	11	99.1	32
254			0.5	7.0	11	99.1	32
255			0.8	11.5	11	99.1	34
256			0.7	11.0	11	99.1	34
257			0.7	9.2	11	99.1	34
258			0.7	9.5	11	99.1	34
259			0.8	7.6	11	99.1	34
260			0.5	12.7	11	99.1	34
261			0.7	11.8	11	99.0	34
262			0.7	11.8	11	99.0	34
263			0.6	10.7	11	99.0	34
264			0.6	9.6	11	99.0	34
265			0.6	10.1	11	99.0	34
266			0.6	10.2	11	99.0	34
267			0.8	11.9	11	99.1	33
268			0.7	12.0	11	99.1	33
269			0.7	12.3	11	99.1	33
270			0.6	12.9	11	99.1	33
271			1.0	9.1	11	99.1	33
272			0.9	11.6	11	99.1	33
273			0.5	10.1	11	99.1	32
274			0.7	10.7	11	99.1	32
275			0.7	14.0	11	99.1	32
276			0.8	10.3	11	99.1	32
277			0.8	7.4	11	99.1	32
278			0.7	11.7	11	99.1	32
279			0.5	11.3	11	99.1	32
280			0.6	13.3	11	99.1	32
281			0.6	10.4	11	99.1	32
282			1.0	9.2	11	99.1	32
283			0.5	10.3	11	99.1	32
284			0.7	7.1	11	99.1	32
285			0.5	7.9	11	99.1	33
286			0.4	8.6	11	99.1	33
287			0.9	9.5	11	99.1	33
288			0.8	9.8	11	99.1	33
289			0.8	8.9	11	99.1	33
290			0.9	10.7	11	99.1	33
291			0.8	11.7	11	99.0	28
292			0.8	10.3	11	99.0	28
293			0.7	9.2	11	99.0	28
294			0.7	7.4	11	99.0	28
295			0.6	11.0	11	99.0	28
296			0.6	12.1	11	99.0	28
297			0.9	11.7	11	99.1	31
298			0.9	12.4	11	99.1	31
299			0.7	10.2	11	99.1	31
300			0.6	6.2	11	99.1	31
301			0.8	12.1	11	99.1	31
302			0.3	8.7	11	99.1	31
303			0.5	9.4	11	99.1	32
304			0.5	10.6	11	99.1	32
305			0.6	6.6	11	99.1	32
306			0.6	12.8	11	99.1	32
307			0.7	8.7	11	99.1	32
308			0.9	8.3	11	99.1	32
309			0.7	7.6	11	99.1	32
310			0.7	9.5	11	99.1	32
311			0.9	9.7	11	99.1	32
312			0.9	9.7	11	99.1	32
313			0.6	10.0	11	99.1	32
314			0.8	6.9	11	99.1	32
315			0.8	9.8	11	99.1	29
316			0.6	8.7	11	99.1	29
317			0.8	10.7	11	99.1	29
318			0.8	10.2	11	99.1	29
319			0.9	8.9	11	99.1	29
320			0.9	11.0	11	99.1	29
321			0.7	8.7	11	99.1	30
322			0.8	7.4	11	99.1	30
323			0.9	7.2	11	99.1	30
324			1.0	10.3	11	99.1	30
325			0.9	10.5	11	99.1	30
326			1.0	9.8	11	99.1	30
327			0.9	9.1	11	99.1	30
328			0.8	12.7	11	99.1	30
329			0.9	10.9	11	99.1	30
330			0.9	6.5	11	99.1	30
331			0.9	12.6	11	99.1	30
332			0.8	11.7	11	99.1	30

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAEq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
333			0.8	11.5	11	99.1	30
334			1.0	13.6	11	99.1	30
335			1.0	8.7	11	99.1	30
336			0.9	13.3	11	99.1	30
337			1.0	12.9	11	99.1	30
338			0.7	10.4	11	99.1	30
339			0.7	12.7	11	99.1	28
340			0.8	10.9	11	99.1	28
341			0.8	8.9	11	99.1	28
342			0.8	12.4	11	99.1	28
343			0.9	10.6	11	99.1	28
344			0.9	9.2	11	99.1	28
345			0.7	13.4	11	99.1	28
346			0.8	9.5	11	99.1	28
347			0.9	10.2	11	99.1	28
348			0.7	7.8	11	99.1	28
349			0.7	6.9	11	99.1	28
350			0.7	9.3	11	99.1	28
351			0.8	9.4	11	99.1	29
352			0.9	13.2	11	99.1	29
353			1.0	11.7	11	99.1	29
354			1.0	13.7	11	99.1	29
355			0.7	11.5	11	99.1	29
356			0.7	9.3	11	99.1	29
357			0.7	13.2	11	99.1	27
358			0.9	8.2	11	99.1	27
359			0.8	8.4	11	99.1	27
360			0.8	5.6	11	99.1	27
361			0.8	4.2	11	99.1	27
362			0.8	9.0	11	99.1	27
363			0.6	8.9	11	99.1	28
364			1.0	11.3	11	99.1	28
365			1.0	10.6	11	99.1	28
366			0.6	11.3	11	99.1	28
367			0.5	10.9	11	99.1	28
368			0.6	9.8	11	99.1	28
369			0.7	6.3	11	99.1	28
370			0.6	8.8	11	99.1	28
371			0.7	7.8	11	99.1	28
372			0.7	7.3	11	99.1	28
373			0.5	7.6	11	99.1	28
374			0.7	8.9	11	99.1	28
375			0.5	13.1	11	99.1	29
376			0.8	13.4	11	99.1	29
377			0.9	10.6	11	99.1	29
378			1.1	8.2	11	99.1	29
379			1.2	11.5	11	99.1	29
380			1.0	12.5	11	99.1	29
381			1.0	13.3	11	99.1	28
382			1.0	8.8	11	99.1	28
383			1.0	10.7	11	99.1	28
384			1.0	11.3	11	99.1	28
385			1.0	8.9	11	99.1	28
386			1.1	8.0	11	99.1	28
387			0.9	9.8	11	99.1	28
388			1.0	11.2	11	99.1	28
389			0.8	10.4	11	99.1	28
390			0.4	11.5	11	99.1	28
391			0.5	13.2	11	99.1	28
392			0.4	11.6	11	99.1	28
393			0.7	10.3	11	99.1	28
394			0.6	9.9	11	99.1	28
395			0.9	8.5	11	99.1	28
396			0.7	7.9	11	99.1	28
397			0.7	9.8	11	99.1	28
398			0.9	10.6	11	99.1	28
399			0.8	7.0	11	99.1	30
400			0.8	9.6	11	99.1	30
401			0.8	8.1	11	99.1	30
402			0.7	8.9	11	99.1	30
403			0.8	8.7	11	99.1	30
404			1.1	6.5	11	99.1	30
405			1.2	10.4	11	99.1	30
406			1.1	10.2	11	99.1	30
407			0.5	11.0	11	99.1	30
408			0.5	10.9	11	99.1	30
409			1.0	10.7	11	99.1	30
410			0.9	8.8	11	99.1	30
411			0.6	7.7	10	99.3	27
412			0.6	8.4	10	99.3	27
413			0.7	8.9	10	99.3	27
414			0.6	8.9	10	99.3	27
415			0.5	7.4	10	99.3	27

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAEq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
416			0.6	10.6	10	99.2	28
417			0.7	9.4	10	99.2	28
418			0.8	8.4	10	99.2	28
419			0.5	10.3	10	99.2	28
420			0.5	8.8	10	99.2	28
421			0.3	9.5	10	99.2	28
422			0.6	10.3	10	99.2	27
423			0.6	11.5	10	99.2	27
424			0.4	10.4	10	99.2	27
425			1.0	11.5	10	99.2	27
426			0.8	10.2	10	99.2	27
427			0.9	6.8	10	99.2	27
428			0.8	7.9	10	99.3	26
429			0.8	12.0	10	99.3	26
430			0.9	11.0	10	99.3	26
431			1.0	9.5	10	99.3	26
432			0.9	9.1	10	99.3	26
433			1.0	11.6	10	99.3	26
434			0.8	10.2	10	99.3	27
435			0.6	13.9	10	99.3	27
436			0.7	4.2	10	99.3	27
437			0.7	7.9	10	99.3	27
438			0.8	9.8	10	99.3	27
439			0.8	6.6	10	99.3	27
440			0.4	9.5	10	99.3	27
441			0.6	7.8	10	99.3	

# Table E.02 Measurement data - Background

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 3 of 4  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
499			0.7	5.8	10	99.3	27
500			0.7	7.1	10	99.3	28
501			0.7	7.2	10	99.3	28
502			0.5	6.9	10	99.3	28
503			0.5	6.3	10	99.3	28
504			0.3	6.0	10	99.3	28
505			0.3	8.5	10	99.3	28
506			0.4	10.4	11	99.3	28
507			0.6	12.2	11	99.3	28
508			0.6	9.1	11	99.3	28
509			0.7	11.3	11	99.3	28
510			0.7	9.7	11	99.3	28
511			0.7	9.7	11	99.3	28
512			0.6	8.4	11	99.3	29
513			0.8	10.1	11	99.3	29
514			0.9	10.9	11	99.3	29
515			0.6	10.1	11	99.3	29
516			0.6	7.6	11	99.3	29
517			0.8	8.7	11	99.3	29
518			0.9	9.8	11	99.3	29
519			0.7	8.4	11	99.3	29
520			0.6	10.4	11	99.3	29
521			0.6	11.6	11	99.3	29
522			0.8	10.4	11	99.3	29
523			0.5	9.4	11	99.3	29
524			0.7	9.1	10	99.3	28
525			0.6	10.4	10	99.3	28
526			0.8	8.4	10	99.3	28
527			0.8	9.5	10	99.3	28
528			0.7	9.2	10	99.3	28
529			0.6	9.7	10	99.3	28
530			0.5	8.3	10	99.3	29
531			0.5	7.4	10	99.3	29
532			0.5	7.2	10	99.3	29
533			0.6	7.1	10	99.3	29
534			0.6	6.0	10	99.3	29
535			0.8	6.6	10	99.3	29
536			0.7	5.3	10	99.3	30
537			0.9	11.4	10	99.3	30
538			0.5	10.6	10	99.3	30
539			0.6	9.4	10	99.3	30
540			0.6	9.8	10	99.3	30
541			0.3	10.6	10	99.3	30
542			0.5	11.1	11	99.3	29
543			0.7	9.8	11	99.3	29
544			0.9	7.2	11	99.3	29
545			1.0	10.8	11	99.3	29
546			0.9	7.5	11	99.3	29
547			1.0	7.9	11	99.3	29
548			0.9	7.6	10	99.3	29
549			0.9	6.9	10	99.3	29
550			0.8	9.4	10	99.3	29
551			0.7	9.1	10	99.3	29
552			0.7	7.5	10	99.3	29
553			0.7	8.6	10	99.3	29
554			0.7	8.2	10	99.3	29
555			0.5	10.7	10	99.3	29
556			0.8	10.1	10	99.3	29
557			1.0	7.3	10	99.3	29
558			0.7	8.4	10	99.3	29
559			0.5	7.9	10	99.3	29
560			0.5	8.8	10	99.3	30
561			0.8	13.6	10	99.3	30
562			0.7	11.0	10	99.3	30
563			0.7	8.4	10	99.3	30
564			0.8	8.6	10	99.3	30
565			0.7	9.1	10	99.3	30
566			0.7	6.9	11	99.3	30
567			0.7	7.5	11	99.3	30
568			0.6	8.5	11	99.3	30
569			0.7	8.4	11	99.3	30
570			0.6	8.0	11	99.3	30
571			0.4	9.5	11	99.3	30
572			0.5	8.1	11	99.3	30
573			0.5	6.5	11	99.3	30
574			0.6	7.9	11	99.3	30
575			0.5	5.8	11	99.3	30
576			0.5	5.4	11	99.3	30
577			0.6	7.9	11	99.3	30
578			0.4	6.9	11	99.3	30
579			0.8	4.5	11	99.3	30
580			0.6	7.3	11	99.3	30
581			0.6	9.5	11	99.3	30

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
582			0.7	8.8	11	99.3	30
583			0.9	7.5	11	99.3	30
584			0.7	9.4	11	99.3	29
585			0.6	9.1	11	99.3	29
586			0.8	11.2	11	99.3	29
587			0.5	12.0	11	99.3	29
588			0.6	3.9	11	99.3	29
589			0.6	8.2	11	99.3	29
590			0.4	9.6	11	99.3	30
591			0.5	8.6	11	99.3	30
592			0.4	8.6	11	99.3	30
593			0.4	10.4	11	99.3	30
594			0.6	8.6	11	99.3	30
595			0.5	10.2	11	99.3	30
596			0.6	8.1	11	99.3	30
597			0.7	6.6	11	99.3	30
598			0.9	8.5	11	99.3	30
599			0.8	3.9	11	99.3	30
600			0.8	10.6	11	99.3	30
601			0.7	8.7	11	99.3	30
602			0.7	10.8	11	99.3	30
603			0.6	10.9	11	99.3	30
604			0.9	10.9	11	99.3	30
605			1.0	7.9	11	99.3	30
606			0.9	7.4	11	99.3	30
607			0.7	10.1	11	99.3	30
608			0.9	9.4	11	99.3	30
609			0.5	8.9	11	99.3	30
610			0.5	6.5	11	99.3	30
611			0.6	9.5	11	99.3	30
612			0.5	7.3	11	99.3	30
613			0.6	8.1	11	99.3	30
614			0.8	9.1	11	99.3	30
615			0.5	8.1	11	99.3	30
616			0.6	6.9	11	99.3	30
617			0.7	6.0	11	99.3	30
618			0.5	6.8	11	99.3	30
619			0.5	6.0	11	99.3	30
620			0.6	6.3	10	99.3	31
621			0.9	6.7	10	99.3	31
622			0.8	6.0	10	99.3	31
623			0.7	6.0	10	99.3	31
624			0.4	10.4	10	99.3	31
625			0.6	10.9	10	99.3	31
626			0.5	9.0	11	99.3	30
627			0.6	5.6	11	99.3	30
628			0.6	9.5	11	99.3	30
629			0.6	8.3	11	99.3	30
630			0.6	5.4	11	99.3	30
631			0.6	5.3	11	99.3	30
632			0.7	10.2	11	99.3	30
633			0.6	10.3	11	99.3	30
634			0.7	11.1	11	99.3	30
635			0.6	9.4	11	99.3	30
636			0.5	7.0	11	99.3	30
637			0.6	10.0	11	99.3	30
638			10.6	40.2	0.3	98.5	-
639			7.4	40.0	0.3	98.5	-
640			7.4	39.7	0.4	98.5	-
641			11.9	38.9	0.1	98.5	-
642			7.6	38.1	0.2	98.5	-
643			10.0	39.5	0.2	98.5	-
644			10.2	39.4	0.1	98.5	-
645			9.2	39.9	0.2	98.5	-
646			12.1	43.6	0.3	98.5	-
647			9.5	41.8	0.3	98.5	-
648			7.0	39.8	0.3	98.5	-
649			9.2	39.4	0.4	98.5	-
650			8.1	39.8	0.3	98.5	-
651			7.2	39.3	0.3	98.5	-
652			3.9	39.8	0.3	98.5	-
653			4.3	39.8	0.3	98.5	-
654			3.9	40.8	0.3	98.5	-
655			3.7	40.9	0.3	98.5	-
656			6.6	43.7	0.2	98.5	-
657			5.7	40.8	0.2	98.5	-
658			8.0	41.9	0.3	98.5	-
659			5.4	42.2	0.3	98.5	-
660			10.9	40.7	0.2	98.5	-
661			8.6	41.1	0.3	98.5	-
662			11.4	41.0	0.4	98.5	-
663			7.2	39.7	0.3	98.5	-
664			9.2	40.6	0.2	98.5	-

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
665			7.5	41.1	0.2	98.5	-
666			7.4	40.7	0.1	98.5	-
667			5.7	39.5	0.2	98.5	-
668			12.3	39.7	0.1	98.5	-
669			8.0	40.1	0.2	98.5	-
670			8.0	39.5	0.4	98.5	-
671			7.9	39.2	0.3	98.5	-
672			9.7	39.2	0.2	98.5	-
673			8.4	40.9	0.3	98.5	-
674			8.3	42.6	0.3	98.5	-
675			9.2	41.9	0.3	98.5	-
676			5.9	41.4	0.3	98.5	-
677			7.2	40.2	0.3	98.5	-
678			4.3	40.1	0.3	98.5	-
679			7.2	39.8	0.4	98.5	-
680			8.7	39.9	0.3	98.5	-
681			7.8	39.5	0.3	98.5	-
682			5.7	40.4	0.3	98.5	-
683			7.3	40.8	0.2	98.5	-
684			5.1	42.3	0.2	98.5	-
685			5.9	42.1	0.3	98.5	-
686			7.1	43.5	0.3	98.5	-
687			8.6	43.5	0.3	98.5	-
688			6.8	40.5	0.3	98.5	-
689			6.3	40.3	0.3	98.5	-
690			6.7	40.5	0.3	98.5	-
6							

# Table E.02 Measurement data - Background

Project: Suncor Adelaide Wind Power Project - Turbine T05 - IEC 61400-11 Measurement  
 Report ID: 14215.01.T05.RP6

Page 4 of 4  
 Created on: 6/15/2018

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
748	9.2	41.6	0.4	4.7	11	98.5	-
749	10.3	42.8	0.4	5.3	11	98.5	-
750	12.8	43.1	0.4	6.6	11	98.5	-
751	6.7	43.0	0.5	3.4	11	98.5	-
752	9.7	42.8	0.5	5.0	11	98.5	-
753	8.2	41.9	0.3	4.2	11	98.5	-
754	10.0	39.7	0.3	5.1	11	98.5	-
755	11.7	42.6	0.2	6.0	11	98.5	-
756	8.2	41.6	0.2	4.2	11	98.5	-
757	8.2	43.2	0.2	4.2	11	98.5	-
758		0.4	2.3	11	98.5	-	-
759		0.4	3.0	11	98.5	-	-
760	7.2	43.6	0.4	3.7	11	98.5	-
761		0.5	3.2	11	98.5	-	-
762		0.5	4.0	11	98.5	-	-
763		0.3	5.0	11	98.5	-	-
764	7.1	41.2	0.5	3.6	11	98.5	-
765	7.2	43.6	0.4	3.7	11	98.5	-
766	7.3	44.3	0.4	3.8	11	98.5	-
767	13.0	44.7	0.3	6.7	11	98.5	-
768	13.6	42.8	0.2	7.0	11	98.5	-
769	14.7	46.0	0.3	7.6	11	98.5	-
770	10.7	42.1	0.4	5.5	11	98.5	-
771	10.1	44.2	0.4	5.2	11	98.5	-
772	8.0	44.4	0.2	4.1	11	98.5	-
773	10.2	44.0	0.2	5.2	11	98.5	-
774	10.3	44.9	0.3	5.3	11	98.5	-
775	9.3	44.5	0.4	4.6	11	98.5	-
776	7.8	43.4	0.3	4.0	11	98.5	-
777	8.1	41.5	0.3	4.2	11	98.5	-
778	6.6	40.7	0.4	3.4	11	98.5	-
779	3.8	39.9	0.3	2.0	11	98.5	-
780	4.3	41.4	0.5	2.2	11	98.5	-
781	12.2	41.8	0.5	6.3	11	98.5	-
782	6.7	44.2	0.4	3.5	11	98.5	-
783	9.1	47.4	0.5	4.7	11	98.5	-
784	6.4	46.2	0.4	3.3	11	98.5	-
785	7.9	43.1	0.4	4.1	11	98.5	-
786	7.6	45.1	0.3	3.9	11	98.5	-
787	8.8	46.3	0.6	4.5	11	98.5	-
788	8.7	45.3	0.4	4.5	11	98.5	-
789	6.2	44.4	0.4	3.2	11	98.5	-
790	7.9	43.5	0.4	2.5	11	98.5	-
791	5.5	44.0	0.5	2.8	11	98.5	-
792	7.6	42.3	0.9	3.9	11	98.5	-
793	8.0	42.9	0.9	4.1	11	98.5	-
794	6.6	41.9	1.4	3.4	11	98.5	-
795	15.9	46.1	1.7	8.2	11	98.5	-
796	14.2	49.5	2.7	7.3	11	98.5	-
797	9.1	45.5	3.6	4.7	11	98.5	-
798	8.8	47.8	4.2	4.5	11	98.5	-
799		4.8	2.2	11	98.5	-	-
800		5.7	3.5	11	98.5	-	-
801		7.1	5.9	11	98.5	-	-
802		8.3	7.2	11	98.5	-	-
803		8.7	6.3	11	98.5	-	-
804		8.6	4.3	11	98.5	-	-
805		8.6	5.9	11	98.5	-	-
806		9.4	7.7	11	98.5	-	-
807	14.3	43.9	0.6	7.4	14	97.0	63
808	9.3	43.4	0.4	4.8	14	97.0	63
809	16.5	43.2	0.5	8.5	14	97.0	62
810	13.4	43.8	0.3	6.9	14	97.0	62
811	8.2	43.9	0.4	4.2	14	97.0	62
812	9.9	42.2	0.4	5.1	14	97.0	62
813	9.9	41.8	0.3	5.1	14	97.0	62
814	12.1	42.0	0.2	6.2	14	97.0	62
815	14.2	42.8	0.4	7.3	14	97.0	62
816	11.7	43.5	0.3	6.0	14	97.0	62
817	12.1	42.1	0.5	6.2	14	97.0	62
818	12.5	44.0	0.3	6.4	14	97.0	62
819	13.1	42.3	0.3	6.8	14	97.0	62
820	11.7	42.1	0.7	6.0	14	97.0	62
821	10.1	42.7	0.7	5.2	14	97.0	62
822	12.9	42.7	0.6	6.7	14	97.0	62
823	9.9	41.6	0.7	5.1	14	97.0	62
824	12.6	42.5	0.5	6.5	14	97.0	62
825	13.0	42.3	0.4	6.7	14	97.0	62
826	10.3	42.8	0.4	5.3	14	97.0	62
827	9.1	41.4	0.5	4.7	14	97.0	62
828	7.8	40.2	0.4	4.0	14	97.0	62
829	8.0	42.9	0.4	4.1	14	97.0	62
830	11.4	42.6	0.7	5.9	14	97.0	62

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
831	9.5	41.9	0.6	4.9	14	97.0	62
832	14.1	41.4	0.5	7.3	14	97.0	62
833	14.9	41.9	0.4	7.7	14	97.0	62
834	15.0	41.6	0.5	7.8	14	97.0	62
835	15.3	41.5	0.6	7.9	14	97.0	62
836	10.9	41.4	0.6	5.6	14	97.0	62
837	8.7	42.3	0.6	4.5	14	97.0	62
838	10.3	42.5	0.6	5.3	14	97.0	62
839	8.5	43.1	0.5	4.4	14	97.0	63
840	10.5	44.5	0.5	5.4	14	97.0	63
841	8.7	41.4	0.5	4.5	14	97.0	63
842	8.7	43.0	0.5	4.5	14	97.0	63
843	10.9	42.2	0.6	5.6	14	97.0	63
844	12.4	42.2	0.4	6.4	14	97.0	63
845	9.1	41.9	0.5	4.7	14	97.0	62
846	9.8	43.5	0.3	5.1	14	97.0	62
847	13.2	42.9	0.4	6.8	14	97.0	62
848	14.9	43.4	0.6	7.7	14	97.0	62
849	13.0	43.3	0.4	6.7	14	97.0	62
850	9.3	43.0	0.5	4.8	14	97.0	62
851	10.6	42.9	0.5	5.5	14	97.0	62
852	13.3	42.1	0.5	6.9	14	97.0	62
853	9.1	42.7	0.6	4.7	14	97.0	62
854	14.0	42.2	0.5	7.2	14	97.0	62
855	14.0	42.6	0.5	7.2	14	97.0	62
856	12.1	43.2	0.5	6.2	14	97.0	62
857	14.1	42.3	0.5	7.3	14	97.0	62
858	11.4	42.8	0.4	5.9	14	97.0	62
859	7.6	42.9	0.7	3.9	14	97.0	62
860	9.5	42.2	0.5	4.9	14	97.0	62
861	15.0	42.5	0.5	7.7	14	97.0	62
862	12.4	42.0	0.6	6.4	14	97.0	62
863	10.3	41.6	0.6	4.7	14	97.0	62
864	9.8	41.4	0.5	5.1	14	97.0	62
865	7.8	42.9	0.4	4.0	14	97.0	62
866	10.9	42.2	0.6	5.6	14	97.0	62
867	9.3	41.9	0.6	4.8	14	97.0	62
868	12.8	42.4	0.6	7.1	14	97.0	62
869	13.8	42.1	0.5	7.1	14	97.0	62
870	14.4	41.4	0.6	7.4	14	97.0	62
871	14.0	41.5	0.6	7.2	14	97.0	62
872	13.6	41.8	0.6	7.0	14	97.0	62
873	13.9	42.1	0.5	7.2	14	97.0	62
874	12.5	42.5	0.6	6.4	14	97.0	62
875	10.7	41.5	0.6	5.5	14	97.0	62
876	13.0	41.8	0.5	6.7	14	97.0	62
877	11.7	42.1	0.5	6.0	14	97.0	62
878	7.8	42.9	0.5	4.0	14	97.0	62
879	11.3	43.6	0.6	5.8	14	97.0	62
880	9.3	42.2	0.5	4.8	14	97.0	62
881	12.5	41.7	0.5	6.4	14	97.0	63
882	15.0	42.2	0.6	7.7	14	97.0	63
883	13.8	43.1	0.5	7.1	14	97.0	63
884	9.2	42.2	0.5	4.7	14	97.0	63
885	9.6	43.3	0.5	4.9	14	97.0	63
886	14.0	44.1	0.5	7.2	14	97.0	63
887	13.6	43.5	0.3	7.0	14	97.0	63
888	13.0	44.4	0.4	6.3	14	97.0	63
889	13.8	44.0	0.5	7.1	14	97.0	63
890	12.6	43.1	0.5	6.5	14	97.0	63
891	12.8	42.0	0.5	6.6	14	97.0	63
892	14.4	43.7	0.4	7.4	14	97.0	63
893	11.7	42.9	0.5	6.0	14	97.0	62
894	12.6	42.8	0.5	6.5	14	97.0	62
895	12.6	41.4	0.4	6.5	14	97.0	62
896	12.1	42.7	0.5	6.2	14	97.0	62
897	11.8	42.6	0.4	6.1	14	97.0	62
898	13.8	44.1	0.6	7.4	14	97.0	62
899	11.6	42.9	0.6	6.0	14	97.0	63
900	16.2	43.2	0.4	8.3	14	97.0	63
901	15.1	44.5	0.5	7.8	14	97.0	63
902	13.4	43.2	0.6	6.9	14	97.0	63
903	12.6	42.3	0.6	6.5	14	97.0	63
904	13.9	42.2	0.5	7.2	14	97.0	63
905	12.1	43.6	0.5	6.2	14	97.0	63
906	12.4	43.0	0.8	6.4	14	97.0	63
907	8.5	43.6	0.5	4.4	14	97.0	63
908	9.3	43.4	0.4	4.7	14	97.0	63
909	10.0	44.3	0.5	5.1	14	97.0	63
910	8.5	44.3	0.6	4.4	14	97.0	63
911	12.8	43.3	0.5	6.6	14	97.0	63
912	14.1	42.8	0.6	7.3	14	97.0	63
913	9.5	43.2	0.5	4.9	14	97.0	63

\*\*\*Blank data denotes values that were omitted in the analysis due to an extraneous event during recording

Data Point #	Standardized Wind Speed	LAeq	RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (C)	Pressure (kPa)	Relative Humidity (%)
914	9.7	42.1	0.6	5.0	14	97.0	63
915	8.4	42.0	0.5	4.3	14	97.0	63
916	11.1	42.7	0.5	6.7	14	97.0	63
917	10.1	41.0	0.5	5.2	14	97.0	63
918</							

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## Appendix F Calibration Certificates

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Certificate number: 1-947579110

# Calibration report

- 'As Found data' -

**Product type: LMS SCADAS**

Calibration Suite: **Calibration Software**  
Calibration Suite Version: **2.0**

**Customer:**

Company name : Aercoustics Engineering  
Division / department : Aercoustics Engineering  
Location (city / country) : Toronto Canada  
Contact person : Mr. Rob Jozwiak

**System:**

System type(s) : SCR05  
Serial number(s) : 53103922

**Calibration conditions:**

Location (factory, office or on-site) : Factory  
Date : 04-June-2014  
Ambient temperature : 22.7°C  
Previous calibration date : Mar-2014

**Calibration results** (refer to page 2 for details):

Calibration successful : YES  
Within published specification : YES  
Within test specification : YES

**Report approved by:**

Name : Mr. A v Aalst



**West Caldwell Calibration Laboratories Inc.**

# Certificate of Calibration

for

**MICROPHONE UNIT**

Manufactured by: **BRUEL & KJAER**  
Model No: **4189-A-021**  
Serial No: **2622170**  
Calibration Recall No: **24274**

Submitted By:

Customer:  
Company: **AERCOUSTICS ENGINEERING**  
Address:

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. **4189-A-021 BRUE**

Upon receipt for Calibration, the instrument was found to be:

Within ( X ) see attached Report of Calibration.

the tolerance of the indicated specification.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NC SL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: **16-Jun-14**

Certificate No: **24274 - 3**

QA Doc. #1051 Rev. 2.0 10/1/01

Certificate Page 1 of 1

*FC*  
Felix Christopher (QA Mgr.)  
ISO/IEC 17025:2005

**West Caldwell  
Calibration  
Laboratories, Inc.**  
uncompromised calibration  
1575 State Route 96, Victor, NY 14564, U.S.A.



Calibration Lab. Cert. # 1533.01

**West Caldwell Calibration Laboratories, Inc.**  
 uncompromised calibration  
 1575 State Route 96, Victor NY 14564



Calibration Lab. Cert. # 1533.01

# REPORT OF CALIBRATION

for  
**Brüel & Kjær Microphone Unit Model No.: 4189-A-021**  
**Mic. Model: 4189**  
**Preamp. Model No.: 2671**  
**Company : Aercoustics Engineering**

**Serial No.: 2622170**  
**Serial No.: 2625197**  
**Serial No.: 2614901**  
**I. D. No.: XXXX**

Calibration results:	Before data: .....	After data: .....
<b>Combined Sensitivity @ 250 Hz and pressure of 99.622 kPa</b>	<b>Before &amp; after data same: ...✓...</b>	
(Sensitivity with microphone and preamplifier.)	Ambient Temperature:	21 °C
<b>-26.67 dB re.1V/Pascal</b>	Ambient Humidity:	51.8 % RH
<b>46.39 mV/Pascal</b>	Ambient Pressure:	99.62 kPa
<b>0.67 Ko ( - dB re 50 mV/Pascal)</b>	Calibration Date:	16-Jun-2014
Sensitivity: Pass	Re-calibration Due:	16-Jun-2015
Freq. Response Pass	Report Number:	24274 -3
All tests: Pass	Control Number:	24274
<b>Combined Sensitivity @ 1000 Hz</b>	<b>-26.74 dB re.1V/Pascal or</b>	<b>46.03 mV/Pascal</b>

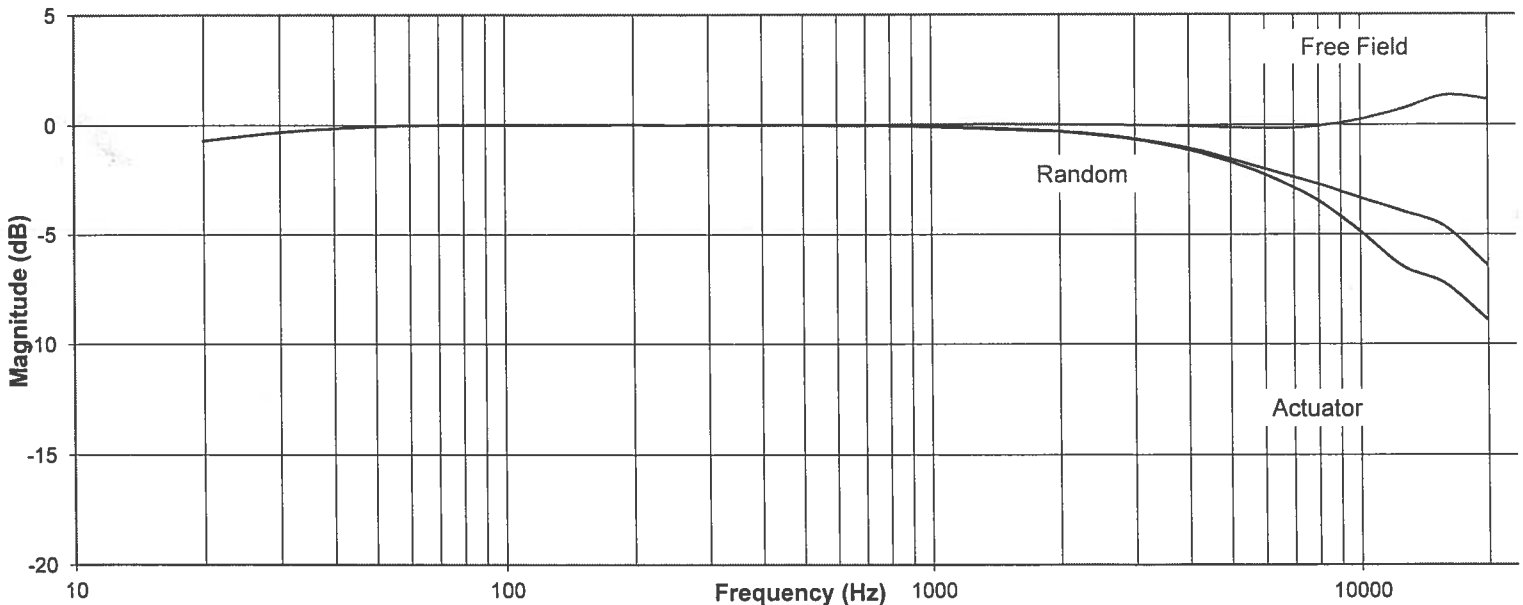
**The above listed instrument meets or exceeds the tested manufacturer's specifications.**

This Calibration is traceable through NIST test numbers: 683/281764-12

The expanded uncertainty of calibration: 0.18dB at 95% confidence level with a coverage factor of k=2.

The lower curve is the pressure response recorded with electrostatic actuator.

**Frequency Response**



The above listed instrument was checked using calibration procedure documented in West Caldwell

Calibration Laboratories Inc. procedure :

**Rev. 7.0 Jan. 24, 2014 Doc. # 1038 4189A021B&K**

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures

intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NCSL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

Measurements performed by: .....

**Felix Christopher**

Calibrated on WCCL system type 9700

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Rev. 7.0 Jan. 24, 2014 Doc. # 1038 4189A021B&K

## West Caldwell Calibration Laboratories Inc.

1575 State Route 96, Victor NY 14564

Tel. (585) 586-3900 FAX (585) 586-4327

# Calibration Data Record

for

Brüel & Kjær Microphone Unit Model No.: 4189-A-021

Serial No.: 2622170

I. D. No.: XXXX

Company : Aercoustics Engineering

### Frequency Response ( Reference = 0 dB @ 250Hz )

Frequency [Hz]	Actuator [dB]	Random (dB)	Free Field (dB)	Frequency [Hz]	Actuator [dB]	Random (dB)	Free Field (dB)
19.95	-0.70	-0.70	-0.70	631.0	-0.03	-0.03	0.00
25.12	-0.47	-0.47	-0.47	794.3	-0.04	-0.04	0.02
31.62	-0.28	-0.28	-0.28	1000.0	-0.07	-0.09	0.03
39.81	-0.15	-0.15	-0.15	1258.9	-0.11	-0.15	0.03
50.12	-0.05	-0.05	-0.05	1584.9	-0.19	-0.24	0.03
63.10	0.00	0.00	0.00	1995.3	-0.30	-0.30	0.03
79.43	0.01	0.01	0.01	2511.9	-0.47	-0.44	0.00
100.00	0.01	0.01	0.01	3162.3	-0.73	-0.70	-0.02
125.89	0.00	0.00	0.00	3981.1	-1.13	-1.04	-0.07
158.49	0.01	0.01	0.01	5011.9	-1.69	-1.55	-0.12
199.53	0.02	0.02	0.02	6309.6	-2.45	-2.13	-0.17
251.19	0.00	0.00	0.00	7943.3	-3.44	-2.69	-0.06
316.23	0.02	0.02	0.02	10000.0	-4.87	-3.34	0.25
398.11	-0.01	-0.01	0.00	12589.3	-6.46	-3.95	0.73
501.19	-0.01	-0.01	0.01	15848.9	-7.24	-4.66	1.35
				19952.6	-8.88	-6.40	1.17

Frequency Response: Expanded Uncertainty (dB) with coverage factor K = 2

20 to 25 Hz 0.8dB, 25 to 160 Hz 0.5dB, 160 to 2kHz 0.3dB, 2k to 10kHz 0.5dB, 10k to 20kHz 1.3dB.

Instruments used for calibration:			Date of Cal.	Traceability No.	Re-cal. Due Date
Brüel & Kjær	4134	S/N 1942286	2-Oct-2013	683/281764-12	3-Oct-2014
HP	34401A	S/N 36064102	8-Oct-2013	,287708	8-Oct-2014
HP	34401A	S/N 36102471	8-Oct-2013	,287708	8-Oct-2014
HP	33120A	S/N 36043716	8-Oct-2013	,287708	8-Oct-2014
Brüel & Kjær	2636	S/N 1324082	3-Oct-2013	683/281764-12	3-Oct-2014
Brüel & Kjær	2669	S/N 1835082	3-Oct-2013	683/281764-12	3-Oct-2014
Brüel & Kjær	4228	S/N 1742061	2-Oct-2013	683/281764-12	3-Oct-2014

Cal. Date: 16-Jun-2014

Tested by: Felix Christopher

Calibrated on WCCL system type 9700

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Rev. 7.0 Jan. 24, 2014 Doc. # 1038 4189A021B&K



**West Caldwell Calibration Laboratories Inc.**

# Certificate of Calibration

for

**ACOUSTICAL CALIBRATOR**

**Manufactured by:** BRUEL & KJAER  
**Model No:** 4231  
**Serial No:** 2513184  
**Calibration Recall No:** 25471

**Submitted By:**

**Customer:**  
**Company:** Aercoustics Engineering, LTD.  
**Address:**

The subject instrument was calibrated to the indicated specification using standards traceable to the National Institute of Standards and Technology or to accepted values of natural physical constants. This document certifies that the instrument met the following specification upon its return to the submitter.

West Caldwell Calibration Laboratories Procedure No. 4231 BRUE

Upon receipt for Calibration, the instrument was found to be:

Within ( X )

tolerance of the indicated specification. See attached Report of Calibration.

West Caldwell Calibration Laboratories' calibration control system meets the requirements, ISO 10012-1 MIL-STD-45662A, ANSI/NCSL Z540-1, IEC Guide 25, ISO 9001:2008 and ISO 17025.

Note: With this Certificate, Report of Calibration is included.

Approved by:

Calibration Date: 01-Jul-15

Certificate No: 25471 - 1

Felix Christopher (QA Mgr.)  
ISO/IEC 17025:2005

QA Doc. #1051 Rev. 2.0 10/1/01

Certificate Page 1 of 1

**West Caldwell  
Calibration  
Laboratories, Inc.**  
uncompromised calibration  
1575 State Route 96, Victor, NY 14564, U.S.A.



Calibration Lab. Cert. # 1533.01

**West Caldwell Calibration Laboratories, Inc.**  
 uncompromised calibration  
 1575 State Route 96, Victor NY 14564



Calibration Lab. Cert. # 1533.01

## REPORT OF CALIBRATION

Brüel & Kjær Acoustical Calibrator

for  
 Model No.: 4231

Serial No.: 2513184

Company : Aercoustics Engineering, LTD.

I. D. No: XXXX

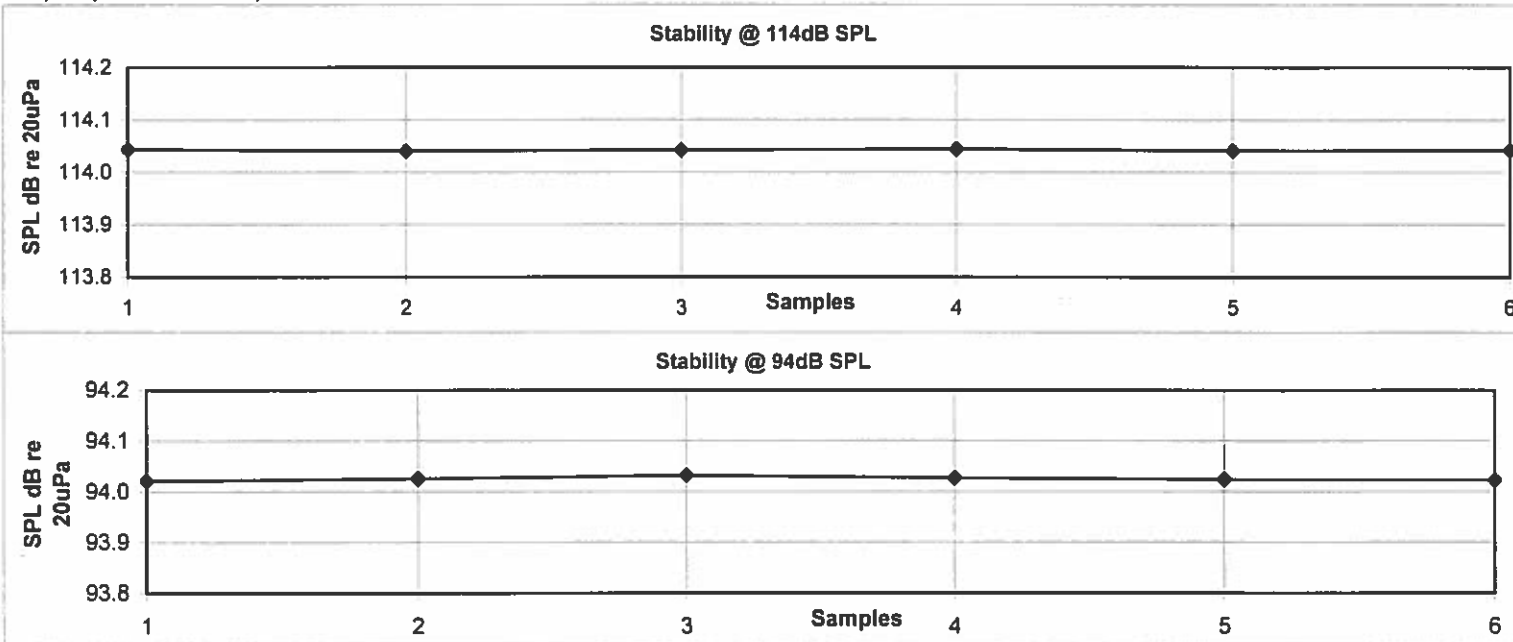
Calibration results: Sound Pressure Level at 999.9 Hz and pressure of 1013 hPa (mbar) was 114.0 dB re 20µPa (Calibrator tested with ½" adaptor UC 0210) IEC 1094-4 Type WS 2 P Microphone was used for measurement.		Before data: ..... After data: ..... Before & after data same: ...X...		
	114dB	94dB	Laboratory Environment:	
Sound Pressure Level:	Pass	Pass	Ambient Temperature:	22.3 °C
Frequency:	Pass	Pass	Ambient Humidity:	49.4 % RH
Distortion:	Pass	Pass	Ambient Pressure:	98.407 kPa
Stability:	Pass	Pass	Calibration Date:	1-Jul-2015
All tested parameters:	Pass	Pass	Re-calibration Due:	1-Jul-2016
			Report Number:	25471 -1
			Control Number:	25471

The above listed instrument meets or exceeds the tested manufacturer's specifications  
 The IEC 942:1988 Class 1 specifications, passed.  
 The ANSI S1.4-1984 specifications, passed.

This Calibration is traceable through NIST test numbers: 683/284413-14

The expanded uncertainty of calibration: 0.09dB at 95% confidence level with a coverage factor of k=2.

Graph represents six samples of Sound Pressure Level measured at 5sec. interval.



The above listed instrument was checked using calibration procedure documented in West Caldwell Calibration Laboratories Inc. procedure : **Rev. 7.0 Jan. 24, 2014 Doc. # 1038 4231B&K**

Calibration was performed by West Caldwell Calibration Laboratories Inc. under Operating Procedures intended to implement the requirements of ISO10012-1, IEC Guide 25, ANSI/NC SL Z540-1, (MIL-STD-45662A) and ISO 9001:2008, ISO 17025

Cal. Date: 1-Jul-2015

Measurements performed by: .....

Calibrated on WCCL system type 9700

**Joanne Lemmon**

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Rev. 7.0 Jan. 24, 2014 Doc. # 1038 4231B&K





# SOH Wind Engineering LLC

141 Leroy Road · Williston, VT 05495 · USA

Tel 802.999.3309 · Fax 802.735.9106 · www.sohwind.com

## CERTIFICATE FOR CALIBRATION OF SONIC ANEMOMETER

**Certificate number:** 13.US1.09043

**Date of issue:** November 25, 2013

**Type:** Vaisala Weather Transmitter, WXT520

**Serial number:** G4420002

**Manufacturer:** VAISALA Oyj, PL 26, FIN-00421 Helsinki, Finland

**Client:** Aeroustics Engineering Ltd., 50 Ronson Dr, Suite 165, Toronto, ON M9W 1B3, Canada

**Anemometer received:** November 19, 2013

**Anemometer calibrated:** November 22, 2013

**Calibrated by:** rps

**Calibration procedure:** IEC 61400-12-1:2005(E) Annex F  
(at 0°)

**Certificate prepared by:** R. Paul Smith

**Approved by:** Calibration engineer, rds

**Calibration equation obtained:**  $v \text{ [m/s]} = 1.0070 \cdot \text{m/s output} + 0.00704$

**Standard uncertainty, slope:** N/A

**Standard uncertainty, offset:** N/A

**Covariance:** N/A

**Coefficient of correlation:** N/A

**Absolute maximum deviation:** 0.062 m/s at 11.022 m/s

**Barometric pressure:** 1003.7 hPa

**Relative humidity:** 23.8%

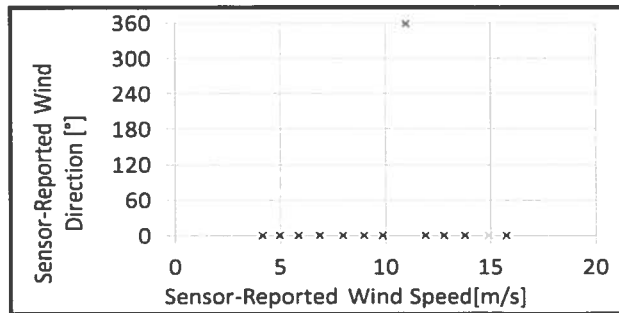
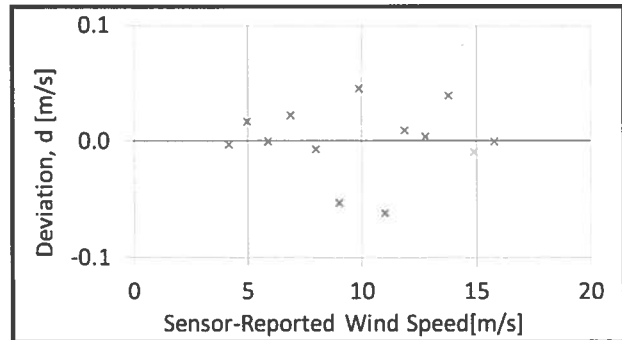
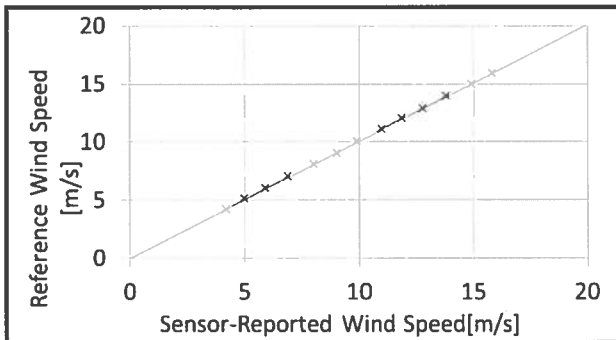


AC-1746

Standard: ISO/IEC 17025

Succession	Direction $\alpha$ [°] <sup>1</sup>	Temperature in		Wind velocity, $v$ . [m/s]	Speed Signal $I_1$ [A]	Uncertainty $u_c$ (k=2) [m/s]	Deviation $d$ . [m/s]	Direction Signal, $I_2$ [A]
		wind tunnel [°C]	d.p. box [°C]					
2	0	22.3	26.5	4.233	4.2	0.045	-0.003	0
4	0	22.3	26.5	5.059	5.0	0.038	0.017	0
6	0	22.3	26.5	5.948	5.9	0.033	0.000	0
8	0	22.3	26.5	6.977	6.9	0.029	0.022	0
10	0	22.3	26.5	8.056	8.0	0.026	-0.007	0
12	0	22.3	26.5	9.017	9.0	0.024	-0.053	0
13-last	0	22.3	26.5	10.022	9.9	0.023	0.045	0
11	0	22.3	26.5	11.022	11.0	0.022	-0.062	359
9	0	22.3	26.5	11.999	11.9	0.022	0.009	0
7	0	22.3	26.5	12.901	12.8	0.022	0.004	0
5	0	22.3	26.5	13.943	13.8	0.022	0.039	0
3	0	22.3	26.5	15.002	14.9	0.023	-0.009	0
1-first	0	22.2	26.5	15.917	15.8	0.024	0.000	0

<sup>1</sup>Wind Direction measurements are not included in the ISO 17025 scope for SOH Wind Engineering and, therefore, not certified.





# SOH Wind Engineering LLC

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Tel 802.999.3309 · Fax 802.735.9106 · www.sohwind.com

## EQUIPMENT USED

Serial Number	Description
Njord 1	Wind tunnel, blockage factor = 1.0035
2254	Control cup anemometer
-	Mounting tube, D = 25 mm
TT001	Summit RT-AUI, wind tunnel
TP001	Summit RT-AUI, differential pressure box
DP006	Setra Model 239 pressure transducer
HY002	Dwyer Instruments RHP-2D20 humidity transmitter
BP002	Setra Model 278 barometer
PL3	Pitot tube
XB001	Computer Board. 16 bit A/D data acquisition board
9PRZRW1	PC dedicated to data acquisition

Traceable calibrations of the equipment are carried out by external accredited institutions: Hayes Instrument Service, Inc., TRANSCAT, Atlantic Scale, & Furness Controls. A real-time analysis module within the data acquisition software detects pulse frequency.



*Photo of the wind tunnel setup. The cross-sectional area is 2.5 x 2.5 m.*



AC-1746

Standard: ISO/IEC 17025

## UNCERTAINTIES

The documented uncertainty is the total combined uncertainty at 95% confidence level ( $k=2$ ) in accordance with EA-4/02. The uncertainty at 10 m/s comply with the requirements in the IEC 61400-12-1:2005 procedure. See Document US.DC.016-00 for further details.

**Certificate number:** 13.US1.09043



# SOH Wind Engineering LLC

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Tel 802.999.3309 · Fax 802.735.9106 · www.sohwind.com

## CERTIFICATE FOR CALIBRATION OF SONIC ANEMOMETER

**Certificate number:** 13.US1. 09045

**Date of issue:** November 25, 2013

**Type:** Vaisala Weather Transmitter, WXT520

**Serial number:** G4420002

**Manufacturer:** VAISALA Oyj, PI 26, FIN-00421 Helsinki, Finland

**Client:** Aercoustics Engineering Ltd., 50 Ronson Dr, Suite 165, Toronto, ON M9W IB3, Canada

**Anemometer received:** November 19, 2013

**Anemometer calibrated:** November 22, 2013

**Calibrated by:** rps

**Calibration procedure:** IEC 61400-12-1:2005(E) Annex F  
(at 90°)

**Certificate prepared by:** R. Paul Smith

**Approved by:** Calibration engineer, rds

**Calibration equation obtained:**  $v$  [m/s] = 1.0347 · m/s output + 0.12046

**Standard uncertainty, slope:** N/A

**Standard uncertainty, offset:** N/A

**Covariance:** N/A

**Coefficient of correlation:** N/A

**Absolute maximum deviation:** 0.173 m/s at 12.890 m/s

**Barometric pressure:** 1002.5 hPa

**Relative humidity:** 23.9%



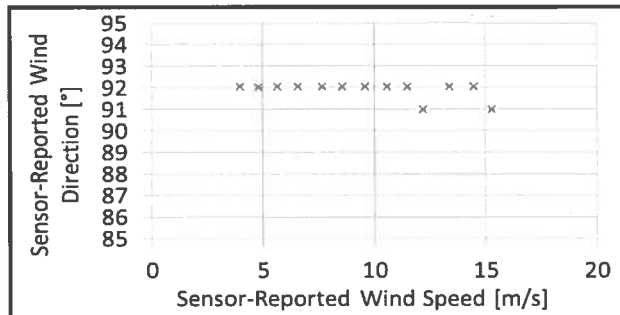
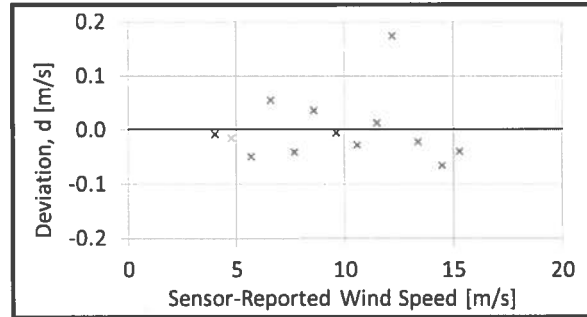
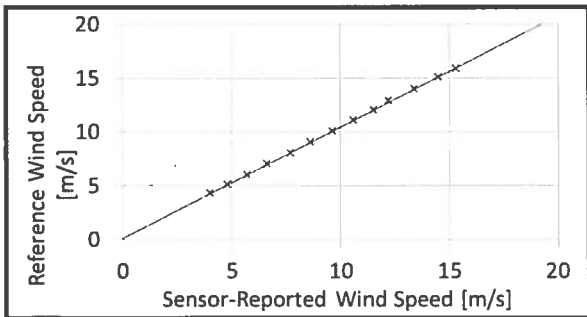
AC-1746

Standard: ISO/IEC 17025



Succession	Direction $\alpha$ [°] <sup>1</sup>	Temperature in		Wind velocity, $v$ [m/s]	Speed Signal $I_1$ [A]	Uncertainty $u_c(k=2)$ [m/s]	Deviation d. [m/s]	Direction Signal, $I_2$ [A]
		wind tunnel [°C]	d.p. box [°C]					
2	0	22.4	26.6	4.242	4.0	0.045	-0.008	91
4	0	22.4	26.6	5.061	4.8	0.038	-0.015	92
6	0	22.5	26.6	5.957	5.7	0.033	-0.049	92
8	0	22.5	26.6	6.989	6.6	0.029	0.055	92
10	0	22.5	26.6	8.030	7.7	0.026	-0.041	92
12	0	22.4	26.6	9.035	8.6	0.024	0.035	92
13-last	0	22.4	26.6	10.026	9.6	0.023	-0.006	91
11	0	22.4	26.6	11.036	10.6	0.022	-0.028	92
9	0	22.4	26.6	12.007	11.5	0.022	0.013	92
7	0	22.4	26.6	12.890	12.2	0.022	0.173	92
5	0	22.4	26.6	13.933	13.4	0.023	-0.023	92
3	0	22.4	26.6	15.026	14.5	0.023	-0.065	92
1-first	0	22.4	26.6	15.877	15.3	0.024	-0.041	92

<sup>1</sup>Wind Direction measurements are not included in the ISO 17025 scope for SOH Wind Engineering and, therefore, not certified.





# SOH Wind Engineering LLC

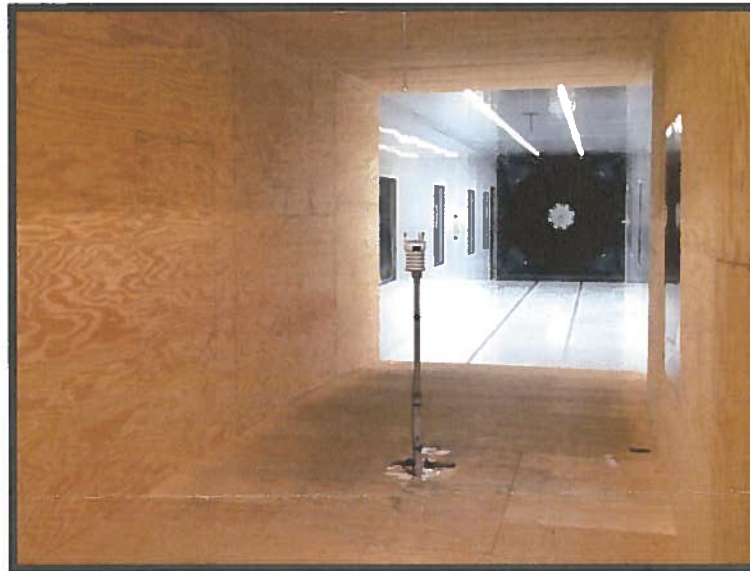
141 Leroy Road · Williston, VT 05495 · USA

Tel 802.999.3309 · Fax 802.735.9106 · www.sohwind.com

## EQUIPMENT USED

Serial Number	Description
Njord 1	Wind tunnel, blockage factor = 1.0035
2254	Control cup anemometer
-	Mounting tube, D = 25 mm
TT001	Summit RT-AUI, wind tunnel
TP001	Summit RT-AUI, differential pressure box
DP006	Setra Model 239 pressure transducer
HY002	Dwyer Instruments RHP-2D20 humidity transmitter
BP002	Setra Model 278 barometer
PL3	Pitot tube
XB001	Computer Board. 16 bit A/D data acquisition board
9PRZRW1	PC dedicated to data acquisition

Traceable calibrations of the equipment are carried out by external accredited institutions: Hayes Instrument Service, Inc., TRANSCAT, Atlantic Scale, & Furness Controls. A real-time analysis module within the data acquisition software detects pulse frequency.



*Photo of the wind tunnel setup. The cross-sectional area is 2.5 x 2.5 m.*



AC-1746

Standard: ISO/IEC 17025

## UNCERTAINTIES

The documented uncertainty is the total combined uncertainty at 95% confidence level ( $k=2$ ) in accordance with EA-4/02. The uncertainty at 10 m/s comply with the requirements in the IEC 61400-12-1:2005 procedure. See Document US.DC.016-00 for further details.

**Certificate number:** 13.US1.09045



# SOH Wind Engineering LLC

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## CERTIFICATE FOR CALIBRATION OF SONIC ANEMOMETER

**Certificate number:** 13.US1. 09046

**Date of issue:** November 25, 2013

**Type:** Vaisala Weather Transmitter, WXT520

**Serial number:** G4420002

**Manufacturer:** VAISALA Oyj, PI 26, FIN-00421 Helsinki, Finland

**Client:** Aercoustics Engineering Ltd., 50 Ronson Dr, Suite 165, Toronto, ON M9W IB3, Canada

**Anemometer received:** November 19, 2013

**Anemometer calibrated:** November 22, 2013

**Calibrated by:** rps

**Calibration procedure:** IEC 61400-12-1:2005(E) Annex F  
(at 270<sup>±1</sup>)

**Certificate prepared by:** R. Paul Smith

**Approved by:** Calibration engineer, rds

**Calibration equation obtained:**  $v$  [m/s] = 1.0229 · m/s output + 0.03701

**Standard uncertainty, slope:** N/A

**Standard uncertainty, offset:** N/A

**Covariance:** N/A

**Coefficient of correlation:** N/A

**Absolute maximum deviation:** 0.061 m/s at 10.021 m/s

**Barometric pressure:** 1002.2 hPa

**Relative humidity:** 24.0%

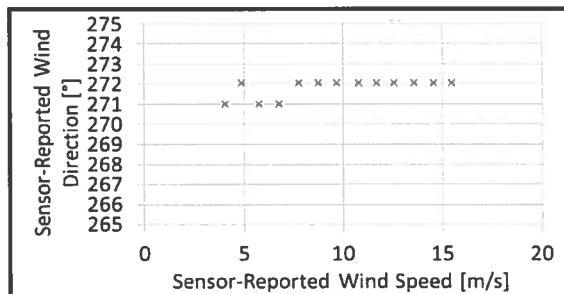
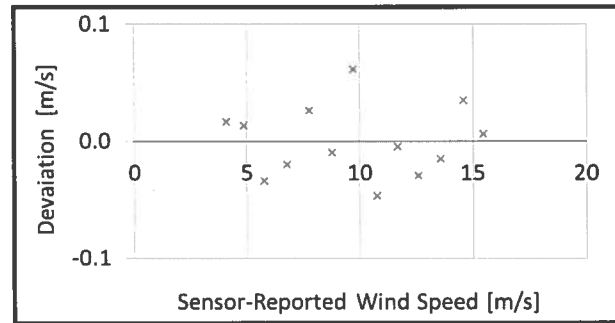
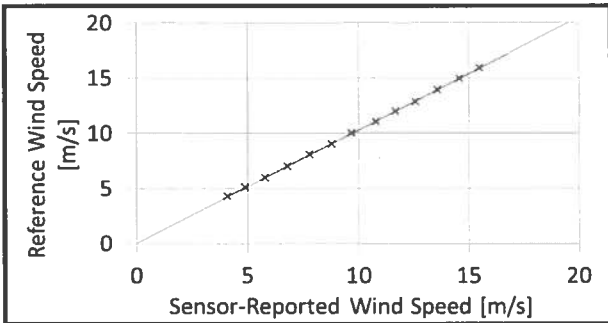


AC-1746

Standard: ISO/IEC 17025

Succession	Direction $\alpha$ [°] <sup>1</sup>	Temperature in		Wind velocity, $v$ [m/s]	Speed Signal $I_1$ [A]	Uncertainty $u_c(k=2)$ [m/s]	Deviation d. [m/s]	Direction Signal, $I_2$ [A]
		wind tunnel [°C]	d.p. box [°C]					
2	270	22.5	26.6	4.247	4.1	0.045	0.016	272
4	270	22.5	26.6	5.063	4.9	0.038	0.013	271
6	270	22.5	26.6	5.936	5.8	0.033	-0.034	272
8	270	22.5	26.6	6.974	6.8	0.029	-0.019	272
10	270	22.5	26.6	8.042	7.8	0.026	0.026	272
12	270	22.5	26.6	9.029	8.8	0.024	-0.010	271
13-last	270	22.5	26.6	10.021	9.7	0.023	0.061	272
11	270	22.5	26.6	11.038	10.8	0.022	-0.046	271
9	270	22.5	26.6	12.001	11.7	0.022	-0.004	272
7	270	22.5	26.6	12.897	12.6	0.022	-0.029	272
5	270	22.5	26.6	13.935	13.6	0.022	-0.014	272
3	270	22.5	26.6	15.007	14.6	0.023	0.035	272
1-first	270	22.4	26.6	15.899	15.5	0.024	0.006	272

<sup>1</sup>Wind Direction measurements are not included in the ISO 17025 scope for SOH Wind Engineering and, therefore, not certified.





## SOH Wind Engineering LLC

141 Leroy Road · Williston, VT 05495 · USA

Tel 802.999.3309 · Fax 802.735.9106 · www.sohwind.com

### EQUIPMENT USED

Serial Number	Description
Njord 1	Wind tunnel, blockage factor = 1.0035
2254	Control cup anemometer
-	Mounting tube, D = 25 mm
TT001	Summit RT-AUI, wind tunnel
TP001	Summit RT-AUI, differential pressure box
DP006	Setra Model 239 pressure transducer
HY002	Dwyer Instruments RHP-2D20 humidity transmitter
BP002	Setra Model 278 barometer
PL3	Pitot tube
XB001	Computer Board. 16 bit A/D data acquisition board
9PRZRW1	PC dedicated to data acquisition

Traceable calibrations of the equipment are carried out by external accredited institutions: Hayes Instrument Service, Inc., TRANSCAT, Atlantic Scale, & Furness Controls. A real-time analysis module within the data acquisition software detects pulse frequency.



*Photo of the wind tunnel setup. The cross-sectional area is 2.5 x 2.5 m.*



AC-1746

Standard: ISO/IEC 17025

## UNCERTAINTIES

The documented uncertainty is the total combined uncertainty at 95% confidence level ( $k=2$ ) in accordance with EA-4/02. The uncertainty at 10 m/s comply with the requirements in the IEC 61400-12-1:2005 procedure. See Document US.DC.016-00 for further details.

**Certificate number:** 13.US1.09046



# SOH Wind Engineering LLC

141 Leroy Road · Williston, VT 05495 · USA

Tel 802.999.3309 · Fax 802.735.9106 · www.sohwind.com

## CERTIFICATE FOR CALIBRATION OF SONIC ANEMOMETER

**Certificate number:** 13.US1.09044

**Date of issue:** November 25, 2013

**Type:** Vaisala Weather Transmitter, WXT520

**Serial number:** G4420002

**Manufacturer:** VAISALA Oyj, PI 26, FIN-00421 Helsinki, Finland

**Client:** Aercooustics Engineering Ltd., 50 Ronson Dr, Suite 165, Toronto, ON M9W IB3, Canada

**Anemometer received:** November 19, 2013

**Anemometer calibrated:** November 22, 2013

**Calibrated by:** rps

**Calibration procedure:** IEC 61400-12-1:2005(E) Annex F  
(at 180°)

**Certificate prepared by:** R. Paul Smith

**Approved by:** Calibration engineer, rds

**Calibration equation obtained:**  $v \text{ [m/s]} = 1.0168 \cdot \text{m/s output} + 0.08458$

**Standard uncertainty, slope:** N/A

**Standard uncertainty, offset:** N/A

**Covariance:** N/A

**Coefficient of correlation:** N/A

**Absolute maximum deviation:** 0.083 m/s at 10.083 m/s

**Barometric pressure:** 1002.9 hPa

**Relative humidity:** 23.7%



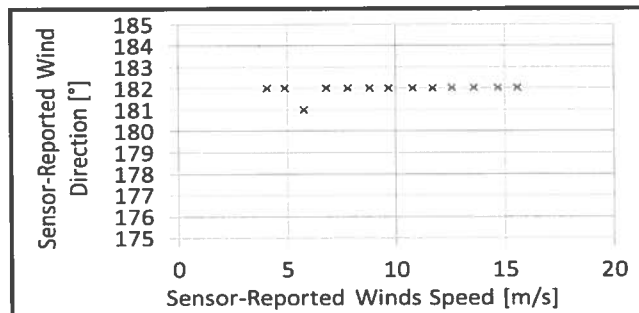
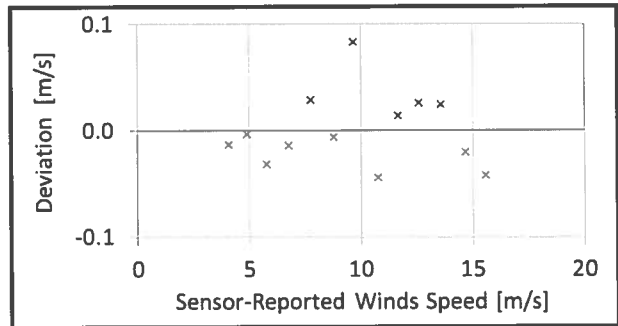
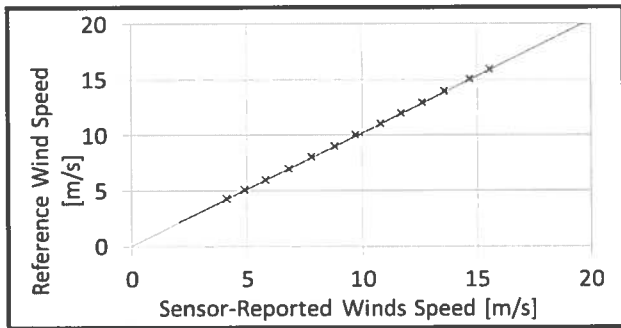
AC-1746

Standard: ISO/IEC 17025



Succession	Direction $\alpha$ [°] <sup>1</sup>	Temperature in wind tunnel [°C]	d.p. box [°C]	Wind velocity, $v$ , [m/s]	Speed Signal $I_1$ [A]	Uncertainty $u_c (k=2)$ [m/s]	Deviation d. [m/s]	Direction Signal, $I_2$ [A]
2	180	22.3	26.5	4.240	4.1	0.045	-0.013	182
4	180	22.3	26.5	5.063	4.9	0.038	-0.004	182
6	180	22.3	26.5	5.951	5.8	0.033	-0.031	182
8	180	22.3	26.5	6.985	6.8	0.029	-0.014	182
10	180	22.3	26.5	8.044	7.8	0.026	0.029	182
12	180	22.3	26.5	9.027	8.8	0.024	-0.006	181
13-last	180	22.3	26.5	10.030	9.7	0.023	0.083	182
11	180	22.3	26.5	11.022	10.8	0.022	-0.044	182
9	180	22.3	26.5	11.995	11.7	0.022	0.014	182
7	180	22.3	26.5	12.922	12.6	0.022	0.025	182
5	180	22.3	26.5	13.937	13.6	0.022	0.024	182
3	180	22.3	26.5	15.012	14.7	0.023	-0.020	182
1-first	180	22.2	26.5	15.904	15.6	0.024	-0.043	182

<sup>1</sup>Wind Direction measurements are not included in the ISO 17025 scope for SOH Wind Engineering and, therefore, not certified.





## SOH Wind Engineering LLC

141 Leroy Road · Williston, VT 05495 · USA

Tel 802.999.3309 · Fax 802.735.9106 · [www.sohwind.com](http://www.sohwind.com)

### EQUIPMENT USED

Serial Number	Description
Njord 1	Wind tunnel, blockage factor = 1.0035
2254	Control cup anemometer
-	Mounting tube, D = 25 mm
TT001	Summit RT-AUI, wind tunnel
TP001	Summit RT-AUI, differential pressure box
DP006	Setra Model 239 pressure transducer
HY002	Dwyer Instruments RHP-2D20 humidity transmitter
BP002	Setra Model 278 barometer
PL3	Pitot tube
XB001	Computer Board. 16 bit A/D data acquisition board
9PRZRW1	PC dedicated to data acquisition

Traceable calibrations of the equipment are carried out by external accredited institutions: Hayes Instrument Service, Inc., TRANSCAT, Atlantic Scale, & Furness Controls. A real-time analysis module within the data acquisition software detects pulse frequency.



*Photo of the wind tunnel setup. The cross-sectional area is 2.5 x 2.5 m.*



AC-1746

Standard: ISO/IEC 17025

## UNCERTAINTIES

The documented uncertainty is the total combined uncertainty at 95% confidence level ( $k=2$ ) in accordance with EA-4/02. The uncertainty at 10 m/s comply with the requirements in the IEC 61400-12-1:2005 procedure. See Document US.DC.016-00 for further details.

**Certificate number:** 13.US1.09044

## CERTIFICATE OF CALIBRATION

**Customer:** AEROCOUSTICS ENGINEERING LTD  
50 RONSON DRIVE  
SUITE 165  
TORONTO, ON M9W 1B3

**Customer Nbr:** 9-322110-000  
**PO Nbr:** C022414  
**Date Received:** February 24, 2014

**Cert/SO Nbr:** 33-8Z881-1-1  
**Manufacturer:** Nokeval  
**Model Nbr:** 7470

**Date Completed:** March 11, 2014  
**Due Date:** March 11, 2015

**Description:** Serial to Analog Converter  
**Serial Nbr:** A159784  
**ID Nbr:** NONE  
**Unit Barcode:** 901B0150195

**Calibrated To:** Manufacturer Specification  
**Calibration Proc:** 1-AC58014-0  
**Item Received:** In Tolerance  
**Item Returned:** In Tolerance

Transcat Calibration Laboratories have been audited and found in compliance with ISO/IEC 17025:2005. Accredited calibrations performed within the Lab's Scope of Accreditation are indicated by the presence of the Accrediting Body's Logo and Certificate Number on this Certificate of Calibration. Any measurements on an accredited calibration not covered by that Lab's Scope are listed in the notes section of the certificate. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

Transcat calibrations, as applicable, are performed in compliance with the requirements of ISO 9001:2008, ISO TS16949, ANSI/NCSL Z540-1994, and ISO 10012:1992. When specified contractually, the requirements of 10CFR21, 10CFR50 App. B and NQA-1 are also covered.

Traceability includes no less than: An unbroken chain of comparison, realization of SI units, measurement uncertainty, documentation, competence, periodic recalibration, and measurement assurance. Transcat documents the traceability of measurements to the SI units through the National Institute of Standards and Technology (NIST) or the National Research Council of Canada (NRC), or other recognized national measurement institutes (NMI's) or international standard bodies, or to measurable conditions created in our laboratory, or accepted fundamental and/or natural physical constants, ratio type of calibration, or by comparison to consensus standards. The specific path of traceability for the reported measurement results is maintained at the Transcat facility and is available there for review.

Complete records of work performed are maintained by Transcat and are available for inspection. Laboratory standards used in the performance of this calibration are shown on the Supplemental Report.

The results in this report relate only to the item calibrated or tested, and the determination of in or out of tolerance is specific to the model/serial no. referenced above based on the tolerances shown on the supplemental report; these tolerances are either the original equipment manufacturer's (OEM's) warranted specifications or the client's requested specifications.

The applied uncertainty is the uncertainty of the calibration process. The Test Uncertainty Ratio (TUR) is calculated as per NCSL International RP-9, section 8.2. All calibrations have been performed using processes having a TUR of 4:1 or better (3:1 for mass calibrations), unless otherwise noted on the Supplemental Report. Uncertainties have been estimated at a 95 percent confidence level (k=2). Calibration at a 4:1 TUR (or greater) provides reasonable confidence that the instrument is within the stated tolerances. For measuring instruments, in order to consider the contribution to the uncertainty from reproducibility of the unit under test (UUT), add 0.6 of the UUT's least significant digit to the reported uncertainty. For mass calibrations, conventional mass referenced to 8.0 g/cm<sup>3</sup>.

Any number of factors can cause a unit to drift out of tolerance at any time following its calibration. Limitations on the uses of this instrument are detailed in the OEM's operating instructions.

### Notes:

**Calibrated At:**

4043 Carling Avenue  
Ottawa, ON K2K 2A4  
By: Shabeba Bucknor

**Facility Responsible:**

4043 Carling Avenue  
Ottawa, ON K2K 2A4  
613-591-8140



**Digitally Signed By Keith Powell**

Date: March 11, 2014

**Keith Powell**  
Lab Manager

Digitally Signed On March 11, 2014

### Revision 0

This certificate may not be reproduced except in full, without the written approval of Transcat. Additional information, if applicable, may be included on separate report(s).

FW011R24 1/27/14

# SUPPLEMENTAL REPORT FOR 33-8Z881-1-1

## CALIBRATION LAB DATA AS FOUND / AS LEFT

Service Order Nbr: 33-8Z881-1-1  
 Description: Serial to Analog Converter  
 Serial: A159784  
 Customer: AEROCOUSTICS ENGINEERING LTD  
 Calibrated: March 11, 2014  
 Date Due: March 11, 2015  
 Service Type: R9  
 Mfg: Nokeval  
 Model: 7470  
 PO Nbr: C022414  
 ID Nbr: NONE  
 Calibration Proc: 1-AC58014-0

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	Q O T	Uncertainty (k=2; #)	TUR
DC Current % Source - 4-20mA Ch #1								
4 - 20mA	0%	±(0.1% Span)	3.984	4.016	3.996 mA		1.6e-004 mA	100.0 : 1
	25%	±(0.1% Span)	7.984	8.016	7.995 mA		2.7e-004 mA	59.3 : 1
	50%	±(0.1% Span)	11.984	12.016	12.000 mA		1.1e-003 mA	14.5 : 1
	75%	±(0.1% Span)	15.984	16.016	16.000 mA		1.3e-003 mA	12.3 : 1
	100%	±(0.1% Span)	19.984	20.016	19.998 mA		1.4e-003 mA	11.4 : 1
DC Current % Source - 4-20mA Ch #2								
4 - 20mA	0%	±(0.1% Span)	3.984	4.016	3.995 mA		1.6e-004 mA	100.0 : 1
	25%	±(0.1% Span)	7.984	8.016	7.999 mA		2.7e-004 mA	59.3 : 1
	50%	±(0.1% Span)	11.984	12.016	11.997 mA		1.1e-003 mA	14.5 : 1
	75%	±(0.1% Span)	15.984	16.016	16.001 mA		1.3e-003 mA	12.3 : 1

The reported uncertainty is the uncertainty of the calibration process. For measuring instruments, add 0.6 of the least significant digit to the reported uncertainty to obtain the measurement uncertainty of the unit under test at the specific test point.  
 Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.  
 Calibration Lab Data Report - Page 1 of 7  
 Field not applicable.  
 FW21R1 1/27/14 Service Order Nbr: 33-8Z881-1-1

# SUPPLEMENTAL REPORT FOR 33-8Z881-1-1

## CALIBRATION LAB DATA AS FOUND / AS LEFT

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	$\frac{Q}{T}$	Uncertainty (k=2; ±)	TUR
DC Current % Source - 4-20mA Ch #3								
4 - 20mA	0%	±(0.1% Span)	3.984	4.016	3.995 mA		1.6e-004 mA	100.0 : 1
	25%	±(0.1% Span)	7.984	8.016	7.995 mA		2.7e-004 mA	59.3 : 1
	50%	±(0.1% Span)	11.984	12.016	11.996 mA		1.1e-003 mA	14.5 : 1
	75%	±(0.1% Span)	15.984	16.016	16.002 mA		1.3e-003 mA	12.3 : 1
	100%	±(0.1% Span)	19.984	20.016	20.002 mA		1.4e-003 mA	11.4 : 1
DC Current % Source - 4-20mA Ch #4								
4 - 20mA	0%	±(0.1% Span)	3.984	4.016	3.997 mA		1.6e-004 mA	100.0 : 1
	25%	±(0.1% Span)	7.984	8.016	7.995 mA		2.7e-004 mA	59.3 : 1
	50%	±(0.1% Span)	11.984	12.016	11.999 mA		1.1e-003 mA	14.5 : 1
	75%	±(0.1% Span)	15.984	16.016	15.998 mA		1.3e-003 mA	12.3 : 1
	100%	±(0.1% Span)	19.984	20.016	20.002 mA		1.4e-003 mA	11.4 : 1
DC Current % Source - 0-20mA Ch #1								
0 - 20mA	0%	±(0.1% Span)	-0.020	0.020	0.000 mA		9.2e-007 mA	100.0 : 1
	25%	±(0.1% Span)	4.980	5.020	4.997 mA		1.9e-004 mA	100.0 : 1
	50%	±(0.1% Span)	9.980	10.020	9.998 mA		3.2e-004 mA	62.5 : 1
	75%	±(0.1% Span)	14.980	15.020	14.998 mA		1.2e-003 mA	16.7 : 1
	100%	±(0.1% Span)	19.980	20.020	19.998 mA		1.4e-003 mA	14.3 : 1

The reported uncertainty is the uncertainty of the calibration process. For measuring instruments, add 0.6 of the least significant digit to the reported uncertainty to obtain the measurement uncertainty of the unit under test at the specific test point. Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.

# SUPPLEMENTAL REPORT FOR 33-8Z881-1-1

## CALIBRATION LAB DATA AS FOUND / AS LEFT

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	$\frac{Q}{T}$	Uncertainty (k=2; ±)	TUR
<b>DC Current % Source - 0-20mA Ch #2</b>								
0 - 20mA	0%	±(0.1% Span)	-0.020	0.020	0.000 mA		9.2e-007 mA	100.0 : 1
	25%	±(0.1% Span)	4.980	5.020	4.996 mA		1.9e-004 mA	100.0 : 1
	50%	±(0.1% Span)	9.980	10.020	10.000 mA		3.2e-004 mA	62.5 : 1
	75%	±(0.1% Span)	14.980	15.020	15.000 mA		1.2e-003 mA	16.7 : 1
	100%	±(0.1% Span)	19.980	20.020	19.999 mA		1.4e-003 mA	14.3 : 1
<b>DC Current % Source - 0-20mA Ch #3</b>								
0 - 20mA	0%	±(0.1% Span)	-0.020	0.020	0.000 mA		9.2e-007 mA	100.0 : 1
	25%	±(0.1% Span)	4.980	5.020	4.995 mA		1.9e-004 mA	100.0 : 1
	50%	±(0.1% Span)	9.980	10.020	9.995 mA		3.2e-004 mA	62.5 : 1
	75%	±(0.1% Span)	14.980	15.020	14.997 mA		1.2e-003 mA	16.7 : 1
	100%	±(0.1% Span)	19.980	20.020	20.002 mA		1.4e-003 mA	14.3 : 1
<b>DC Current % Source - 0-20mA Ch #4</b>								
0 - 20mA	0%	±(0.1% Span)	-0.020	0.020	0.000 mA		9.2e-007 mA	100.0 : 1
	25%	±(0.1% Span)	4.980	5.020	4.992 mA		1.9e-004 mA	100.0 : 1
	50%	±(0.1% Span)	9.980	10.020	9.997 mA		3.2e-004 mA	62.5 : 1
	75%	±(0.1% Span)	14.980	15.020	14.996 mA		1.2e-003 mA	16.7 : 1
	100%	±(0.1% Span)	19.980	20.020	20.002 mA		1.4e-003 mA	14.3 : 1
<b>DC Voltage % Source - 0-5V Ch#1</b>								

The reported uncertainty is the uncertainty of the calibration process. For measuring instruments, add 0.6 of the least significant digit to the reported uncertainty to obtain the measurement uncertainty of the unit under test at the specific test point. Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.

# SUPPLEMENTAL REPORT FOR 33-8Z881-1-1

## CALIBRATION LAB DATA AS FOUND / AS LEFT

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	$\frac{O}{I}$	Uncertainty (k=2; ±)	TUR
0 -5V	0%	±(0.1% Span)	-0.0050	0.0050	0.0004 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	0.9950	1.0050	1.0006 V		5.5e-006 V	100.0 : 1
	40%	±(0.1% Span)	1.9950	2.0050	1.9990 V		1.1e-005 V	100.0 : 1
	60%	±(0.1% Span)	2.9950	3.0050	2.9969 V		1.6e-005 V	100.0 : 1
	80%	±(0.1% Span)	3.9950	4.0050	3.9981 V		2.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	4.9950	5.0050	4.9970 V		2.6e-005 V	100.0 : 1
<b>DC Voltage % Source - 0-5V Ch#2</b>								
0 -5V	0%	±(0.1% Span)	-0.0050	0.0050	0.0016 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	0.9950	1.0050	0.9993 V		5.5e-006 V	100.0 : 1
	40%	±(0.1% Span)	1.9950	2.0050	1.9998 V		1.1e-005 V	100.0 : 1
	60%	±(0.1% Span)	2.9950	3.0050	2.9979 V		1.6e-005 V	100.0 : 1
	80%	±(0.1% Span)	3.9950	4.0050	3.9963 V		2.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	4.9950	5.0050	4.9974 V		2.6e-005 V	100.0 : 1
<b>DC Voltage % Source - 0-5V Ch#3</b>								
0 -5V	0%	±(0.1% Span)	-0.0050	0.0050	0.0004 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	0.9950	1.0050	0.9988 V		5.5e-006 V	100.0 : 1
	40%	±(0.1% Span)	1.9950	2.0050	1.9980 V		1.1e-005 V	100.0 : 1
	60%	±(0.1% Span)	2.9950	3.0050	2.9968 V		1.6e-005 V	100.0 : 1
	80%	±(0.1% Span)	3.9950	4.0050	3.9989 V		2.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	4.9950	5.0050	4.9974 V		2.6e-005 V	100.0 : 1

The reported uncertainty is the uncertainty of the calibration process. For measuring instruments, add 0.6 of the least significant digit to the reported uncertainty to obtain the measurement uncertainty of the unit under test at the specific test point. Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.



# SUPPLEMENTAL REPORT FOR 33-8Z881-1-1

## CALIBRATION LAB DATA AS FOUND / AS LEFT

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	$\frac{O}{I}$	Uncertainty (k=2; ±)	TUR
DC Voltage % Source - 0-5V Ch#4								
0-5V	0%	±(0.1% Span)	-0.0050	0.0050	0.0002 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	0.9950	1.0050	1.0000 V		5.5e-006 V	100.0 : 1
	40%	±(0.1% Span)	1.9950	2.0050	1.9981 V		1.1e-005 V	100.0 : 1
	60%	±(0.1% Span)	2.9950	3.0050	2.9985 V		1.6e-005 V	100.0 : 1
	80%	±(0.1% Span)	3.9950	4.0050	3.9967 V		2.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	4.9950	5.0050	4.9975 V		2.6e-005 V	100.0 : 1
DC Voltage % Source - 0-10V Ch#1								
0-10V	0%	±(0.1% Span)	-0.010	0.010	0.001 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	1.990	2.010	2.000 V		1.1e-005 V	100.0 : 1
	40%	±(0.1% Span)	3.990	4.010	4.000 V		2.1e-005 V	100.0 : 1
	60%	±(0.1% Span)	5.990	6.010	6.000 V		3.1e-005 V	100.0 : 1
	80%	±(0.1% Span)	7.990	8.010	7.997 V		4.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	9.990	10.010	9.997 V		5.2e-005 V	100.0 : 1
DC Voltage % Source - 0-10V Ch#2								
0-10V	0%	±(0.1% Span)	-0.010	0.010	0.002 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	1.990	2.010	2.001 V		1.1e-005 V	100.0 : 1
	40%	±(0.1% Span)	3.990	4.010	3.998 V		2.1e-005 V	100.0 : 1

The reported uncertainty is the uncertainty of the calibration process. For measuring instruments, add 0.6 of the least significant digit to the reported uncertainty to obtain the measurement uncertainty of the unit under test at the specific test point. Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.

# SUPPLEMENTAL REPORT FOR 33-8Z881-1-1

## CALIBRATION LAB DATA AS FOUND / AS LEFT

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	$\frac{Q}{T}$	Uncertainty (k=2; ±)	TUR
DC Voltage % Source - 0-10V Ch#3								
0 - 10V	60%	±(0.1% Span)	5.990	6.010	5.998 V		3.1e-005 V	100.0 : 1
	80%	±(0.1% Span)	7.990	8.010	7.998 V		4.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	9.990	10.010	9.998 V		5.2e-005 V	100.0 : 1
DC Voltage % Source - 0-10V Ch#4								
0 - 10V	0%	±(0.1% Span)	-0.010	0.010	0.001 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	1.990	2.010	1.999 V		1.1e-005 V	100.0 : 1
	40%	±(0.1% Span)	3.990	4.010	4.001 V		2.1e-005 V	100.0 : 1
	60%	±(0.1% Span)	5.990	6.010	6.000 V		3.1e-005 V	100.0 : 1
	80%	±(0.1% Span)	7.990	8.010	7.999 V		4.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	9.990	10.010	9.998 V		5.2e-005 V	100.0 : 1
DC Voltage % Source - 0-10V Ch#4								
0 - 10V	0%	±(0.1% Span)	-0.010	0.010	0.001 V		5.0e-007 V	100.0 : 1
	20%	±(0.1% Span)	1.990	2.010	1.999 V		1.1e-005 V	100.0 : 1
	40%	±(0.1% Span)	3.990	4.010	3.998 V		2.1e-005 V	100.0 : 1
	60%	±(0.1% Span)	5.990	6.010	6.000 V		3.1e-005 V	100.0 : 1
	80%	±(0.1% Span)	7.990	8.010	8.000 V		4.1e-005 V	100.0 : 1
	100%	±(0.1% Span)	9.990	10.010	9.999 V		5.2e-005 V	100.0 : 1

The reported uncertainty is the uncertainty of the calibration process. For measuring instruments, add 0.6 of the least significant digit to the reported uncertainty to obtain the measurement uncertainty of the unit under test at the specific test point.

Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.

# SUPPLEMENTAL REPORT FOR 33-8Z881-1-1

## CALIBRATION LAB DATA AS FOUND / AS LEFT

Description	Setpoints	Accuracy	Low Limit	High Limit	As Found / As Left	$\frac{O}{I}$	Uncertainty (k=2; $\pm$ )	TUR
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As Found and As Left Data recorded on March 11, 2014

Temperature: 69.8°F / 21.0°C      Relative Humidity: 48%

Temp/RH Asset: N0457

Asset: N0118

Manufacturer: Agilent/HP

Model: 3458A Opt 002

Description: Multimeter, 8.5 Digit

Cal Date: June 25, 2013

Due Date: June 30, 2014

Traceability Numbers: 5-&N0118-10-6

The reported uncertainty is the uncertainty of the calibration process. For measuring instruments, add 0.6 of the least significant digit to the reported uncertainty to obtain the measurement uncertainty of the unit under test at the specific test point. Reported resolution of the UUT does not represent calibration uncertainty or accuracy of the UUT.

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## E-Audit Checklist

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**(2017 Compliance Protocol AF5): E-Audit checklist****Wind Energy Project – Screening Document – Acoustic Audit Report – Emission IEC61400-11 Standard  
Information Required in the Acoustic Audit Report – Immission**

Item #	Description	Complete?	Comment
1	Characterization of the wind turbine Items 1 to 26; IEC61400-11:2013, Section 10.2	✓	
2	Physical environment Items 27 to 33; IEC61400-11:2013, Section 10.3, Physical Environment	✓	
3	Measurement instrumentation Items 34 to 39; IEC61400-11:2013, Section 10.4, Instrumentation	✓	
4	Acoustic data Items 40 to 52; IEC61400-11:2013, Section 10.5, Acoustic Data	✓	
5	Non-acoustic data Items 50 to 53, and 56; IEC61400-11:2003 Section 10.6, Non-Acoustic Data Items 59 and 60; NPC-233, Section 12.3, Acoustic Audit – Acoustical Data, bullet point number 8, All necessary and supporting calculations	✓	
6	Uncertainty the apparent sound power level at integer wind speeds one-third octave band spectrum of the noise at the reference position at each integer wind speed the Tonality of the sound emissions of the wind turbine measured at the reference position	✓	
7	Additional information Item 60; NPC-233, Section 10, Report Format, bullet point number 4, Conclusions and Recommendations Item 61; NPC-233, Section 12.3, Acoustic Audit – Acoustical Data, bullet point number 8, All necessary and supporting calculations Item 62; NPC-233, Section 12.3, Acoustic Audit – Acoustical Data, bullet point number 3, Details of measurement procedure	✓	All data Excel sheet provided
8	Items 68 to 72; IEC61400-11:2013, Section 10.5, Acoustic Data	⊗	Items 68 to 72 acoustic data as per IEC 61400-11 standard are optional; low frequency noise, infrasound, impulsivity, amplitude modulation not reported
9	Non-acoustic data Items 73 to 74 are from IEC61400-11:2013, Section 10.6, Non-Acoustic Data	⊗	Items 73 to 74 non-acoustic data as per IEC 64100-11 standard are optional; turbulence intensity during acoustic meeasurements not reported

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**End of Report**

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