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REPORT ID: **14461.02.T52.RP2**

Goshen Wind Energy Centre – Turbine T52
IEC 61400-11 Edition 3.0 Measurement Report

Prepared for:

Goshen Wind LP
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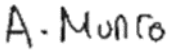
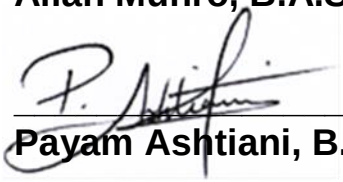


Allan Munro, B.A.Sc.



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

07 November 2017 – Revision #2

SCC Accredited CB-P/S OCPS Accrédité CCN

Revision History

Revision Number	Description	Date
1	Issued Edition 2.1 test report	2016.01.28
2	Issued Edition 3.0 test report	2017.11.07

This report in its entirety, including appendices contains 92 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.

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1 Introduction

Aercoustics Engineering Limited (Aercoustics) was retained by Goshen Wind LP to conduct an acoustic measurement of turbine T52 at the Goshen Wind Energy Centre. 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 T52.

2 Wind Turbine Information

2.1 Wind turbine equipment specific information

Wind turbine specific equipment information for turbine T52 was provided by Nextera and is summarized in Tables 1 – 5.

Table 1 - Wind Turbine Details

Wind Turbine Details	
Manufacturer	GE
Model Number	1.56 – 100 ESS
Turbine ID	WGS1-0052

Table 2 - Operating Details

Operating Details	
Vertical or Horizontal axis wind turbine	Horizontal
Upwind or downwind rotor	Upwind
Hub height	80m
Horizontal distance from rotor centre to tower axis	4100mm
Diameter of rotor	100m
Tower type (lattice or tube)	tube
Passive stall, active stall, or pitch controlled turbine	Pitch controlled
Constant or variable speed	Variable Speed
Power curve	See Figure B.01
Rotational speed at each integer standardised wind speed	See Figure B.02
Rated power output	1.56MW
Control software version	4.07.03

Table 3 - Rotor Details

Rotor Details	
Rotor control devices	Electric Motors
Presence of vortex generators, stall strips, serrated trailing edges	serrated trailing edges
Blade type	TBI
Serial number	40375, 30356, 10400
Number of blades	3

Table 4 - Gearbox Details

Gearbox Details	
Manufacturer	Winergy
Model number	-
Serial number	NFP4856166-0110-6

Table 5 - Generator Details

Generator Details	
Manufacturer	HITACHI
Model number	-
Serial number	530500-8

2.2 Wind Turbine Location

Turbine T52 is located in the municipality of South Huron, approximately 515m North of Greenway Road, and 450m East of Eagleson Line. The area surrounding T52 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 T52 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	2513183

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 yaw position from turbine T52. 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 132m 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 T52. 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 T52 were taken, the surrounding land cleared farmland. 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
January 24,2016	Turbine ON	12:31pm	1:55pm
	Background	2:02pm	3:02pm
January 25,2016	Turbine ON	3:04pm	3:48pm
	Background	3:53pm	4:25pm
	Turbine ON	4:29pm	4:59pm
	Turbine ON	5:04pm	6:04pm

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 T52's power curve (as per the standard), while wind direction was provided by T52's yaw position. Background data was obtained from an anemometer located 10m above ground level near T52.

Temperature and pressure readings during the measurement period were provided by the 10m anemometer, located near turbine T52 for the duration of Aercoustics 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 Aercoustics data acquisition system.

4 Measurement Results

4.1 Deviations from IEC-61400-11 Edition 3.0

Originally, the test contract required measurements in accordance to edition 2.1 of the standard (61400-11) which requires the anemometer to be placed upwind of the turbine. This test report is a reprocessing of the originally acquired data and as such during the test, the anemometer position was erected in an upwind (Ed 2.1), rather than crosswind (Ed 3.0) position relative to the test turbine.

The acoustic signal to noise ratio for the noise levels is >11dB across the entire wind speed range. This deviation is therefore considered to be negligible to the assessment of the maximum sound power of this turbine for this test. This method is in accordance with recommendations made by the convenor of the IEC 61400-11 working group and detailed in Note N6.023.17 and is provided in Appendix F.

4.2 Special Notes & Considerations

T56 was turned off for the duration of test.

4.3 Analysis Details

The following section outlines analysis of the measurement data acquired for T52. 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.

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).

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 9, while detailed information (including data in 1/3 octave) is provided in Appendix C.

Table 9 - 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 10. 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.

Table 10 - 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	
6.5	47.7	93	37.4	75	47.3
7	49.0	52	38	46	48.7
7.5	50.5	42	38.5	42	50.2
8	52.6	44	39.1	34	52.4
8.5	53.5	81	38.4	31	53.3
9	53.6	70	40.2	38	53.4
9.5	53.7	106	40.2	28	53.5
10	53.8	86	40.7	31	53.6
10.5	53.9	43	40.9	12	53.7
11	54.0	16	41.4	14	53.7

4.6 Sound Power Level of Turbine

The calculated sound power level of the turbine T52 (as per IEC 61400-11) is summarized in Table 11 (hub height) and Table 12 (10m height). Detailed 1/3 Octave band spectrum data and respective uncertainties are provided in Appendix C.

Table 11 - $L_{WA,K}$ at each integer wind speed

Wind Speed (m/s)	Apparent L_{WA}, (dBA)	Uncertainty (dB)
6.5	96.3	0.7
7	97.6	0.7
7.5	99.2	0.8
8	101.4	0.8
8.5	102.3	0.7
9	102.3	0.7
9.5	102.5	0.7
10	102.5	0.7
10.5	102.7	0.7
11	102.7	0.8

Table 12 - $L_{WA\ 10m,K}$ at each integer wind speed

Wind Speed (m/s)	Apparent L_{WA}, (dBA)	Uncertainty (dB)
4	93.9	0.9
5	97.7	0.7
6	101.6	0.7
7	102.5	0.7
8	102.7	0.6

4.7 Tonality Analysis

The tonality analysis for Turbine T52 is summarized in Table 13, while plots of narrow band spectra at each wind speed are provided in Appendix D. The ΔL_{tn} and ΔL_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.

Table 13 - Tonality Assessment Summary

Wind Speed (m/s)	Frequency (Hz)	Tonality, ΔL_{tn} (dB)	Tonal audibility, ΔL_a (dB)	FFT's with tones	Total # of FFT's	Presence (%)
6.5	103	-3.5	-1.5	74	93	79%
6.5	209	-4.4	-2.4	69	93	74%
6.5	458	-3.3	-1.0	38	93	41%
7	111	-4.1	-2.1	52	52	100%
7	223	-2.1	-0.1	38	52	73%
7	313	-4.7	-2.6	13	52	25%
7	481	-2.9	-0.6	30	52	58%
7.5	238	-2.4	-0.3	27	42	64%
7.5	327	-3.8	-1.7	14	42	33%
7.5	459	-4.1	-1.9	14	42	33%
8	127	-3.6	-1.6	43	44	98%
8	253	-2.9	-0.9	33	44	75%
8	540	-2.0	0.3	30	44	68%
8	1809	-5.7	-2.3	29	44	66%
8.5	133	2.0	4.0	81	81	100%
9	134	0.4	2.5	70	70	100%
9.5	136	-1.0	1.0	105	106	99%
10	136	-1.2	0.8	84	85	99%
10.5	136	-0.8	1.2	40	43	93%
11	137	-0.6	1.5	16	16	100%

5 Closure

Measurements and analysis were carried on Turbine T52 of the Goshen Wind Energy Centre, located in the municipality of South Huron 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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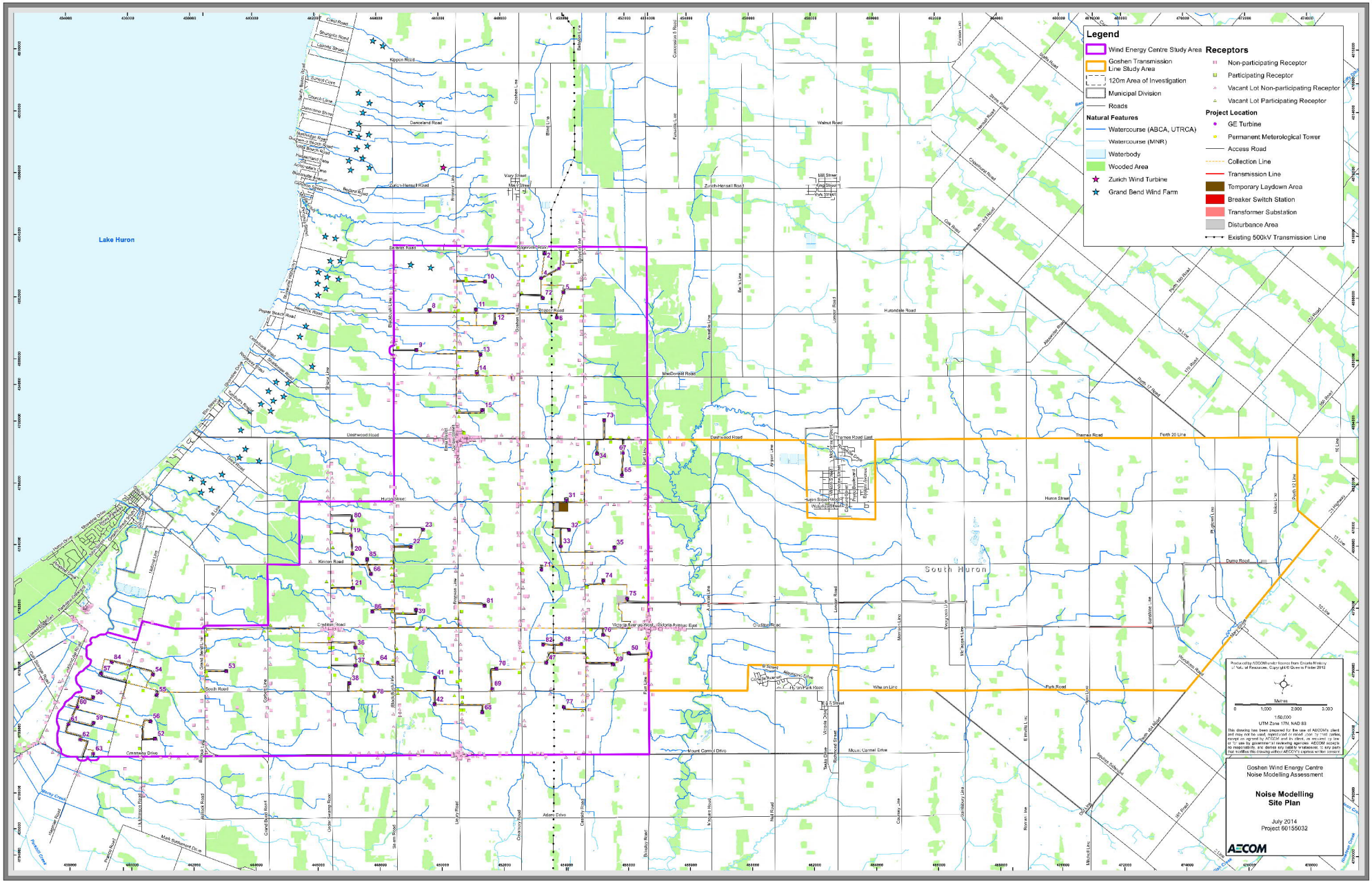
Appendix A
Site Details



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14461.02.T52.RP2	**Project Name**
Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0
	Figure Title Site Plan

Figure A.01

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	Figure Title Site Photos

Figure A.02

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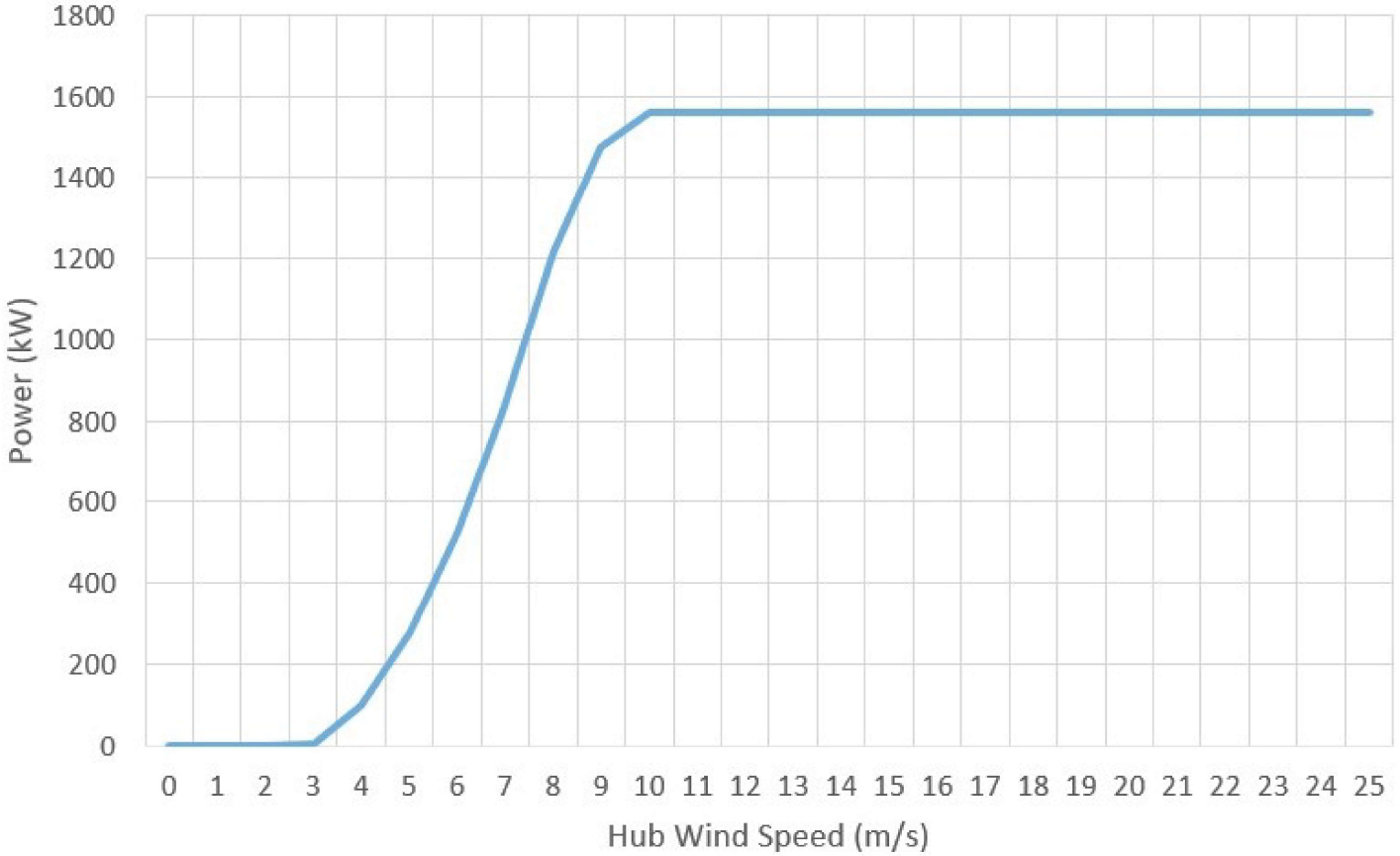
Appendix B
Turbine Information



Power Curve	
Hub Wind Speed (m/s)	Power [kW]
0	0
1	0
2	0
3	4
4	97
5	280
6	526
7	835
8	1216
9	1478
10	1560
11	1560
12	1560
13	1560
14	1560
15	1560
16	1560
17	1560
18	1560
19	1560
20	1560
21	1560
22	1560
23	1560
24	1560
25	1560

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Revision: 1

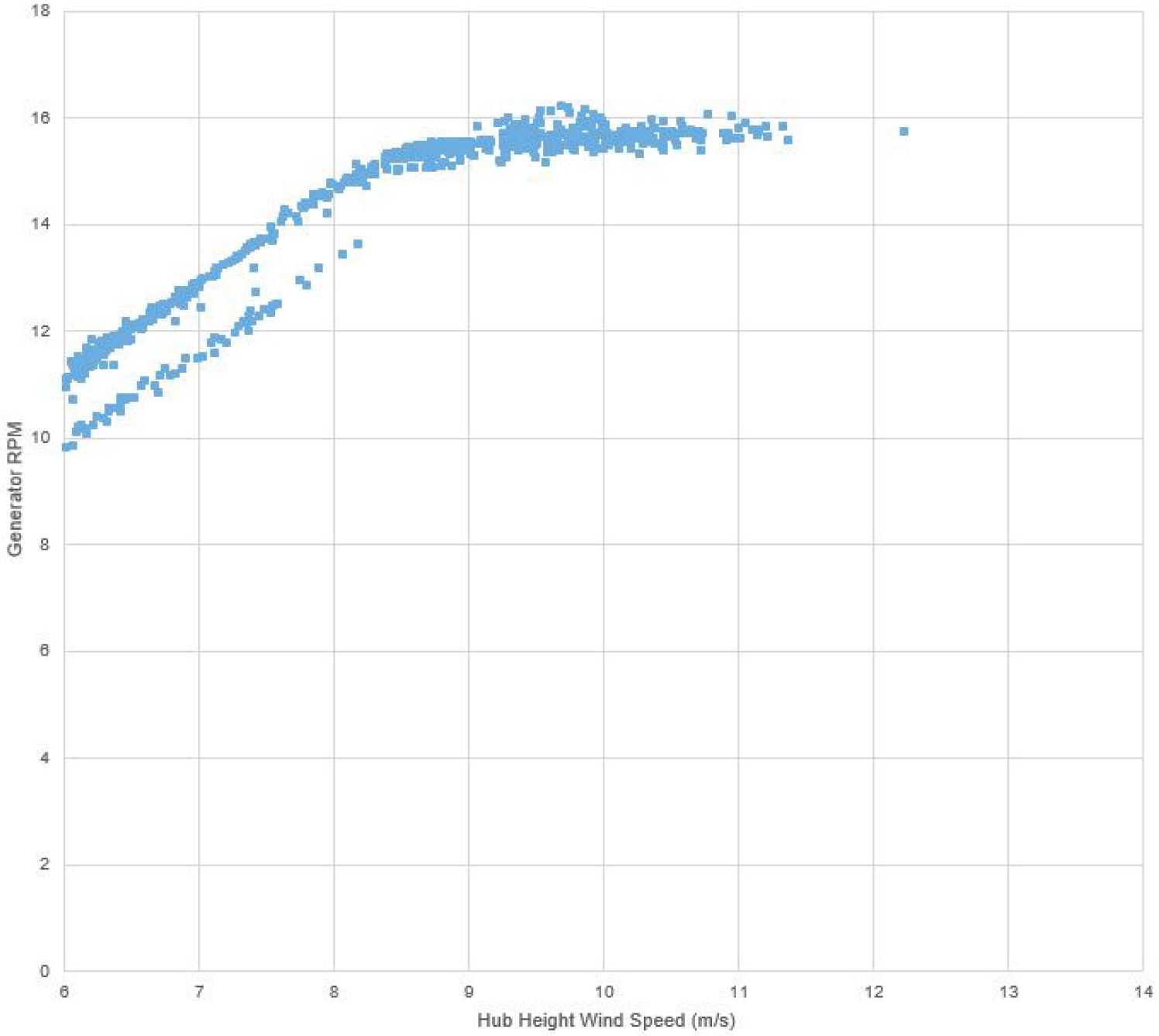
Project Name

Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0

Figure Title

Power Curve

Figure B.01



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14461.02.T52.RP2	**Project Name**
Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0
	Figure Title Rotor RPM vs Wind Speed

Figure B.02

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Appendix C
Apparent Sound Power Level

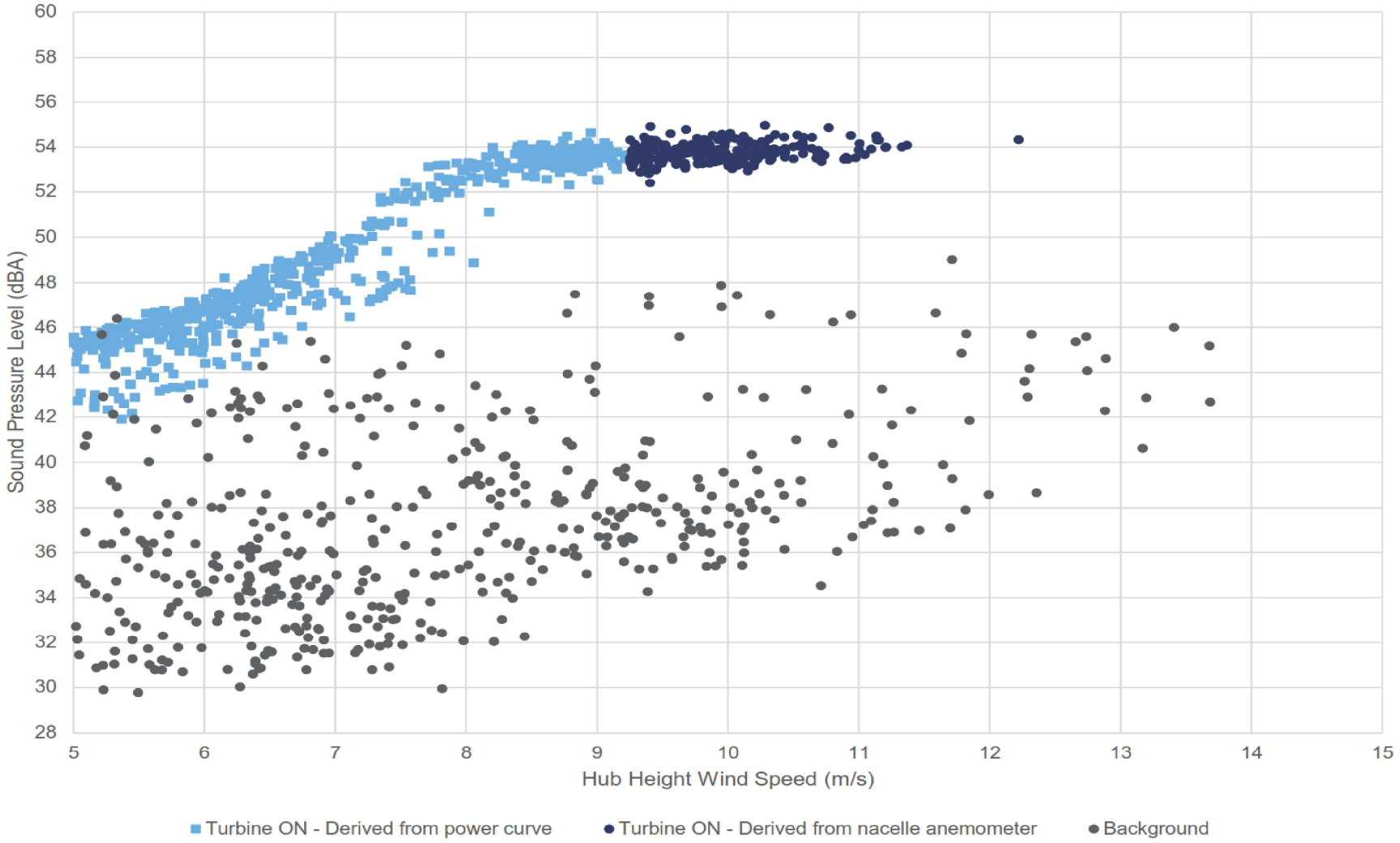

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Figure C.01

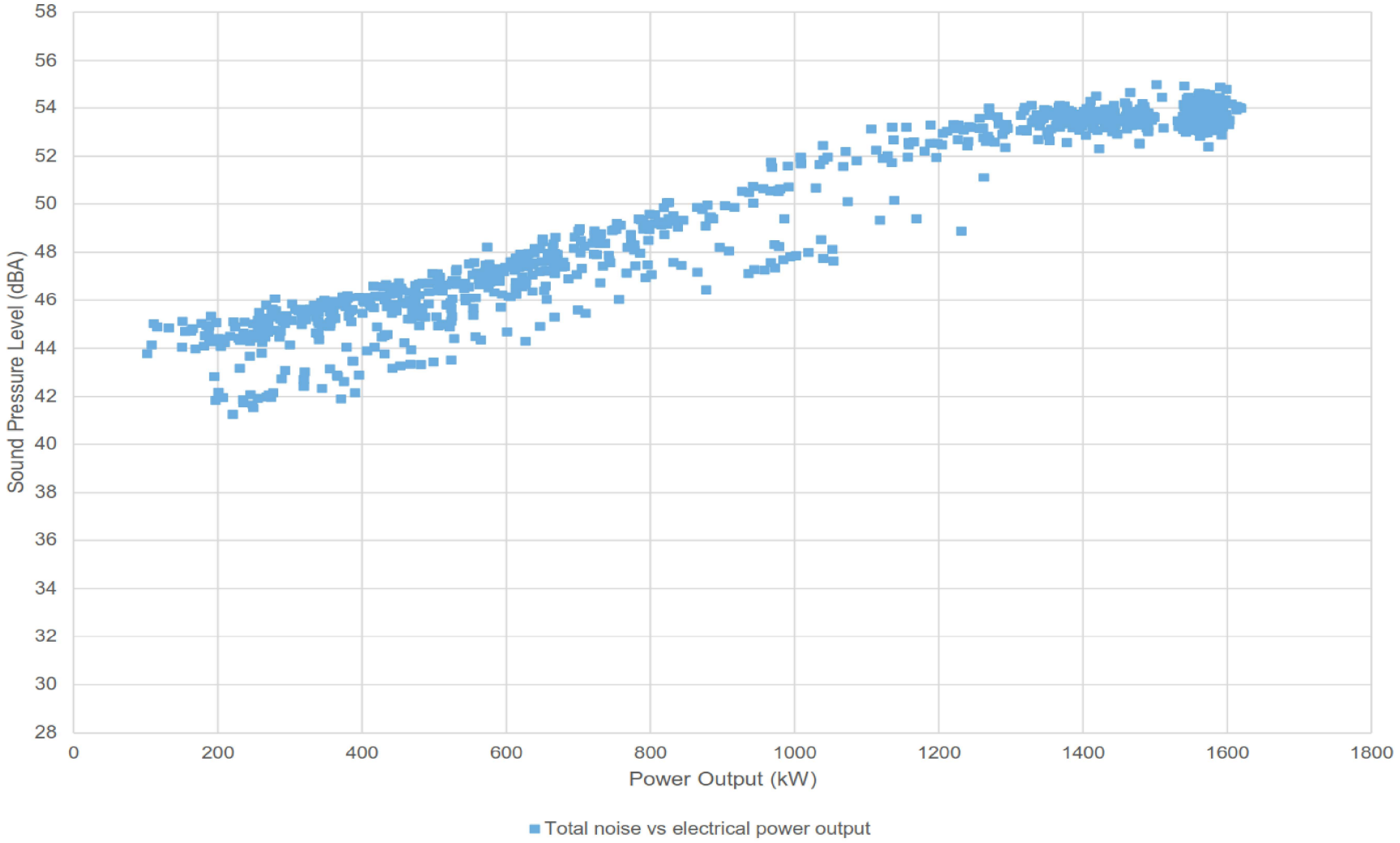

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Figure C.02

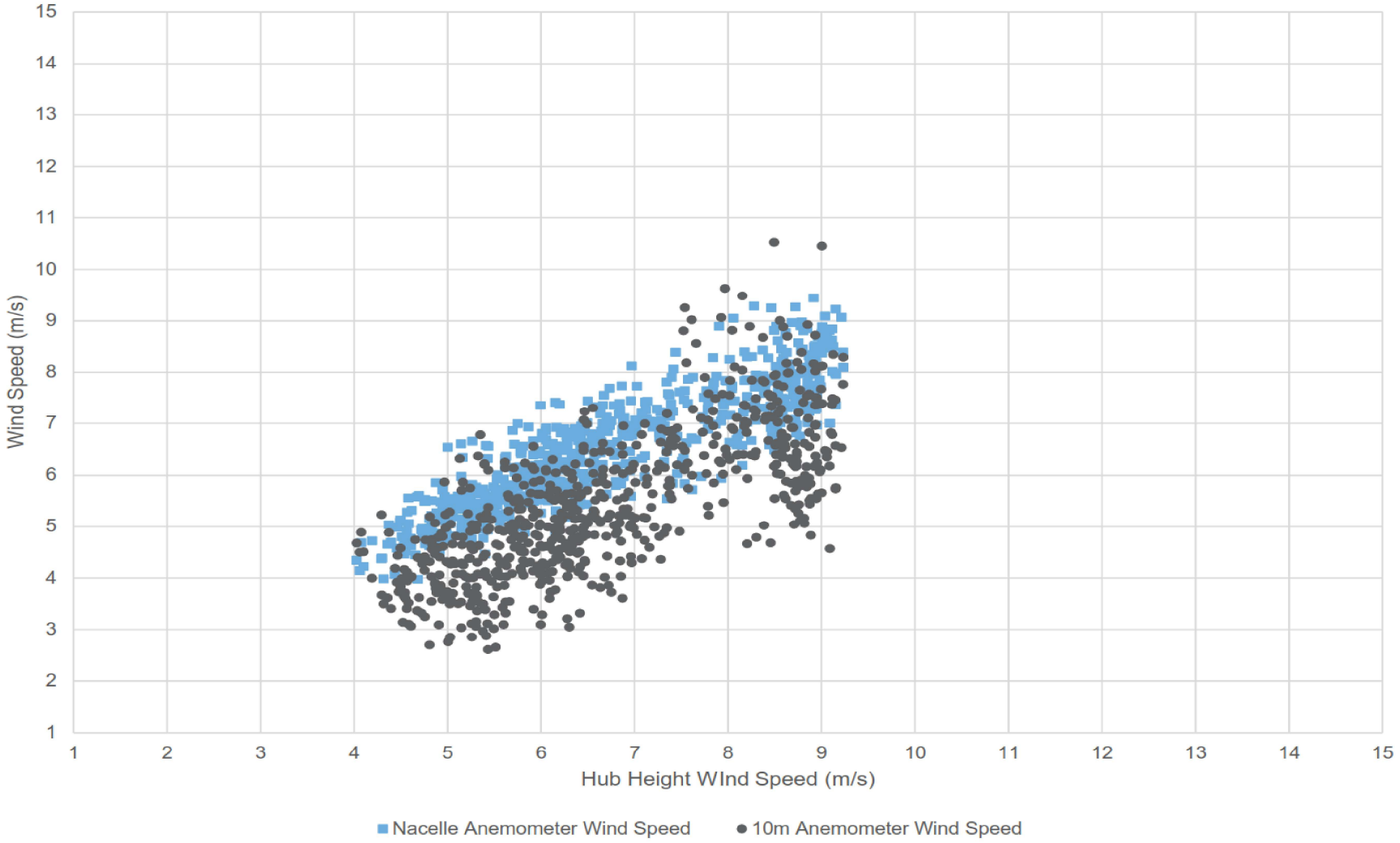

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Figure C.03

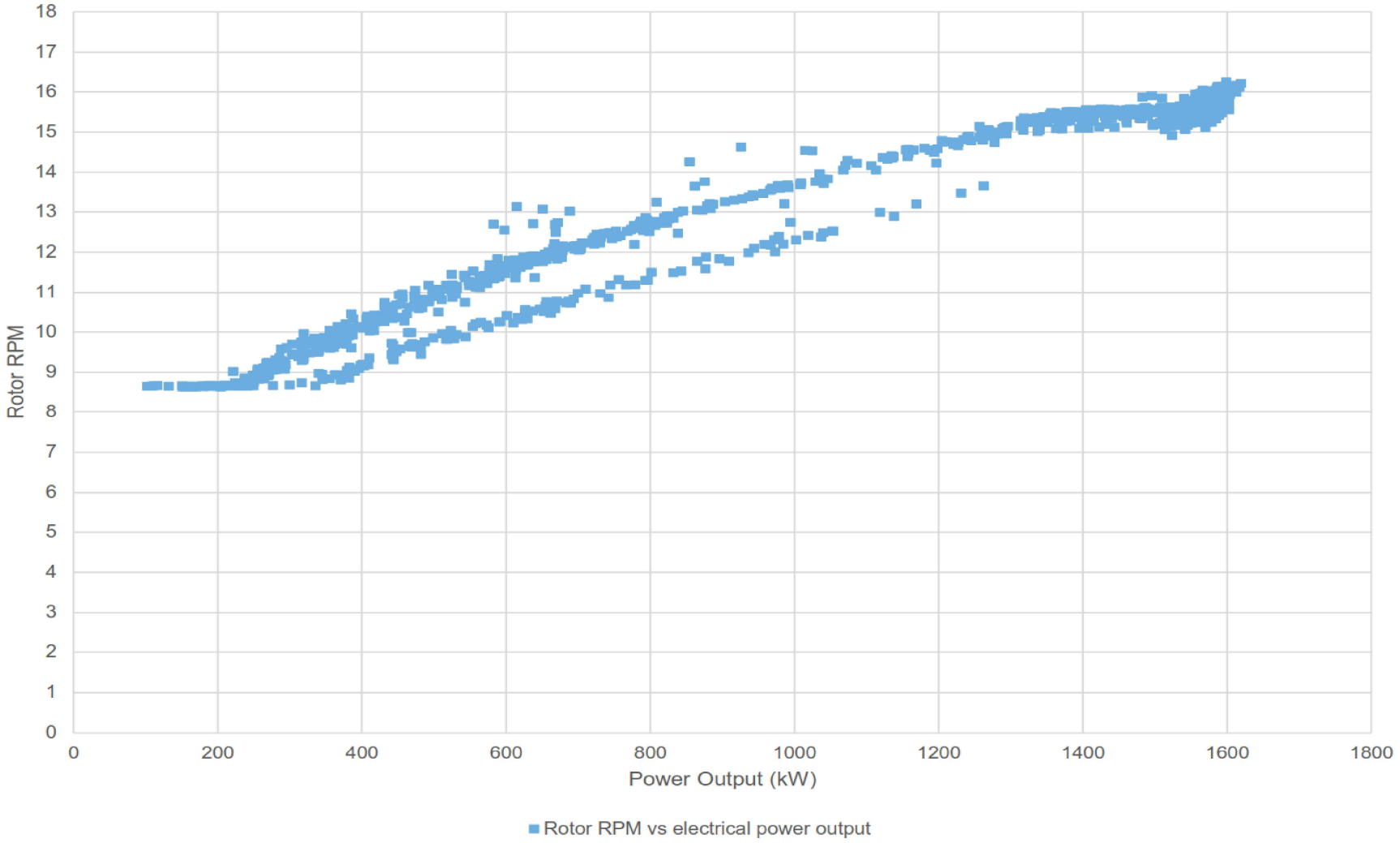

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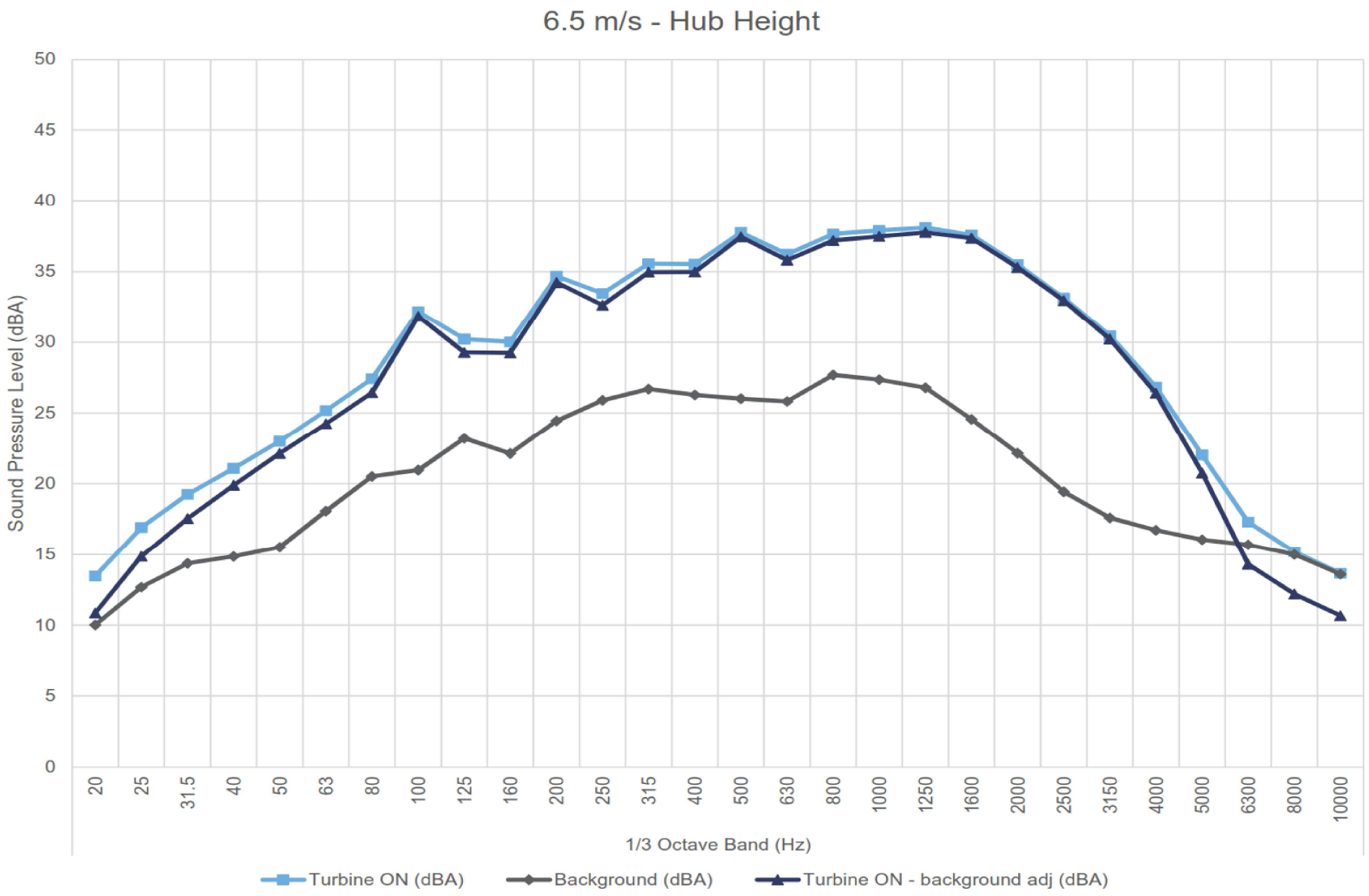
Figure C.04



aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 6.5m/s

Figure C.05

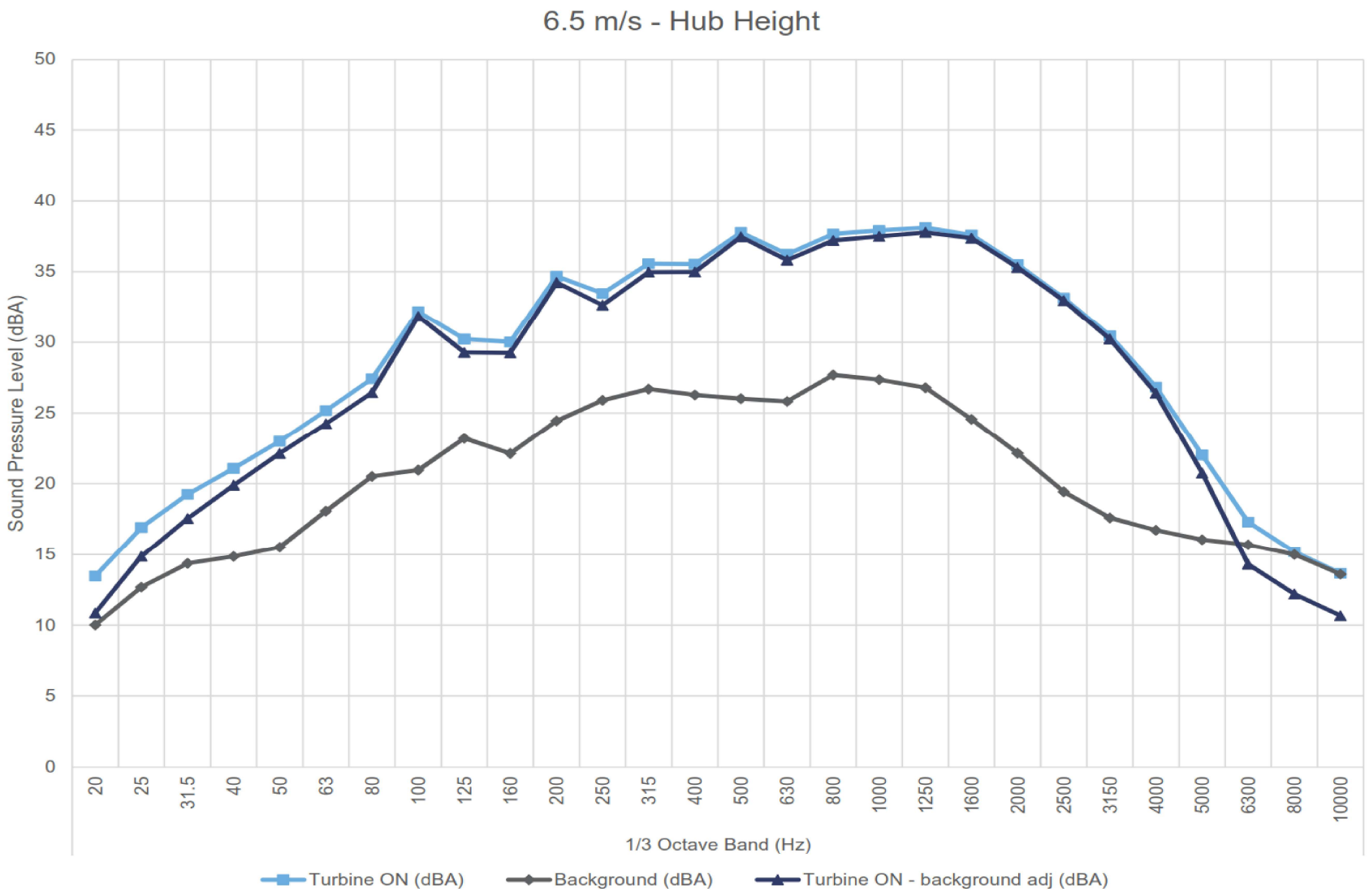


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Figure C.05

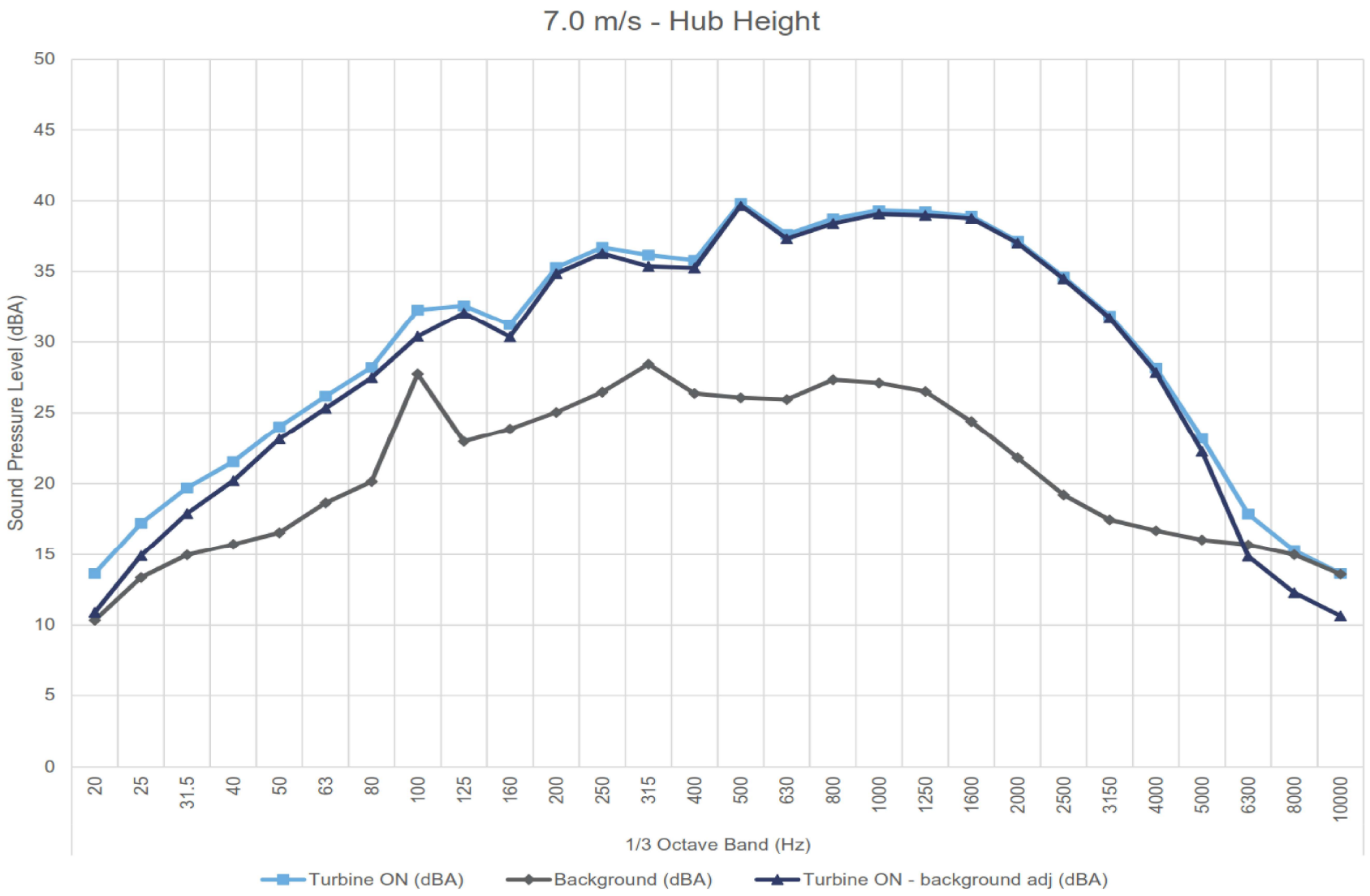

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Figure C.06

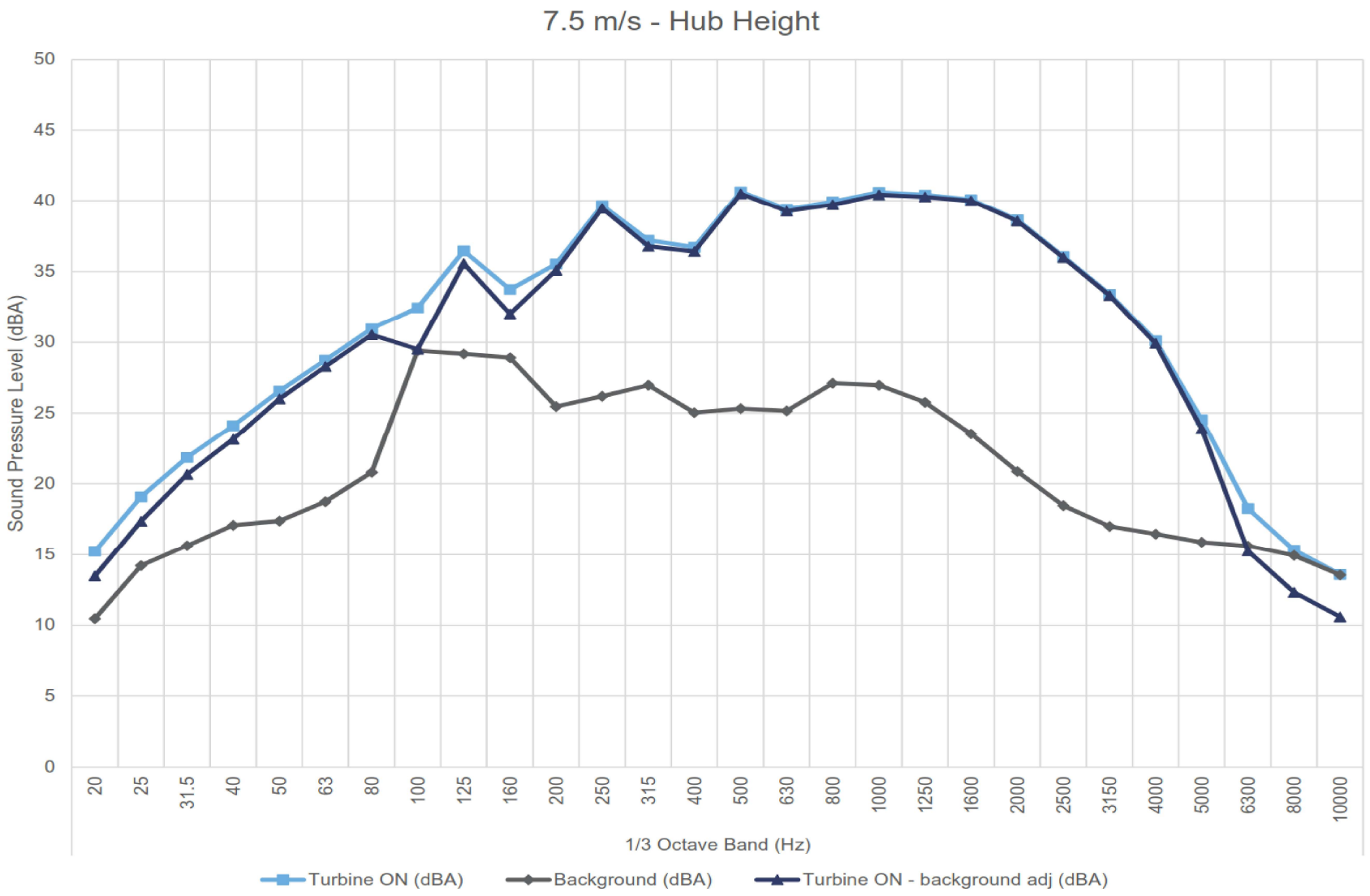

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Figure C.07

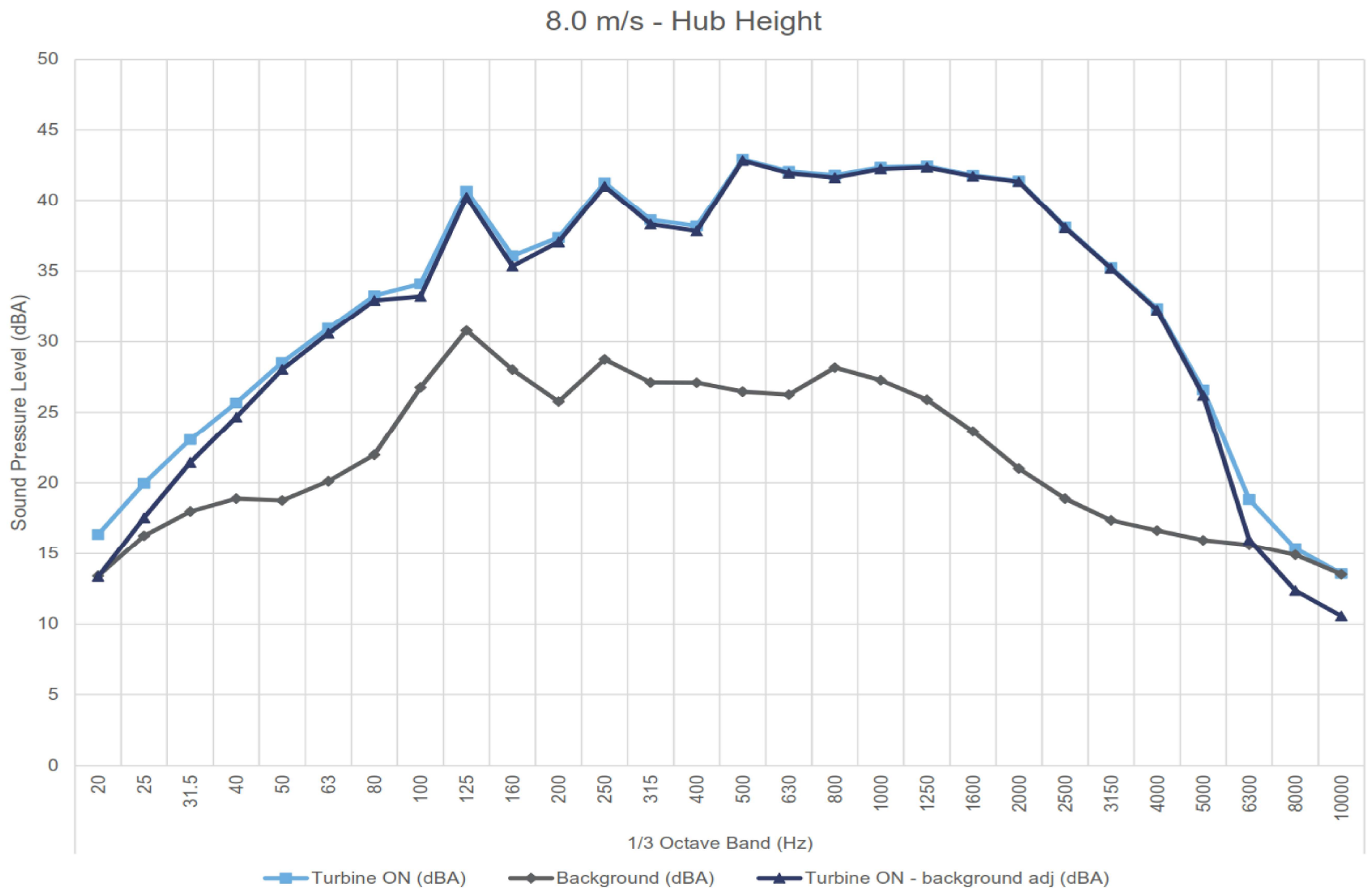

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Figure C.08

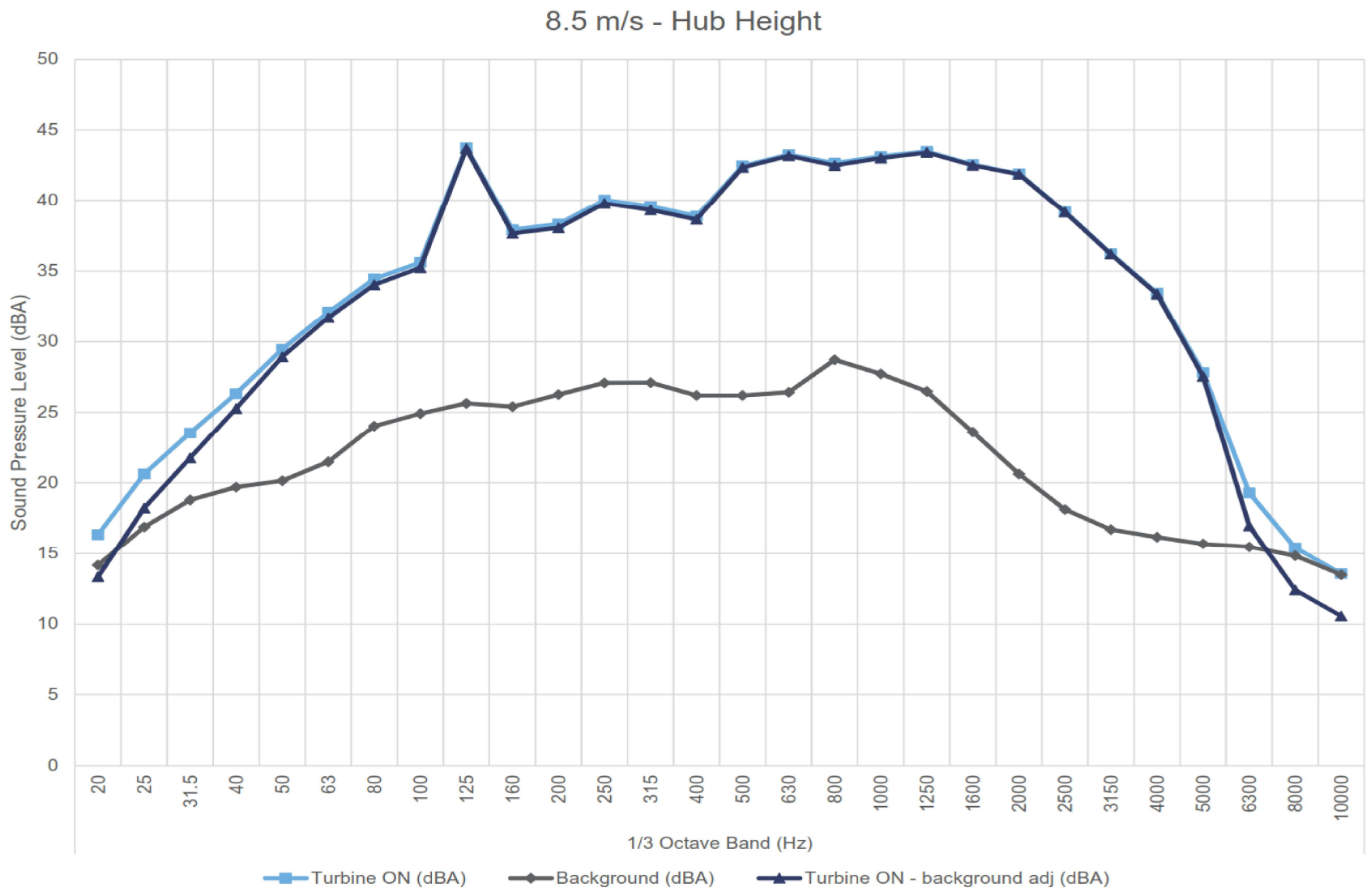

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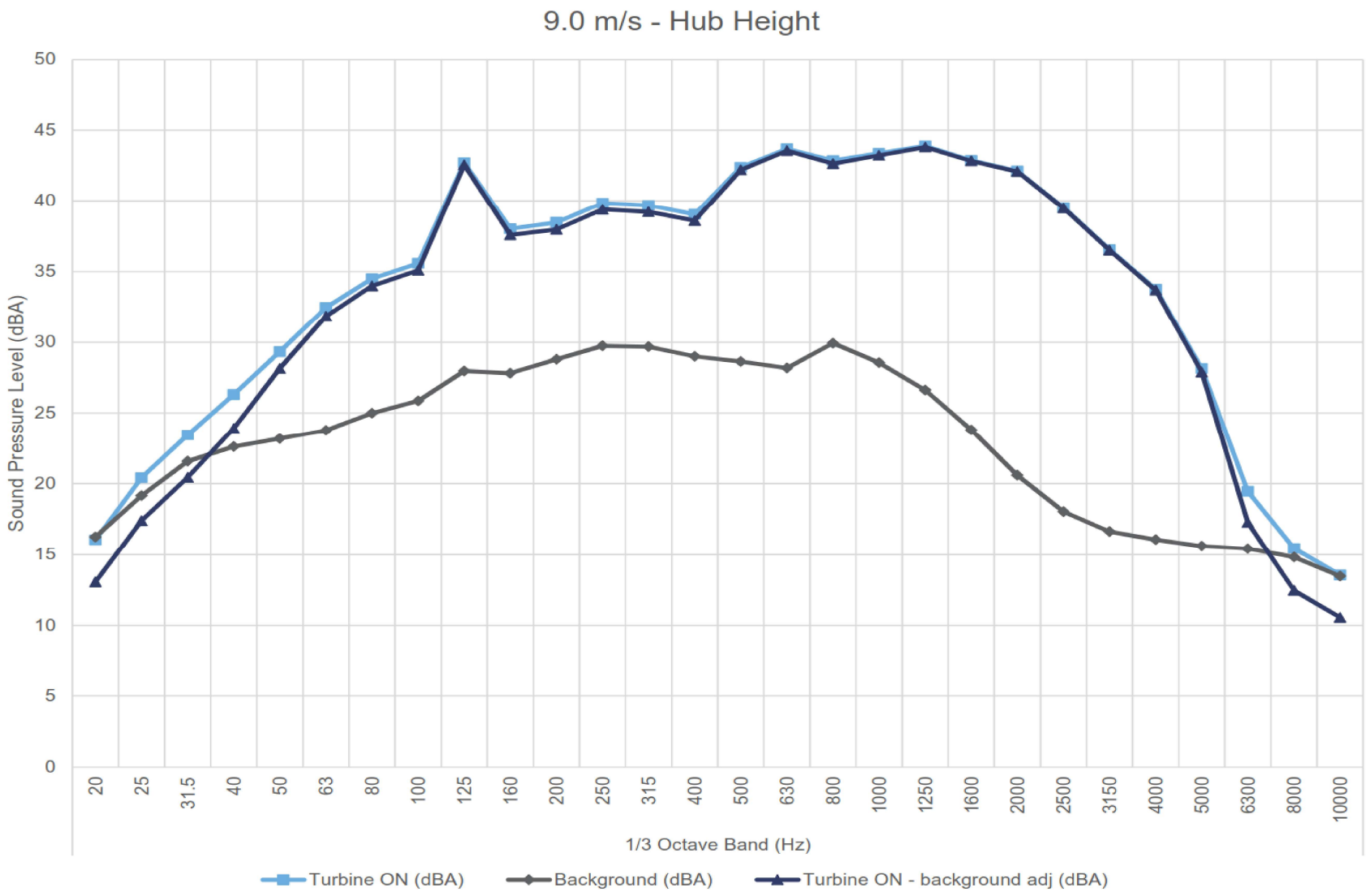
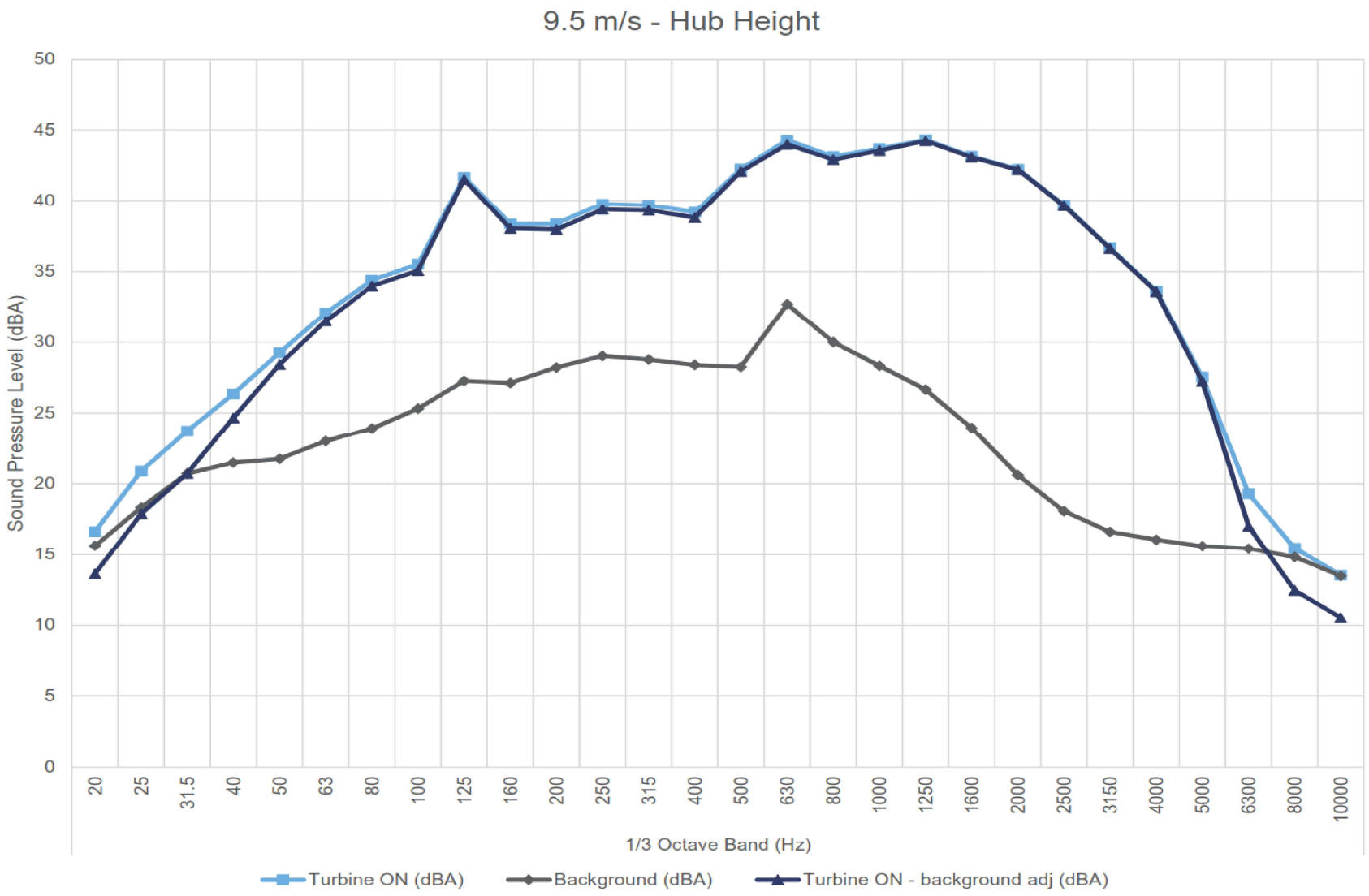
Figure C.09



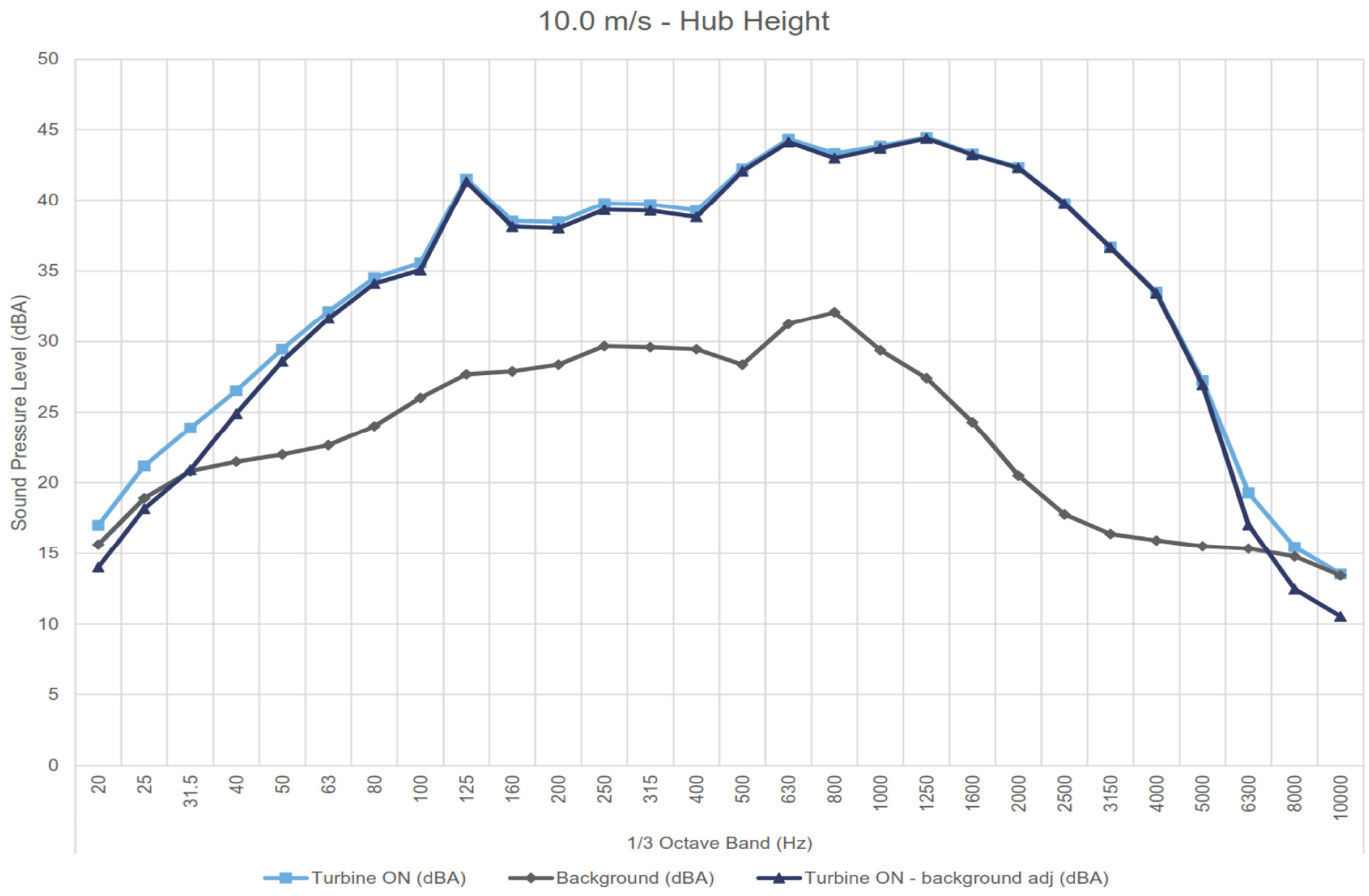
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 9m/s

Figure C.10



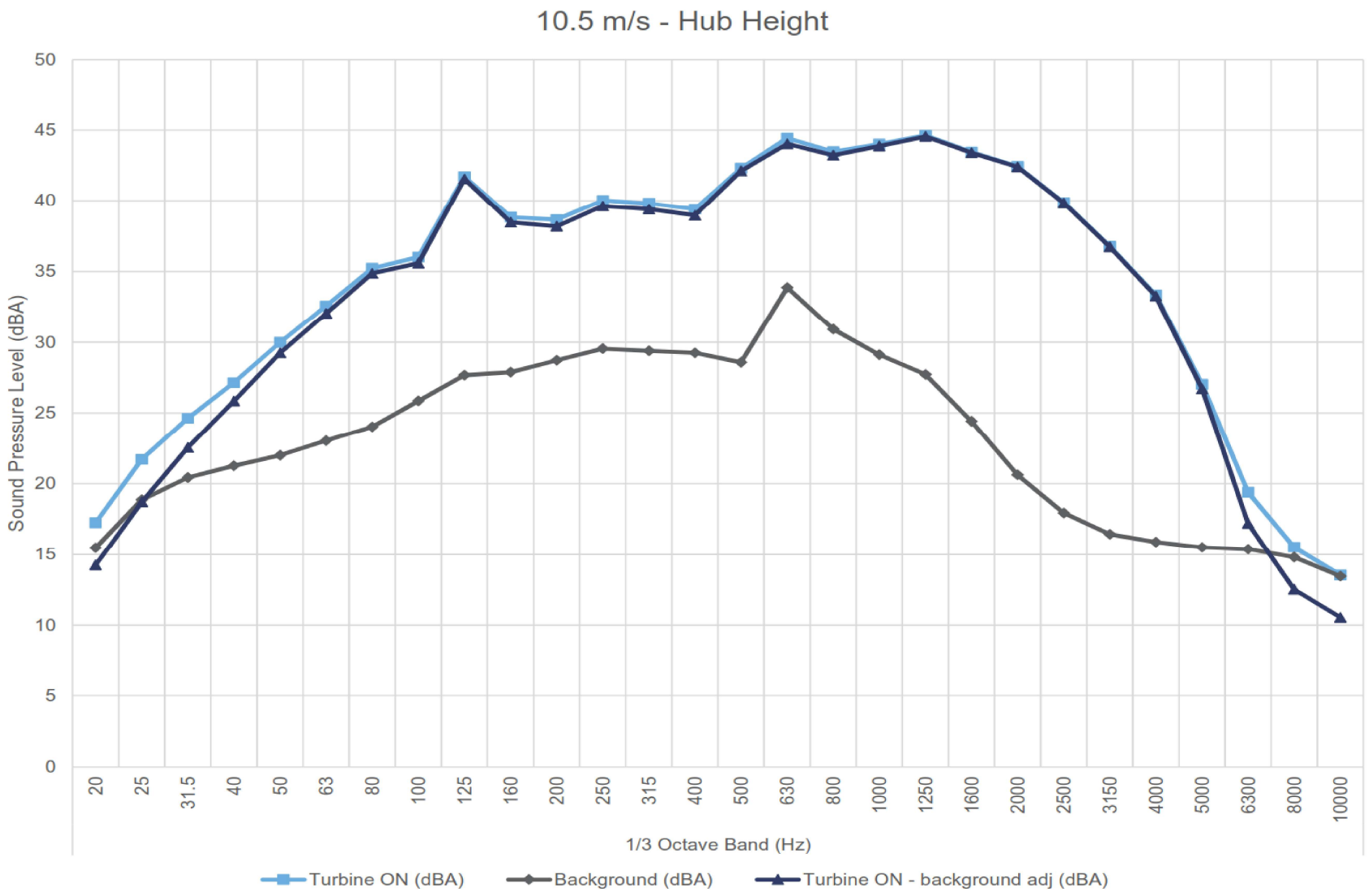
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 9.5m/s

Figure C.11



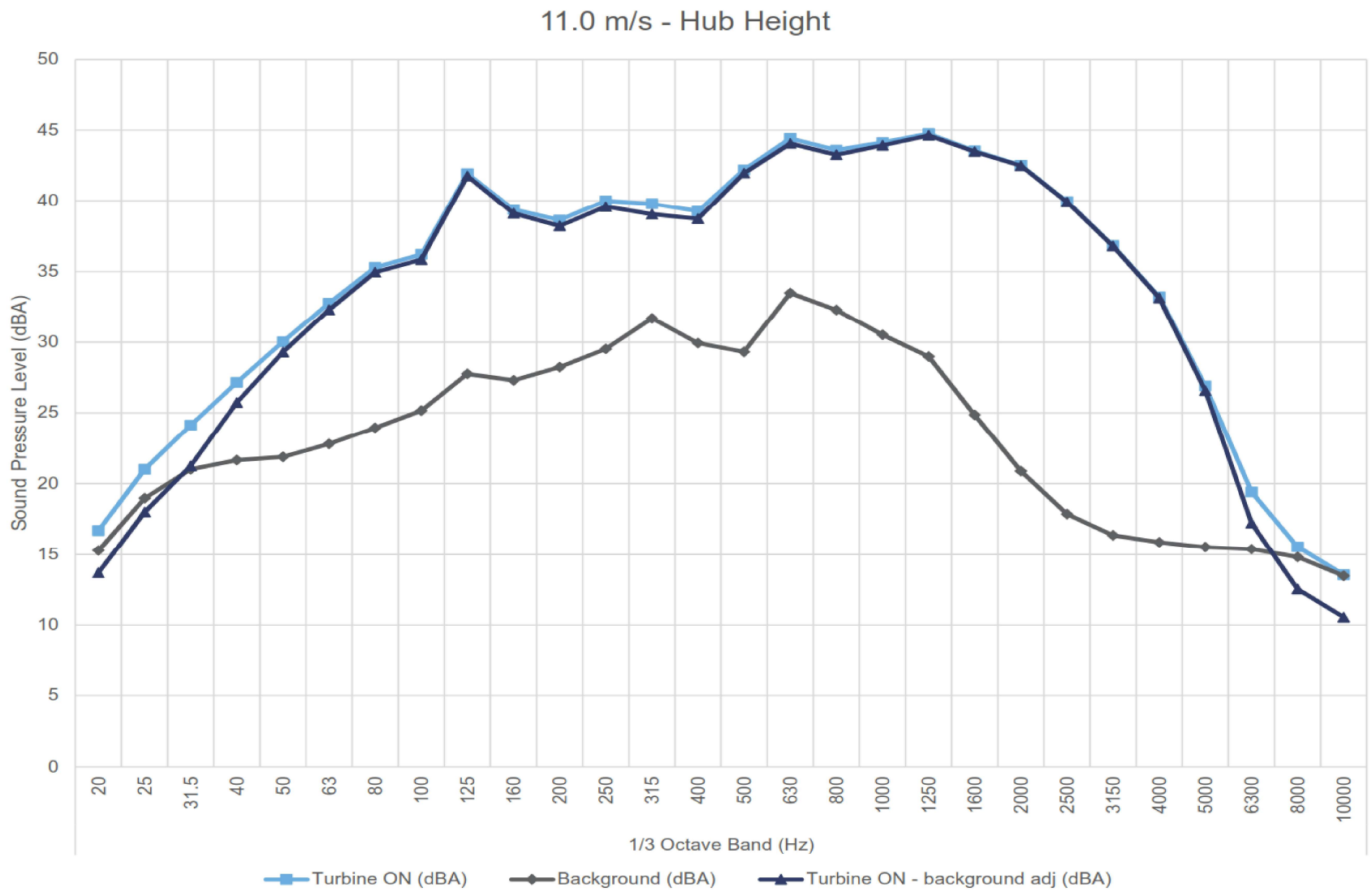
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 10m/s

Figure C.12



aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 10.5m/s

Figure C.13



aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 25, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of sound pressure spectrum at 1/3 Octave at 11m/s

Figure C.14

Table C.01 Detailed apparent sound power level data at hub height

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 9/25/2017

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	
6.5	Turbine ON (dBA)	13.5	16.9	19.3	21.1	23.0	25.2	27.4	32.2	30.2	30.0	34.7	33.5	35.6	35.5	37.7	36.2	37.6	37.9	38.1	37.6	35.5	33.1	30.5	26.8	22.0	17.3	15.2	13.7	47.7
	Background (dBA)	10.0	12.7	14.4	14.9	15.5	18.1	20.5	21.0	23.2	22.1	24.4	25.9	26.7	26.3	26.0	25.8	27.7	27.4	26.8	24.6	22.1	19.4	17.6	16.7	16.1	15.7	15.0	13.6	37.4
	Turbine ON - background adj (dBA)	10.9	14.9	17.6	19.9	22.1	24.2	26.4	31.9	29.3	29.3	34.2	32.6	35.0	35.0	37.4	35.8	37.2	37.5	37.7	37.3	35.3	33.0	30.2	26.4	20.7	[14.3]	[12.2]	[10.7]	47.3
	Signal to noise (dB)	3.4	4.2	4.9	6.2	7.5	7.1	6.9	11.2	7.0	7.9	10.2	7.6	8.9	9.2	11.7	10.4	10.0	10.5	11.3	13.0	13.4	13.7	12.9	10.1	6.0	1.6	0.2	0.1	10.3
	Uncertainty (dB)	2.1	1.8	1.3	1.1	1.0	1.0	1.0	0.8	1.0	0.9	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	1.0	1.7	1.7	3.0	0.7
	PWL (dBA)	59.8	63.8	66.5	68.9	71.1	73.2	75.4	80.8	78.2	78.2	83.2	81.6	83.9	83.9	86.4	84.8	86.1	86.4	86.7	86.3	84.2	81.9	79.2	75.4	69.7	[63.3]	[61.2]	[59.6]	96.3
7.0	Turbine ON (dBA)	13.6	17.2	19.7	21.5	24.0	26.2	28.2	32.3	32.6	31.2	35.3	36.7	36.2	35.8	39.8	37.6	38.7	39.3	39.2	38.9	37.1	34.6	31.9	28.2	23.2	17.9	15.3	13.6	49.0
	Background (dBA)	10.4	13.4	15.0	15.7	16.5	18.6	20.1	27.8	23.0	23.8	25.0	26.5	28.4	26.4	26.1	25.9	27.3	27.1	26.5	24.4	21.8	19.2	17.5	16.7	16.0	15.7	15.0	13.6	38.0
	Turbine ON - background adj (dBA)	10.9	14.9	17.9	20.2	23.1	25.3	27.5	30.4	32.1	30.4	34.8	36.3	35.4	35.2	39.6	37.3	38.4	39.0	38.9	38.7	37.0	34.5	31.7	27.8	22.3	[14.9]	[12.3]	[10.6]	48.7
	Signal to noise (dB)	3.3	3.9	4.7	5.8	7.5	7.5	8.1	4.5	9.6	7.4	10.2	10.2	7.7	9.4	13.7	11.6	11.4	12.2	12.6	14.5	15.3	15.4	14.4	11.5	7.1	2.2	0.3	0.0	11.0
	Uncertainty (dB)	2.2	1.9	1.4	1.1	1.0	1.0	0.9	1.5	0.9	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.7	1.7	3.0	0.7
	PWL (dBA)	59.9	63.9	66.9	69.2	72.1	74.3	76.4	79.4	81.1	79.3	83.8	85.2	84.3	84.2	88.6	86.2	87.3	88.0	87.9	87.7	86.0	83.4	80.7	76.8	71.2	[63.8]	[61.2]	[59.6]	97.6
7.5	Turbine ON (dBA)	15.2	19.1	21.8	24.1	26.6	28.7	31.0	32.5	36.5	33.8	35.5	39.7	37.2	36.7	40.6	39.4	39.9	40.6	40.4	40.1	38.6	36.1	33.4	30.1	24.5	18.3	15.3	13.6	50.5
	Background (dBA)	10.5	14.2	15.6	17.1	17.4	18.7	20.8	29.4	29.2	28.9	25.5	26.2	27.0	25.0	25.3	25.2	27.1	27.0	25.8	23.5	20.9	18.5	17.0	16.5	15.9	15.6	14.9	13.6	38.5
	Turbine ON - background adj (dBA)	13.5	17.4	20.7	23.1	26.0	28.3	30.5	29.5	35.6	32.0	35.1	39.5	36.8	36.4	40.5	39.3	39.7	40.4	40.3	40.0	38.6	36.0	33.3	29.9	23.9	[15.3]	[12.3]	[10.6]	50.2
	Signal to noise (dB)	4.8	4.9	6.2	7.0	9.2	10.0	10.2	3.1	7.3	4.8	10.1	13.5	10.2	11.7	15.3	14.3	12.8	13.6	14.7	16.6	17.8	17.6	16.4	13.7	8.6	2.6	0.4	0.0	12.0
	Uncertainty (dB)	1.7	1.7	1.2	1.1	1.0	1.0	1.0	2.5	1.2	1.5	0.8	1.0	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.7	1.7	3.0	0.8
	PWL (dBA)	62.4	66.3	69.6	72.1	75.0	77.2	79.5	78.5	84.5	81.0	84.0	88.4	85.7	85.4	89.5	88.2	88.7	89.4	89.2	88.9	87.5	84.9	82.3	78.9	72.8	[64.2]	[61.3]	[59.5]	99.2
8.0	Turbine ON (dBA)	16.4	20.0	23.0	25.7	28.5	31.0	33.3	34.1	40.7	36.1	37.4	41.3	38.6	38.2	42.9	42.1	41.8	42.4	42.4	41.8	41.4	38.1	35.3	32.4	26.6	18.8	15.4	13.6	52.6
	Background (dBA)	13.4	16.3	18.0	18.9	18.8	20.1	22.0	26.8	30.8	28.0	25.8	28.7	27.1	27.1	26.5	26.2	28.2	27.3	25.9	23.6	21.0	18.9	17.4	16.7	16.0	15.6	14.9	13.5	39.1
	Turbine ON - background adj (dBA)	[13.4]	17.5	21.4	24.6	28.0	30.6	32.9	33.2	40.2	35.3	37.0	41.0	38.3	37.8	42.8	41.9	41.6	42.2	42.4	41.7	41.3	38.0	35.2	32.2	26.2	16.0	[12.4]	[10.6]	52.4
	Signal to noise (dB)	3.0	3.7	5.1	6.8	9.8	10.9	11.3	7.3	9.9	8.1	11.6	12.5	11.5	11.1	16.5	15.8	13.7	15.1	16.6	18.2	20.4	19.2	17.9	15.7	10.6	3.2	0.5	0.1	13.5
	Uncertainty (dB)	2.7	2.2	1.4	1.1	0.9	0.9	0.9	1.1	1.1	1.0	0.8	0.9	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.7	1.8	3.2	0.8
	PWL (dBA)	[62.3]	66.5	70.4	73.6	77.0	79.6	81.9	82.2	89.2	84.3	86.0	90.0	87.3	86.8	91.8	90.9	90.6	91.2	91.3	90.7	90.3	87.0	84.1	81.2	75.1	64.9	[61.3]	[59.5]	101.4
8.5	Turbine ON (dBA)	16.4	20.6	23.5	26.3	29.5	32.1	34.5	35.6	43.7	37.9	38.3	40.0	39.6	38.9	42.4	43.2	42.7	43.1	43.5	42.6	41.9	39.2	36.2	33.5	27.8	19.3	15.4	13.6	53.5
	Background (dBA)	14.2	16.9	18.8	19.7	20.1	21.5	24.0	24.9	25.6	25.4	26.2	27.1	27.1	26.2	26.2	26.4	28.7	27.7	26.5	23.6	20.6	18.1	16.7	16.2	15.7	15.5	14.8	13.5	38.4
	Turbine ON - background adj (dBA)	[13.4]	18.2	21.8	25.3	28.9	31.7	34.0	35.2	43.7	37.6	38.0	39.8	39.3	38.6	42.3	43.2	42.5	43.0	43.4	42.5	41.9	39.2	36.2	33.4	27.5	17.0	[12.4]	[10.6]	53.3
	Signal to noise (dB)	2.2	3.7	4.7	6.6	9.3	10.6	10.4	10.7	18.1	12.5	12.1	12.9	12.5	12.7	16.2	16.8	13.9	15.4	17.0	19.0	21.3	21.1	19.5	17.3	12.1	3.8	0.6	0.1	15.1
	Uncertainty (dB)	2.3	1.9	1.3	1.0	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	0.6	0.7	0.8	0.8	0.8	1.4	1.7	3.0	0.7
	PWL (dBA)	[62.3]	67.2	70.7	74.2	77.9	80.7	83.0	84.2	92.6	86.6	87.0	88.7	88.3	87.6	91.3	92.1	91.4	92.0	92.4	91.5	90.8	88.1	85.1	82.3	76.5	65.9	[61.4]	[59.5]	102.3
9.0	Turbine ON (dBA)	16.1	20.4	23.4	26.3	29.3	32.5	34.5	35.6	42.7	38.0	38.5	39.8	39.7	39.0	42.4	43.7	42.9	43.4	43.9	42.9	42.1	39.5	36.5	33.8	28.1	19.5	15.5	13.5	53.6
	Background (dBA)	16.3	19.2	21.6	22.6	23.2	23.8	25.0	25.9	28.0	27.8	28.8	29.8	29.7	29.0	28.6	28.2	29.9	28.6	26.6	23.8	20.6	18.0	16.6	16.1	15.6	15.4	14.8	13.5	40.2
	Turbine ON - background adj (dBA)	[13.1]	[17.4]	[20.4]	23.9	28.1	31.9	34.0	35.1	42.5	37.6	38.0	39.4	39.2	38.6	42.2	43.6	42.6	43.2	43.8	42.8	42.1	39.5	36.5	33.7	27.9	17.3	[12.5]	[10.5]	53.4
	Signal to noise (dB)	-0.2	1.2	1.9	3.7	6.2	8.7	9.5	9.7	14.7	10.2	9.7	10.1	10.0	10.0	13.7	15.5	12.9	14.8	17.3	19.1	21.5	21.5	19.9	17.7	12.5	4.0	0.6	0.1	13.4
	Uncertainty (dB)	2.3	2.3	2.0	1.6	1.0	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	1.3	1.6	3.0	0.7
	PWL (dBA)	[62]	[66.4]	[69.4]	72.8	77.1	80.8	83.0	84.1	91.5	86.5	86.9	88.3	88.2	87.5	91.1	92.5	91.6	92.2	92.8	91.8	91.0	88.4	85.5	82.7	76.9	66.2	[61.4]	[59.5]	102.3
9.5	Turbine ON (dBA)	16.6	20.9	23.7	26.4	29.3	32.1	34.4	35.5	41.7	38.4	38.4	39.8	39.7	39.2	42.3	44.3	43.1	43.7	44.3	43.2	42.2	39.7	36.7	33.7	27.5	19.3	15.5	13.5	53.7
	Background (dBA)	15.6	18.3	20.7	21.5	21.7	23.0	23.9	25.3	27.3	27.1	28.2	29.0	28.8	28.4	28.2	32.7	30.0	28.3	26.7	23.9	20.6	18.1	16.6	16.1	15.6	15.4	14.8	13.5	40.2
	Turbine ON - background adj (dBA)	[13.6]	[17.9]	[20.7]	24.6	28.4	31.5	34.0	35.1	41.5	38.0	37.9	39.4	39.3	38.8	42.1	44.0	42.9	43.6	44.2	43.1	42.2	39.7	36.6	33.6	27.2	17.0	[12.5]	[10.5]	53.5
	Signal to noise (dB)	1.0	2.6	3.0	4.9	7.5	9.1	10.5	10.2	14.4	11.2	10.2	10.7	10.9	10.8	14.0	11.6	13.1	15.4	17.7	19.2	21.6	21.6	20.0	17.6	11.9	3.9	0.6	0.1	13.5
	Uncertainty (dB)	2.4	2.4	2.0	1.3	1.0	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	0.8	0.8	0.8	1.4	1.7	3.0	0.7
	PWL (dBA)	[62.6]	[66.9]	[69.7]	73.6	77.4	80.5	82.9	84.0	90.5	87.0	86.9	88.3	88.3	87.7	91.0	93.0	91.9	92.5	93.2	92.1	91.2	88.6	85.6	82.5	76.2	66.0	[61.4]	[59.5]	102.5
10.0	Turbine ON (dBA)	17.0	21.2	23.9	26.5	29.5	32.2	34.5	35.6	41.5	38.5	38.5	39.8	39.7	39.3	42.2	44.3	43.3	43.8	44.5	43.3	42.3	39.8	36.7	33.5	27.2	19.3	15.5	13.5	53.8
	Background (dBA)	15.6	18.9	20.8	21.5	22.0	22.6	24.0	26.0	27.7	27.9	28.4	29.7	29.6	29.5	28.4	31.3	32.1	29.4	27.4	24.3	20.5	17.8	16.4	15.9	15.5	15.4	14.8	13.4	40.7
	Turbine ON - background adj (dBA)	[14]	[18.2]	20.9	24.9	28.6	31.6	34.1	35.1	41.3	38.1	38.0	39.3	39.3	38.8	42.1	44.1	43.0	43.7	44.4	43.2	42.3	39.7	36.7	33.4	26.9	17.0	[12.5]	[10.5]	53.6
	Signal to noise (dB)	1.4	2.3	3.1	5.1	7.5	9.5	10.5	9.6	13.8	10.6	10.1	10.1	10.1	9.8	13.9	13.1	11.2	14.5	17.1	19.0	21.8	22.0	20.3	17.6	11.7	3.9	0.7	0.1	13.1
	Uncertainty (dB)	2.5	2.5	2.1	1.3	1.0	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	1.4	1.7	3.1	0.7
	PWL (dBA)	[63]	[67.1]	69.9	73.9	77.6	80.6	83.1	84.0	90.3	87.1	87.0	88.3	88.2	87.8	91.0	93.1	91.9	92.6	93.3	92.2	91.3	88.7	85.6	82.4	75.9	66.0	[61.4]	[59.5]	102.5

Table C.01 Detailed apparent sound power level data at hub height

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 9/25/2017

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	
10.5	Turbine ON (dBA)	17.3	21.7	24.6	27.1	30.0	32.6	35.2	36.0	41.7	38.8	38.6	40.0	39.8	39.4	42.3	44.4	43.5	44.0	44.6	43.4	42.4	39.9	36.8	33.3	27.0	19.4	15.5	13.5	53.9
	Background (dBA)	15.5	18.9	20.4	21.3	22.0	23.0	24.0	25.8	27.7	27.9	28.7	29.6	29.4	29.2	28.6	33.9	30.9	29.1	27.7	24.4	20.6	17.9	16.4	15.9	15.5	15.4	14.8	13.5	40.9
	Turbine ON - background adj (dBA)	[14.3]	[18.7]	22.5	25.8	29.2	32.1	34.9	35.6	41.5	38.5	38.2	39.6	39.4	39.0	42.1	44.0	43.2	43.9	44.5	43.4	42.4	39.8	36.7	33.3	26.7	17.2	[12.5]	[10.5]	53.7
	Signal to noise (dB)	1.8	2.8	4.2	5.9	8.0	9.6	11.2	10.2	14.0	10.9	9.9	10.5	10.4	10.2	13.7	10.5	12.5	14.9	16.9	19.1	21.8	21.9	20.3	17.5	11.5	4.0	0.7	0.1	13.0
	Uncertainty (dB)	2.8	2.9	1.8	1.2	1.0	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	0.8	0.8	0.8	1.3	1.7	3.0	0.7
	PWL (dBA)	[63.2]	[67.7]	71.5	74.8	78.2	81.0	83.8	84.5	90.5	87.4	87.1	88.6	88.3	87.9	91.1	93.0	92.2	92.8	93.5	92.4	91.3	88.8	85.7	82.2	75.7	66.2	[61.5]	[59.5]	102.7
11.0	Turbine ON (dBA)	16.7	21.0	24.1	27.2	30.0	32.8	35.3	36.2	41.9	39.4	38.6	40.0	39.8	39.3	42.2	44.4	43.6	44.1	44.7	43.5	42.5	39.9	36.8	33.2	26.9	19.4	15.5	13.5	54.0
	Background (dBA)	15.3	19.0	21.0	21.7	21.9	22.8	23.9	25.2	27.8	27.3	28.2	29.5	31.7	29.9	29.3	33.5	32.3	30.5	29.0	24.9	20.9	17.9	16.4	15.9	15.5	15.4	14.8	13.5	41.4
	Turbine ON - background adj (dBA)	[13.7]	[18]	21.2	25.7	29.3	32.3	34.9	35.8	41.7	39.1	38.2	39.6	39.0	38.7	42.0	44.0	43.2	43.9	44.6	43.5	42.5	39.9	36.8	33.1	26.6	17.2	[12.5]	[10.5]	53.7
	Signal to noise (dB)	1.4	2.0	3.1	5.5	8.2	10.0	11.3	11.0	14.2	12.1	10.4	10.5	8.1	9.3	12.9	10.9	11.3	13.6	15.8	18.7	21.6	22.1	20.5	17.4	11.4	4.0	0.7	0.1	12.6
	Uncertainty (dB)	2.9	2.9	2.4	1.3	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.9	1.4	1.7	3.1	0.8
	PWL (dBA)	[62.7]	[66.9]	70.2	74.7	78.3	81.3	83.9	84.8	90.7	88.0	87.2	88.5	88.0	87.7	90.9	93.0	92.2	92.9	93.6	92.4	91.4	88.9	85.7	82.1	75.5	66.2	[61.5]	[59.5]	102.7

Table C.02 Detailed apparent sound power level data at 10m height

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

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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	
4.0	Turbine ON (dBA)	11.0	14.3	16.7	18.6	20.2	22.9	28.9	30.8	28.6	30.6	32.5	31.5	34.0	34.6	34.3	34.0	35.5	35.6	35.8	35.5	33.3	30.0	27.5	23.9	19.4	16.3	15.1	13.6	45.6
	Background (dBA)	8.3	10.7	12.7	13.5	15.1	17.5	19.3	20.1	29.1	22.8	25.8	29.8	27.3	27.4	26.1	24.8	27.0	27.2	25.7	23.6	21.0	18.3	16.9	16.4	15.9	15.6	15.0	13.6	38.1
	Turbine ON - background adj (dBA)	[8]	11.9	14.4	16.9	18.6	21.4	28.4	30.4	[25.6]	29.8	31.5	[28.5]	32.9	33.6	33.6	33.4	34.9	34.9	35.3	35.2	33.0	29.7	27.1	23.0	16.9	[13.3]	[12.1]	[10.6]	44.9
	Signal to noise (dB)	2.7	3.6	3.9	5.1	5.1	5.4	9.6	10.7	-0.4	7.8	6.7	1.8	6.6	7.1	8.2	9.2	8.5	8.4	10.0	11.9	12.3	11.7	10.6	7.5	3.6	0.7	0.1	0.0	7.5
	Uncertainty (dB)	2.3	2.0	1.5	1.2	1.2	1.1	0.9	0.9	2.0	1.0	0.9	1.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.8	0.9	1.0	1.5	1.7	1.7	3.1	0.9
	PWL (dBA)	[57]	60.8	63.4	65.9	67.5	70.3	77.4	79.4	[74.6]	78.7	80.4	[77.5]	81.9	82.6	82.5	82.4	83.8	83.9	84.3	84.1	82.0	78.7	76.0	72.0	65.9	[62.3]	[61]	[59.6]	93.9
5.0	Turbine ON (dBA)	14.1	17.7	20.2	22.2	24.5	26.7	28.9	32.4	33.4	31.7	35.2	36.5	36.3	36.1	39.3	37.8	38.8	39.2	39.2	38.8	37.1	34.6	31.9	28.4	23.3	17.8	15.3	13.6	49.0
	Background (dBA)	10.1	13.2	14.7	15.6	16.2	18.3	20.2	26.7	25.7	25.0	24.9	26.2	27.3	26.0	25.8	25.6	27.4	27.1	26.4	24.2	21.7	19.1	17.4	16.6	16.0	15.7	15.0	13.6	37.8
	Turbine ON - background adj (dBA)	11.8	15.8	18.7	21.2	23.7	26.0	28.3	31.1	32.6	30.7	34.8	36.1	35.7	35.6	39.0	37.5	38.4	38.9	39.0	38.7	36.9	34.5	31.8	28.1	22.4	[14.8]	[12.3]	[10.6]	48.7
	Signal to noise (dB)	4.0	4.5	5.4	6.6	8.2	8.4	8.7	5.7	7.8	6.7	10.3	10.4	9.0	10.0	13.4	12.1	11.4	12.1	12.9	14.6	15.4	15.5	14.5	11.7	7.3	2.1	0.3	0.0	11.2
	Uncertainty (dB)	1.9	1.7	1.2	1.0	0.9	0.9	0.9	1.1	0.9	1.0	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	0.9	1.7	1.7	3.0	0.7
	PWL (dBA)	60.8	64.8	67.7	70.1	72.7	75.0	77.2	80.0	81.6	79.6	83.7	85.1	84.7	84.6	88.0	86.5	87.4	87.9	88.0	87.6	85.9	83.4	80.7	77.0	71.3	[63.7]	[61.2]	[59.6]	97.7
6.0	Turbine ON (dBA)	16.0	20.1	23.1	25.8	28.8	31.5	33.7	35.1	42.1	37.0	37.9	39.9	39.1	38.5	42.2	42.6	42.2	42.7	43.0	42.1	41.4	38.6	35.7	32.9	27.3	19.1	15.4	13.6	52.9
	Background (dBA)	15.1	18.0	20.1	21.1	21.5	22.3	24.1	26.1	28.9	27.8	27.3	28.9	28.3	27.9	27.4	27.1	29.1	27.9	26.3	23.7	20.8	18.5	17.0	16.4	15.8	15.5	14.9	13.5	39.5
	Turbine ON - background adj (dBA)	[13]	[17.1]	[20.1]	24.0	27.9	31.0	33.2	34.5	41.9	36.5	37.5	39.6	38.7	38.1	42.1	42.5	41.9	42.5	42.9	42.1	41.4	38.6	35.7	32.8	27.0	16.6	[12.4]	[10.6]	52.7
	Signal to noise (dB)	0.9	2.1	3.0	4.7	7.3	9.2	9.6	9.0	13.2	9.2	10.6	11.0	10.8	10.6	14.8	15.5	13.1	14.8	16.7	18.4	20.6	20.2	18.7	16.5	11.5	3.6	0.5	0.1	13.4
	Uncertainty (dB)	2.3	2.3	1.8	1.3	0.9	0.9	0.8	0.9	0.8	0.9	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.7	0.7	0.8	0.8	1.5	1.7	3.0	0.7
	PWL (dBA)	[62]	[66.1]	[69.1]	72.9	76.9	80.0	82.2	83.4	90.9	85.4	86.5	88.5	87.7	87.1	91.0	91.4	90.9	91.5	91.8	91.0	90.3	87.6	84.6	81.7	75.9	65.6	[61.4]	[59.5]	101.6
7.0	Turbine ON (dBA)	16.8	21.1	23.9	26.5	29.4	32.2	34.6	35.6	41.7	38.5	38.4	39.8	39.7	39.2	42.3	44.3	43.2	43.8	44.4	43.2	42.3	39.7	36.7	33.6	27.4	19.3	15.5	13.5	53.7
	Background (dBA)	15.0	18.0	20.1	20.8	21.3	22.4	23.6	25.3	27.1	27.2	27.9	28.9	28.7	28.4	28.0	31.9	30.8	28.8	27.0	24.0	20.5	17.8	16.5	16.0	15.6	15.4	14.8	13.5	40.1
	Turbine ON - background adj (dBA)	[13.8]	18.1	21.5	25.2	28.7	31.7	34.2	35.2	41.5	38.1	38.0	39.4	39.3	38.8	42.1	44.0	43.0	43.6	44.3	43.2	42.3	39.7	36.6	33.5	27.1	17.1	[12.5]	[10.5]	53.5
	Signal to noise (dB)	1.8	3.1	3.8	5.7	8.1	9.8	11.0	10.3	14.6	11.3	10.6	10.9	11.0	10.8	14.3	12.4	12.4	15.0	17.4	19.2	21.8	21.9	20.2	17.6	11.9	3.9	0.7	0.1	13.6
	Uncertainty (dB)	2.3	2.3	1.6	1.2	1.0	0.9	0.9	0.9	0.8	0.9	0.8	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	1.4	1.8	3.2	0.7
	PWL (dBA)	[62.8]	67.1	70.5	74.1	77.6	80.7	83.2	84.1	90.5	87.1	87.0	88.4	88.3	87.8	91.1	93.0	91.9	92.6	93.3	92.1	91.2	88.7	85.6	82.5	76.1	66.0	[61.4]	[59.5]	102.5
8.0	Turbine ON (dBA)	17.1	21.4	24.3	27.1	29.8	32.2	34.9	36.0	42.2	39.2	38.7	40.0	39.8	39.6	42.3	44.5	43.6	44.1	44.8	43.5	42.5	40.0	36.8	33.1	26.8	19.4	15.6	13.6	54.0
	Background (dBA)	17.3	20.7	23.3	24.2	24.2	24.9	25.8	26.8	29.3	29.0	30.0	31.2	32.3	31.0	30.5	33.2	32.0	29.9	28.5	24.6	21.1	18.4	16.8	16.1	15.6	15.4	14.8	13.5	42.1
	Turbine ON - background adj (dBA)	[14.1]	[18.4]	[21.3]	[24.1]	28.4	31.4	34.3	35.5	42.0	38.8	38.0	39.4	39.0	38.9	42.0	44.2	43.3	44.0	44.7	43.5	42.5	39.9	36.8	33.0	26.5	17.2	[12.6]	[10.6]	53.8
	Signal to noise (dB)	-0.2	0.7	1.1	2.8	5.6	7.3	9.1	9.2	12.9	10.3	8.6	8.8	7.6	8.6	11.8	11.3	11.6	14.2	16.2	18.9	21.4	21.6	20.1	17.0	11.2	4.0	0.8	0.1	11.9
	Uncertainty (dB)	2.2	2.3	2.0	1.9	1.0	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	1.2	1.5	2.7	0.6
	PWL (dBA)	[63.1]	[67.4]	[70.3]	[73]	77.4	80.3	83.3	84.4	90.9	87.8	87.0	88.4	88.0	87.9	91.0	93.1	92.2	92.9	93.6	92.4	91.4	88.9	85.7	82.0	75.4	66.2	[61.5]	[59.5]	102.7

Table C.03 Type B measurement uncertainty summary

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

Table C.04 Detailed measurement uncertainty at hub height

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 9/25/2017

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	
6.5	Turbine ON	6.49	93	Average (dBA)	13.5	16.9	19.2	21.1	22.9	25.1	27.4	32.2	30.1	29.9	34.6	33.2	35.5	35.5	37.6	36.1	37.6	37.8	38.0	37.5	35.4	33.0	30.4	26.8	21.9	17.3	15.2	13.7	47.6
				Uncertainty A (dB)	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	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	
	Background	6.47	75	Average (dBA)	10.0	12.6	14.3	14.8	15.5	18.0	20.5	20.6	23.2	22.0	24.4	25.9	26.6	26.3	26.0	25.8	27.7	27.4	26.8	24.6	22.2	19.4	17.6	16.7	16.1	15.7	15.0	13.6	37.4
				Uncertainty A (dB)	0.6	0.6	0.6	0.5	0.5	0.5	0.7	0.7	0.7	0.7	0.8	0.7	0.8	0.7	0.6	0.5	0.6	0.5	0.5	0.5	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.2	1.2	1.0	0.9	0.9	0.9	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
7.0	Turbine ON	7.02	52	Average (dBA)	13.5	17.1	19.5	21.3	23.8	26.0	28.0	32.3	32.3	31.1	35.3	36.5	36.1	35.7	39.8	37.5	38.6	39.2	39.1	38.8	37.0	34.5	31.8	28.0	23.1	17.8	15.3	13.7	48.9
				Uncertainty A (dB)	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.1	0.1	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.7	0.8	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	0.8	1.4	
	Background	6.98	46	Average (dBA)	10.4	13.3	14.9	15.7	16.5	18.6	20.1	27.7	22.7	23.6	25.0	26.5	28.5	26.4	26.1	26.0	27.3	27.1	26.6	24.4	21.8	19.2	17.5	16.7	16.1	15.7	15.0	13.6	38.0
				Uncertainty A (dB)	0.7	0.8	0.8	0.8	0.7	0.6	0.8	1.6	0.9	1.0	1.1	1.0	1.2	1.0	0.9	0.7	0.6	0.6	0.6	0.6	0.6	0.4	0.2	0.1	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.3	1.3	1.2	1.1	1.0	1.0	1.2	1.8	1.2	1.3	1.3	1.2	1.4	1.2	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
7.5	Turbine ON	7.53	42	Average (dBA)	15.1	19.0	21.7	24.0	26.4	28.5	30.8	32.3	36.1	33.5	35.4	39.5	37.1	36.6	40.4	39.2	39.8	40.5	40.2	39.9	38.4	35.9	33.3	29.9	24.3	18.2	15.3	13.6	50.3
				Uncertainty A (dB)	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.6	0.4	0.4	0.7	0.3	0.2	0.3	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.1	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.2	1.2	1.0	0.9	0.9	0.9	1.0	0.9	1.0	0.9	0.8	1.0	0.7	0.7	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	0.8	1.4	
	Background	7.45	42	Average (dBA)	10.2	14.0	15.4	16.9	17.2	18.6	20.7	29.7	29.0	29.0	25.4	26.0	27.0	24.8	25.2	25.1	27.0	26.9	25.8	23.5	20.8	18.4	17.0	16.4	15.9	15.6	14.9	13.6	38.5
				Uncertainty A (dB)	0.9	1.1	1.0	1.0	0.8	0.7	0.9	2.0	1.7	1.7	1.1	0.9	1.0	0.8	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.2	0.1	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.3	1.5	1.3	1.3	1.1	1.1	1.2	2.1	1.9	1.9	1.3	1.2	1.2	1.1	1.0	0.9	0.9	0.9	0.9	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
8.0	Turbine ON	7.99	44	Average (dBA)	16.4	20.0	23.1	25.7	28.5	31.0	33.3	34.1	40.7	36.1	37.4	41.3	38.6	38.2	42.9	42.1	41.8	42.4	42.5	41.8	41.4	38.1	35.3	32.4	26.6	18.8	15.4	13.6	52.6
				Uncertainty A (dB)	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.5	0.3	0.3	0.4	0.2	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.2	0.2	0.1	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.1	1.1	0.9	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.7	0.8	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	0.8	1.4	
	Background	8.02	34	Average (dBA)	13.5	16.3	18.1	19.0	18.8	20.2	22.0	26.7	30.9	28.0	25.8	28.8	27.1	27.2	26.5	26.3	28.2	27.3	25.9	23.6	21.0	18.9	17.4	16.7	16.0	15.6	14.9	13.5	39.1
				Uncertainty A (dB)	1.1	1.2	1.2	1.1	0.8	0.9	1.0	1.5	1.7	1.3	1.0	1.1	0.9	0.9	0.7	0.6	0.6	0.6	0.5	0.6	0.5	0.5	0.3	0.2	0.1	0.1	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.5	1.6	1.5	1.4	1.2	1.2	1.3	1.7	1.9	1.6	1.3	1.3	1.1	1.2	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8	1.4	
8.5	Turbine ON	8.51	81	Average (dBA)	16.4	20.7	23.6	26.4	29.5	32.2	34.6	35.7	44.0	38.0	38.4	39.9	39.6	38.9	42.4	43.3	42.7	43.2	43.6	42.6	41.9	39.3	36.3	33.6	27.9	19.3	15.4	13.6	53.5
				Uncertainty A (dB)	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
	Background	8.46	31	Average (dBA)	14.0	16.7	18.6	19.5	19.9	21.3	23.9	24.8	25.5	25.2	26.1	26.9	26.9	26.0	26.0	26.3	28.6	27.6	26.5	23.6	20.6	18.1	16.7	16.2	15.7	15.5	14.8	13.5	38.2
				Uncertainty A (dB)	0.8	0.9	0.9	0.9	0.8	0.7	0.9	0.9	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.2	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.3	1.4	1.2	1.2	1.1	1.1	1.2	1.2	1.2	1.1	1.1	1.0	1.0	1.0	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
9.0	Turbine ON	8.99	70	Average (dBA)	16.0	20.4	23.4	26.3	29.4	32.5	34.5	35.6	42.8	38.0	38.5	39.8	39.7	39.0	42.4	43.6	42.8	43.3	43.8	42.8	42.1	39.5	36.5	33.8	28.2	19.5	15.5	13.5	53.5
				Uncertainty A (dB)	0.3	0.2	0.2	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
	Background	9.00	38	Average (dBA)	16.3	19.2	21.6	22.6	23.2	23.8	25.0	25.9	28.0	27.8	28.8	29.8	29.7	29.0	28.6	28.2	29.9	28.6	26.6	23.8	20.6	18.0	16.6	16.1	15.6	15.4	14.8	13.5	40.2
				Uncertainty A (dB)	0.8	0.9	1.0	1.0	0.9	0.7	0.7	0.7	0.6	0.7	0.7	0.8	0.8	0.8	0.7	0.6	0.5	0.5	0.3	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.3	1.4	1.3	1.3	1.2	1.1	1.1	1.0	1.0	1.1	1.0	1.0	1.0	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
9.5	Turbine ON	9.48	106	Average (dBA)	16.6	20.9	23.7	26.3	29.3	32.1	34.4	35.5	41.7	38.4	38.4	39.8	39.7	39.2	42.3	44.3	43.1	43.7	44.3	43.1	42.2	39.7	36.7	33.7	27.6	19.3	15.5	13.5	53.7
				Uncertainty A (dB)	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
	Background	9.48	28	Average (dBA)	15.6	18.3	20.7	21.5	21.7	23.0	23.9	25.3	27.2	27.1	28.2	29.0	28.7	28.3	28.2	32.8	29.9	28.3	26.6	23.9	20.6	18.1	16.6	16.1	15.6	15.4	14.8	13.5	40.2
				Uncertainty A (dB)	1.0	1.0	1.1	1.1	0.8	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.7	0.8	0.7	1.5	0.8	0.6	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	
				Combined Uncertainty (dB)	1.4	1.4	1.3	1.3	1.2	1.1	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.0	1.6	1.1	0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4	

Table C.04 Detailed measurement uncertainty at hub height

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 9/25/2017

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	86	Average (dBA)	17.0	21.2	23.8	26.5	29.4	32.1	34.5	35.6	41.5	38.5	38.4	39.8	39.7	39.3	42.2	44.3	43.3	43.8	44.5	43.3	42.3	39.8	36.7	33.5	27.2	19.3	15.5	13.5	53.8
				Uncertainty A (dB)	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (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	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
	Background	10.00	31	Average (dBA)	15.6	18.9	20.8	21.5	22.0	22.6	24.0	26.0	27.7	27.9	28.4	29.7	29.6	29.5	28.4	31.2	32.1	29.4	27.4	24.3	20.5	17.8	16.4	15.9	15.5	15.4	14.8	13.4	40.7
				Uncertainty A (dB)	1.0	1.1	1.1	1.1	0.9	0.7	0.6	0.7	0.6	0.7	0.8	0.8	0.9	1.0	0.8	1.2	1.0	0.7	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.4	1.5	1.4	1.3	1.2	1.0	1.0	1.1	1.0	1.1	1.0	1.1	1.1	1.2	1.0	1.4	1.2	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
10.5	Turbine ON	10.46	43	Average (dBA)	17.3	21.8	24.6	27.1	30.0	32.6	35.2	36.0	41.7	38.8	38.6	40.0	39.8	39.4	42.3	44.4	43.5	44.0	44.6	43.4	42.4	39.8	36.8	33.4	27.0	19.4	15.5	13.5	53.9
				Uncertainty A (dB)	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.1	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	0.1	0.1	0.1	0.0	0.0		
				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	0.8	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	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
	Background	10.46	12	Average (dBA)	15.5	18.9	20.4	21.2	22.0	23.0	24.0	25.9	27.7	27.9	28.8	29.6	29.2	29.2	28.5	33.9	30.8	29.0	27.6	24.4	20.6	17.9	16.5	15.9	15.5	15.4	14.8	13.5	40.9
				Uncertainty A (dB)	1.8	2.0	1.9	1.7	1.5	1.2	0.9	1.1	0.8	1.2	1.3	1.2	1.3	1.4	1.2	2.4	1.2	1.0	0.8	0.9	0.6	0.4	0.2	0.1	0.0	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	2.1	2.3	2.1	1.9	1.7	1.4	1.2	1.3	1.2	1.4	1.4	1.4	1.5	1.6	1.3	2.5	1.4	1.2	1.1	1.1	0.9	0.9	0.8	0.8	0.8	0.8	0.8	1.4		
11.0	Turbine ON	10.99	16	Average (dBA)	16.7	21.0	24.1	27.2	30.0	32.8	35.3	36.2	41.9	39.4	38.6	40.0	39.8	39.2	42.2	44.4	43.6	44.1	44.7	43.5	42.5	39.9	36.8	33.2	26.9	19.4	15.5	13.5	54.0
				Uncertainty A (dB)	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.4	0.4	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	0.2	0.2	0.1	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.2	1.1	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.9	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		
	Background	11.03	14	Average (dBA)	15.3	19.0	21.0	21.7	21.9	22.8	23.9	25.1	27.8	27.3	28.2	29.5	31.8	30.0	29.3	33.5	32.4	30.6	29.1	24.9	20.9	17.8	16.3	15.9	15.5	15.4	14.8	13.5	41.4
				Uncertainty A (dB)	1.6	1.9	1.8	1.6	1.3	1.1	1.0	1.0	0.9	1.2	1.3	1.3	1.8	1.5	1.1	2.0	1.3	1.0	0.8	0.7	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0		
				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	0.8	0.8	0.8	0.8	0.8	0.8	1.4		
				Combined Uncertainty (dB)	1.9	2.1	1.9	1.8	1.6	1.4	1.3	1.3	1.2	1.4	1.5	1.5	1.9	1.6	1.3	2.1	1.4	1.2	1.1	1.0	0.8	0.9	0.8	0.8	0.8	0.8	0.8	1.4		

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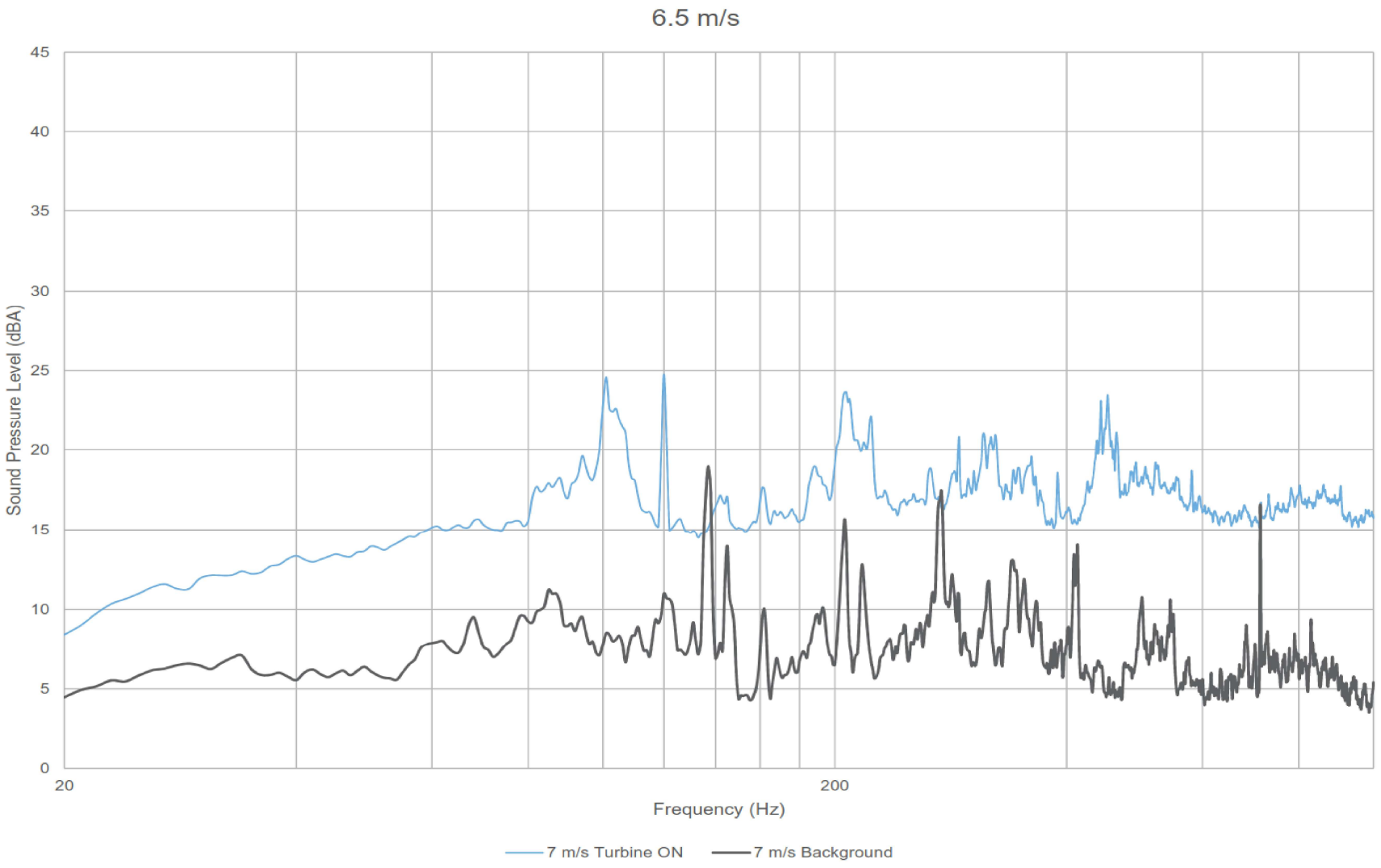
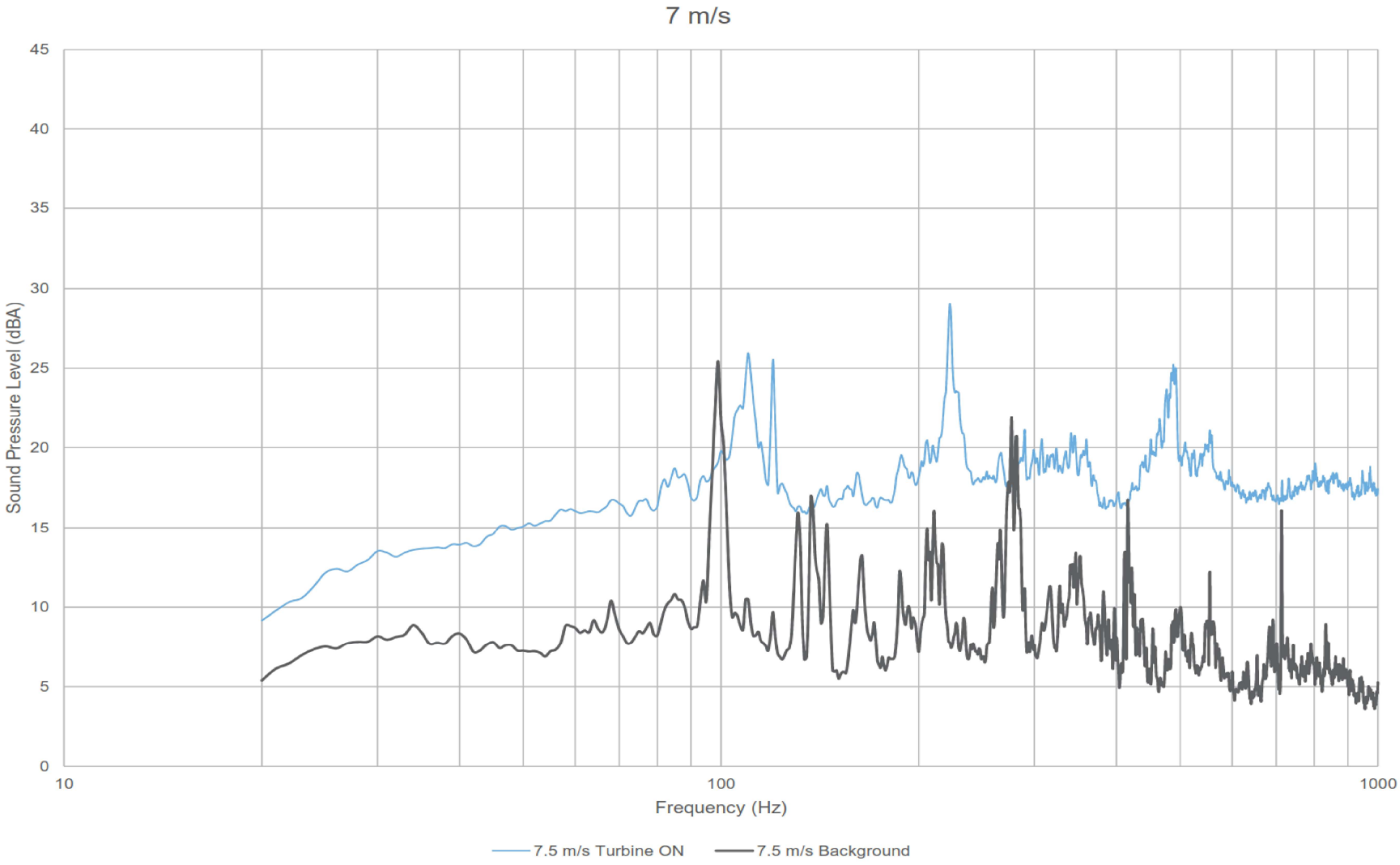
Appendix D
Tonality Assessment



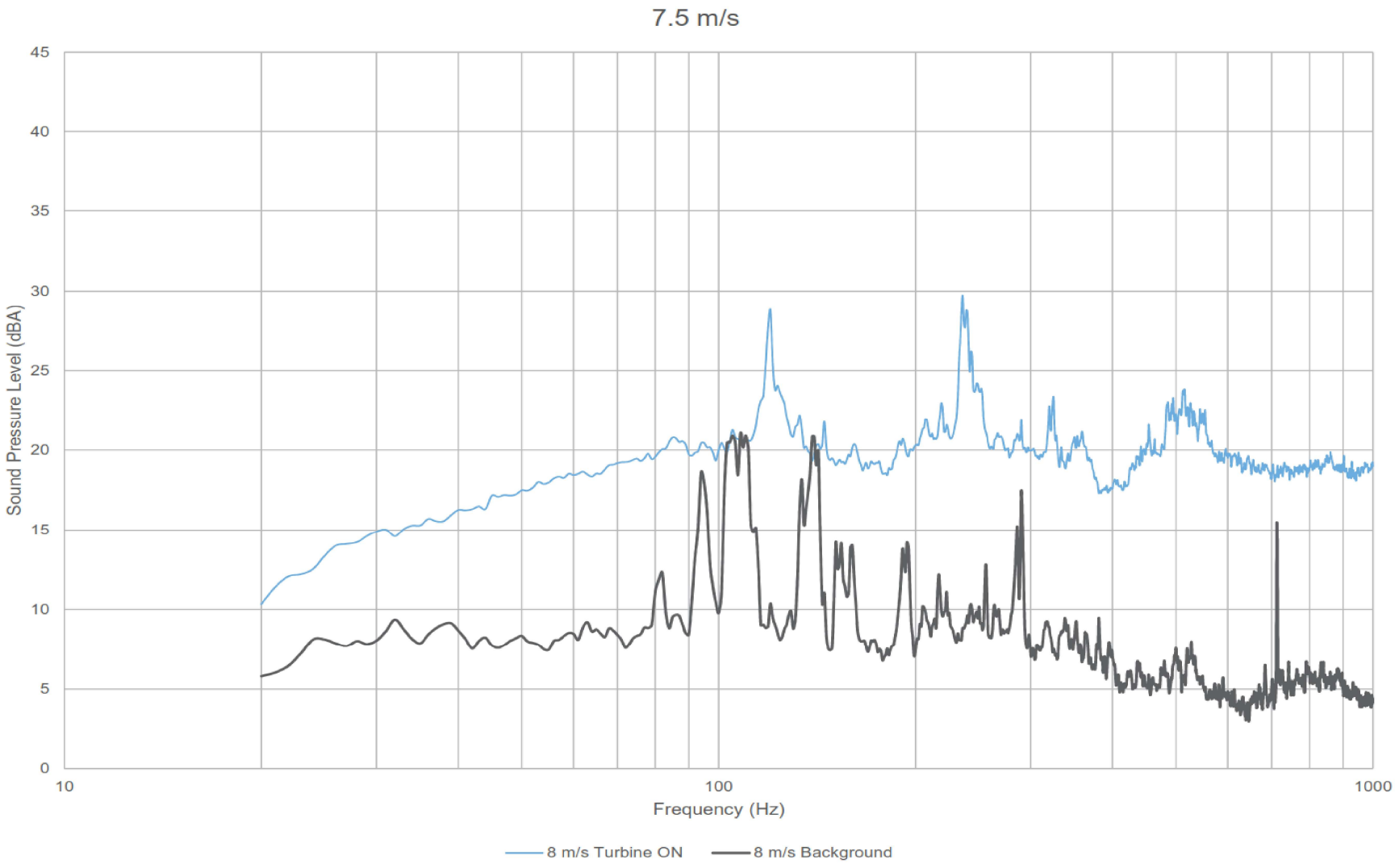
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 6.5 m/s

Figure D.01



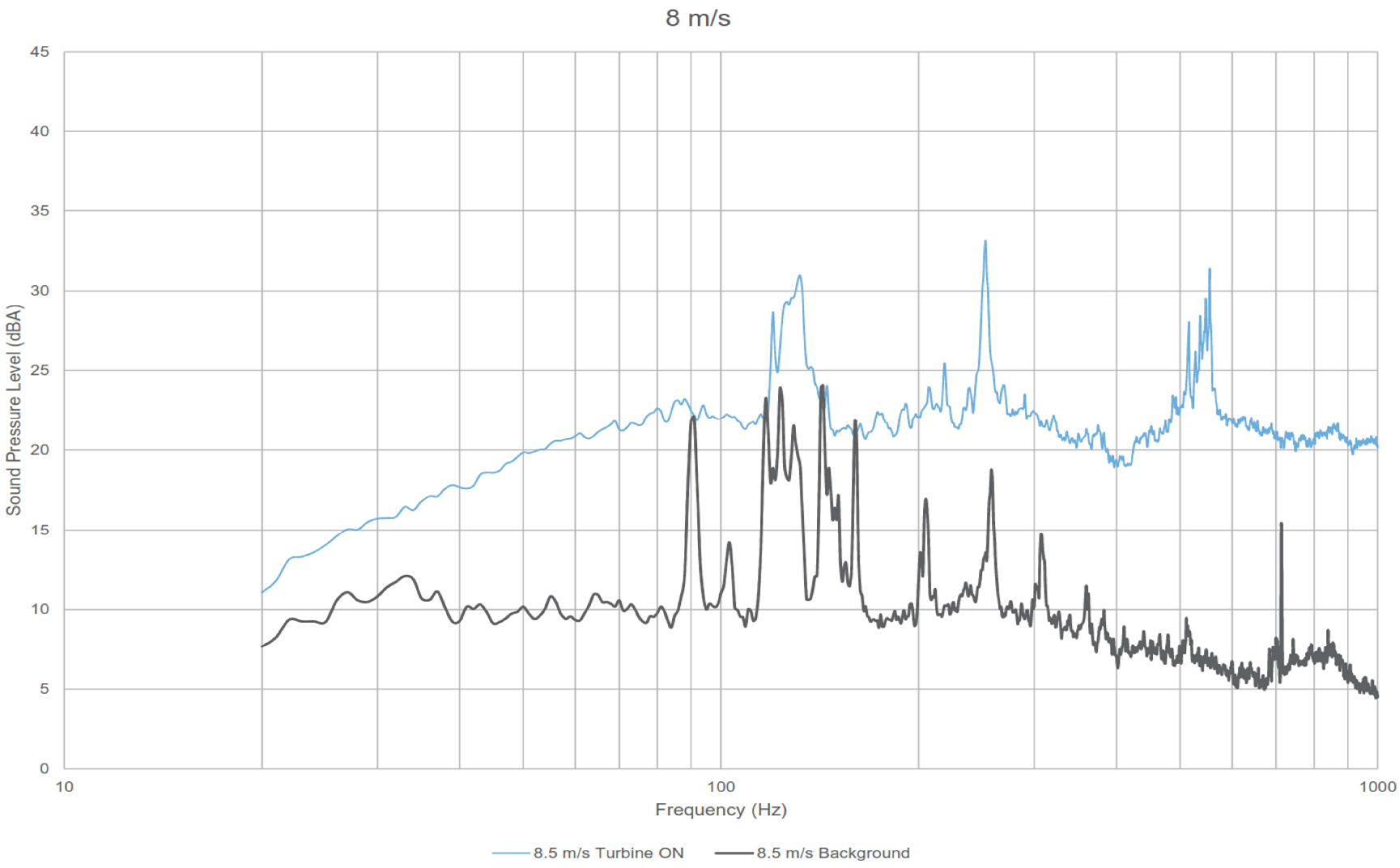
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 7 m/s

Figure D.02



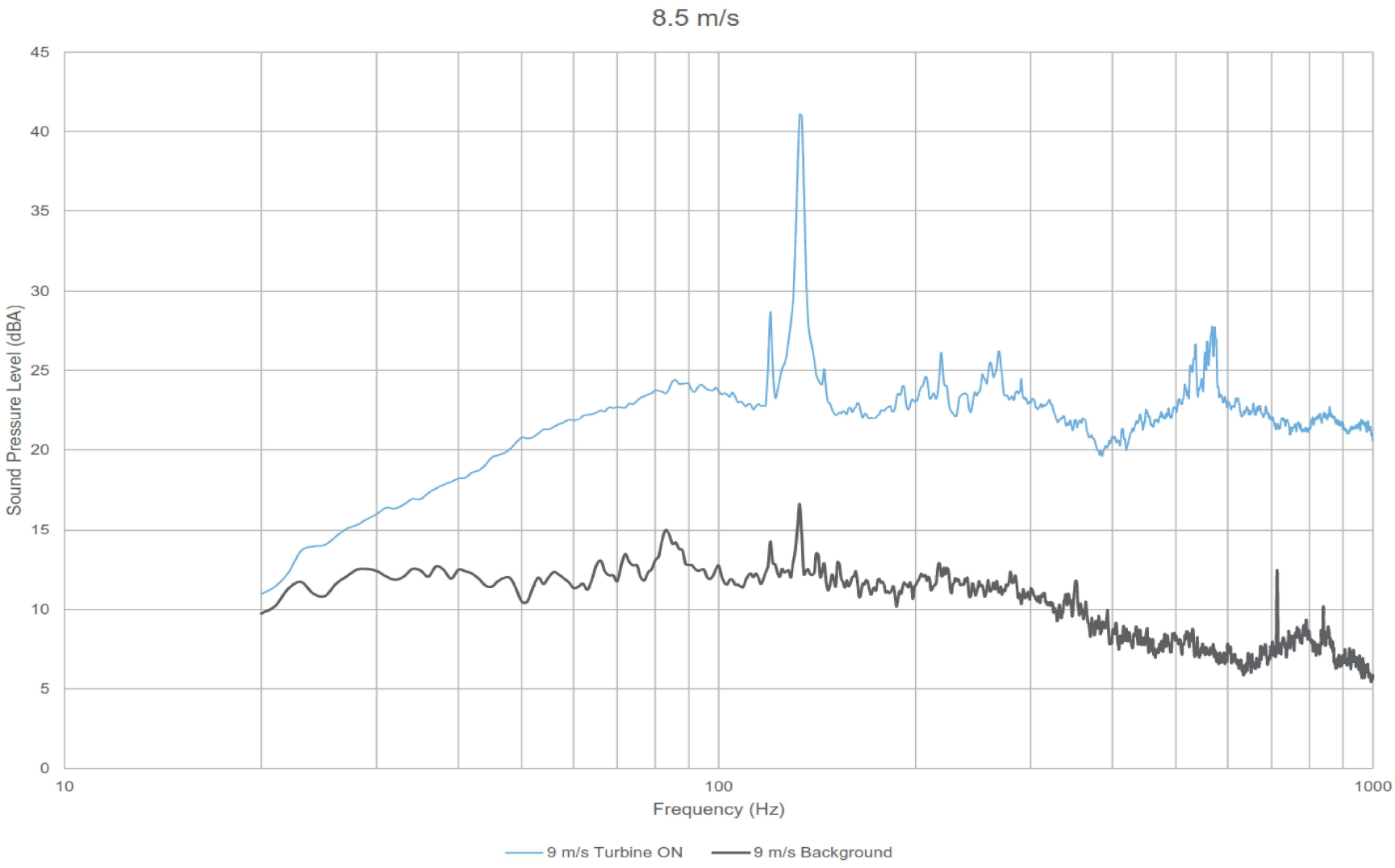
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 7.5 m/s

Figure D.03



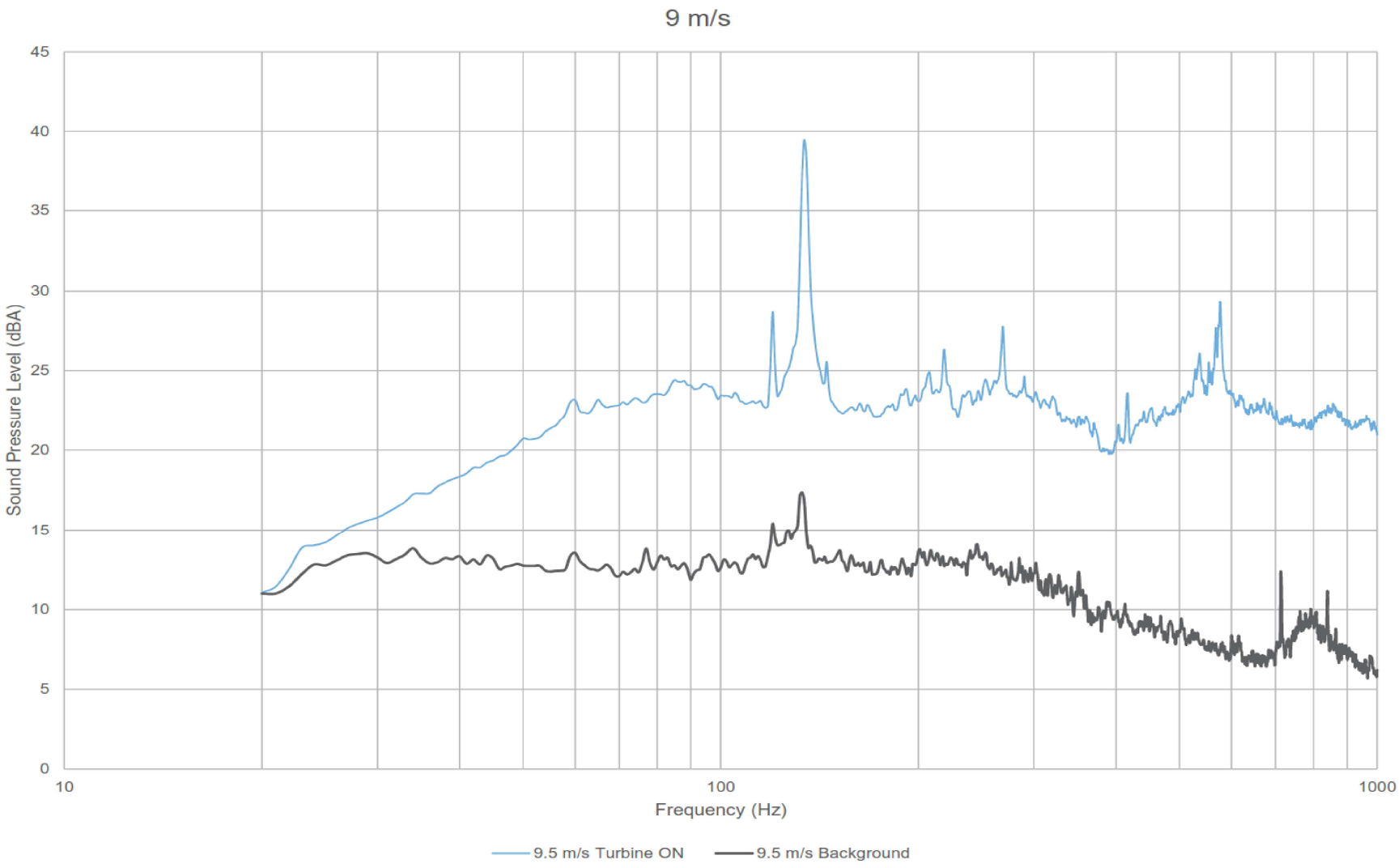
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 8 m/s

Figure D.04



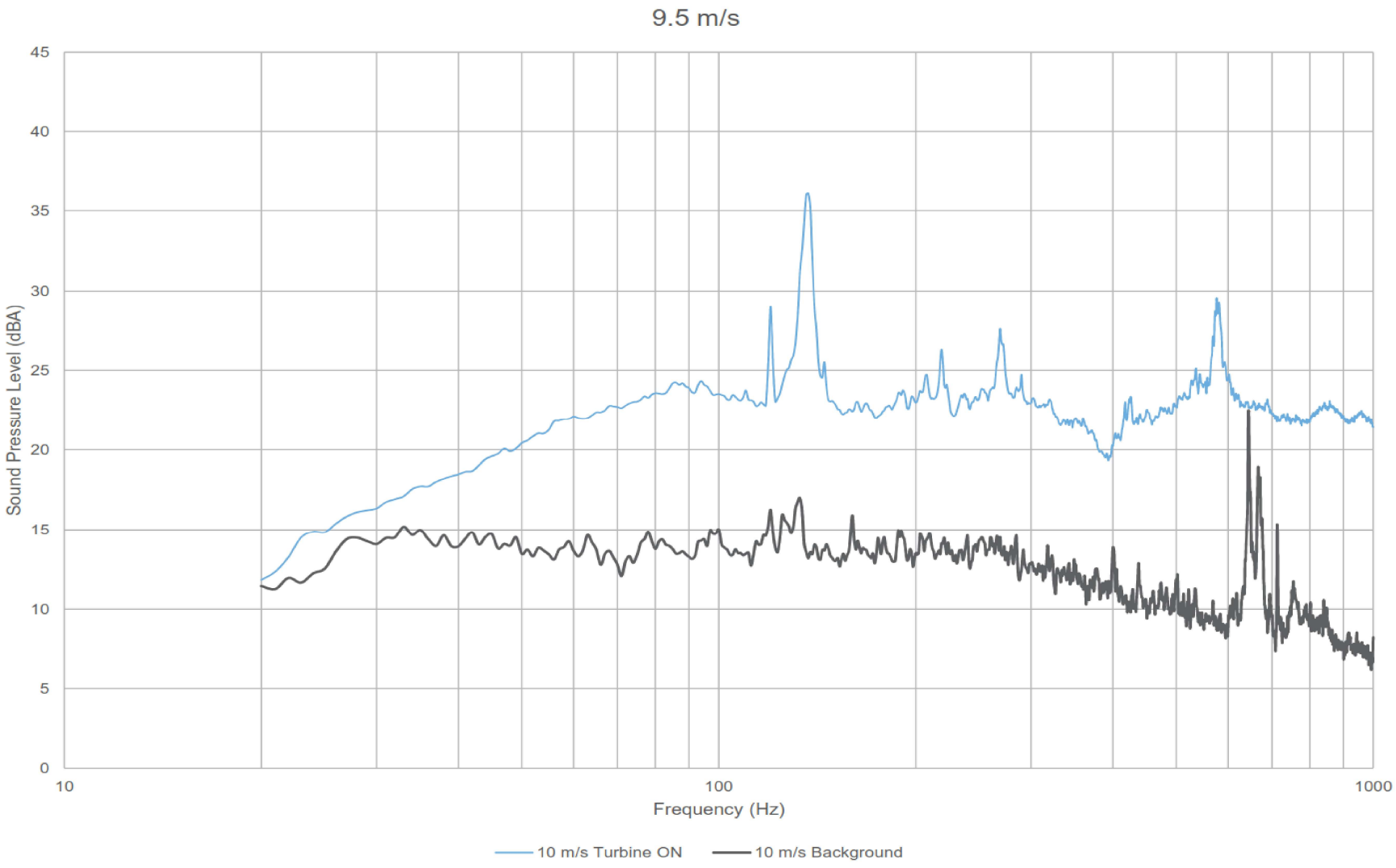
aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 8.5 m/s

Figure D.05

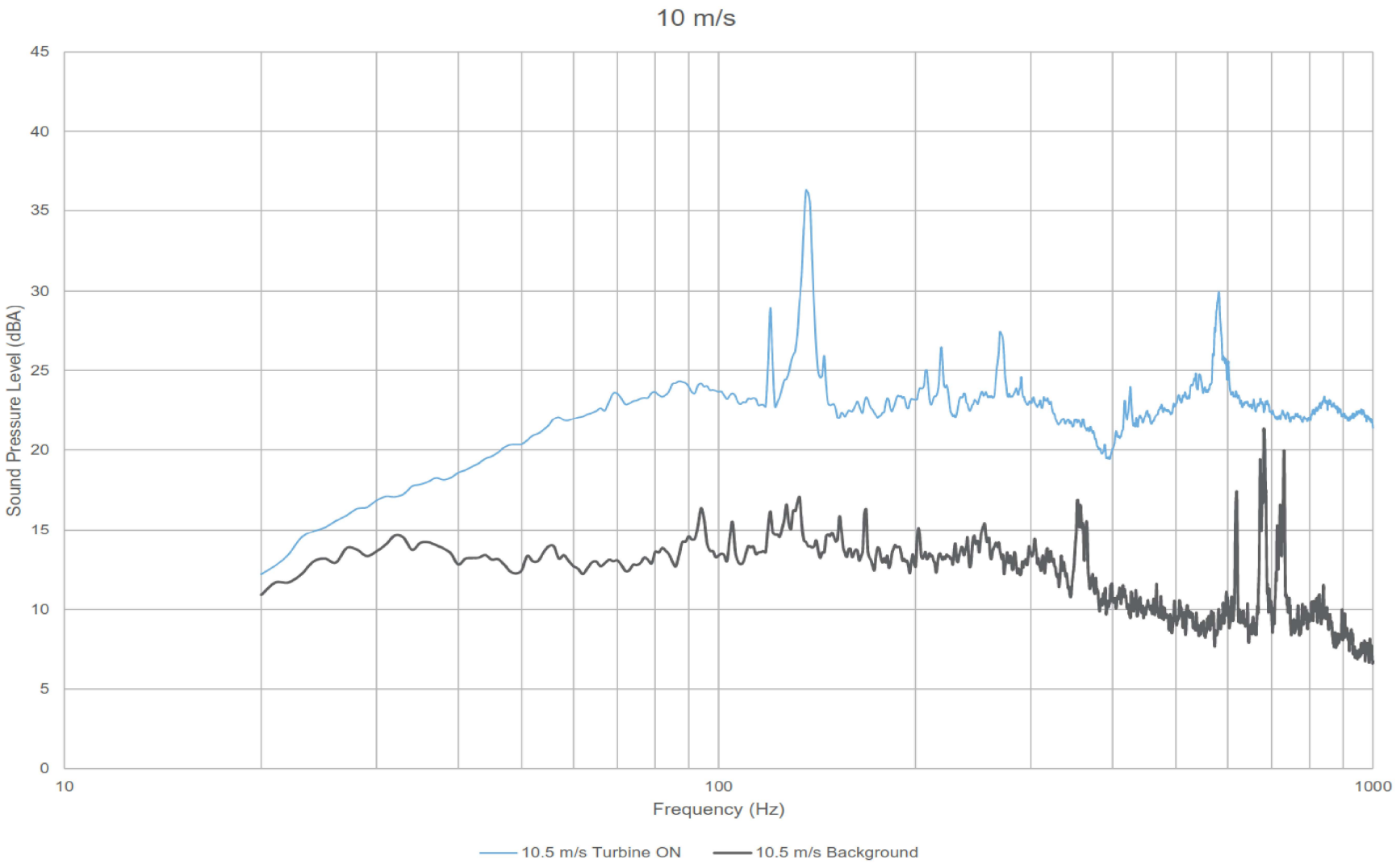


aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 9 m/s

Figure D.06

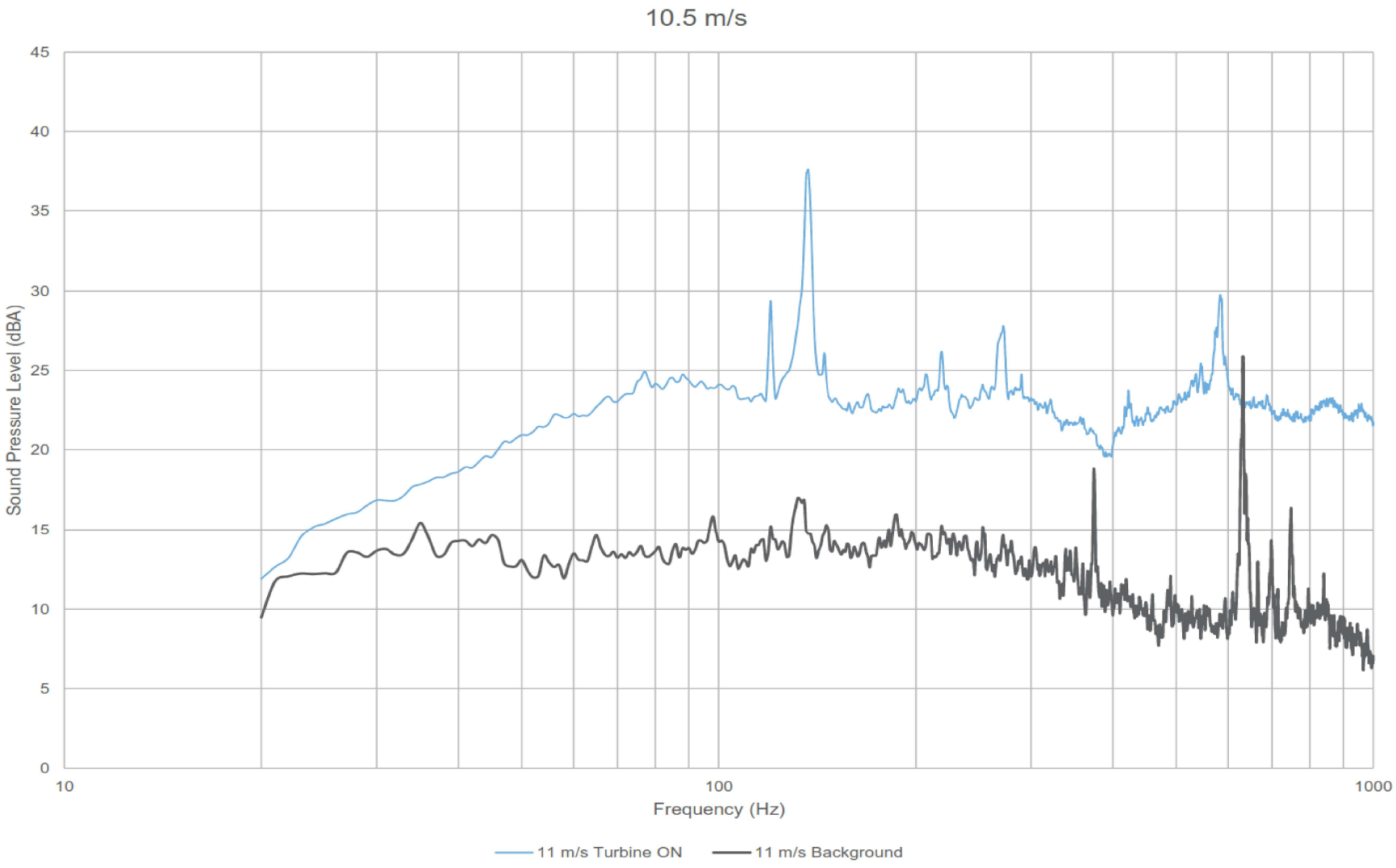


aercoustics	14461.02.T52.RP2	**Project Name**
	Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0
		Figure Title Plot of narrow band spectra - Turbine ON vs Background at 9.5 m/s
		Figure D.07



aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 10 m/s

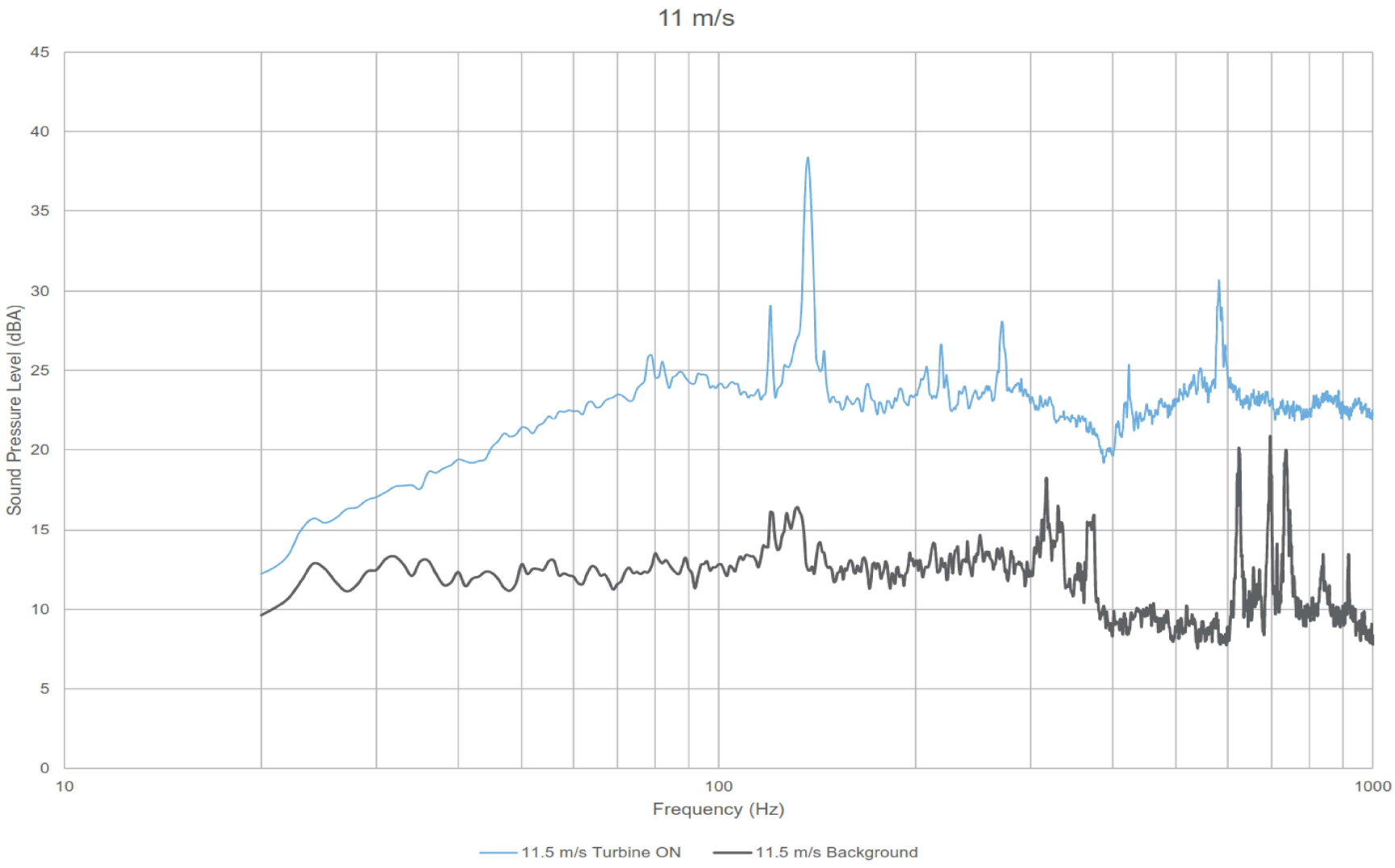
Figure D.08



aercoustics

14461.02.T52.RP2	**Project Name**
Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0
	Figure Title Plot of narrow band spectra - Turbine ON vs Background at 10.5 m/s

Figure D.09



aercoustics	14461.02.T52.RP2 Scale: NTS Drawn by: SS Reviewed by: AM Date: Sept 26, 2017 Revision: 1	**Project Name** Goshen Wind Farm - Turbine T52 - IEC61400-11 Edition 3.0 **Figure Title** Plot of narrow band spectra - Turbine ON vs Background at 11 m/s

Figure D.10

Table D.01 Tonality Assessment Table - 6.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
120	91			12.7	31.0	30.8	-0.2	-2.0	1.8
484	94			14.9	33.2	32.1	-1.1	-2.0	0.9
119	94			13.9	32.2	30.2	-2.0	-2.0	0.0
249	95			15.6	33.8	29.7	-4.2	-2.0	-2.1
122	98			12.6	30.9	29.8	-1.1	-2.0	0.9
426	99			14.7	33.0	29.8	-3.2	-2.0	-1.2
443	100			15.7	34.0	33.2	-0.8	-2.0	1.2
294	100			15.3	33.6	33.2	-0.4	-2.0	1.6
245	100			15.8	34.0	30.9	-3.1	-2.0	-1.1
409	100			15.9	34.2	31.3	-2.9	-2.0	-0.9
340	101			15.9	34.2	32.4	-1.8	-2.0	0.2
23	101			16.1	34.3	30.8	-3.5	-2.0	-1.5
197	101			15.5	33.8	31.6	-2.2	-2.0	-0.2
421	101			14.9	33.2	30.6	-2.6	-2.0	-0.6
233	101			16.3	34.6	31.1	-3.5	-2.0	-1.4
439	101			16.3	34.6	34.1	-0.5	-2.0	1.5
263	101			15.9	34.2	30.0	-4.2	-2.0	-2.2
5	101			16.3	34.6	30.6	-4.0	-2.0	-2.0
80	101			15.8	34.1	32.6	-1.5	-2.0	0.5
436	101			16.5	34.7	34.0	-0.7	-2.0	1.3
326	101			15.6	33.9	33.2	-0.7	-2.0	1.3
212	101			16.6	34.9	31.1	-3.8	-2.0	-1.8
442	101			16.5	34.8	32.8	-2.0	-2.0	0.0
200	101			15.9	34.1	31.8	-2.4	-2.0	-0.4
213	101			16.2	34.4	31.6	-2.8	-2.0	-0.8
322	101			17.0	35.3	29.1	-6.2	-2.0	-4.2
112	101			19.2	37.4	27.3	-10.1	-2.0	-8.1
223	101			16.6	34.9	32.1	-2.8	-2.0	-0.8
444	101			15.7	34.0	31.6	-2.4	-2.0	-0.4
435	101			16.0	34.2	34.6	0.3	-2.0	2.4
214	101			16.9	35.2	28.8	-6.5	-2.0	-4.4
22	102			16.1	34.4	28.0	-6.4	-2.0	-4.4
261	102			16.5	34.8	30.4	-4.4	-2.0	-2.4
262	102			16.4	34.7	27.4	-7.2	-2.0	-5.2
472	103			16.2	34.5	29.1	-5.4	-2.0	-3.4
260	103			16.9	35.2	29.2	-6.0	-2.0	-4.0
136	103			15.5	33.7	31.2	-2.5	-2.0	-0.5
79	103			15.3	33.6	31.1	-2.4	-2.0	-0.4
106	103			13.7	31.9	30.9	-1.0	-2.0	1.0
196	103			15.4	33.6	26.5	-7.1	-2.0	-5.1
441	103			16.3	34.5	28.9	-5.6	-2.0	-3.6
4	103			17.2	35.4	28.5	-6.9	-2.0	-4.9
137	103			16.6	34.9	29.9	-5.0	-2.0	-3.0
129	103			14.8	33.0	29.0	-4.1	-2.0	-2.1
404	103			17.5	35.8	27.4	-8.4	-2.0	-6.4
420	104			16.1	34.4	30.8	-3.6	-2.0	-1.6
440	104			16.2	34.5	29.2	-5.3	-2.0	-3.3
3	104			17.9	36.2	27.8	-8.4	-2.0	-6.4
109	104			15.4	33.7	28.5	-5.2	-2.0	-3.2
231	104			17.5	35.8	28.2	-7.6	-2.0	-5.6
107	104			14.5	32.8	29.9	-2.9	-2.0	-0.9
108	104			15.2	33.5	30.9	-2.6	-2.0	-0.6
473	104			16.0	34.3	28.9	-5.4	-2.0	-3.4
182	105			16.9	35.2	31.2	-4.0	-2.0	-2.0
405	105			16.7	34.9	31.9	-3.0	-2.0	-1.0
232	105			16.6	34.8	28.8	-6.0	-2.0	-4.0
142	105			15.4	33.7	30.8	-2.8	-2.0	-0.8
138	105			17.9	36.1	31.3	-4.8	-2.0	-2.8
293	105			17.1	35.3	30.0	-5.4	-2.0	-3.4
1	106			16.7	35.0	28.8	-6.2	-2.0	-4.2
141	106			16.7	35.0	26.9	-8.1	-2.0	-6.1
383	107			19.0	37.3	29.4	-7.9	-2.0	-5.9
195	107			17.0	35.3	30.0	-5.2	-2.0	-3.2
110	107			15.8	34.1	30.2	-3.9	-2.0	-1.9
323	107			17.5	35.8	29.5	-6.3	-2.0	-4.3
2	107			17.0	35.2	30.5	-4.7	-2.0	-2.7
281	107			16.0	34.3	30.4	-3.9	-2.0	-1.9
280	107			16.4	34.6	30.9	-3.8	-2.0	-1.8
475	107			16.1	34.4	30.2	-4.2	-2.0	-2.2
474	107			16.3	34.5	30.0	-4.6	-2.0	-2.6
408	107			17.1	35.4	29.5	-5.9	-2.0	-3.9
111	108			17.6	35.8	30.5	-5.4	-2.0	-3.4
271	110			17.3	35.6	33.6	-1.9	-2.0	0.1
201	110			16.9	35.1	32.5	-2.7	-2.0	-0.7
Average	103						-3.5	-2.0	-1.5

Table D.01 Tonality Assessment Table - 6.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
443	200			17.7	36.1	26.0	-10.1	-2.0	-8.1
80	200			16.3	34.7	23.8	-10.9	-2.0	-8.8
442	201			17.9	36.2	29.2	-7.1	-2.0	-5.0
439	201			17.6	36.0	27.0	-8.9	-2.0	-6.9
435	202			17.3	35.6	25.8	-9.8	-2.0	-7.8
436	202			17.4	35.8	25.5	-10.3	-2.0	-8.3
261	203			17.2	35.5	28.9	-6.7	-2.0	-4.6
444	203			17.4	35.8	25.5	-10.2	-2.0	-8.2
197	203			16.0	34.3	31.5	-2.8	-2.0	-0.8
23	204			17.1	35.5	28.3	-7.2	-2.0	-5.1
262	204			17.9	36.2	30.3	-5.9	-2.0	-3.8
263	204			17.5	35.9	25.9	-10.0	-2.0	-8.0
213	204			16.4	34.8	29.9	-4.9	-2.0	-2.8
214	204			17.5	35.9	31.0	-4.8	-2.0	-2.8
204	205			16.2	34.6	34.9	0.3	-2.0	2.3
404	205			18.2	36.5	31.8	-4.8	-2.0	-2.7
196	205			16.1	34.5	31.6	-2.9	-2.0	-0.8
22	205			17.1	35.4	30.5	-5.0	-2.0	-2.9
233	205			17.0	35.3	30.4	-4.9	-2.0	-2.9
472	205			17.2	35.6	27.7	-7.9	-2.0	-5.9
5	205			17.9	36.3	25.7	-10.5	-2.0	-8.5
129	205			16.1	34.4	30.3	-4.2	-2.0	-2.1
212	206			17.0	35.4	27.8	-7.6	-2.0	-5.6
441	206			17.4	35.8	32.1	-3.7	-2.0	-1.7
79	206			16.6	35.0	26.3	-8.7	-2.0	-6.7
294	206			16.8	35.2	25.2	-10.0	-2.0	-7.9
260	206			18.2	36.5	30.1	-6.4	-2.0	-4.4
187	206			17.6	36.0	31.7	-4.3	-2.0	-2.3
137	206			16.6	35.0	31.4	-3.6	-2.0	-1.5
200	207			16.4	34.7	35.3	0.5	-2.0	2.6
421	207			17.2	35.6	33.2	-2.3	-2.0	-0.3
136	207			16.4	34.7	34.5	-0.3	-2.0	1.8
4	207			18.0	36.4	33.0	-3.4	-2.0	-1.3
106	207			15.9	34.3	30.0	-4.2	-2.0	-2.2
409	208			17.2	35.5	28.4	-7.1	-2.0	-5.0
195	208			18.1	36.4	31.1	-5.3	-2.0	-3.3
440	208			18.0	36.4	29.5	-6.8	-2.0	-4.8
107	208			16.3	34.7	29.4	-5.2	-2.0	-3.2
340	208			17.3	35.7	33.7	-2.0	-2.0	0.0
420	208			18.2	36.6	33.1	-3.5	-2.0	-1.5
3	209			18.4	36.8	27.4	-9.4	-2.0	-7.3
245	209			17.7	36.0	33.6	-2.4	-2.0	-0.4
322	209			18.3	36.7	26.0	-10.6	-2.0	-8.6
108	209			16.7	35.0	31.9	-3.2	-2.0	-1.1
142	209			16.9	35.3	28.4	-6.9	-2.0	-4.8
183	209			16.1	34.5	35.0	0.5	-2.0	2.6
325	209			18.1	36.5	33.0	-3.5	-2.0	-1.5
232	209			17.7	36.1	31.8	-4.3	-2.0	-2.2
231	209			18.4	36.8	31.7	-5.1	-2.0	-3.1
473	209			17.9	36.2	29.5	-6.8	-2.0	-4.7
293	210			18.2	36.6	33.2	-3.4	-2.0	-1.3
405	210			19.3	37.7	27.2	-10.5	-2.0	-8.5
182	210			17.0	35.4	37.3	2.0	-2.0	4.0
408	210			18.6	36.9	26.8	-10.1	-2.0	-8.1
140	211			17.7	36.1	30.9	-5.2	-2.0	-3.1
1	212			18.7	37.0	27.2	-9.8	-2.0	-7.8
141	212			17.0	35.4	32.3	-3.1	-2.0	-1.0
474	213			18.1	36.4	32.3	-4.2	-2.0	-2.1
110	213			17.7	36.1	30.0	-6.1	-2.0	-4.0
324	215			19.1	37.5	31.0	-6.5	-2.0	-4.4
323	216			19.0	37.4	28.3	-9.1	-2.0	-7.1
111	217			18.9	37.3	31.4	-5.9	-2.1	-3.8
205	219			18.2	36.6	30.7	-5.9	-2.1	-3.8
201	222			18.1	36.4	37.9	1.5	-2.1	3.6
475	223			18.4	36.8	27.7	-9.1	-2.1	-7.0
271	223			19.7	38.1	28.5	-9.6	-2.1	-7.6
138	223			18.9	37.3	37.3	0.0	-2.1	2.0
281	224			18.8	37.2	29.0	-8.2	-2.1	-6.1
2	224			18.4	36.8	28.0	-8.8	-2.1	-6.8
Average	209						-4.4	-2.0	-2.4

Table D.01 Tonality Assessment Table - 6.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
232	448			17.6	36.4	31.6	-4.8	-2.2	-2.6
281	448			18.9	37.7	28.2	-9.5	-2.2	-7.2
245	449			17.9	36.7	27.9	-8.8	-2.2	-6.6
108	449			17.1	35.9	33.1	-2.8	-2.2	-0.6
322	450			17.8	36.6	33.8	-2.8	-2.2	-0.6
3	450			18.1	36.9	32.2	-4.8	-2.2	-2.5
223	450			19.1	37.9	28.9	-9.0	-2.2	-6.7
142	450			17.1	35.9	33.5	-2.4	-2.2	-0.2
293	451			17.7	36.6	35.2	-1.3	-2.2	0.9
138	451			19.1	37.9	32.8	-5.1	-2.2	-2.9
271	451			19.9	38.7	35.4	-3.3	-2.2	-1.1
325	452			18.4	37.2	33.3	-3.9	-2.2	-1.6
182	452			17.1	35.9	36.5	0.5	-2.2	2.8
408	452			18.9	37.7	33.0	-4.8	-2.2	-2.5
110	452			17.8	36.6	38.0	1.4	-2.2	3.7
280	452			18.8	37.6	34.0	-3.7	-2.2	-1.4
187	452			17.8	36.6	32.6	-4.1	-2.2	-1.8
473	452			17.9	36.7	35.0	-1.7	-2.2	0.5
140	453			17.8	36.6	36.5	-0.1	-2.2	2.1
195	453			18.0	36.8	33.1	-3.7	-2.2	-1.5
1	454			18.0	36.8	35.7	-1.1	-2.2	1.1
141	454			17.3	36.2	34.0	-2.2	-2.2	0.1
383	456			19.1	37.9	25.8	-12.2	-2.3	-9.9
405	457			19.6	38.5	29.4	-9.0	-2.3	-6.8
475	457			18.3	37.1	31.7	-5.4	-2.3	-3.2
474	457			18.6	37.4	33.6	-3.8	-2.3	-1.5
120	459			13.3	32.1	22.7	-9.5	-2.3	-7.2
205	460			19.3	38.1	33.3	-4.8	-2.3	-2.5
2	460			18.4	37.2	35.1	-2.1	-2.3	0.1
324	460			18.7	37.5	35.6	-1.9	-2.3	0.3
112	463			19.2	38.0	34.6	-3.4	-2.3	-1.2
323	464			19.1	37.9	31.8	-6.1	-2.3	-3.8
111	464			18.9	37.7	40.7	3.0	-2.3	5.3
201	476			19.5	38.4	32.8	-5.6	-2.3	-3.3
123	484			14.2	33.1	22.1	-11.0	-2.3	-8.7
284	487			17.2	36.1	25.5	-10.6	-2.3	-8.3
121	487			15.2	34.1	27.5	-6.6	-2.3	-4.3
122	490			15.1	34.0	26.3	-7.7	-2.3	-5.4
Average	458						-3.3	-2.3	-1.0

Table D.02 Tonality Assessment Table - 7 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
248	96			16.2	34.5	29.2	-5.4	-2.0	-3.3
253	98			16.0	34.2	28.7	-5.5	-2.0	-3.5
250	99			16.3	34.5	28.7	-5.8	-2.0	-3.8
173	100			16.0	34.2	30.1	-4.2	-2.0	-2.2
251	100			16.0	34.3	30.7	-3.6	-2.0	-1.6
252	100			16.3	34.6	29.8	-4.8	-2.0	-2.8
247	101			15.9	34.2	28.4	-5.8	-2.0	-3.8
283	101			16.0	34.3	28.2	-6.0	-2.0	-4.0
246	105			16.1	34.3	26.9	-7.4	-2.0	-5.4
282	108			16.6	34.9	30.3	-4.6	-2.0	-2.6
209	109			18.4	36.7	32.9	-3.8	-2.0	-1.8
194	109			17.3	35.6	32.6	-3.0	-2.0	-1.0
339	109			17.2	35.5	31.5	-4.1	-2.0	-2.0
193	109			16.6	34.9	32.6	-2.3	-2.0	-0.3
480	109			17.3	35.5	30.9	-4.6	-2.0	-2.6
224	110			18.4	36.7	33.4	-3.3	-2.0	-1.3
203	110			16.6	34.9	33.1	-1.8	-2.0	0.2
192	110			16.3	34.6	32.4	-2.2	-2.0	-0.2
380	110			18.0	36.3	34.8	-1.5	-2.0	0.5
379	110			17.2	35.5	35.1	-0.4	-2.0	1.6
476	110			18.7	37.0	29.7	-7.3	-2.0	-5.3
279	110			16.8	35.0	32.8	-2.3	-2.0	-0.3
188	110			16.5	34.8	33.5	-1.2	-2.0	0.8
210	110			18.1	36.4	34.0	-2.4	-2.0	-0.4
230	110			18.5	36.7	30.3	-6.4	-2.0	-4.4
382	110			20.3	38.6	33.0	-5.6	-2.0	-3.6
407	110			17.5	35.7	32.2	-3.6	-2.0	-1.6
381	110			19.1	37.3	35.1	-2.2	-2.0	-0.2
143	110			16.7	35.0	32.1	-3.0	-2.0	-1.0
139	110			15.6	33.8	31.5	-2.4	-2.0	-0.3
337	111			18.2	36.5	32.6	-4.0	-2.0	-1.9
384	111			18.8	37.1	34.7	-2.4	-2.0	-0.4
338	111			18.0	36.3	32.8	-3.5	-2.0	-1.5
479	111			17.0	35.3	32.1	-3.2	-2.0	-1.2
406	112			17.4	35.7	33.1	-2.6	-2.0	-0.5
478	113			17.2	35.5	29.7	-5.8	-2.0	-3.8
202	113			18.4	36.7	31.3	-5.3	-2.0	-3.3
477	114			17.5	35.8	28.0	-7.8	-2.0	-5.8
225	115			18.4	36.7	28.7	-8.0	-2.0	-6.0
272	115			18.3	36.6	29.8	-6.8	-2.0	-4.8
190	115			17.5	35.8	30.7	-5.1	-2.0	-3.1
189	120			17.2	35.5	30.5	-5.1	-2.0	-3.1
149	120			14.9	33.2	27.8	-5.4	-2.0	-3.4
385	120			17.4	35.7	25.9	-9.9	-2.0	-7.9
191	120			16.7	35.0	28.0	-6.9	-2.0	-4.9
206	120			17.2	35.5	30.5	-5.0	-2.0	-3.0
148	120			15.2	33.5	28.0	-5.5	-2.0	-3.5
208	120			17.5	35.8	30.8	-4.9	-2.0	-2.9
207	120			17.6	35.9	28.7	-7.1	-2.0	-5.1
254	120			16.6	34.8	27.3	-7.5	-2.0	-5.5
278	120			18.8	37.1	29.7	-7.5	-2.0	-5.5
211	120			17.0	35.3	32.2	-3.1	-2.0	-1.1
Average	111						-4.1	-2.0	-2.1

Table D.02 Tonality Assessment Table - 7 m/s

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
339	210			19.2	37.5	26.8	-10.8	-2.0	-8.7
246	210			18.0	36.4	29.7	-6.7	-2.0	-4.7
282	216			18.7	37.1	24.9	-12.1	-2.0	-10.1
209	218			18.8	37.2	29.7	-7.5	-2.1	-5.5
193	219			18.3	36.7	29.1	-7.7	-2.1	-5.6
480	219			19.1	37.4	30.1	-7.4	-2.1	-5.3
194	219			18.2	36.6	29.1	-7.5	-2.1	-5.4
143	222			18.2	36.6	31.6	-4.9	-2.1	-2.9
380	222			19.1	37.5	32.1	-5.5	-2.1	-3.4
379	222			19.1	37.5	33.9	-3.7	-2.1	-1.6
206	222			18.5	36.9	39.7	2.8	-2.1	4.8
381	222			19.5	37.9	33.6	-4.3	-2.1	-2.3
384	222			19.5	37.9	30.6	-7.2	-2.1	-5.2
479	222			19.1	37.5	37.5	0.0	-2.1	2.1
192	223			18.2	36.5	36.6	0.0	-2.1	2.1
338	223			19.2	37.6	38.1	0.5	-2.1	2.5
407	223			19.1	37.5	36.8	-0.7	-2.1	1.4
188	223			18.4	36.8	34.6	-2.2	-2.1	-0.2
139	223			18.1	36.5	39.4	2.9	-2.1	4.9
203	223			17.6	36.0	34.4	-1.6	-2.1	0.5
476	223			19.9	38.3	28.8	-9.4	-2.1	-7.4
337	223			20.1	38.5	38.6	0.1	-2.1	2.2
211	223			18.3	36.7	35.5	-1.2	-2.1	0.9
207	223			18.6	37.0	37.9	0.9	-2.1	2.9
202	224			18.5	36.9	37.5	0.6	-2.1	2.6
210	224			18.7	37.1	37.4	0.3	-2.1	2.4
406	224			19.0	37.4	35.1	-2.3	-2.1	-0.2
279	224			18.9	37.3	34.9	-2.5	-2.1	-0.4
224	224			19.9	38.3	35.1	-3.2	-2.1	-1.1
478	225			19.3	37.7	33.2	-4.6	-2.1	-2.5
191	226			18.4	36.8	36.2	-0.6	-2.1	1.5
230	227			19.2	37.6	33.3	-4.3	-2.1	-2.2
477	228			19.1	37.5	32.8	-4.8	-2.1	-2.7
189	229			19.0	37.4	33.9	-3.6	-2.1	-1.5
190	230			18.7	37.1	36.0	-1.1	-2.1	0.9
272	230			19.9	38.3	32.6	-5.7	-2.1	-3.6
225	230			20.1	38.5	35.5	-3.0	-2.1	-1.0
278	234			19.9	38.3	35.7	-2.6	-2.1	-0.6
Average	223						-2.1	-2.1	-0.1

Table D.02 Tonality Assessment Table - 7 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
254	299			17.6	36.1	33.0	-3.1	-2.1	-1.0
248	302			18.1	36.6	24.9	-11.7	-2.1	-9.6
253	303			17.8	36.3	32.5	-3.8	-2.1	-1.7
250	307			18.2	36.7	33.5	-3.2	-2.1	-1.1
252	307			18.4	36.9	33.1	-3.8	-2.1	-1.7
251	308			18.5	37.1	32.4	-4.7	-2.1	-2.5
173	308			16.8	35.3	31.8	-3.6	-2.1	-1.4
148	314			15.7	34.2	33.5	-0.7	-2.1	1.4
149	318			15.7	34.2	32.2	-2.1	-2.1	0.1
208	324			17.6	36.2	24.3	-11.9	-2.1	-9.7
203	324			17.2	35.8	24.8	-10.9	-2.1	-8.8
246	324			18.8	37.3	28.0	-9.3	-2.1	-7.2
209	325			17.9	36.5	24.3	-12.2	-2.1	-10.1
Average	313						-4.7	-2.1	-2.6

Table D.02 Tonality Assessment Table - 7 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
382	465			19.3	38.2	27.1	-11.1	-2.3	-8.8
282	466			18.8	37.6	32.9	-4.7	-2.3	-2.5
209	466			18.3	37.1	33.8	-3.3	-2.3	-1.0
194	466			18.2	37.1	31.2	-5.9	-2.3	-3.6
381	475			19.3	38.1	35.6	-2.5	-2.3	-0.3
384	475			19.5	38.3	27.7	-10.6	-2.3	-8.3
380	475			19.7	38.6	28.1	-10.5	-2.3	-8.2
337	477			20.6	39.4	34.6	-4.8	-2.3	-2.5
379	477			19.3	38.2	33.6	-4.6	-2.3	-2.3
338	477			19.7	38.6	35.5	-3.1	-2.3	-0.9
479	477			19.3	38.2	35.3	-3.0	-2.3	-0.7
139	478			19.8	38.6	28.8	-9.9	-2.3	-7.6
210	479			19.1	38.0	34.0	-4.0	-2.3	-1.7
407	481			19.6	38.5	32.4	-6.0	-2.3	-3.8
406	481			19.2	38.1	35.4	-2.7	-2.3	-0.4
224	484			19.8	38.7	37.4	-1.3	-2.3	1.0
476	485			20.1	39.0	34.1	-4.9	-2.3	-2.6
206	485			20.0	38.9	36.0	-2.8	-2.3	-0.5
202	485			19.1	38.0	37.9	-0.1	-2.3	2.2
478	485			19.8	38.6	36.6	-2.1	-2.3	0.2
191	486			19.3	38.2	37.4	-0.8	-2.3	1.4
254	486			16.9	35.8	26.3	-9.4	-2.3	-7.2
477	488			20.4	39.3	40.2	0.9	-2.3	3.2
207	488			19.9	38.8	37.1	-1.7	-2.3	0.6
278	488			20.5	39.4	36.1	-3.2	-2.3	-1.0
143	489			19.9	38.8	28.6	-10.2	-2.3	-7.9
272	491			20.0	38.9	38.4	-0.5	-2.3	1.8
189	492			19.7	38.6	38.8	0.3	-2.3	2.5
225	493			20.8	39.7	40.6	0.8	-2.3	3.1
190	494			20.4	39.3	38.7	-0.6	-2.3	1.7
Average	481						-2.9	-2.3	-0.6

Table D.03 Tonality Assessment Table - 7.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
156	227			18.4	36.8	29.8	-7.0	-2.1	-5.0
144	231			18.6	37.0	29.5	-7.6	-2.1	-5.5
226	232			20.4	38.8	30.8	-8.0	-2.1	-5.9
273	233			20.1	38.5	33.4	-5.1	-2.1	-3.0
229	233			20.1	38.5	37.2	-1.3	-2.1	0.7
227	233			21.0	39.4	35.0	-4.3	-2.1	-2.3
744	234			23.6	42.0	32.0	-10.0	-2.1	-7.9
695	234			23.0	41.4	36.7	-4.8	-2.1	-2.7
275	235			20.7	39.1	39.4	0.4	-2.1	2.4
687	235			22.8	41.2	40.0	-1.3	-2.1	0.8
276	235			20.3	38.7	37.2	-1.4	-2.1	0.6
696	236			23.1	41.5	37.6	-3.9	-2.1	-1.9
274	236			20.8	39.2	35.4	-3.8	-2.1	-1.8
228	236			20.5	38.9	40.3	1.4	-2.1	3.5
277	236			20.3	38.7	39.4	0.8	-2.1	2.8
743	238			22.9	41.3	39.9	-1.4	-2.1	0.7
853	238			22.8	41.3	39.7	-1.6	-2.1	0.5
709	239			22.7	41.1	38.1	-2.9	-2.1	-0.9
688	240			23.6	42.0	38.8	-3.2	-2.1	-1.1
694	240			23.4	41.8	39.7	-2.2	-2.1	-0.1
697	240			23.2	41.6	41.3	-0.3	-2.1	1.8
742	240			23.7	42.1	38.0	-4.1	-2.1	-2.0
710	240			22.6	41.0	39.5	-1.5	-2.1	0.6
711	244			23.2	41.6	37.4	-4.2	-2.1	-2.1
854	249			24.0	42.4	42.9	0.5	-2.1	2.5
157	251			21.6	40.0	30.3	-9.8	-2.1	-7.7
852	252			23.2	41.6	39.4	-2.2	-2.1	-0.2
Average	238						-2.4	-2.1	-0.3

Table D.03 Tonality Assessment Table - 7.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
167	318			18.0	36.6	24.3	-12.2	-2.1	-10.1
165	320			15.9	34.4	35.1	0.7	-2.1	2.8
147	323			16.8	35.4	31.7	-3.7	-2.1	-1.6
164	324			16.5	35.0	33.7	-1.3	-2.1	0.8
172	324			17.1	35.6	29.3	-6.3	-2.1	-4.2
166	325			16.5	35.1	35.8	0.7	-2.1	2.8
151	325			16.6	35.1	34.7	-0.5	-2.1	1.6
145	328			17.1	35.6	27.0	-8.6	-2.1	-6.5
152	328			17.1	35.7	27.4	-8.3	-2.1	-6.2
150	328			16.5	35.1	32.3	-2.8	-2.1	-0.7
146	329			17.3	35.9	25.2	-10.7	-2.1	-8.6
153	334			16.6	35.2	25.9	-9.3	-2.1	-7.2
154	334			17.0	35.6	23.9	-11.6	-2.1	-9.5
155	334			17.2	35.7	24.8	-11.0	-2.1	-8.8
Average	327						-3.8	-2.1	-1.7

Table D.03 Tonality Assessment Table - 7.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
167	442			17.3	36.1	30.4	-5.7	-2.2	-3.5
165	445			15.8	34.6	29.0	-5.6	-2.2	-3.3
166	451			16.8	35.6	30.9	-4.7	-2.2	-2.4
164	453			16.6	35.4	28.8	-6.6	-2.2	-4.4
145	454			17.2	36.0	28.5	-7.5	-2.2	-5.3
151	454			17.0	35.8	32.3	-3.5	-2.2	-1.3
152	455			17.5	36.3	32.9	-3.4	-2.3	-1.1
150	455			17.4	36.3	30.1	-6.2	-2.3	-4.0
146	457			17.9	36.7	25.7	-11.0	-2.3	-8.7
153	461			17.1	35.9	31.2	-4.7	-2.3	-2.5
147	462			17.8	36.6	23.8	-12.8	-2.3	-10.5
155	464			17.9	36.7	29.4	-7.3	-2.3	-5.0
171	486			18.5	37.4	39.8	2.3	-2.3	4.6
144	490			19.9	38.9	36.7	-2.2	-2.3	0.1
Average	459						-4.1	-2.3	-1.9

Table D.04 Tonality Assessment Table - 8 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
170	114			15.8	34.1	30.1	-4.0	-2.0	-2.0
168	120			18.8	37.1	28.1	-9.0	-2.0	-7.0
997	120			22.1	40.4	35.8	-4.6	-2.0	-2.5
163	120			17.0	35.3	28.7	-6.6	-2.0	-4.6
169	120			16.6	34.8	30.2	-4.6	-2.0	-2.6
162	123			18.5	36.8	30.9	-5.9	-2.0	-3.9
712	124			24.2	42.5	35.7	-6.9	-2.0	-4.8
924	124			23.3	41.6	35.5	-6.1	-2.0	-4.1
633	125			22.7	41.0	37.9	-3.1	-2.0	-1.1
160	125			20.5	38.8	30.4	-8.4	-2.0	-6.4
161	125			20.3	38.6	32.4	-6.2	-2.0	-4.2
923	125			22.6	40.9	34.9	-5.9	-2.0	-3.9
741	125			22.9	41.2	33.4	-7.8	-2.0	-5.7
693	125			23.7	42.0	32.1	-9.9	-2.0	-7.9
996	125			22.6	40.9	33.6	-7.3	-2.0	-5.3
524	126			21.8	40.1	37.8	-2.3	-2.0	-0.3
995	126			21.9	40.2	33.9	-6.2	-2.0	-4.2
1014	126			22.2	40.5	41.2	0.7	-2.0	2.7
1013	127			22.1	40.4	39.2	-1.2	-2.0	0.8
686	127			23.3	41.5	37.0	-4.5	-2.0	-2.5
575	128			23.0	41.3	36.8	-4.5	-2.0	-2.5
699	128			23.9	42.2	36.9	-5.2	-2.0	-3.2
892	128			22.8	41.0	37.6	-3.4	-2.0	-1.4
574	128			22.9	41.2	38.0	-3.1	-2.0	-1.1
726	128			23.9	42.2	35.1	-7.2	-2.0	-5.1
762	128			21.9	40.2	37.7	-2.4	-2.0	-0.4
698	128			23.7	42.0	36.9	-5.1	-2.0	-3.1
740	129			24.4	42.7	30.7	-12.0	-2.0	-10.0
978	129			23.5	41.8	36.4	-5.4	-2.0	-3.4
713	130			24.3	42.6	37.2	-5.4	-2.0	-3.4
548	130			23.7	41.9	36.2	-5.8	-2.0	-3.8
158	130			19.0	37.3	33.9	-3.4	-2.0	-1.4
159	130			19.6	37.9	32.9	-5.0	-2.0	-3.0
855	131			23.8	42.1	41.4	-0.7	-2.0	1.3
708	131			22.8	41.1	39.2	-1.8	-2.0	0.2
632	131			23.4	41.7	37.9	-3.8	-2.0	-1.8
689	131			22.6	40.9	37.5	-3.4	-2.0	-1.4
922	131			23.4	41.7	39.5	-2.2	-2.0	-0.2
851	132			24.6	42.9	42.1	-0.8	-2.0	1.2
893	132			22.8	41.1	40.5	-0.6	-2.0	1.4
700	132			24.0	42.3	37.7	-4.7	-2.0	-2.7
977	132			23.2	41.5	40.4	-1.2	-2.0	0.9
891	133			22.9	41.2	43.3	2.1	-2.0	4.1
Average	127						-3.6	-2.0	-1.6

Table D.04 Tonality Assessment Table - 8 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
997	246			22.5	40.9	35.7	-5.2	-2.1	-3.2
708	249			23.6	42.0	36.2	-5.8	-2.1	-3.7
996	249			23.0	41.4	37.1	-4.3	-2.1	-2.2
162	249			19.2	37.6	36.1	-1.5	-2.1	0.6
161	250			20.9	39.4	39.0	-0.4	-2.1	1.7
160	250			20.9	39.3	36.4	-2.9	-2.1	-0.9
995	251			22.3	40.7	36.9	-3.7	-2.1	-1.7
741	251			22.6	41.1	38.7	-2.4	-2.1	-0.3
693	252			24.2	42.6	39.9	-2.7	-2.1	-0.7
855	252			24.1	42.6	39.7	-2.8	-2.1	-0.8
633	252			24.2	42.6	43.8	1.1	-2.1	3.2
524	252			23.5	41.9	43.4	1.5	-2.1	3.5
1013	253			22.5	40.9	39.5	-1.4	-2.1	0.6
700	253			24.4	42.9	38.1	-4.8	-2.1	-2.7
632	253			24.1	42.6	39.7	-2.9	-2.1	-0.8
692	253			24.1	42.5	44.6	2.0	-2.1	4.1
922	253			23.8	42.2	38.7	-3.5	-2.1	-1.4
699	253			24.3	42.7	40.4	-2.3	-2.1	-0.2
740	253			24.2	42.6	35.8	-6.9	-2.1	-4.8
712	253			23.6	42.1	39.8	-2.2	-2.1	-0.2
923	253			22.7	41.1	39.2	-1.9	-2.1	0.2
924	253			24.0	42.5	36.1	-6.4	-2.1	-4.3
1014	253			22.2	40.7	37.1	-3.5	-2.1	-1.4
698	253			25.1	43.6	36.8	-6.8	-2.1	-4.7
686	253			23.2	41.6	39.4	-2.2	-2.1	-0.1
892	255			23.1	41.6	39.8	-1.7	-2.1	0.3
548	255			24.3	42.8	30.6	-12.2	-2.1	-10.1
726	255			23.7	42.1	36.1	-6.0	-2.1	-4.0
689	255			23.9	42.3	30.9	-11.4	-2.1	-9.3
575	255			23.5	42.0	36.5	-5.5	-2.1	-3.4
762	255			23.1	41.6	34.8	-6.7	-2.1	-4.6
574	256			23.6	42.0	34.0	-8.1	-2.1	-6.0
978	257			23.2	41.7	33.1	-8.5	-2.1	-6.4
Average	253						-2.9	-2.1	-0.9

Table D.04 Tonality Assessment Table - 8 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
169	514			20.8	39.8	43.5	3.7	-2.3	6.0
168	516			21.2	40.2	41.1	0.9	-2.3	3.2
708	526			23.3	42.3	32.1	-10.2	-2.3	-7.9
693	527			23.5	42.5	30.6	-11.9	-2.3	-9.5
923	528			22.8	41.8	31.3	-10.5	-2.3	-8.2
996	528			22.0	41.0	37.9	-3.1	-2.3	-0.8
997	528			22.8	41.8	29.3	-12.6	-2.3	-10.2
741	534			22.3	41.3	28.5	-12.8	-2.3	-10.5
162	536			22.2	41.2	39.4	-1.7	-2.3	0.6
160	536			22.3	41.3	43.3	1.9	-2.3	4.3
161	537			22.9	41.9	43.5	1.5	-2.3	3.9
633	537			24.4	43.4	30.8	-12.6	-2.3	-10.2
524	539			23.8	42.9	41.3	-1.6	-2.3	0.8
692	541			23.1	42.1	33.2	-9.0	-2.3	-6.6
700	542			23.9	43.0	31.4	-11.6	-2.3	-9.3
699	543			24.3	43.4	33.0	-10.4	-2.3	-8.0
686	545			23.0	42.0	35.8	-6.2	-2.3	-3.9
698	545			24.0	43.0	34.9	-8.1	-2.3	-5.8
762	545			23.0	42.1	35.3	-6.8	-2.3	-4.5
995	546			22.4	41.4	35.1	-6.4	-2.3	-4.0
892	546			23.5	42.6	35.3	-7.3	-2.3	-5.0
575	547			23.3	42.3	42.4	0.1	-2.4	2.4
574	547			23.8	42.8	41.1	-1.7	-2.4	0.7
978	549			23.1	42.2	36.2	-5.9	-2.4	-3.6
548	549			23.6	42.6	37.0	-5.6	-2.4	-3.2
893	553			23.3	42.4	36.1	-6.3	-2.4	-3.9
891	553			24.0	43.1	33.7	-9.3	-2.4	-7.0
924	554			24.9	43.9	35.7	-8.3	-2.4	-5.9
158	555			22.7	41.8	48.1	6.2	-2.4	8.6
159	557			22.6	41.6	44.0	2.4	-2.4	4.8
Average	540						-2.0	-2.3	0.3

Table D.04 Tonality Assessment Table - 8 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
693	1773			17.7	40.1	30.6	-9.5	-3.4	-6.1
996	1779			16.5	39.0	32.4	-6.6	-3.4	-3.2
1014	1779			17.7	40.2	34.4	-5.8	-3.4	-2.4
923	1779			16.8	39.2	33.9	-5.3	-3.4	-1.9
997	1780			17.5	39.9	27.8	-12.1	-3.4	-8.7
633	1784			18.0	40.5	35.8	-4.7	-3.4	-1.3
161	1787			16.9	39.4	38.2	-1.2	-3.4	2.2
712	1790			17.2	39.8	33.4	-6.4	-3.4	-3.0
741	1792			16.3	38.9	35.6	-3.2	-3.4	0.2
700	1802			17.5	40.1	35.3	-4.8	-3.4	-1.4
855	1804			18.0	40.5	25.9	-14.6	-3.4	-11.2
699	1804			17.3	39.9	35.1	-4.8	-3.4	-1.4
1013	1806			17.5	40.0	30.5	-9.5	-3.4	-6.1
686	1809			17.2	39.7	33.1	-6.7	-3.4	-3.3
995	1810			17.7	40.3	33.7	-6.6	-3.4	-3.2
162	1811			16.9	39.4	28.9	-10.6	-3.4	-7.2
892	1811			17.3	39.9	32.2	-7.7	-3.4	-4.2
726	1816			17.6	40.2	32.2	-8.0	-3.4	-4.6
574	1818			16.8	39.4	38.3	-1.1	-3.4	2.3
524	1820			16.8	39.4	36.6	-2.8	-3.4	0.6
548	1822			17.3	39.9	35.4	-4.5	-3.4	-1.1
698	1823			17.8	40.4	24.1	-16.3	-3.4	-12.9
632	1825			18.2	40.8	30.5	-10.3	-3.4	-6.9
924	1828			17.5	40.1	33.0	-7.1	-3.4	-3.7
160	1831			17.2	39.9	37.2	-2.7	-3.4	0.7
893	1838			17.5	40.2	30.6	-9.6	-3.4	-6.2
762	1841			17.5	40.1	24.8	-15.4	-3.4	-11.9
159	1847			17.7	40.4	33.9	-6.5	-3.4	-3.1
575	1849			16.7	39.3	36.3	-3.0	-3.4	0.4
Average	1809						-5.7	-3.4	-2.3

Table D.05 Tonality Assessment Table - 8.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
663	131			23.9	42.2	39.4	-2.7	-2.0	-0.7
1011	131			23.2	41.5	39.0	-2.5	-2.0	-0.5
573	131			23.6	41.9	39.4	-2.5	-2.0	-0.5
581	131			24.8	43.1	39.4	-3.7	-2.0	-1.7
664	131			23.6	41.9	39.9	-1.9	-2.0	0.1
669	131			23.9	42.2	38.8	-3.4	-2.0	-1.3
822	131			24.3	42.6	39.1	-3.5	-2.0	-1.5
952	132			23.6	41.9	34.7	-7.2	-2.0	-5.2
555	132			23.1	41.4	39.5	-1.9	-2.0	0.1
965	132			23.1	41.4	41.8	0.4	-2.0	2.4
639	132			23.8	42.1	43.3	1.2	-2.0	3.2
1012	132			22.8	41.1	41.3	0.2	-2.0	2.2
976	132			22.9	41.2	39.9	-1.3	-2.0	0.7
662	132			23.8	42.1	44.3	2.2	-2.0	4.2
884	132			24.4	42.7	43.6	1.0	-2.0	3.0
994	132			22.8	41.1	36.3	-4.8	-2.0	-2.8
739	132			23.2	41.4	36.7	-4.8	-2.0	-2.8
549	132			23.0	41.3	43.1	1.8	-2.0	3.8
887	133			24.3	42.6	45.7	3.1	-2.0	5.1
823	133			24.4	42.7	44.9	2.2	-2.0	4.2
896	133			23.4	41.7	45.8	4.1	-2.0	6.1
1023	133			23.5	41.8	40.4	-1.4	-2.0	0.6
725	133			24.0	42.3	44.0	1.7	-2.0	3.7
685	133			22.6	40.9	41.4	0.6	-2.0	2.6
532	133			22.9	41.2	46.8	5.6	-2.0	7.6
830	133			23.6	41.9	38.1	-3.8	-2.0	-1.8
716	133			23.3	41.6	44.4	2.8	-2.0	4.8
661	133			24.1	42.4	42.9	0.6	-2.0	2.6
572	133			23.6	41.9	47.2	5.2	-2.0	7.2
641	133			23.8	42.1	46.0	3.8	-2.0	5.9
634	133			23.1	41.4	42.9	1.5	-2.0	3.5
898	133			23.5	41.8	45.2	3.4	-2.0	5.4
608	133			24.0	42.3	45.1	2.8	-2.0	4.8
646	133			24.0	42.3	39.5	-2.8	-2.0	-0.8
631	133			23.8	42.1	45.8	3.6	-2.0	5.6
691	133			23.7	42.0	46.5	4.4	-2.0	6.4
718	133			24.0	42.2	45.9	3.6	-2.0	5.7
724	133			23.5	41.8	45.3	3.5	-2.0	5.5
640	133			24.1	42.4	46.6	4.2	-2.0	6.2
719	133			23.6	41.9	46.3	4.4	-2.0	6.4
883	133			24.3	42.6	45.6	3.0	-2.0	5.0
707	133			23.5	41.8	44.7	2.8	-2.0	4.9
795	133			23.5	41.8	42.8	1.0	-2.0	3.1
773	133			23.2	41.5	40.3	-1.2	-2.0	0.8
645	133			23.9	42.2	44.9	2.7	-2.0	4.8
890	133			23.3	41.6	45.8	4.2	-2.0	6.2
1029	133			22.9	41.2	43.9	2.7	-2.0	4.7
714	133			23.6	41.9	42.9	1.0	-2.0	3.0
889	133			24.1	42.4	44.4	1.9	-2.0	3.9
576	133			23.5	41.8	43.7	1.9	-2.0	3.9
842	133			24.3	42.6	44.7	2.1	-2.0	4.1
547	134			23.5	41.8	47.1	5.3	-2.0	7.3
1028	134			22.8	41.1	45.7	4.5	-2.0	6.6
583	134			25.5	43.8	43.3	-0.5	-2.0	1.5
1001	134			24.1	42.4	45.7	3.3	-2.0	5.3
668	134			24.1	42.4	44.9	2.5	-2.0	4.5
761	134			23.0	41.3	43.7	2.5	-2.0	4.5
886	134			24.0	42.3	44.5	2.2	-2.0	4.2
979	134			23.8	42.1	43.5	1.5	-2.0	3.5
796	134			23.8	42.0	43.7	1.6	-2.0	3.7
878	134			24.3	42.6	46.7	4.1	-2.0	6.1
897	134			23.6	41.9	45.3	3.4	-2.0	5.5
953	134			24.1	42.4	41.9	-0.5	-2.0	1.5
998	134			23.3	41.6	39.4	-2.3	-2.0	-0.2
895	134			23.7	42.0	45.2	3.2	-2.0	5.2
715	134			23.8	42.1	47.4	5.3	-2.0	7.3
723	134			23.7	42.0	42.0	0.0	-2.0	2.0
864	134			24.3	42.6	42.1	-0.5	-2.0	1.5
1021	134			23.4	41.7	45.4	3.7	-2.0	5.8
556	134			22.4	40.6	42.7	2.0	-2.0	4.0
1030	134			23.3	41.6	44.5	3.0	-2.0	5.0
1022	134			23.7	42.0	44.3	2.3	-2.0	4.3
682	134			23.7	42.0	46.6	4.7	-2.0	6.7
684	134			23.0	41.3	45.2	3.9	-2.0	5.9
921	134			23.6	41.9	44.9	3.0	-2.0	5.0
964	134			22.8	41.1	44.4	3.3	-2.0	5.3
1019	134			24.0	42.3	42.7	0.5	-2.0	2.5
607	134			23.8	42.1	44.5	2.4	-2.0	4.4
1010	134			24.2	42.5	40.1	-2.4	-2.0	-0.4
1020	135			24.2	42.5	42.0	-0.4	-2.0	1.6
1002	135			24.1	42.4	43.1	0.8	-2.0	2.8
Average	133						2.0	-2.0	4.0

Table D.06 Tonality Assessment Table - 9 m/s

Project: Goshen Wind Energy Centre - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
780	130			23.5	41.8	37.3	-4.5	-2.0	-2.5
738	133			23.5	41.8	42.3	0.5	-2.0	2.5
839	133			24.0	42.3	43.4	1.1	-2.0	3.1
554	133			23.8	42.1	39.0	-3.1	-2.0	-1.1
828	133			24.1	42.4	40.4	-2.0	-2.0	0.0
526	133			22.1	40.4	43.6	3.2	-2.0	5.3
745	133			23.6	41.9	38.8	-3.1	-2.0	-1.1
705	133			23.3	41.6	40.4	-1.2	-2.0	0.9
844	133			24.4	42.7	44.5	1.8	-2.0	3.9
1308	133			23.6	41.9	38.8	-3.1	-2.0	-1.1
850	133			23.2	41.5	37.2	-4.3	-2.0	-2.3
630	133			23.5	41.8	44.4	2.6	-2.0	4.6
594	133			23.3	41.6	38.8	-2.8	-2.0	-0.8
628	133			23.9	42.2	37.1	-5.0	-2.0	-3.0
1015	133			23.2	41.5	37.3	-4.2	-2.0	-2.2
905	133			23.9	42.2	41.0	-1.2	-2.0	0.8
760	133			23.4	41.7	39.1	-2.6	-2.0	-0.6
947	133			23.6	41.8	39.1	-2.8	-2.0	-0.8
571	133			23.9	42.2	43.4	1.2	-2.0	3.2
678	133			23.1	41.4	43.9	2.5	-2.0	4.5
797	133			24.6	42.8	40.1	-2.8	-2.0	-0.8
993	133			22.7	41.0	37.6	-3.4	-2.0	-1.4
888	134			24.4	42.7	44.0	1.4	-2.0	3.4
1026	134			22.8	41.1	40.1	-1.1	-2.0	0.9
966	134			23.8	42.1	42.5	0.5	-2.0	2.5
557	134			23.9	42.2	44.3	2.1	-2.0	4.2
1068	134			23.2	41.5	40.9	-0.7	-2.0	1.4
999	134			23.5	41.8	43.1	1.3	-2.0	3.3
836	134			24.2	42.5	40.2	-2.3	-2.0	-0.2
981	134			22.8	41.1	40.0	-1.2	-2.0	0.8
729	134			24.4	42.7	42.0	-0.7	-2.0	1.3
683	134			23.4	41.7	44.5	2.8	-2.0	4.8
665	134			23.7	42.0	43.5	1.4	-2.0	3.5
1000	134			24.1	42.4	44.4	2.0	-2.0	4.0
577	134			24.3	42.6	44.8	2.2	-2.0	4.2
531	134			22.9	41.2	44.7	3.5	-2.0	5.5
774	134			24.3	42.6	39.6	-2.9	-2.0	-0.9
872	134			23.8	42.1	40.5	-1.6	-2.0	0.4
962	134			23.6	41.9	43.0	1.1	-2.0	3.1
706	134			23.7	42.0	41.8	-0.2	-2.0	1.8
1309	134			23.3	41.6	41.5	-0.1	-2.0	1.9
857	134			24.7	43.0	46.1	3.1	-2.0	5.2
690	134			24.2	42.5	43.8	1.3	-2.0	3.3
582	134			25.2	43.5	45.5	2.0	-2.0	4.0
894	134			23.5	41.8	45.0	3.2	-2.0	5.2
829	134			24.0	42.3	41.5	-0.8	-2.0	1.2
1025	134			22.7	41.0	39.6	-1.5	-2.0	0.5
680	134			23.3	41.6	45.3	3.7	-2.0	5.7
1024	134			23.0	41.3	40.4	-0.9	-2.0	1.1
1003	135			24.8	43.1	41.5	-1.6	-2.0	0.4
882	135			23.6	41.9	40.2	-1.7	-2.0	0.3
644	135			23.8	42.1	45.0	3.0	-2.0	5.0
954	135			24.3	42.6	41.7	-0.9	-2.0	1.1
963	135			23.2	41.5	43.9	2.4	-2.0	4.4
982	135			23.1	41.4	35.5	-5.9	-2.0	-3.9
984	135			22.8	41.1	39.7	-1.4	-2.0	0.6
679	135			24.1	42.4	44.8	2.4	-2.0	4.5
1031	135			22.8	41.1	43.5	2.4	-2.0	4.4
980	135			23.9	42.2	42.0	-0.2	-2.0	1.8
837	135			24.4	42.7	42.7	0.0	-2.0	2.0
967	135			23.7	42.0	42.7	0.7	-2.0	2.7
879	135			24.6	42.9	44.3	1.5	-2.0	3.5
681	135			23.6	41.9	44.4	2.5	-2.0	4.6
529	135			23.3	41.6	44.5	2.8	-2.0	4.8
717	135			23.2	41.5	42.1	0.6	-2.0	2.6
983	135			23.0	41.3	38.8	-2.5	-2.0	-0.5
1004	135			24.1	42.4	41.9	-0.5	-2.0	1.5
763	137			22.3	40.6	40.9	0.3	-2.0	2.3
950	137			24.1	42.4	42.2	-0.2	-2.0	1.8
951	138			23.4	41.7	43.6	1.9	-2.0	3.9
Average	134						0.4	-2.0	2.5

Table D.07 Tonality Assessment Table - 9.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
1204	132			23.1	41.4	33.7	-7.7	-2.0	-5.6
1203	132			23.0	41.3	36.2	-5.1	-2.0	-3.1
1289	132			23.4	41.7	37.6	-4.1	-2.0	-2.1
808	132			24.2	42.5	36.6	-5.8	-2.0	-3.8
913	133			23.5	41.8	38.5	-3.2	-2.0	-1.2
1232	133			23.8	42.1	36.7	-5.4	-2.0	-3.4
1085	133			23.3	41.6	35.1	-6.6	-2.0	-4.5
1277	133			23.8	42.1	35.3	-6.9	-2.0	-4.8
1298	133			23.0	41.3	33.2	-8.1	-2.0	-6.1
929	133			24.6	42.9	36.9	-6.0	-2.0	-4.0
550	133			23.0	41.3	44.3	2.9	-2.0	5.0
1303	133			23.0	41.3	39.2	-2.1	-2.0	-0.1
622	133			21.8	40.1	35.2	-5.0	-2.0	-2.9
658	133			24.2	42.5	39.7	-2.8	-2.0	-0.7
1199	133			23.7	42.0	34.6	-7.4	-2.0	-5.4
1293	133			23.5	41.8	36.6	-5.1	-2.0	-3.1
759	134			24.8	43.1	33.6	-9.5	-2.0	-7.5
920	134			24.2	42.5	42.7	0.2	-2.0	2.3
1050	134			24.1	42.4	37.4	-5.0	-2.0	-3.0
949	134			24.3	42.6	37.7	-5.0	-2.0	-3.0
735	134			24.9	43.2	37.1	-6.1	-2.0	-4.1
1150	134			22.4	40.6	38.2	-2.5	-2.0	-0.5
623	134			22.7	41.0	32.9	-8.1	-2.0	-6.1
570	134			23.2	41.5	40.5	-0.9	-2.0	1.1
1049	134			23.8	42.1	38.8	-3.3	-2.0	-1.3
1155	134			22.3	40.6	37.3	-3.2	-2.0	-1.2
1258	134			24.2	42.5	37.4	-5.1	-2.0	-3.1
746	134			23.1	41.4	38.7	-2.7	-2.0	-0.7
1141	134			23.4	41.7	37.9	-3.7	-2.0	-1.7
881	135			23.4	41.6	44.5	2.8	-2.0	4.9
1201	135			23.5	41.8	36.9	-4.9	-2.0	-2.9
624	135			23.4	41.7	31.3	-10.4	-2.0	-8.4
747	135			24.3	42.6	39.9	-2.6	-2.0	-0.6
803	135			24.3	42.6	33.7	-8.9	-2.0	-6.9
1037	135			22.9	41.2	37.7	-3.5	-2.0	-1.5
657	135			24.3	42.6	42.8	0.2	-2.0	2.2
1261	135			23.9	42.2	38.6	-3.5	-2.0	-1.5
1281	135			23.0	41.3	39.1	-2.2	-2.0	-0.2
1046	135			23.9	42.2	39.2	-3.0	-2.0	-1.0
908	135			23.0	41.3	39.2	-2.1	-2.0	-0.1
933	135			23.1	41.4	39.2	-2.2	-2.0	-0.2
1119	135			22.9	41.2	35.6	-5.7	-2.0	-3.6
1182	135			23.2	41.5	41.4	-0.2	-2.0	1.8
911	136			23.2	41.5	41.1	-0.3	-2.0	1.7
1151	136			23.1	41.4	38.0	-3.3	-2.0	-1.3
1090	136			24.1	42.4	42.6	0.1	-2.0	2.1
1127	136			23.3	41.6	42.7	1.1	-2.0	3.2
860	136			24.3	42.6	36.6	-6.0	-2.0	-4.0
754	136			22.8	41.1	38.0	-3.1	-2.0	-1.1
792	136			23.0	41.3	40.6	-0.7	-2.0	1.3
1193	136			22.9	41.2	42.6	1.4	-2.0	3.4
539	136			23.2	41.5	39.9	-1.6	-2.0	0.4
1062	136			23.4	41.7	40.5	-1.2	-2.0	0.8
1306	136			23.1	41.4	39.4	-2.0	-2.0	0.1
1095	136			23.3	41.6	36.9	-4.6	-2.0	-2.6
675	136			24.3	42.6	40.0	-2.7	-2.0	-0.6
1075	136			24.8	43.1	41.6	-1.5	-2.0	0.5
604	136			22.8	41.1	37.7	-3.4	-2.0	-1.4
820	136			23.8	42.1	40.0	-2.1	-2.0	-0.1
793	136			23.5	41.8	38.1	-3.7	-2.0	-1.7
778	136			23.4	41.7	36.7	-5.0	-2.0	-3.0
567	136			22.9	41.2	41.3	0.1	-2.0	2.1
1174	136			23.0	41.3	38.6	-2.7	-2.0	-0.7
835	136			23.2	41.5	41.4	-0.1	-2.0	1.9
721	136			23.5	41.8	41.6	-0.2	-2.0	1.8
1197	136			23.5	41.8	39.9	-1.9	-2.0	0.1
1142	136			23.6	41.9	41.9	0.0	-2.0	2.1

Table D.07 Tonality Assessment Table - 9.5 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
755	136			23.7	42.0	40.7	-1.3	-2.0	0.7
1216	136			23.8	42.1	40.8	-1.3	-2.0	0.7
912	136			23.5	41.8	38.1	-3.7	-2.0	-1.7
946	136			24.6	42.9	40.2	-2.7	-2.0	-0.7
1081	137			24.0	42.3	39.9	-2.4	-2.0	-0.4
1229	137			23.5	41.8	41.6	-0.2	-2.0	1.8
615	137			24.5	42.8	41.8	-1.0	-2.0	1.0
868	137			23.3	41.6	43.0	1.3	-2.0	3.3
736	137			23.8	42.1	41.5	-0.6	-2.0	1.5
1073	137			23.8	42.1	43.1	0.9	-2.0	3.0
817	137			24.3	42.6	39.7	-2.9	-2.0	-0.9
1034	137			22.7	41.0	43.3	2.3	-2.0	4.3
1061	137			23.4	41.7	42.0	0.4	-2.0	2.4
1230	137			23.3	41.6	43.4	1.8	-2.0	3.8
1153	137			23.9	42.2	43.0	0.8	-2.0	2.8
1106	137			24.7	43.0	41.8	-1.2	-2.0	0.8
1041	137			22.8	41.1	40.3	-0.8	-2.0	1.3
1226	137			22.9	41.2	44.6	3.4	-2.0	5.4
956	137			23.6	41.9	41.9	0.0	-2.0	2.0
654	138			24.5	42.8	47.2	4.4	-2.0	6.4
1033	138			23.4	41.7	43.5	1.8	-2.0	3.8
910	138			23.1	41.4	44.2	2.8	-2.0	4.8
859	138			25.2	43.5	43.2	-0.3	-2.0	1.8
1082	138			24.2	42.5	44.0	1.5	-2.0	3.5
1286	138			24.0	42.3	44.5	2.2	-2.0	4.2
609	138			23.3	41.6	42.7	1.1	-2.0	3.1
1171	138			23.4	41.7	44.1	2.4	-2.0	4.4
838	138			24.3	42.6	42.0	-0.5	-2.0	1.5
973	138			23.5	41.8	41.8	-0.1	-2.0	1.9
1194	138			22.5	40.8	45.5	4.8	-2.0	6.8
1117	138			23.0	41.3	44.8	3.5	-2.0	5.5
824	139			24.6	42.9	43.7	0.9	-2.0	2.9
670	139			24.8	43.1	38.6	-4.5	-2.0	-2.5
991	139			23.3	41.6	42.5	0.9	-2.0	2.9
900	140			23.0	41.3	41.7	0.4	-2.0	2.4
595	140			25.1	43.4	41.0	-2.4	-2.0	-0.4
858	141			25.1	43.4	39.4	-3.9	-2.0	-1.9
845	141			23.8	42.1	44.0	1.9	-2.0	4.0
Average	136						-1.0	-2.0	1.0

Table D.08 Tonality Assessment Table - 10 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
1047	132			23.5	41.8	35.7	-6.1	-2.0	-4.1
772	133			23.4	41.7	37.7	-4.0	-2.0	-1.9
1251	133			24.6	42.9	35.7	-7.2	-2.0	-5.2
1241	133			24.2	42.5	36.7	-5.8	-2.0	-3.8
975	134			22.6	40.9	35.8	-5.1	-2.0	-3.1
1279	134			22.8	41.1	39.9	-1.3	-2.0	0.8
770	134			23.4	41.7	38.2	-3.5	-2.0	-1.5
1108	134			23.4	41.7	37.6	-4.1	-2.0	-2.0
1275	134			23.9	42.2	36.9	-5.3	-2.0	-3.3
1274	134			22.4	40.6	40.2	-0.5	-2.0	1.5
758	135			24.7	43.0	31.3	-11.7	-2.0	-9.7
1138	135			22.5	40.8	39.7	-1.1	-2.0	0.9
672	135			23.0	41.3	37.8	-3.6	-2.0	-1.5
1166	135			23.2	41.5	41.5	-0.1	-2.0	2.0
1093	135			23.6	41.9	37.7	-4.2	-2.0	-2.2
1139	135			22.7	40.9	38.0	-2.9	-2.0	-0.9
1276	135			23.2	41.5	39.7	-1.8	-2.0	0.2
1266	135			24.4	42.7	40.0	-2.7	-2.0	-0.7
1305	135			23.5	41.8	36.9	-4.9	-2.0	-2.9
1299	135			23.8	42.1	34.0	-8.1	-2.0	-6.1
1235	135			24.8	43.1	39.5	-3.6	-2.0	-1.5
1218	135			23.2	41.4	40.0	-1.4	-2.0	0.6
1247	135			24.5	42.8	32.3	-10.5	-2.0	-8.5
1231	135			23.5	41.8	35.1	-6.7	-2.0	-4.7
1236	135			24.5	42.8	41.3	-1.4	-2.0	0.6
1246	136			23.9	42.2	34.6	-7.7	-2.0	-5.6
1165	136			24.4	42.7	42.3	-0.4	-2.0	1.6
1118	136			23.6	41.9	38.8	-3.1	-2.0	-1.1
1264	136			24.1	42.4	37.3	-5.1	-2.0	-3.1
1228	136			23.6	41.9	42.2	0.4	-2.0	2.4
1221	136			22.4	40.7	43.9	3.2	-2.0	5.2
1160	136			23.4	41.7	41.3	-0.4	-2.0	1.6
869	136			22.8	41.1	41.6	0.5	-2.0	2.5
1213	136			23.3	41.6	38.4	-3.2	-2.0	-1.2
1288	136			23.1	41.4	36.0	-5.4	-2.0	-3.3
1301	136			23.4	41.7	39.3	-2.4	-2.0	-0.3
1280	136			22.9	41.2	41.6	0.3	-2.0	2.3
1242	136			23.6	41.9	40.1	-1.8	-2.0	0.3
1147	136			23.1	41.4	39.9	-1.5	-2.0	0.5
1101	136			23.4	41.7	39.1	-2.6	-2.0	-0.6
1249	136			24.7	43.0	37.4	-5.5	-2.0	-3.5
1185	136			23.9	42.2	39.8	-2.4	-2.0	-0.4
1283	136			22.9	41.2	39.1	-2.2	-2.0	-0.1
1295	136			23.2	41.5	39.3	-2.2	-2.0	-0.2
1167	136			23.0	41.3	33.4	-7.8	-2.0	-5.8
1256	136			24.3	42.6	37.6	-5.0	-2.0	-3.0
617	136			24.0	42.3	33.1	-9.2	-2.0	-7.2
1161	136			23.6	41.9	41.2	-0.6	-2.0	1.4
1287	136			23.3	41.6	41.0	-0.6	-2.0	1.4
620	136			22.2	40.5	39.0	-1.5	-2.0	0.5
1202	136			23.5	41.8	37.3	-4.4	-2.0	-2.4
1304	136			23.6	41.9	36.0	-5.8	-2.0	-3.8
1008	136			24.3	42.6	40.7	-1.9	-2.0	0.1
1048	136			23.9	42.2	39.2	-2.9	-2.0	-0.9
1268	137			23.9	42.2	42.4	0.1	-2.0	2.2
1227	137			23.2	41.5	44.9	3.4	-2.0	5.4
1078	137			23.8	42.1	40.1	-2.0	-2.0	0.0
1184	137			23.2	41.5	41.2	-0.3	-2.0	1.7
969	137			23.7	42.0	41.9	-0.1	-2.0	1.9
831	137			24.3	42.6	38.5	-4.1	-2.0	-2.1
756	137			24.0	42.3	40.0	-2.3	-2.0	-0.3
1214	137			22.6	40.9	41.7	0.8	-2.0	2.8
847	137			23.9	42.2	43.3	1.1	-2.0	3.1
1074	137			23.8	42.1	43.3	1.2	-2.0	3.2
649	137			24.4	42.7	33.9	-8.8	-2.0	-6.8
1269	137			23.7	42.0	43.5	1.5	-2.0	3.5
986	137			23.2	41.5	40.8	-0.7	-2.0	1.3

Table D.08 Tonality Assessment Table - 10 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
1172	138			22.5	40.8	42.0	1.2	-2.0	3.2
648	138			24.5	42.8	39.9	-2.9	-2.0	-0.9
1125	138			23.6	41.9	45.0	3.0	-2.0	5.0
1060	138			23.4	41.7	43.5	1.8	-2.0	3.9
1209	138			24.1	42.4	44.4	2.0	-2.0	4.0
777	138			23.5	41.8	39.6	-2.2	-2.0	-0.2
811	138			24.0	42.3	42.7	0.4	-2.0	2.5
798	138			25.3	43.6	40.2	-3.4	-2.0	-1.4
1040	138			22.8	41.1	44.0	3.0	-2.0	5.0
816	138			24.0	42.3	41.3	-1.1	-2.0	0.9
1097	138			23.9	42.2	46.0	3.8	-2.0	5.8
551	138			23.9	42.2	40.0	-2.2	-2.0	-0.2
919	138			23.5	41.8	42.5	0.7	-2.0	2.7
552	139			24.7	43.0	43.1	0.1	-2.0	2.1
614	139			24.6	42.9	43.4	0.5	-2.0	2.6
637	140			23.6	41.9	42.2	0.4	-2.0	2.4
585	140			23.1	41.4	43.7	2.3	-2.0	4.3
Average	136						-1.2	-2.0	0.8

Table D.09 Tonality Assessment Table - 10.5 m/s

Project: Goshen Wind Energy Centre - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
1136	133			22.9	41.2	33.0	-8.1	-2.0	-6.1
1224	133			24.0	42.2	38.7	-3.5	-2.0	-1.5
1244	134			24.6	42.9	36.9	-6.0	-2.0	-4.0
807	134			24.3	42.6	37.1	-5.5	-2.0	-3.5
1255	134			24.9	43.2	35.5	-7.6	-2.0	-5.6
1143	135			22.9	41.2	37.4	-3.8	-2.0	-1.8
1186	135			23.1	41.4	39.1	-2.3	-2.0	-0.3
1245	135			24.0	42.2	35.9	-6.4	-2.0	-4.4
1198	135			22.9	41.2	36.2	-5.1	-2.0	-3.1
1260	136			24.1	42.4	40.9	-1.5	-2.0	0.6
616	136			23.7	42.0	41.2	-0.8	-2.0	1.2
1222	136			23.1	41.4	44.8	3.4	-2.0	5.4
1300	136			23.6	41.9	39.3	-2.6	-2.0	-0.6
588	136			23.9	42.2	41.0	-1.2	-2.0	0.8
1270	136			23.0	41.3	37.1	-4.2	-2.0	-2.2
1083	136			23.9	42.2	39.1	-3.1	-2.0	-1.1
1240	136			24.8	43.1	38.4	-4.7	-2.0	-2.7
1297	136			23.4	41.7	37.1	-4.6	-2.0	-2.6
671	136			24.5	42.8	38.1	-4.7	-2.0	-2.7
1282	136			23.6	41.9	41.4	-0.6	-2.0	1.4
1215	136			23.3	41.6	44.0	2.5	-2.0	4.5
655	136			23.1	41.4	43.2	1.9	-2.0	3.9
1162	136			23.4	41.7	40.8	-1.0	-2.0	1.0
1032	136			23.0	41.3	43.1	1.9	-2.0	3.9
944	137			24.7	43.0	40.7	-2.3	-2.0	-0.3
1239	137			24.1	42.3	44.7	2.3	-2.0	4.4
974	137			22.9	41.2	38.1	-3.1	-2.0	-1.1
1291	137			24.1	42.4	35.6	-6.8	-2.0	-4.8
1080	137			24.4	42.7	42.9	0.3	-2.0	2.3
1100	137			23.7	42.0	42.9	0.9	-2.0	2.9
932	137			23.3	41.6	43.5	1.9	-2.0	3.9
757	137			25.4	43.7	38.5	-5.1	-2.0	-3.1
1058	138			23.5	41.8	45.7	3.9	-2.0	5.9
819	138			24.3	42.6	43.9	1.3	-2.0	3.3
926	138			24.6	42.9	44.2	1.3	-2.0	3.3
586	138			22.9	41.2	44.1	2.9	-2.0	4.9
702	138			24.5	42.8	41.3	-1.5	-2.0	0.5
703	138			24.8	43.1	39.7	-3.4	-2.0	-1.4
1077	138			24.8	43.1	41.8	-1.4	-2.0	0.7
732	138			23.6	41.9	41.5	-0.4	-2.0	1.6
Average	136						-0.8	-2.0	1.2

Table D.10 Tonality Assessment Table - 11 m/s

Project: Goshen Wind Energy Centre- Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

Measurement #	Centre frequency (Hz)	Energy average of all masking lines (dB)	Background (dB)	Background adjusted criterion level (dB)	Masking level (dB)	Tone level (dB)	Determination of tonality (dB)	Frequency dependent audibility criterion (dB)	Tonal Audibility (dB)
1234	136			24.6	42.9	40.9	-2.0	-2.0	0.0
1164	136			23.7	42.0	39.8	-2.2	-2.0	-0.2
1223	136			23.8	42.1	42.5	0.4	-2.0	2.4
1200	136			23.8	42.1	38.9	-3.2	-2.0	-1.2
1248	136			25.1	43.4	37.1	-6.3	-2.0	-4.3
1187	136			23.3	41.6	42.2	0.6	-2.0	2.6
1254	137			24.7	43.0	41.1	-1.9	-2.0	0.1
927	137			23.9	42.2	43.1	0.9	-2.0	2.9
801	137			24.2	42.5	39.7	-2.8	-2.0	-0.8
751	137			25.2	43.5	41.1	-2.4	-2.0	-0.4
1133	137			23.5	41.8	45.0	3.2	-2.0	5.2
1181	137			23.7	42.0	43.1	1.1	-2.0	3.1
621	137			22.2	40.5	37.8	-2.7	-2.0	-0.7
1296	138			23.9	42.2	42.4	0.2	-2.0	2.2
846	139			23.8	42.1	43.6	1.5	-2.0	3.5
750	139			25.4	43.7	40.8	-2.9	-2.0	-0.8
Average	137						-0.6	-2.0	1.5

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Appendix E
Measurement Data

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
1	6.6	48.7	726	204.0	207.3	0.2	12.2	6.6	6.5	-1	99.3	65
2	6.7	48.8	732	204.0	207.3	0.1	12.4	7.0	6.1	-1	99.3	65
3	6.6	48.5	704	204.0	207.3	0.2	12.1	6.6	5.3	-1	99.3	65
4	6.4	48.2	665	204.0	207.3	0.1	11.9	6.6	4.9	-1	99.3	65
5	6.3	47.9	629	204.0	207.3	0.1	11.7	6.4	5.5	-1	99.3	65
6	6.1	47.1	559	204.0	207.3	0.1	11.2	5.7	5.6	-1	99.3	65
7	5.9	47.1	505	204.0	207.3	0.1	10.9	6.0	5.3	-1	99.3	65
8	5.7	46.6	443	204.0	207.3	0.4	10.3	5.4	5.0	-1	99.3	65
9	5.3	45.9	361	204.0	207.3	0.4	9.6	5.1	6.4	-1	99.3	65
10	5.1	45.6	312	204.0	207.3	0.1	9.4	5.3	6.3	-1	99.3	65
11	5.2	45.2	317	204.0	207.3	0.1	9.6	5.0	5.7	-1	99.3	65
12	5.2	45.6	328	204.0	207.3	0.3	9.5	5.5	4.0	-1	99.3	66
13	5.1	45.4	294	204.0	207.3	0.1	9.2	5.2	3.7	-1	99.3	66
14	5.0	46.1	280	204.0	207.3	0.1	9.1	5.3	3.7	-1	99.3	66
15	4.9	45.8	267	204.0	207.3	0.0	9.0	5.2	3.9	-1	99.3	66
16	4.9	45.0	270	204.0	207.3	0.1	9.0	5.4	4.8	-1	99.3	66
17	5.0	45.6	276	204.0	207.3	0.1	9.2	5.5	5.2	-1	99.3	66
18	5.1	45.1	303	204.0	207.3	0.1	9.4	5.5	4.8	-1	99.3	65
19	5.3	45.0	356	204.0	207.3	0.2	9.9	5.6	5.0	-1	99.3	65
20	5.7	45.9	457	204.0	207.3	0.3	10.8	6.1	4.6	-1	99.3	65
21	6.1	46.7	563	204.0	207.3	0.1	11.4	5.9	4.3	-1	99.3	65
22	6.3	47.6	625	204.0	207.3	0.1	11.8	6.2	4.7	-1	99.3	65
23	6.3	47.4	618	204.0	207.3	0.1	11.6	6.1	4.6	-1	99.3	65
24	6.1	47.0	566	204.0	207.3	0.2	11.3	6.0	4.5	-1	99.3	65
25	6.1	46.6	548	204.0	207.3	0.0	11.3	6.3	4.1	-1	99.3	65
26	6.1	47.1	554	204.0	207.3	0.0	11.3	6.4	3.6	-1	99.3	65
27	6.0	46.8	530	204.0	207.3	0.0	11.1	6.8	3.3	-1	99.3	65
28	5.9	46.5	507	204.0	207.3	0.0	10.9	6.1	3.4	-1	99.3	65
29	5.8	46.7	479	204.0	207.3	0.1	10.8	6.6	4.3	-1	99.3	65
30	5.6	46.0	432	204.0	207.3	0.3	10.3	5.2	4.3	-1	99.3	65
31	5.3	45.5	356	204.0	207.3	0.4	9.6	5.5	3.8	-1	99.3	65
32	4.9	44.5	266	204.0	207.3	0.6	8.9	5.5	3.8	-1	99.3	65
33	4.6	44.2	210	204.0	207.3	0.5	8.7	5.3	4.0	-1	99.3	65
34	4.8	44.6	236	204.0	207.3	0.4	8.7	5.5	3.2	-1	99.3	65
35	4.9	44.7	270	204.0	207.3	0.2	9.2	5.7	3.6	-1	99.3	65
36	5.2	45.7	334	204.0	207.3	0.0	9.8	5.1	3.7	-1	99.3	65
37	5.0	45.5	275	204.0	207.3	0.9	9.2	4.7	3.7	-1	99.3	65
38	4.1	45.0	111	204.0	207.3	1.8	8.7	4.7	4.9	-1	99.3	65
39	4.0	43.8	102	204.0	207.3	2.0	8.6	4.3	4.7	-1	99.3	65
40	4.1	44.1	109	204.0	207.3	2.0	8.7	4.1	4.5	-1	99.3	65
41	4.3	44.0	151	204.0	207.3	1.6	8.7	4.4	5.2	-1	99.3	65
42	4.9	45.5	257	204.0	207.3	0.4	8.8	5.9	3.8	-1	99.3	66
43	5.1	45.3	296	204.0	207.3	0.2	9.6	5.5	3.9	-1	99.3	66
44	5.2	45.2	319	204.0	207.3	0.7	9.3	5.0	4.6	-1	99.3	66
45	4.9	43.8	261	204.0	207.3	0.4	8.8	4.5	4.8	-1	99.3	66
46	5.0	45.3	289	204.0	207.3	0.4	9.6	5.5	4.3	-1	99.3	66
47	5.4	46.1	383	204.0	207.3	0.0	10.1	5.5	4.0	-1	99.3	66
48	5.5	46.1	411	204.0	207.3	0.0	10.4	5.4	4.4	-1	99.3	66
49	5.5	46.0	402	204.0	207.3	0.4	10.1	5.2	3.0	-1	99.3	66
50	4.7	45.1	222	204.0	207.3	1.3	9.0	4.0	4.4	-1	99.3	66
51	4.1	44.9	116	204.0	207.3	2.1	8.7	4.2	4.5	-1	99.3	66
52	4.5	45.3	191	204.0	207.3	1.3	8.7	4.8	4.0	-1	99.3	66
53	4.5	44.3	193	204.0	207.3	0.5	8.6	4.5	3.1	-1	99.3	66
54	4.6	44.4	201	204.0	207.3	0.6	8.6	4.9	3.4	-1	99.3	65
55	4.6	44.3	202	204.0	207.3	0.5	8.7	4.7	3.9	-1	99.3	65
56	4.8	45.0	250	204.0	207.3	0.3	8.7	4.9	4.6	-1	99.3	65
57	4.8	45.1	237	204.0	207.3	0.0	8.9	5.5	4.7	-1	99.3	65
58	4.9	44.4	259	204.0	207.3	0.0	8.9	5.3	3.7	-1	99.3	65
59	4.9	45.2	268	204.0	207.3	0.0	9.1	5.2	3.8	-1	99.3	65
60	4.9	45.0	270	204.0	207.3	0.2	8.9	5.2	3.7	-1	99.3	65
61	4.8	43.7	245	204.0	207.3	0.1	8.7	5.2	4.3	-1	99.3	65
62	4.7	41.2	221	204.0	207.3	0.1	8.7	5.6	3.4	-1	99.3	65
63	4.8	41.7	236	204.0	207.3	0.2	8.7	4.9	4.4	-1	99.3	65
64	4.9	41.9	256	204.0	207.3	0.2	9.0	5.2	4.5	-1	99.3	65
65	5.1	43.1	294	204.0	207.3	0.2	9.3	4.8	4.7	-1	99.3	65
66	5.0	42.1	277	204.0	207.3	0.1	9.0	5.1	5.0	-1	99.3	65
67	5.0	42.7	289	204.0	207.3	0.0	9.3	5.3	5.0	-1	99.3	64
68	5.0	42.1	271	204.0	207.3	0.3	8.9	5.1	4.6	-1	99.3	64
69	4.8	41.5	249	204.0	207.3	0.2	8.7	5.5	4.8	-1	99.3	64
70	4.9	42.0	268	204.0	207.3	0.3	9.2	5.2	4.9	-1	99.3	64
71	5.3	43.1	356	204.0	207.3	0.2	10.0	5.5	4.9	-1	99.3	64
72	5.6	44.0	418	204.0	207.3	0.1	10.4	5.7	4.0	-1	99.3	64
73	5.6	44.6	435	204.0	207.3	0.2	10.4	5.3	4.2	-1	99.3	64
74	5.4	43.5	387	204.0	207.3	0.3	9.9	5.2	6.1	-1	99.3	64
75	5.4	42.8	366	204.0	207.3	0.0	9.9	5.5	6.8	-1	99.3	64
76	5.6	43.8	431	204.0	207.3	0.3	10.6	6.2	6.3	-1	99.3	64
77	6.0	45.1	524	204.0	207.3	0.1	11.2	5.9	5.9	-1	99.3	64
78	6.2	45.7	593	204.0	207.3	0.2	11.6	5.7	5.5	-1	99.3	63
79	6.4	47.2	646	204.0	207.3	0.0	11.9	5.6	5.3	-1	99.3	63
80	6.3	46.8	614	204.0	207.3	0.2	11.6	6.2	5.5	-1	99.3	63
81	6.1	46.1	550	204.0	207.3	0.2	11.2	5.5	5.0	-1	99.3	63
82	5.8	45.6	484	204.0	207.3	0.4	10.6	4.9	5.1	-1	99.3	63
83	5.6	44.5	428	204.0	207.3	0.1	10.3	5.2	4.9	-1	99.3	63
84	5.7	44.2	459	204.0	207.3	0.0	10.3	5.8	5.0	-1	99.3	64
85	5.8	43.3	482	204.0	207.3	0.2	9.4	6.1	5.0	-1	99.3	64
86	5.4	41.9	371	204.0	207.3	0.3	8.8	5.4	5.2	-1	99.3	64
87	5.4	42.6	375	204.0	207.3	0.3	8.9	5.0	5.2	-1	99.3	64
88	5.5	42.9	396	204.0	207.3	0.3	9.1	5.2	5.1	-1	99.3	64

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
89	5.4	42.2	390	204.0	207.3	0.3	9.0	5.6	5.0	-1	99.3	64
90	5.3	42.3	345	204.0	207.3	0.5	8.9	5.8	5.0	-1	99.3	64
91	5.2	42.7	320	204.0	207.3	0.5	10.0	6.3	4.8	-1	99.3	64
92	5.5	43.9	407	204.0	207.3	0.2	10.2	5.6	4.1	-1	99.3	64
93	5.3	42.9	366	204.0	207.3	0.3	9.8	5.3	4.1	-1	99.3	64
94	5.2	42.4	319	204.0	207.3	0.3	9.4	5.2	4.1	-1	99.3	64
95	4.8	41.6	248	204.0	207.3	0.6	8.8	5.2	3.5	-1	99.3	64
96	4.5	41.8	197	204.0	207.3	0.5	8.7	4.7	3.7	-1	99.3	64
97	4.5	42.8	195	204.0	207.3	0.7	8.7	4.5	4.2	-1	99.3	65
98	4.7	43.2	231	204.0	207.3	0.5	8.7	4.9	4.3	-1	99.3	65
99	4.8	41.9	235	204.0	207.3	0.1	8.7	5.5	4.1	-1	99.3	65
100	4.6	41.9	207	204.0	207.3	0.2	8.7	4.8	4.0	-1	99.3	65
101	4.6	42.2	201	204.0	207.3	0.4	8.7	5.3	4.1	-1	99.3	65
102	4.8	42.1	246	204.0	207.3	0.3	8.7	5.0	5.2	-1	99.3	65
103	5.0	42.0	274	204.0	207.3	0.3	9.2	5.6	5.9	-1	99.3	65
104	5.4	43.5	388	204.0	207.3	0.4	10.3	6.6	5.4	-1	99.3	65
105	6.1	45.4	555	204.0	207.3	0.3	11.5	6.6	4.6	-1	99.3	65
106	6.4	47.2	654	204.0	207.3	0.0	11.9	6.4	4.8	-1	99.3	65
107	6.5	47.5	671	204.0	207.2	0.0	12.0	6.2	7.2	-1	99.3	65
108	6.5	47.6	678	204.0	207.2	0.0	12.0	5.4	7.0	-1	99.3	64
109	6.5	47.1	668	204.0	207.2	0.0	11.9	5.9	7.1	-1	99.3	63
110	6.6	47.1	698	204.0	207.2	0.0	12.2	7.3	7.3	-1	99.3	63
111	6.7	48.9	753	204.0	207.2	0.0	12.5	7.7	6.5	-1	99.3	63
112	6.6	49.0	702	204.0	207.3	0.5	12.1	5.9	6.4	-1	99.3	63
113	6.2	48.2	574	204.0	207.3	0.4	11.2	4.9	5.0	-1	99.3	63
114	6.1	46.7	564	204.0	207.3	0.1	11.1	5.7	4.1	-1	99.3	63
115	6.4	46.4	653	204.0	207.3	0.2	10.5	5.4	4.5	-1	99.3	63
116	6.0	44.4	528	204.0	207.3	0.4	9.8	6.0	4.1	-1	99.3	63
117	6.0	43.5	524	204.0	207.3	0.4	9.9	6.5	5.1	-1	99.3	63
118	6.3	44.3	627	204.0	207.2	0.4	10.5	6.7	6.0	-1	99.3	63
119	6.5	45.3	667	204.0	207.2	0.4	10.7	6.5	6.6	-1	99.3	63
120	6.4	44.9	647	204.0	207.3	0.3	10.6	6.3	5.8	-1	99.3	63
121	6.6	45.4	710	204.0	207.3	0.2	11.1	6.6	5.9	-1	99.3	64
122	6.7	46.0	756	204.0	207.3	0.2	11.3	6.6	5.2	-1	99.3	64
123	6.6	45.6	700	204.0	207.3	0.2	11.0	6.1	6.0	-1	99.3	64
124	6.2	44.7	601	204.0	207.3	0.2	10.4	5.9	5.5	-1	99.3	64
125	6.1	44.3	565	204.0	207.3	0.2	10.2	6.6	6.3	-1	99.3	64
126	5.9	44.9	506	204.0	207.3	0.4	10.5	6.2	6.6	-1	99.3	64
127	5.9	45.3	503	204.0	207.3	0.2	11.1	5.7	6.2	-1	99.3	64
128	6.2	46.3	594	204.0	207.3	0.2	11.7	6.3	5.3	-1	99.3	64
129	6.4	47.1	636	204.0	207.3	0.0	11.8	6.2	5.0	-1	99.3	64
130	6.2	46.3	584	204.0	207.3	0.4	11.3	5.9	4.5	-1	99.3	64
131	5.8	44.9	479	204.0	207.3	0.4	10.6	5.0	4.8	-1	99.3	64
132	5.6	44.9	421	204.0	207.3	0.2	10.3	5.2	4.0	-1	99.3	64
133	5.4	44.0	379	204.0	207.3	0.7	9.7	4.5	4.1	-1	99.3	65
134	5.2	43.0	321	204.0	207.3	0.0	9.5	5.0	5.9	-1	99.3	65
135	5.6	44.5	432	204.0	207.3	0.5	10.7	6.3	6.1	-1	99.3	65
136	6.3	46.2	604	204.0	207.3	0.2	11.8	6.9	4.6	-1	99.3	65
137	6.5	47.3	667	204.0	207.3	0.1	11.9	7.0	4.0	-1	99.3	65
138	6.7	47.7	743	204.0	207.3	0.1	12.5	7.1	5.8	-1	99.3	63
139	6.9	49.6	799	204.0	207.3	0.2	12.7	6.0	7.0	-1	99.3	63
140	6.7	48.4	730	204.0	207.3	0.3	12.2	7.0	6.0	-1	99.3	63
141	6.6	48.3	708	204.0	207.3	0.3	12.2	6.4	5.2	-1	99.3	63
142	6.6	48.0	703	204.0	207.3	0.2	12.1	6.4	4.8	-1	99.3	63
143	6.8	48.0	786	204.0	207.3	0.2	12.7	7.4	5.1	-1	99.3	63
144	7.4	49.4	986	204.0	207.2	0.1	13.2	7.9	5.5	-1	99.3	63
145	7.5	48.5	1037	204.0	207.3	0.1	12.4	7.5	6.2	-1	99.3	63
146	7.5	48.0	1019	204.0	207.3	0.3	12.4	7.6	4.9	-1	99.3	63
147	7.4	48.3	972	204.0	207.3	0.9	12.3	7.6	5.8	-1	99.3	63
148	7.1	47.2	865	204.0	207.3	1.2	11.8	7.2	6.8	-1	99.3	63
149	7.1	46.5	877	204.0	207.3	1.1	11.9	6.4	7.0	-1	99.3	63
150	7.3	47.3	959	204.0	207.3	1.3	12.2	7.0	6.1	-1	99.3	63
151	7.4	47.7	985	204.0	207.3	1.5	12.2	7.4	6.7	-1	99.3	64
152	7.4	47.9	1002	204.0	207.3	1.6	12.3	8.4	6.7	-1	99.3	64
153	7.5	47.7	1040	204.0	207.3	1.5	12.5	7.6	6.5	-1	99.3	64
154	7.6	47.6	1054	204.0	207.3	1.7	12.5	7.9	5.7	-1	99.3	64
155	7.6	48.1	1052	204.0	207.3	1.7	12.5	7.4	6.2	-1	99.3	64
156	7.4	47.8	994	204.0	207.3	1.8	12.7	8.1	6.6	-1	99.3	63
157	7.6	50.1	1074	204.0	207.3	1.8	14.3	7.9	7.3	-1	99.3	63
158	8.2	52.8	1262	204.0	207.3	2.6	15.0	8.4	6.9	-1	99.3	63
159	8.2	53.2	1260	204.0	207.3	2.6	15.0	7.2	6.4	-1	99.3	63
160	7.9	52.5	1188	204.0	207.3	2.3	14.5	7.0	6.2	-1	99.3	63
161	7.8	52.5	1159	204.0	207.3	2.1	14.5	7.8	5.9	-1	99.3	63
162	7.9	51.9	1197	204.0	207.3	2.2	14.2	7.4	6.0	-1	99.3	63
163	7.8	50.1	1138	204.0	207.3	2.4	12.9	7.0	5.2	-1	99.3	62
164	7.3	47.6	967	204.0	207.3	1.8	12.2	6.5	5.0	-1	99.3	62
165	7.3	47.1	936	204.0	207.3	1.4	12.0	6.8	6.2	-1	99.3	62
166	7.3	47.3	944	204.0	207.3	1.4	12.1	7.0	6.9	-1	99.3	62
167	7.4	47.4	973	204.0	207.3	1.5	12.0	7.2	6.6	-1	99.3	62
168	8.1	48.9	1231	204.0	207.3	2.0	13.5	9.0	6.9	-1	99.3	63
169	8.2	51.1	1262	204.0	207.3	2.7	13.6	7.8	7.0	-1	99.3	63
170	7.9	49.4	1169	204.0	207.3	2.4	13.2	7.9	6.8	-1	99.3	63
171	7.7	49.3	1119	204.0	207.3	2.1	13.0	7.5	6.4	-1	99.3	63
172	7.4	48.2	979	204.0	207.3	1.8	12.4	7.2	5.8	-1	99.3	63
173	6.9	47.1	802	204.0	207.3	1.3	11.5	7.1	5.6	-1	99.3	63
174	6.4	46.0	656	204.0	207.3	1.1	10.8	5.6	5.7	-1	99.3	61
175	6.1	44.5	558	204.0	207.3	1.1	10.2	6.0	5.7	-1	99.3	61
176	5.9	43.4	499	204.0	207.3	0.2	9.9	5.6	5.7	-1	99.3	61

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
177	5.8	43.3	467	204.0	207.3	0.5	9.7	6.0	5.3	-1	99.3	61
178	5.7	43.3	453	204.0	207.3	0.7	9.6	5.5	4.9	-1	99.3	61
179	5.7	43.2	442	204.0	207.3	0.7	9.5	6.1	5.6	-1	99.3	61
180	5.8	43.9	468	204.0	207.3	0.7	10.0	5.9	5.5	-1	99.3	62
181	6.0	45.3	525	204.0	207.3	0.5	11.4	7.4	5.6	-1	99.3	63
182	6.5	47.6	679	204.0	207.3	0.1	12.1	7.0	5.7	-1	99.3	63
183	6.5	47.8	669	204.0	207.3	0.2	11.9	6.5	5.2	-1	99.3	63
184	6.2	46.8	591	204.0	207.3	0.3	11.4	5.3	4.9	-1	99.3	63
185	5.9	45.0	511	204.0	207.3	0.3	10.8	6.0	4.5	-1	99.3	63
186	6.0	45.0	519	204.0	207.3	0.2	11.2	6.4	4.8	-1	99.3	64
187	6.4	46.4	636	204.0	207.3	0.2	11.9	5.6	5.3	-1	99.3	64
188	6.8	48.1	778	204.0	207.3	0.2	12.7	6.4	5.0	-1	99.3	64
189	7.1	49.4	888	204.0	207.3	0.2	13.2	7.4	5.9	-1	99.3	64
190	7.2	49.9	917	204.0	207.3	0.0	13.3	7.0	5.0	-1	99.3	64
191	7.1	49.5	884	204.0	207.3	0.1	13.1	7.1	5.8	-1	99.3	64
192	6.9	49.2	807	204.0	207.3	0.1	12.7	6.2	5.3	-1	99.3	63
193	6.8	48.2	768	204.0	207.3	0.1	12.5	6.4	5.0	-1	99.3	63
194	6.8	48.7	773	204.0	207.3	0.1	12.6	5.8	4.9	-1	99.3	63
195	6.6	47.9	722	204.0	207.3	0.1	12.2	6.0	3.8	-1	99.3	63
196	6.4	47.3	656	204.0	207.3	0.1	11.8	6.5	4.2	-1	99.3	63
197	6.3	46.2	614	204.0	207.3	0.1	11.7	6.1	4.0	-1	99.3	63
198	6.1	46.1	558	204.0	207.3	0.4	11.1	5.9	3.7	-1	99.3	64
199	6.0	44.9	522	204.0	207.3	0.0	11.1	6.2	5.0	-1	99.3	64
200	6.3	46.1	606	204.0	207.3	0.2	11.7	6.5	6.1	-1	99.3	64
201	6.7	47.4	734	204.0	207.3	0.2	12.5	7.5	5.6	-1	99.3	64
202	7.0	49.3	846	204.0	207.3	0.1	13.0	7.7	4.8	-1	99.3	64
203	6.9	49.1	790	204.0	207.3	0.3	12.6	5.8	4.0	-1	99.3	64
204	6.5	47.4	677	204.0	207.3	0.3	11.9	5.8	4.8	-1	99.3	63
205	6.6	47.3	705	204.0	207.3	0.1	12.2	6.8	5.5	-1	99.3	63
206	7.0	49.3	839	204.0	207.3	0.2	13.0	7.1	5.9	-1	99.3	63
207	7.1	49.8	865	204.0	207.3	0.1	13.0	6.3	4.4	-1	99.3	63
208	6.9	48.9	790	204.0	207.3	0.3	12.5	6.4	5.2	-1	99.3	63
209	6.8	48.4	774	204.0	207.3	0.0	12.6	5.9	6.1	-1	99.3	63
210	6.9	48.7	820	204.0	207.3	0.0	12.9	6.5	5.0	-1	99.3	63
211	6.9	49.3	790	204.0	207.3	0.3	12.6	5.9	4.7	-1	99.3	62
212	6.5	47.9	671	204.0	207.3	0.3	11.8	6.0	4.3	-1	99.3	62
213	6.3	47.0	623	204.0	207.3	0.1	11.7	6.2	4.9	-1	99.3	62
214	6.3	46.8	628	204.0	207.3	0.1	11.8	6.3	5.7	-1	99.3	62
215	6.2	47.4	599	204.0	207.3	0.1	11.5	6.1	5.5	-1	99.3	62
216	6.2	47.2	590	204.0	207.3	0.1	11.4	6.6	5.1	-1	99.3	64
217	6.3	46.8	616	204.0	207.3	0.0	10.4	5.7	6.1	-1	99.3	64
218	5.8	45.7	481	204.0	207.3	0.5	9.7	6.0	5.8	-1	99.3	64
219	5.8	45.5	470	204.0	207.3	0.7	9.7	5.6	5.2	-1	99.3	64
220	5.7	45.6	448	204.0	207.3	0.7	9.5	5.5	5.0	-1	99.3	64
221	5.8	45.2	469	204.0	207.3	0.7	9.6	6.2	5.5	-1	99.3	64
222	6.1	46.7	543	204.0	207.3	0.7	10.7	6.9	6.1	-1	99.3	63
223	6.5	48.0	667	204.0	207.3	0.4	12.2	6.9	6.5	-1	99.3	62
224	7.0	49.3	827	204.0	207.3	0.1	12.9	6.8	6.1	-1	99.3	62
225	7.2	49.9	904	204.0	207.3	0.0	13.2	7.0	5.4	-1	99.3	62
226	7.3	50.5	937	204.0	207.3	0.0	13.4	6.7	4.8	-1	99.3	62
227	7.3	50.6	957	204.0	207.3	0.0	13.5	6.3	4.9	-1	99.3	62
228	7.4	50.5	978	204.0	207.3	0.7	13.6	7.1	5.6	-1	99.3	63
229	7.3	50.7	942	204.0	207.3	1.5	13.4	6.7	4.4	-1	99.3	63
230	7.0	50.0	823	204.0	207.3	1.2	12.7	5.6	4.4	-1	99.3	63
231	6.6	48.9	701	204.0	207.3	1.2	12.1	6.3	5.3	-1	99.3	63
232	6.5	48.6	668	204.0	207.3	1.2	12.0	6.6	5.0	-1	99.3	63
233	6.3	47.9	631	204.0	207.3	0.5	11.7	6.1	4.8	-1	99.3	63
234	6.1	47.6	556	204.0	207.3	0.4	11.2	6.2	5.8	-1	99.3	63
235	5.7	45.8	463	204.0	207.3	0.4	10.5	5.0	5.9	-1	99.3	63
236	5.7	46.3	441	204.0	207.3	0.1	10.6	5.8	5.3	-1	99.3	63
237	6.0	46.6	517	204.0	207.3	0.2	11.2	6.0	5.6	-1	99.3	63
238	6.1	47.2	571	204.0	207.3	0.0	11.4	6.5	5.5	-1	99.3	63
239	6.2	46.8	578	204.0	207.3	0.0	11.5	6.6	5.7	-1	99.3	63
240	6.1	47.5	548	204.0	207.3	0.2	11.2	6.6	5.6	-1	99.3	62
241	5.9	47.0	508	204.0	207.3	0.2	10.9	5.7	6.1	-1	99.3	62
242	5.8	46.7	484	204.0	207.3	0.1	10.8	5.5	6.2	-1	99.3	62
243	5.8	46.6	474	204.0	207.3	0.1	10.7	5.9	5.3	-1	99.3	62
244	5.9	46.4	505	204.0	207.3	0.1	11.0	6.7	5.2	-1	99.3	62
245	6.3	47.3	612	204.0	207.3	0.2	11.8	6.6	5.4	-1	99.3	62
246	6.8	48.3	778	204.0	207.3	0.0	12.2	6.6	5.5	-1	99.3	62
247	7.2	48.1	909	204.0	207.3	0.1	11.8	6.9	5.6	-1	99.3	62
248	6.8	47.4	779	204.0	207.3	0.1	11.2	6.2	4.9	-1	99.3	62
249	6.7	46.7	731	204.0	207.3	0.1	11.0	7.4	6.6	-1	99.3	62
250	6.9	47.0	794	204.0	207.3	0.1	11.3	7.7	6.6	-1	99.3	62
251	7.0	47.5	843	204.0	207.3	0.1	11.5	6.9	6.6	-1	99.3	62
252	7.0	47.6	832	204.0	207.3	0.1	11.5	6.9	6.2	-1	99.3	62
253	6.9	47.5	796	204.0	207.3	0.1	11.3	6.8	6.4	-1	99.3	62
254	6.8	47.1	767	204.0	207.3	0.1	11.2	7.3	6.1	-1	99.3	62
255	6.5	46.9	687	204.0	207.3	0.1	10.8	6.6	6.2	-1	99.3	62
256	6.2	47.0	591	204.0	207.3	0.1	10.2	6.8	4.8	-1	99.3	62
257	6.0	45.8	519	204.0	207.3	0.1	9.8	6.1	5.3	-1	99.3	62
258	5.7	45.8	443	204.0	207.3	0.2	9.7	5.7	4.9	-1	99.3	63
259	5.7	46.7	452	204.0	207.3	0.6	10.9	6.9	5.1	-1	99.3	63
260	6.3	47.5	624	204.0	207.3	0.1	11.9	5.7	5.2	-1	99.3	63
261	6.4	48.0	639	204.0	207.3	0.1	11.8	6.4	5.1	-1	99.3	63
262	6.3	47.5	628	204.0	207.3	0.1	11.8	6.1	4.6	-1	99.3	63
263	6.3	47.6	619	204.0	207.3	0.1	11.7	6.1	4.3	-1	99.3	63
264	6.2	47.5	577	204.0	207.3	0.1	11.3	6.4	4.4	-1	99.3	63

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
265	6.0	47.3	532	204.0	207.3	0.1	11.1	5.8	4.3	-1	99.3	63
266	5.9	46.7	493	204.0	207.3	0.1	10.8	6.1	4.7	-1	99.3	63
267	5.6	46.2	439	204.0	207.3	0.1	10.4	5.7	5.6	-1	99.3	63
268	5.4	45.7	378	204.0	207.3	0.6	9.7	5.3	6.2	-1	99.3	63
269	5.2	44.6	340	204.0	207.3	0.1	9.7	5.6	5.8	-1	99.3	63
270	5.9	45.8	493	204.0	207.3	0.5	11.2	6.9	5.5	-1	99.3	63
271	6.6	47.9	726	204.0	207.3	0.4	12.4	6.8	5.6	-1	99.3	62
272	7.1	49.4	882	204.0	207.3	0.2	13.2	7.3	5.2	-1	99.3	62
273	7.3	50.0	943	204.0	207.3	0.0	13.4	7.2	6.6	-1	99.3	62
274	7.4	50.6	980	204.0	207.3	0.0	13.6	7.1	5.8	-1	99.3	62
275	7.4	50.7	992	204.0	207.3	0.3	13.6	7.2	6.7	-1	99.3	62
276	7.3	50.5	966	204.0	207.3	1.5	13.5	7.8	6.4	-1	99.3	62
277	7.4	50.6	977	204.0	207.3	1.5	13.6	7.5	5.9	-1	99.3	62
278	7.2	50.5	927	204.0	207.3	1.5	13.3	7.3	6.1	-1	99.3	62
279	6.9	49.8	819	204.0	207.3	1.2	12.7	6.1	6.1	-1	99.3	62
280	6.6	48.9	722	204.0	207.3	1.1	12.2	6.4	5.7	-1	99.3	62
281	6.5	48.2	694	204.0	207.3	1.1	12.1	6.8	5.2	-1	99.3	62
282	6.9	48.9	799	204.0	207.3	0.2	12.5	7.0	5.3	-1	99.3	62
283	7.2	48.2	896	204.0	207.3	0.2	11.8	7.0	4.6	-1	99.3	62
284	6.7	47.6	745	204.0	207.3	0.4	11.2	6.5	4.4	-1	99.3	62
285	6.3	46.7	627	204.0	207.3	0.5	10.6	5.8	4.6	-1	99.3	62
286	6.0	45.9	523	204.0	207.3	0.5	9.9	6.0	4.1	-1	99.3	62
287	5.8	45.7	473	204.0	207.3	0.5	9.7	6.4	4.5	-1	99.3	62
288	5.7	45.4	442	204.0	207.3	0.6	9.7	5.5	4.4	-1	99.3	63
289	5.4	45.8	378	204.0	207.3	0.3	10.2	5.6	6.2	-1	99.3	63
290	5.7	46.5	454	204.0	207.3	0.2	10.7	5.5	6.1	-1	99.3	63
291	5.9	46.9	508	204.0	207.3	0.2	11.1	5.5	5.9	-1	99.3	63
292	6.2	47.2	586	204.0	207.3	0.2	11.6	6.2	5.6	-1	99.3	63
293	6.5	48.3	666	204.0	207.3	0.1	12.1	6.0	4.8	-1	99.3	63
294	6.4	48.2	640	204.0	207.3	0.7	11.4	5.5	6.2	-1	99.2	63
295	6.2	46.5	576	204.0	207.3	0.1	10.1	5.3	6.0	-1	99.2	63
296	5.8	46.0	466	204.0	207.3	0.0	9.6	5.8	5.6	-1	99.2	63
297	5.4	45.5	382	204.0	207.3	0.0	9.1	5.3	5.3	-1	99.2	63
298	4.7	44.5	217	204.0	207.3	0.2	8.7	4.4	4.7	-1	99.2	63
299	5.1	44.1	300	204.0	207.3	0.2	8.7	5.4	4.3	-1	99.2	63
300	5.2	44.4	341	204.0	207.3	0.3	9.0	5.5	4.6	-1	99.3	63
301	5.1	45.8	303	204.0	207.3	0.4	9.7	5.4	4.1	-1	99.3	62
302	5.2	45.0	340	204.0	207.3	0.5	9.6	5.2	3.5	-1	99.3	62
303	4.9	45.0	256	204.0	207.3	0.7	8.9	4.7	3.9	-1	99.3	62
304	4.9	45.2	256	204.0	207.3	0.0	8.9	4.6	3.9	-1	99.3	62
305	5.1	45.5	316	204.0	207.3	0.3	9.7	6.6	3.5	-1	99.3	62
306	5.4	46.1	380	204.0	207.3	0.1	10.1	5.6	3.4	-1	99.3	63
307	5.5	46.1	407	204.0	207.3	0.0	10.3	5.7	2.7	-1	99.3	63
308	5.6	46.2	428	204.0	207.3	0.0	10.4	5.9	3.1	-1	99.3	63
309	5.6	46.7	434	204.0	207.3	0.1	10.5	5.8	3.3	-1	99.3	63
310	5.6	46.6	430	204.0	207.3	0.1	10.4	5.5	3.9	-1	99.3	63
311	5.5	45.7	412	204.0	207.3	0.1	10.3	6.0	4.1	-1	99.3	63
312	5.6	46.6	416	204.0	207.3	0.0	10.3	5.7	4.6	-1	99.3	63
313	5.7	46.6	448	204.0	207.3	0.1	10.7	5.8	4.7	-1	99.3	63
314	5.8	46.4	466	204.0	207.3	0.2	10.6	5.5	4.8	-1	99.3	63
315	5.6	46.1	433	204.0	207.3	0.1	10.4	5.8	3.5	-1	99.3	63
316	5.6	46.2	419	204.0	207.3	0.2	10.2	5.1	4.3	-1	99.3	63
317	5.3	45.8	363	204.0	207.3	0.4	9.7	5.3	3.5	-1	99.3	63
318	5.0	45.3	282	204.0	207.3	0.5	9.1	5.5	2.8	-1	99.3	63
319	4.7	44.9	224	204.0	207.3	0.6	8.7	5.6	3.6	-1	99.3	63
320	5.0	44.5	286	204.0	207.3	0.4	9.4	5.6	5.3	-1	99.3	63
321	5.7	46.4	456	204.0	207.3	0.5	11.0	6.6	5.5	-1	99.3	63
322	6.4	47.6	638	204.0	207.3	0.3	11.9	6.9	5.4	-1	99.3	63
323	6.7	48.4	737	204.0	207.3	0.1	12.5	6.6	4.0	-1	99.3	63
324	6.7	48.9	750	204.0	207.3	0.1	12.4	6.6	3.9	-1	99.3	63
325	6.5	48.6	695	204.0	207.3	0.2	12.1	6.7	3.9	-1	99.3	63
326	6.3	47.9	620	204.0	207.3	0.2	11.6	6.2	3.0	-1	99.3	63
327	6.0	47.2	530	204.0	207.3	0.5	10.9	5.5	3.9	-1	99.3	63
328	5.6	45.7	417	204.0	207.3	0.6	10.0	5.2	4.9	-1	99.3	63
329	5.2	45.5	340	204.0	207.3	0.2	9.5	5.2	4.9	-1	99.3	63
330	5.2	45.8	334	204.0	207.3	0.1	9.8	5.2	5.3	-1	99.3	63
331	5.3	45.7	359	204.0	207.3	0.1	9.8	5.7	4.3	-1	99.3	63
332	5.3	45.2	363	204.0	207.3	0.1	10.0	5.0	4.6	-1	99.3	63
333	5.4	46.2	380	204.0	207.3	0.4	10.0	5.0	4.5	-1	99.3	63
334	5.2	45.7	339	204.0	207.3	0.3	9.5	4.8	4.4	-1	99.3	63
335	5.4	46.1	374	204.0	207.3	0.3	10.1	5.7	4.4	-1	99.3	63
336	6.2	47.2	577	204.0	207.3	0.5	11.7	6.4	5.1	-1	99.3	63
337	6.8	49.3	788	204.0	207.3	0.2	12.8	7.3	4.3	-1	99.3	62
338	7.0	50.0	826	204.0	207.3	0.1	12.8	8.1	4.3	-1	99.3	62
339	6.8	49.1	759	204.0	207.3	0.1	12.4	7.0	3.7	-1	99.3	62
340	6.4	48.5	651	204.0	207.3	0.2	11.8	6.3	4.7	-1	99.3	62
341	6.0	46.8	526	204.0	207.3	0.6	10.9	5.3	4.2	-1	99.3	62
342	5.4	45.6	385	204.0	207.3	0.7	9.6	4.9	3.1	-1	99.3	63
343	4.9	44.6	263	204.0	207.3	0.5	8.8	5.2	3.1	-1	99.3	63
344	4.6	45.1	198	204.0	207.3	0.2	8.6	4.5	3.6	-1	99.3	63
345	4.3	45.1	151	204.0	207.3	0.7	8.6	4.4	3.7	-1	99.3	63
346	4.5	44.7	188	204.0	207.3	0.7	8.7	5.1	3.9	-1	99.3	63
347	4.6	44.4	204	204.0	207.3	0.6	8.6	5.6	3.5	-1	99.3	63
348	4.7	44.4	229	204.0	207.3	0.4	8.7	4.9	3.3	-1	99.3	64
349	4.6	44.1	204	204.0	207.3	0.3	8.6	5.1	3.1	-1	99.3	64
350	4.5	44.9	188	204.0	207.3	0.5	8.6	4.5	3.8	-1	99.3	64
351	4.5	44.3	195	204.0	207.3	0.6	8.6	4.6	3.7	-1	99.3	64
352	4.5	44.1	181	204.0	207.3	0.7	8.6	4.6	3.9	-1	99.3	64

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
353	4.5	44.9	185	204.0	207.3	0.8	8.7	4.6	3.7	-1	99.3	64
354	4.3	44.7	155	204.0	207.3	0.7	8.6	4.0	3.5	-1	99.3	64
355	4.2	44.8	132	204.0	207.3	0.9	8.6	4.7	4.0	-1	99.3	64
356	4.4	44.7	163	204.0	207.3	1.0	8.7	4.7	3.6	-1	99.3	64
357	4.6	44.3	208	204.0	207.3	0.7	8.7	4.6	3.1	-1	99.3	64
358	4.4	44.0	169	204.0	207.3	0.7	8.6	4.7	3.4	-1	99.3	64
359	4.5	44.5	182	204.0	207.3	0.8	8.7	5.0	4.4	-1	99.3	64
360	4.5	44.3	188	204.0	207.3	0.7	8.7	5.1	4.6	-1	99.3	64
361	4.4	44.8	165	204.0	207.3	0.8	8.6	5.0	4.9	-1	99.3	64
362	4.4	45.0	178	204.0	207.3	0.7	8.7	4.1	4.2	-1	99.3	64
363	4.8	44.5	237	204.0	207.3	0.4	8.7	4.7	4.4	-1	99.3	64
364	4.9	44.8	256	204.0	207.3	0.1	9.1	4.9	5.1	-1	99.3	64
365	5.0	45.1	290	204.0	207.3	0.0	9.2	5.4	3.6	-1	99.3	64
366	5.0	44.7	287	204.0	207.3	0.1	9.2	5.2	2.8	-1	99.3	64
367	5.0	45.2	287	204.0	207.3	0.0	9.2	5.1	3.5	-1	99.3	64
368	5.1	45.6	308	204.0	207.3	0.1	9.5	5.6	3.5	-1	99.3	64
369	5.2	45.5	330	204.0	207.3	0.1	9.7	5.4	3.8	-1	99.3	64
370	5.3	45.9	344	204.0	207.3	0.2	9.6	4.8	3.1	-1	99.3	64
371	5.2	45.3	336	204.0	207.3	0.0	9.7	5.6	4.4	-1	99.3	64
372	5.3	45.5	360	204.0	207.3	0.0	9.9	5.7	4.1	-1	99.3	64
373	5.3	45.5	358	204.0	207.3	0.2	9.8	5.7	3.4	-1	99.3	64
374	5.1	45.6	317	204.0	207.3	0.3	9.3	4.9	4.3	-1	99.3	64
375	5.0	44.7	278	204.0	207.3	0.2	9.1	4.9	4.3	-1	99.3	64
376	4.9	44.9	265	204.0	207.3	0.1	8.8	4.5	4.4	-1	99.3	64
377	5.2	45.2	322	204.0	207.3	0.5	9.8	5.4	4.3	-1	99.3	64
378	6.2	47.2	588	204.0	207.3	0.6	11.8	7.4	5.0	-1	99.2	63
379	6.9	49.1	796	204.0	207.3	0.1	12.8	6.9	3.6	-1	99.2	62
380	6.9	49.2	812	204.0	207.3	0.1	12.7	6.9	5.3	-1	99.2	62
381	6.9	49.6	806	204.0	207.3	0.0	12.8	7.0	5.2	-1	99.2	62
382	6.8	49.4	784	204.0	207.3	0.1	12.6	7.2	5.2	-1	99.2	62
383	6.7	49.2	754	204.0	207.3	0.1	12.4	7.0	5.2	-1	99.2	62
384	6.9	49.1	815	204.0	207.3	0.0	12.7	6.7	5.7	-1	99.2	62
385	7.1	49.1	877	204.0	207.3	0.1	11.6	6.0	4.7	-1	99.2	62
386	6.3	46.6	622	204.0	207.3	0.1	10.3	5.8	4.2	-1	99.2	62
387	6.0	45.8	517	204.0	207.3	0.1	9.8	5.5	4.2	-1	99.2	62
388	5.8	45.3	482	204.0	207.3	0.1	9.6	5.5	4.5	-1	99.2	62
389	5.7	45.6	443	204.0	207.3	0.1	9.3	5.6	4.4	-1	99.2	62
390	5.5	45.9	403	204.0	207.3	0.3	9.2	5.3	3.3	-1	99.3	62
391	5.5	46.1	410	204.0	207.3	0.6	9.4	5.9	4.1	-1	99.3	62
392	5.5	45.4	401	204.0	207.3	0.6	9.2	5.8	3.6	-1	99.3	62
393	5.3	45.1	356	204.0	207.3	0.6	8.8	5.3	3.2	-1	99.3	62
394	5.3	45.0	345	204.0	207.3	0.6	8.8	6.7	3.5	-1	99.3	62
395	5.1	45.0	317	204.0	207.3	0.6	8.7	6.0	3.0	-1	99.3	62
396	4.8	44.3	245	204.0	207.3	0.4	8.7	4.6	2.7	-1	99.3	63
397	4.8	44.5	249	204.0	207.3	0.0	8.9	5.1	4.0	-1	99.3	63
398	4.9	44.2	262	204.0	207.3	0.0	8.9	4.8	4.6	-1	99.3	63
399	5.0	45.6	281	204.0	207.3	0.2	9.3	6.5	4.3	-1	99.3	63
400	5.4	45.9	367	204.0	207.3	0.3	10.1	5.1	5.2	-1	99.3	63
401	5.8	46.0	473	204.0	207.3	0.2	10.9	5.6	4.8	-1	99.3	63
402	6.0	46.7	532	204.0	207.3	0.0	11.2	6.7	4.6	-1	99.3	62
403	6.2	47.2	588	204.0	207.3	0.1	11.6	6.1	4.6	-1	99.3	62
404	6.4	47.6	650	204.0	207.3	0.0	11.9	6.7	4.1	-1	99.3	62
405	6.6	48.7	722	204.0	207.3	0.1	12.4	7.2	5.1	-1	99.3	62
406	7.0	49.2	823	204.0	207.3	0.1	12.9	7.4	5.0	-1	99.3	62
407	7.0	49.4	825	204.0	207.3	0.1	12.8	6.9	5.2	-1	99.3	62
408	6.7	48.9	747	204.0	207.3	0.3	12.3	6.8	5.2	-1	99.3	62
409	6.4	48.4	651	204.0	207.3	0.3	11.8	6.3	5.6	-1	99.3	62
410	6.1	46.9	563	204.0	207.3	0.3	11.2	6.0	4.7	-1	99.3	62
411	5.9	46.8	506	204.0	207.3	0.3	10.9	6.4	4.1	-1	99.3	62
412	5.8	46.1	473	204.0	207.3	0.2	10.6	5.6	4.2	-1	99.3	62
413	5.7	46.3	443	204.0	207.3	0.1	10.5	5.2	3.5	-1	99.3	62
414	5.6	46.1	425	204.0	207.3	0.2	10.3	5.5	3.4	-1	99.3	63
415	5.4	45.3	382	204.0	207.3	0.2	9.9	6.6	2.9	0	99.3	63
416	5.3	45.0	344	204.0	207.3	0.1	9.6	5.8	2.9	0	99.3	63
417	5.3	45.7	348	204.0	207.3	0.1	9.9	5.7	4.0	0	99.3	63
418	5.6	45.7	435	204.0	207.3	0.2	10.6	6.4	4.0	0	99.3	63
419	6.1	46.1	543	204.0	207.3	0.2	11.4	6.7	4.6	0	99.3	63
420	6.4	47.5	634	204.0	207.3	0.1	11.9	6.1	4.8	0	99.3	61
421	6.4	48.1	647	204.0	207.3	0.1	11.8	6.0	4.5	0	99.3	61
422	6.2	47.4	573	204.0	207.3	0.1	11.3	6.1	5.2	0	99.3	61
423	5.9	46.3	493	204.0	207.3	0.1	10.7	6.0	5.0	0	99.3	61
424	5.8	46.0	474	204.0	207.3	0.0	10.8	6.5	4.1	0	99.3	61
425	6.0	46.1	526	204.0	207.3	0.1	11.2	6.2	3.1	0	99.3	61
426	6.3	46.5	613	204.0	207.3	0.0	11.4	6.8	3.2	0	99.3	60
427	6.4	46.6	655	204.0	207.3	0.2	10.7	6.4	3.3	0	99.3	60
428	6.1	45.7	554	204.0	207.3	0.4	10.1	6.2	4.0	0	99.3	60
429	6.0	45.6	524	204.0	207.3	0.7	10.0	6.4	3.9	0	99.3	60
430	5.9	46.4	512	204.0	207.3	0.7	10.0	5.8	4.8	0	99.3	60
431	5.8	45.3	488	204.0	207.3	0.7	9.8	5.9	4.3	0	99.3	60
432	5.7	45.2	464	204.0	207.3	0.7	10.0	7.0	4.6	0	99.3	61
433	5.8	46.3	474	204.0	207.3	0.4	11.1	6.4	4.6	0	99.3	61
434	6.2	47.3	590	204.0	207.3	0.1	11.6	5.9	4.4	0	99.3	61
435	6.3	47.8	614	204.0	207.3	0.1	11.7	5.2	4.0	0	99.3	61
436	6.3	47.6	611	204.0	207.3	0.1	11.6	6.8	5.6	0	99.3	61
437	6.2	47.2	597	204.0	207.3	0.1	11.5	6.1	5.2	0	99.3	61
438	6.2	46.8	580	204.0	207.3	0.1	11.4	6.2	4.4	0	99.3	61
439	6.3	47.8	614	204.0	207.3	0.1	11.7	6.6	4.3	0	99.3	61
440	6.4	47.6	659	204.0	207.3	0.1	12.0	6.9	5.6	0	99.3	61

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
441	6.4	48.0	658	204.0	207.3	0.1	11.9	6.8	5.2	0	99.3	61
442	6.3	47.8	622	204.0	207.3	0.1	11.7	5.7	4.5	0	99.3	61
443	6.3	47.6	607	204.0	207.3	0.1	11.6	6.1	4.3	0	99.3	61
444	6.3	47.6	609	204.0	207.3	0.1	11.6	6.1	4.7	0	99.3	61
445	6.2	47.1	574	204.0	207.3	0.2	11.3	6.1	4.8	0	99.3	61
446	6.2	47.4	577	204.0	207.3	0.0	11.5	6.9	4.8	0	99.3	61
447	6.1	47.5	572	204.0	207.3	0.1	11.4	6.1	4.9	0	99.3	61
448	6.0	46.7	525	204.0	207.3	0.2	11.0	5.8	4.6	0	99.3	61
449	5.8	46.2	480	204.0	207.3	0.3	10.7	5.8	4.1	0	99.3	61
450	5.5	45.9	411	204.0	207.3	0.5	10.0	5.7	3.8	0	99.3	61
451	5.3	44.9	356	204.0	207.3	0.1	9.8	5.8	3.1	0	99.3	61
452	5.3	44.9	344	204.0	207.3	0.1	9.7	5.4	3.7	0	99.3	61
453	5.3	45.2	358	204.0	207.3	0.1	10.0	5.3	3.7	0	99.3	61
454	5.4	45.6	387	204.0	207.3	0.1	10.1	5.2	2.6	0	99.3	61
455	5.4	46.2	373	204.0	207.3	0.1	9.9	5.4	3.0	0	99.3	61
456	5.3	44.9	354	204.0	207.3	0.1	9.8	5.1	3.7	0	99.3	61
457	5.3	45.8	344	204.0	207.3	0.1	9.7	5.1	4.6	0	99.3	61
458	5.2	45.1	339	204.0	207.3	0.0	9.8	5.7	3.7	0	99.3	61
459	5.2	44.6	336	204.0	207.3	0.2	9.5	5.6	4.0	0	99.3	61
460	5.1	45.0	293	204.0	207.3	0.3	9.1	5.4	4.3	0	99.3	61
461	4.8	44.6	250	204.0	207.3	0.2	8.8	4.8	4.6	0	99.3	61
462	4.7	44.3	231	204.0	207.3	0.1	8.7	5.0	4.3	0	99.2	62
463	4.9	44.7	264	204.0	207.3	0.2	9.1	5.3	4.1	0	99.2	62
464	5.4	45.1	386	204.0	207.3	0.5	10.5	6.3	4.9	0	99.2	62
465	5.9	47.1	498	204.0	207.3	0.2	11.0	5.7	4.3	0	99.2	62
466	5.7	46.3	450	204.0	207.3	0.4	10.4	5.7	4.1	0	99.2	62
467	5.5	46.1	397	204.0	207.3	0.1	10.1	5.2	3.9	0	99.2	62
468	5.4	46.0	375	204.0	207.3	0.2	9.9	4.8	3.5	0	99.2	62
469	5.3	46.0	348	204.0	207.3	0.1	9.7	5.1	4.5	0	99.2	62
470	5.5	46.0	408	204.0	207.3	0.3	10.4	5.5	4.7	0	99.2	62
471	6.1	46.5	542	204.0	207.3	0.2	11.4	6.9	6.1	0	99.2	62
472	6.3	47.4	630	204.0	207.3	0.0	11.8	6.4	5.9	0	99.2	62
473	6.5	47.4	681	204.0	207.3	0.0	12.1	7.4	5.1	0	99.2	62
474	6.6	48.4	720	204.0	207.3	0.0	12.3	6.7	5.1	0	99.2	61
475	6.7	48.6	730	204.0	207.3	0.0	12.3	6.2	5.9	0	99.2	60
476	6.9	48.5	797	204.0	207.3	0.0	12.8	7.0	6.0	0	99.2	60
477	7.1	49.9	879	204.0	207.3	0.1	13.1	7.4	6.1	0	99.2	60
478	7.1	49.8	872	204.0	207.3	0.0	13.0	7.1	5.2	0	99.2	60
479	7.0	49.5	832	204.0	207.3	0.1	12.8	6.3	5.0	0	99.2	60
480	7.0	49.0	838	204.0	207.3	0.2	12.5	6.9	5.2	0	99.2	59
481	6.7	47.9	742	204.0	207.3	0.1	10.9	5.6	4.8	0	99.2	59
482	6.1	46.0	544	204.0	207.3	0.3	9.9	5.7	4.3	0	99.2	59
483	6.2	46.7	573	204.0	211.0	0.3	10.2	7.4	3.8	0	99.2	59
484	6.5	47.7	670	204.0	218.2	0.3	10.8	6.9	4.3	0	99.2	59
485			694	204.0	222.9	0.3	10.8	6.8	5.2	0	99.2	59
486			684	204.0	222.9	0.1	10.7	6.5	5.2	0	99.2	60
487			630	204.0	222.9	0.3	10.3	6.7	4.4	0	99.2	61
488			610	204.0	222.9	0.3	10.2	6.3	4.4	0	99.2	61
489			668	204.0	222.9	0.3	10.6	5.9	4.1	0	99.2	61
490			690	204.0	222.9	0.3	10.7	6.3	3.8	0	99.2	61
491			662	204.0	222.9	0.3	10.5	6.4	4.0	0	99.2	61
492			637	204.0	222.9	0.3	10.5	6.1	3.5	0	99.2	61
493			592	204.0	222.9	0.1	10.3	6.3	3.6	0	99.2	61
494			531	204.0	222.9	0.1	9.9	6.2	4.2	0	99.2	61
495			444	204.0	222.9	0.1	9.3	4.9	4.3	0	99.2	61
496			382	204.0	222.9	0.1	8.9	5.4	4.0	0	99.2	61
497			399	204.0	222.9	0.1	9.2	6.9	4.2	0	99.2	61
498			442	204.0	222.9	0.1	9.4	6.1	3.9	0	99.2	62
499			380	204.0	222.9	0.4	9.0	5.4	4.5	0	99.2	62
500			241	204.0	222.9	0.2	8.7	5.1	5.4	0	99.2	62
501			229	204.0	222.9	0.1	8.6	5.2	5.1	0	99.2	62
502			241	204.0	222.9	0.1	8.6	4.7	4.5	0	99.2	62
503			277	204.0	220.0	0.1	8.7	5.2	5.4	0	99.2	62
504			336	204.0	219.9	0.3	8.7	4.9	5.6	0	99.2	60
505			363	204.0	219.9	0.4	8.9	6.1	5.8	0	99.2	59
506			409	204.0	219.9	0.4	9.2	5.8	4.2	0	99.2	59
507			672	162.0	165.4	8.4	12.7	7.5	7.2	3	99.0	54
508			669	162.0	165.4	6.8	12.5	6.5	7.6	3	99.0	54
509			669	162.0	165.4	6.5	12.7	6.1	7.9	3	99.0	55
510			638	162.0	165.4	6.2	12.7	6.0	7.8	3	99.0	55
511			598	162.0	165.4	5.9	12.6	5.7	7.3	3	99.0	55
512			583	162.0	165.4	6.5	12.7	5.9	7.8	3	99.0	55
513			615	162.0	165.4	8.2	13.1	6.3	8.1	3	99.0	55
514			651	162.0	165.4	8.4	13.1	6.3	8.1	3	99.0	55
515			689	162.0	165.4	8.4	13.0	7.7	8.1	3	99.0	54
516			794	162.0	165.4	6.3	12.9	6.3	9.0	3	99.0	54
517			809	162.0	165.4	5.7	13.2	7.2	9.0	3	99.0	54
518			862	162.0	165.4	5.5	13.6	7.2	8.5	3	99.0	54
519			875	162.0	165.4	4.9	13.8	6.1	7.8	3	99.0	54
520			855	162.0	165.4	6.2	14.3	7.6	7.9	3	99.0	54
521			926	162.0	165.4	7.6	14.6	7.9	7.3	3	99.0	55
522			1015	162.0	165.4	7.0	14.5	7.5	7.1	3	99.0	55
523			1025	162.0	165.4	6.5	14.5	7.0	7.1	3	99.0	55
524	7.8	53.2	1155	162.0	165.4	5.5	14.6	8.3	7.2	3	99.0	55
525			1524	162.0	165.4	3.2	14.9	7.6	7.2	3	99.0	55
526	8.8	53.2	1438	162.0	165.4	3.6	15.4	8.8	7.5	3	99.0	55
527			1537	162.0	165.4	3.6	15.6	8.4	7.2	3	99.0	55
528			1516	162.0	165.4	3.5	15.6	7.7	6.1	3	99.0	55

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
529	8.8	53.9	1436	162.0	165.4	3.1	15.6	7.7	6.2	3	99.0	55
530			1522	162.0	165.4	3.2	15.6	8.3	6.2	3	99.0	55
531	9.0	53.6	1474	162.0	165.4	3.3	15.6	7.8	6.1	3	99.0	55
532	8.6	54.0	1373	162.0	165.4	2.9	15.4	7.4	5.6	3	99.0	56
533			1520	162.0	165.4	3.1	15.6	8.4	5.5	3	99.0	57
534			1573	162.0	165.4	3.5	15.7	7.7	5.2	3	99.0	57
535			1608	162.0	165.4	5.7	16.1	8.5	5.3	3	99.0	57
536			1576	162.0	165.4	6.2	15.9	8.3	5.5	3	99.0	57
537			1564	162.0	165.4	5.3	15.6	8.4	5.4	3	99.0	57
538			1573	162.0	165.4	4.8	15.4	8.5	5.3	3	99.0	58
539	9.5	53.6	1582	162.0	165.4	4.8	15.5	9.2	6.3	3	99.0	58
540			1553	162.0	165.4	3.6	15.4	8.3	7.3	3	99.0	58
541			1596	162.0	165.4	4.2	15.7	8.0	7.2	3	99.0	58
542			1588	162.0	165.4	4.4	15.6	7.5	7.7	3	99.0	58
543			1588	162.0	165.4	4.3	15.6	8.5	7.3	3	99.0	58
544			1576	162.0	165.4	3.7	15.4	8.3	7.8	3	99.0	58
545			1585	162.0	165.4	3.7	15.5	8.5	7.4	3	99.0	55
546			1572	162.0	165.4	3.4	15.5	8.5	7.0	3	99.0	55
547	8.6	53.9	1367	162.0	165.4	3.2	15.4	8.2	6.8	3	99.0	55
548	8.2	53.7	1270	162.0	165.4	2.5	14.9	7.0	5.9	3	99.0	55
549	8.3	53.1	1291	162.0	165.4	2.2	15.1	7.7	6.4	3	99.0	55
550	9.3	53.9	1558	162.0	165.4	3.4	15.6	9.0	6.3	3	99.0	56
551	9.9	53.5	1603	162.0	165.4	5.1	15.9	9.6	6.3	3	99.0	57
552	9.8	54.0	1587	162.0	165.4	6.3	15.9	9.5	5.5	3	99.0	57
553			1565	162.0	165.4	5.0	15.5	8.4	5.0	3	99.0	57
554	8.8	53.4	1432	162.0	165.4	3.3	15.2	7.6	6.0	3	99.0	57
555	8.3	53.3	1294	162.0	165.4	2.7	15.1	7.8	6.5	3	99.0	57
556	8.7	52.9	1404	162.0	165.4	2.9	15.3	7.9	6.6	3	99.0	57
557	8.9	53.7	1440	162.0	165.4	3.1	15.5	7.0	5.9	3	99.0	56
558			1561	162.0	165.4	3.5	15.7	7.7	7.0	3	99.0	56
559			1600	162.0	165.4	5.3	16.0	8.5	7.4	3	99.0	56
560			1581	162.0	165.4	5.4	15.8	7.4	7.7	3	99.0	56
561			1575	162.0	165.4	5.5	15.7	8.6	7.2	3	99.0	56
562			1579	162.0	165.4	5.4	15.6	8.3	6.7	3	99.0	56
563			1580	162.0	165.4	5.3	15.6	8.8	5.7	3	99.0	56
564			1571	162.0	165.4	4.3	15.3	8.9	6.0	3	99.0	56
565			1589	162.0	165.4	3.9	15.4	8.0	6.5	3	99.0	56
566			1587	162.0	165.4	4.1	15.5	8.3	7.4	3	99.0	56
567	9.5	53.4	1599	162.0	165.4	4.1	15.6	9.2	7.7	3	99.0	56
568			1589	162.0	165.4	4.6	15.7	9.0	8.2	3	99.0	56
569			1577	162.0	165.4	4.1	15.5	8.2	6.9	3	99.0	55
570	9.6	53.5	1584	162.0	165.4	3.9	15.5	9.3	6.8	3	99.0	55
571	9.1	53.5	1488	162.0	165.4	3.5	15.4	8.0	7.5	3	99.0	55
572	8.5	53.7	1336	162.0	165.4	3.1	15.3	7.3	7.5	3	99.0	55
573	8.3	53.3	1284	162.0	165.4	2.5	15.0	8.3	7.8	3	99.0	55
574	8.1	53.1	1235	162.0	165.4	2.3	14.8	7.4	8.1	3	99.0	55
575	8.0	53.1	1222	162.0	165.4	2.3	14.7	7.2	7.8	3	99.0	55
576	8.4	53.1	1314	162.0	165.4	2.2	15.1	8.4	7.8	3	99.0	55
577	9.0	53.8	1466	162.0	165.4	3.2	15.5	7.6	7.4	3	99.0	55
578			1611	162.0	165.4	4.9	16.0	7.9	6.1	3	99.0	55
579			1581	162.0	165.4	6.6	16.0	8.7	7.3	3	99.0	55
580			1561	162.0	165.4	5.4	15.5	7.9	6.5	3	99.0	55
581	8.5	53.5	1337	162.0	165.4	3.3	15.0	6.9	7.3	3	99.0	56
582	8.8	53.6	1415	162.0	165.4	2.6	15.4	7.5	7.2	3	99.0	56
583	8.7	54.3	1411	162.0	165.4	3.4	15.5	7.4	8.2	3	99.0	56
584			1563	162.0	165.4	3.9	15.7	7.3	7.6	3	99.0	56
585	9.9	54.1	1613	162.0	165.4	6.1	16.2	9.6	8.2	3	99.0	56
586	10.6	54.2	1579	162.0	165.4	7.2	16.0	10.3	7.1	3	99.0	56
587			1570	162.0	165.4	6.9	15.7	8.6	7.2	3	99.0	57
588	10.7	53.7	1579	162.0	165.4	6.9	15.7	10.4	6.8	3	99.0	57
589			1572	162.0	165.4	6.4	15.4	8.9	6.4	3	99.0	57
590			1586	162.0	165.4	6.8	15.6	8.5	7.2	3	99.0	57
591			1578	162.0	165.4	6.4	15.5	8.0	8.3	3	99.0	57
592			1572	162.0	165.4	5.1	15.2	8.3	8.1	3	99.0	57
593			1584	162.0	165.4	4.6	15.3	7.6	6.8	3	99.0	56
594	8.9	53.0	1441	162.0	165.4	3.2	15.3	7.4	7.1	3	99.0	56
595	9.7	54.0	1617	162.0	165.4	5.3	16.1	9.5	7.6	3	99.0	56
596			1573	162.0	165.4	6.4	15.9	8.6	7.3	3	99.0	56
597			1580	162.0	165.4	6.2	15.8	8.9	8.4	3	99.0	56
598			1578	162.0	165.4	6.7	15.7	8.9	7.8	3	99.0	56
599			1564	162.0	165.4	5.7	15.4	8.0	7.8	3	99.0	56
600			1578	162.0	165.4	4.7	15.3	7.5	9.0	3	99.0	56
601			1602	162.0	165.4	5.6	15.7	8.9	9.4	3	99.0	56
602			1584	162.0	165.4	5.8	15.6	7.5	8.5	3	99.0	56
603			1587	162.0	165.4	5.2	15.5	8.7	10.8	3	99.0	56
604	9.7	53.2	1586	162.0	165.4	5.5	15.6	9.4	10.4	3	99.0	56
605			1573	162.0	165.4	4.8	15.4	8.0	9.4	3	99.0	55
606			1545	162.0	165.4	3.7	15.3	7.5	9.1	3	99.0	55
607	8.6	53.9	1384	162.0	165.4	3.1	15.4	7.3	8.0	3	99.0	55
608	8.6	53.9	1380	162.0	165.4	3.1	15.4	8.4	8.2	3	99.0	55
609	9.3	53.8	1592	162.0	165.4	4.1	15.8	9.0	7.7	3	99.0	55
610			1593	162.0	165.4	5.5	15.9	7.9	7.4	3	99.0	55
611			1576	162.0	165.4	6.1	15.8	8.3	6.9	3	99.0	55
612			1568	162.0	165.4	5.0	15.5	8.2	6.1	3	99.0	55
613			1591	162.0	165.4	5.2	15.6	8.4	6.3	3	99.0	55
614	9.8	54.2	1606	162.0	165.4	7.6	16.0	9.6	6.0	3	99.0	55
615	9.6	54.6	1569	162.0	165.4	7.8	15.7	9.3	5.9	3	99.0	55
616	10.4	53.7	1586	162.0	165.4	8.2	15.7	10.1	6.2	3	99.0	56

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
617	10.1	53.9	1575	162.0	165.4	8.1	15.5	9.8	7.1	3	99.0	58
618	9.8	53.5	1577	162.0	165.4	7.3	15.4	9.5	6.3	3	99.0	58
619			1589	162.0	165.4	6.8	15.5	8.4	7.1	3	99.0	58
620	10.1	53.2	1594	162.0	165.4	7.5	15.6	9.8	6.3	3	99.0	58
621	10.9	53.5	1589	162.0	165.4	8.4	15.7	10.6	7.0	3	99.0	58
622	9.7	53.3	1575	162.0	165.4	7.6	15.5	9.4	7.6	3	99.0	58
623	9.7	53.1	1579	162.0	165.4	6.6	15.4	9.4	8.0	3	99.0	56
624	9.3	52.9	1593	162.0	165.4	6.4	15.5	9.1	7.5	3	99.0	56
625			1592	162.0	165.4	7.1	15.6	8.9	7.9	3	99.0	56
626			1570	162.0	165.4	6.1	15.3	8.6	8.5	3	99.0	56
627			1582	162.0	165.4	5.1	15.3	7.8	7.9	3	99.0	56
628	9.2	53.6	1497	162.0	165.4	4.0	15.2	8.1	8.3	3	99.0	56
629			1592	162.0	165.4	3.9	15.6	8.7	7.8	3	99.0	56
630	9.0	53.9	1476	162.0	165.4	3.9	15.5	7.7	8.1	3	99.0	56
631	8.5	53.9	1346	162.0	165.4	3.2	15.4	6.5	7.9	3	99.0	56
632	8.2	53.6	1257	162.0	165.4	2.5	14.9	6.2	9.5	3	99.0	56
633	7.9	53.3	1189	162.0	165.4	2.2	14.5	5.9	9.1	3	99.0	56
634	8.6	53.6	1382	162.0	165.4	2.5	15.3	8.0	8.7	3	99.0	56
635			1500	162.0	165.4	3.4	15.6	8.3	7.9	3	99.0	56
636			1590	162.0	165.4	4.0	15.8	8.5	7.4	3	99.0	56
637	10.0	54.0	1594	162.0	165.4	5.7	16.0	9.7	6.6	3	99.0	56
638			1553	162.0	165.4	4.3	15.4	7.7	6.9	3	99.0	56
639	8.4	53.5	1332	162.0	165.4	3.1	15.3	6.6	7.1	3	99.0	56
640	8.6	53.6	1365	162.0	165.4	2.7	15.4	7.2	7.3	3	99.0	56
641	8.6	54.1	1375	162.0	165.4	2.9	15.4	7.5	6.6	3	99.0	56
642			1533	162.0	165.4	3.4	15.6	9.0	7.2	3	99.0	56
643			1527	162.0	165.4	3.7	15.6	8.3	8.4	3	99.0	56
644	8.8	53.9	1422	162.0	165.4	3.2	15.5	8.4	8.1	3	99.0	56
645	8.5	53.8	1354	162.0	165.4	2.9	15.4	6.6	7.4	3	99.0	56
646	8.5	53.3	1340	162.0	165.4	2.7	15.0	6.8	7.5	3	99.0	57
647			1603	162.0	165.4	4.1	15.7	7.7	7.0	3	99.0	56
648	9.9	54.3	1598	162.0	165.4	5.9	16.0	9.6	7.3	3	99.0	56
649	9.8	54.4	1578	162.0	165.4	6.1	15.7	9.5	7.4	3	99.0	56
650			1518	162.0	165.4	5.0	15.3	8.8	7.8	3	99.0	56
651			1530	162.0	165.4	5.0	15.3	8.3	8.2	3	99.0	56
652			1572	162.0	165.4	5.1	15.4	8.0	8.2	3	99.0	56
653			1583	162.0	165.4	4.0	15.3	8.0	7.2	3	99.0	56
654	9.4	54.4	1510	162.0	165.4	6.5	15.8	9.1	6.6	3	99.0	56
655	10.3	55.0	1502	162.0	165.4	6.5	15.5	10.0	6.1	3	99.0	56
656			1538	162.0	165.4	5.2	15.3	8.0	6.6	3	99.0	56
657	9.5	53.7	1543	162.0	165.4	6.1	15.6	9.2	6.0	3	99.0	56
658	9.6	53.4	1549	162.0	165.4	5.5	15.4	9.3	6.2	3	99.0	56
659			1523	162.0	165.4	3.7	15.1	8.6	7.2	3	99.0	57
660			1503	162.0	165.4	3.4	15.2	8.2	7.7	3	99.0	57
661	8.4	53.0	1322	162.0	165.4	3.2	15.2	7.8	7.1	3	99.0	57
662	8.5	53.5	1341	162.0	165.4	2.9	15.3	7.9	7.1	3	99.0	57
663	8.3	53.3	1294	162.0	165.4	2.5	15.1	7.1	7.2	3	99.0	57
664	8.3	52.4	1292	162.0	165.4	2.4	15.0	7.4	7.1	3	99.0	58
665	8.9	53.4	1464	162.0	165.4	2.9	15.4	7.3	5.5	3	99.0	58
666			1557	162.0	165.4	3.6	15.6	8.3	6.5	3	99.0	58
667			1524	162.0	165.4	3.3	15.6	7.9	6.3	3	99.0	58
668	8.5	53.8	1347	162.0	165.4	3.2	15.4	6.9	5.5	3	99.0	58
669	8.6	53.3	1363	162.0	165.4	2.8	15.1	7.0	6.0	3	99.0	58
670	9.7	54.0	1619	162.0	165.4	6.8	16.2	9.5	6.0	3	99.0	58
671	10.3	54.2	1564	162.0	165.4	7.9	15.7	10.0	8.4	3	99.0	59
672	9.9	53.4	1573	162.0	165.4	6.9	15.6	9.6	8.7	3	99.0	59
673			1563	162.0	165.4	5.7	15.3	7.6	7.7	3	99.0	59
674			1588	162.0	165.4	5.4	15.4	8.3	7.4	3	99.0	59
675	9.5	53.6	1599	162.0	165.4	6.2	15.6	9.3	7.3	3	99.0	59
676			1566	162.0	165.4	5.4	15.3	8.1	7.9	3	99.0	58
677			1579	162.0	165.4	3.9	15.2	8.9	8.1	3	99.0	57
678	9.1	53.0	1490	162.0	165.4	3.7	15.4	8.0	7.5	3	99.0	57
679	8.9	54.1	1462	162.0	165.4	3.2	15.5	8.2	7.0	3	99.0	57
680	8.8	53.9	1437	162.0	165.4	3.4	15.5	8.1	5.8	3	99.0	57
681	8.9	54.1	1443	162.0	165.4	3.0	15.5	8.3	5.9	3	99.0	57
682	8.7	53.8	1394	162.0	165.4	3.2	15.5	7.7	5.8	3	99.0	57
683	8.9	54.0	1461	162.0	165.4	2.8	15.5	8.5	6.7	3	99.0	58
684	8.7	53.7	1409	162.0	165.4	3.2	15.5	7.4	6.3	3	99.0	58
685	8.3	53.6	1282	162.0	165.4	2.7	14.9	6.7	6.4	3	99.0	58
686	7.9	52.6	1165	162.0	165.4	2.2	14.5	7.0	7.5	3	99.0	58
687	7.5	51.8	1041	162.0	165.4	1.8	13.7	5.8	9.3	3	99.0	58
688	7.7	51.8	1087	162.0	165.4	1.7	14.2	6.7	8.6	3	99.0	57
689	8.1	52.6	1241	162.0	165.4	2.3	14.9	6.7	7.1	3	99.0	56
690	8.8	53.2	1431	162.0	165.4	3.0	15.4	8.1	6.6	3	99.0	56
691	8.4	54.0	1320	162.0	165.4	3.2	15.3	7.7	7.1	3	99.0	56
692	8.0	53.2	1221	162.0	165.4	2.5	14.7	6.6	7.5	3	99.0	56
693	7.8	53.2	1135	162.0	165.4	2.1	14.3	6.9	7.1	3	99.0	56
694	7.5	52.4	1040	162.0	165.3	1.7	13.8	6.2	6.1	3	99.0	57
695	7.3	51.8	968	162.0	165.3	1.5	13.5	5.5	7.2	3	99.0	58
696	7.4	51.5	969	162.0	165.3	1.3	13.6	7.2	6.8	3	99.0	58
697	7.5	51.7	1009	162.0	165.3	1.4	13.7	6.7	6.9	3	99.0	58
698	7.8	52.6	1158	162.0	165.3	1.9	14.6	7.8	6.6	3	99.0	58
699	8.0	53.3	1221	162.0	165.3	2.5	14.7	8.2	6.3	3	99.0	58
700	8.1	53.2	1245	162.0	165.3	2.2	14.8	6.8	6.4	3	99.0	58
701			1534	162.0	165.3	3.3	15.5	7.2	8.1	3	99.0	58
702	10.4	53.9	1613	162.0	165.3	5.4	16.0	10.1	8.9	3	99.0	58
703	10.4	54.6	1577	162.0	165.3	6.2	15.8	10.1	8.8	3	99.0	58
704			1564	162.0	165.3	4.9	15.5	8.7	8.7	3	99.0	58

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
705	8.9	53.1	1461	162.0	165.3	3.4	15.2	8.4	8.7	3	99.0	58
706	8.9	53.5	1439	162.0	165.3	2.9	15.5	7.8	8.9	3	99.0	57
707	8.6	53.7	1361	162.0	165.3	3.1	15.4	7.9	9.0	3	99.0	55
708	8.0	53.3	1228	162.0	165.3	4.1	14.7	7.7	8.8	3	99.0	55
709	7.6	52.0	1046	162.0	165.3	4.4	13.8	6.6	8.2	3	99.0	55
710	7.5	51.7	1035	162.0	165.3	4.4	14.0	6.3	8.8	3	99.0	55
711	7.6	51.6	1068	162.0	165.3	4.4	14.0	6.7	9.0	3	99.0	55
712	7.8	51.9	1123	162.0	165.3	4.4	14.4	7.1	7.9	3	99.0	55
713	8.2	52.7	1270	162.0	165.3	4.3	15.0	8.3	7.0	3	99.0	56
714	8.5	53.0	1351	162.0	165.3	3.8	15.2	8.1	6.4	3	99.0	56
715	8.6	53.8	1366	162.0	165.3	2.9	15.4	8.4	6.6	3	99.0	56
716	8.6	54.0	1367	162.0	165.3	2.8	15.3	7.9	6.8	3	99.0	56
717	9.1	53.5	1483	162.0	165.3	3.3	15.5	8.6	6.5	3	99.0	56
718	8.6	53.9	1369	162.0	165.3	3.0	15.4	7.1	6.3	3	99.0	56
719	8.6	54.1	1368	162.0	165.3	2.9	15.4	7.3	6.4	3	99.0	57
720			1525	162.0	165.3	3.1	15.6	7.9	6.4	3	99.0	57
721	9.3	54.3	1586	162.0	165.3	3.9	15.7	9.0	6.1	3	99.0	57
722			1514	162.0	165.3	3.6	15.5	8.1	6.7	3	99.0	57
723	8.7	54.0	1405	162.0	165.3	3.1	15.5	7.8	6.2	3	99.0	57
724	8.6	53.4	1371	162.0	165.3	2.7	15.4	8.0	7.7	3	99.0	57
725	8.4	54.1	1329	162.0	165.3	2.8	15.2	8.3	7.6	3	99.0	57
726	8.2	53.2	1262	162.0	165.3	2.4	14.8	6.9	7.4	3	99.0	57
727			1542	162.0	165.3	2.9	15.4	8.7	7.7	3	99.0	57
728			1540	162.0	165.3	3.7	15.6	8.7	7.9	3	99.0	57
729	8.9	53.5	1461	162.0	165.3	3.1	15.6	8.0	7.4	3	99.0	57
730			1604	162.0	165.3	4.6	15.9	8.5	7.0	3	99.0	57
731			1592	162.0	165.3	6.2	16.0	8.9	6.5	3	99.0	57
732	10.3	54.2	1578	162.0	165.3	6.5	15.8	10.0	6.3	3	99.0	57
733			1554	162.0	165.3	5.2	15.4	8.6	6.2	3	99.0	57
734			1536	162.0	165.3	3.4	15.2	8.2	5.9	3	99.0	57
735	9.3	53.6	1539	162.0	165.3	3.2	15.5	9.0	6.0	3	99.0	57
736	9.3	53.5	1591	162.0	165.3	4.1	15.7	9.0	5.8	3	99.0	57
737			1582	162.0	165.3	4.8	15.7	8.6	7.8	3	99.0	58
738	8.9	53.5	1456	162.0	165.3	4.3	15.4	9.4	8.2	3	99.0	58
739	8.6	53.3	1371	162.0	165.3	5.0	15.1	8.3	8.9	3	99.0	58
740	8.2	52.6	1277	162.0	165.3	4.9	14.7	7.3	8.9	3	99.0	58
741	7.9	52.5	1194	162.0	165.3	4.9	14.5	7.2	7.6	3	99.0	58
742	7.7	52.2	1113	162.0	165.3	5.0	14.1	7.1	6.8	3	99.0	58
743	7.5	52.0	1009	162.0	165.3	5.0	13.7	6.0	6.2	3	99.0	57
744	7.5	50.7	1030	162.0	165.3	3.8	13.8	6.3	6.6	3	99.0	57
745	8.8	52.3	1423	162.0	165.3	2.1	15.1	9.0	8.4	3	99.0	57
746	9.6	53.2	1533	162.0	165.3	3.7	15.5	9.3	8.1	3	99.0	57
747	9.4	53.5	1532	162.0	165.3	3.6	15.6	9.1	7.7	3	99.0	57
748			1592	162.0	165.3	3.7	15.7	8.3	7.1	3	99.0	57
749			1606	162.0	165.3	5.8	16.1	8.7	7.3	3	99.0	57
750	10.8	54.9	1591	162.0	165.3	7.4	16.1	10.5	8.5	3	99.0	57
751	11.2	54.3	1571	162.0	165.3	7.5	15.8	10.8	8.3	3	99.0	57
752	10.3	53.7	1556	162.0	165.3	6.4	15.3	10.0	7.2	3	99.0	57
753			1570	162.0	165.3	4.4	15.1	8.6	7.3	3	99.0	57
754	9.6	53.3	1603	162.0	165.3	5.4	15.6	9.4	7.1	3	99.0	57
755	9.6	53.7	1599	162.0	165.3	6.0	15.7	9.3	7.2	3	99.0	57
756	10.2	53.9	1591	162.0	165.3	6.3	15.7	10.0	8.8	3	99.0	57
757	10.6	54.4	1590	162.0	165.3	7.3	15.8	10.3	9.2	3	99.0	57
758	9.9	53.8	1568	162.0	165.3	6.4	15.5	9.6	9.0	3	99.0	57
759	9.4	53.7	1578	162.0	165.3	5.7	15.4	9.1	9.4	3	99.0	57
760	9.0	53.3	1479	162.0	165.3	5.0	15.3	8.4	10.5	3	99.0	57
761	8.5	53.6	1345	162.0	165.3	5.0	15.3	8.8	10.5	3	99.0	55
762	8.0	52.5	1204	162.0	165.3	4.7	14.8	7.4	9.6	3	99.0	55
763	9.0	52.5	1479	162.0	165.3	4.2	15.5	8.6	8.1	3	99.0	55
764			1579	162.0	165.3	5.1	15.7	7.7	8.6	3	99.0	55
765			1555	162.0	165.3	4.6	15.6	8.4	8.0	3	99.0	55
766			1596	162.0	165.3	5.8	15.9	8.6	8.3	3	99.0	56
767			1579	162.0	165.3	5.7	15.7	8.0	7.4	3	99.0	56
768			1587	162.0	165.3	6.1	15.7	8.6	7.2	3	99.0	56
769	9.8	54.3	1588	162.0	165.3	8.3	15.9	9.5	7.8	3	99.0	56
770	10.1	53.6	1569	162.0	165.4	5.4	15.5	9.8	6.2	3	99.0	57
771			1568	162.0	165.4	5.2	15.5	8.0	6.7	3	99.0	57
772	10.0	53.3	1558	162.0	165.4	4.7	15.4	9.7	7.5	3	99.0	57
773	8.7	53.3	1399	162.0	165.4	3.3	15.2	7.6	6.9	3	99.0	57
774	9.0	53.6	1477	162.0	165.4	3.2	15.5	8.4	7.7	3	99.0	57
775			1543	162.0	165.4	3.9	15.7	7.5	7.2	3	99.0	57
776			1587	162.0	165.4	5.9	16.1	8.3	6.3	3	99.0	57
777	10.0	54.3	1560	162.0	165.4	6.8	15.9	9.7	7.2	3	99.0	57
778	9.6	53.6	1546	162.0	165.4	6.4	15.7	9.3	6.8	3	99.0	57
779			1547	162.0	165.4	5.5	15.5	8.6	7.7	3	99.0	57
780	8.9	53.2	1444	162.0	165.4	3.6	15.1	7.2	6.8	3	99.0	57
781			1582	162.0	165.4	4.0	15.7	7.7	6.4	3	99.0	57
782			1569	162.0	165.4	5.0	15.7	7.7	6.7	3	99.0	57
783			1561	162.0	165.4	4.8	15.6	9.0	6.6	3	99.0	57
784			1562	162.0	165.4	4.7	15.6	8.0	6.7	3	99.0	57
785			1561	162.0	165.4	4.7	15.6	7.4	7.1	3	99.0	57
786			1557	162.0	165.4	4.4	15.5	7.4	6.7	3	99.0	57
787			1559	162.0	165.4	3.8	15.5	8.7	6.5	3	99.0	57
788			1520	162.0	165.4	3.6	15.5	8.0	6.8	3	99.0	57
789			1527	162.0	165.4	3.7	15.6	7.9	6.5	3	99.0	57
790			1585	162.0	165.4	5.4	16.0	8.6	6.5	3	99.0	57
791			1564	162.0	165.4	6.2	15.9	8.9	6.9	3	99.0	57
792	9.5	53.6	1545	162.0	165.4	5.8	15.6	9.2	5.8	3	99.0	57

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
793	9.3	53.5	1557	162.0	165.4	5.5	15.6	9.0	7.0	3	99.0	57
794			1530	162.0	165.4	4.5	15.2	8.3	7.0	3	99.0	57
795	8.5	53.1	1356	162.0	165.4	3.1	15.3	8.6	7.0	3	99.0	57
796	8.5	53.6	1345	162.0	165.4	3.1	15.4	7.0	6.2	3	99.0	57
797	9.0	53.4	1476	162.0	165.4	3.4	15.5	8.5	6.1	3	99.0	57
798	9.9	54.4	1586	162.0	165.4	5.5	16.1	9.6	6.8	3	99.0	57
799			1545	162.0	165.4	5.3	15.7	8.1	6.4	3	99.0	57
800			1564	162.0	165.4	5.3	15.7	8.5	7.2	3	99.0	57
801	11.0	53.9	1567	162.0	165.4	6.5	15.8	10.7	6.8	3	99.0	57
802			1560	162.0	165.4	6.9	15.7	8.9	5.2	3	99.0	57
803	9.3	53.5	1551	162.0	165.4	6.5	15.5	9.0	5.0	3	99.0	58
804			1558	162.0	165.4	5.9	15.5	9.0	5.3	3	99.0	58
805	10.4	53.6	1561	162.0	165.4	5.6	15.5	10.1	5.2	3	99.0	58
806			1572	162.0	165.4	5.7	15.5	8.6	5.6	3	99.0	58
807	10.4	53.8	1563	162.0	165.4	6.1	15.6	10.1	6.3	3	99.0	58
808	9.6	53.6	1539	162.0	165.4	4.5	15.2	9.3	7.1	3	99.0	58
809			1515	162.0	165.4	3.3	15.3	8.2	7.5	3	99.0	57
810			1579	162.0	165.4	4.5	15.9	7.6	7.2	3	99.0	57
811	10.0	54.5	1562	162.0	165.4	6.5	16.0	9.7	8.4	3	99.0	57
812			1552	162.0	165.4	6.3	15.7	8.7	8.1	3	99.0	57
813			1557	162.0	165.4	5.7	15.6	8.3	8.3	3	99.0	57
814			1552	162.0	165.4	5.8	15.5	8.4	7.2	3	99.0	57
815			1557	162.0	165.4	5.0	15.4	8.8	8.1	3	99.0	56
816	10.0	53.6	1586	162.0	165.4	6.5	15.8	9.7	7.5	3	99.0	56
817	9.4	54.3	1558	162.0	165.4	7.1	15.7	9.2	7.8	3	99.0	56
818			1554	162.0	165.4	5.9	15.5	7.1	7.9	3	99.0	56
819	10.6	54.4	1573	162.0	165.4	8.1	15.9	10.3	6.9	3	99.0	56
820	9.5	54.1	1540	162.0	165.4	7.1	15.4	9.2	6.4	3	99.0	56
821			1542	162.0	165.4	4.6	15.1	8.3	6.5	3	99.0	56
822	8.7	53.1	1395	162.0	165.4	3.5	15.1	9.0	6.9	3	99.0	56
823	8.4	53.4	1330	162.0	165.4	3.1	15.3	7.8	6.7	3	99.0	56
824	9.5	54.1	1581	162.0	165.4	4.4	15.9	9.3	5.5	3	99.0	56
825			1566	162.0	165.4	6.3	16.0	8.9	7.0	3	99.0	56
826			1541	162.0	165.4	5.2	15.6	8.6	7.3	3	99.0	56
827			1548	162.0	165.4	4.5	15.4	6.8	7.5	3	99.0	56
828	8.9	53.4	1461	162.0	165.4	3.4	15.3	7.3	8.0	3	99.0	56
829	8.8	53.6	1418	162.0	165.4	3.2	15.5	6.8	7.7	3	99.0	56
830	8.5	53.4	1336	162.0	165.4	3.2	15.2	7.1	7.6	3	99.0	56
831	10.0	53.2	1576	162.0	165.4	3.9	15.7	9.7	7.5	3	99.0	56
832			1551	162.0	165.4	4.2	15.5	7.2	6.7	3	99.0	56
833			1569	162.0	165.4	3.7	15.7	8.2	6.1	3	99.0	56
834			1572	162.0	165.4	4.2	15.7	8.8	5.9	3	99.0	56
835	9.4	54.0	1541	162.0	165.4	4.1	15.6	9.2	6.4	3	99.0	56
836	8.9	53.7	1460	162.0	165.4	3.2	15.5	8.5	7.0	3	99.0	56
837	9.1	53.6	1487	162.0	165.4	3.2	15.6	8.6	7.4	3	99.0	56
838	9.3	54.1	1579	162.0	165.4	4.9	16.0	9.0	7.2	3	99.0	56
839	8.9	54.2	1458	162.0	165.4	4.0	15.4	8.5	6.2	3	99.0	56
840			1570	162.0	165.4	3.6	15.7	8.5	5.0	3	99.0	56
841			1545	162.0	165.4	4.7	15.7	7.8	5.5	3	99.0	56
842	8.7	53.9	1402	162.0	165.4	3.1	15.4	7.0	5.0	3	99.0	56
843			1551	162.0	165.4	3.7	15.7	7.5	4.4	3	99.0	56
844	8.8	54.0	1431	162.0	165.4	3.2	15.4	7.3	5.1	3	99.0	56
845	9.6	53.9	1593	162.0	165.4	5.5	16.1	9.3	6.6	3	99.0	58
846	10.9	54.5	1566	162.0	165.4	7.4	16.0	10.6	7.7	3	99.0	58
847	9.8	54.1	1547	162.0	165.4	7.0	15.7	9.5	7.6	3	99.0	58
848			1538	162.0	165.4	5.7	15.4	7.4	7.7	3	99.0	58
849			1558	162.0	165.4	5.0	15.3	7.6	8.3	3	99.0	58
850	9.2	53.6	1497	162.0	165.4	4.3	15.2	8.4	7.8	3	99.0	58
851	8.2	53.1	1257	162.0	165.4	3.0	15.1	6.6	8.0	3	99.0	56
852	7.7	53.1	1107	162.0	165.4	2.3	14.2	6.0	7.1	3	99.0	56
853	7.4	51.6	991	162.0	165.4	1.6	13.7	5.8	6.9	3	99.0	56
854	7.6	52.2	1071	162.0	165.4	1.6	14.2	5.7	6.0	3	99.0	56
855	8.0	53.0	1212	162.0	165.4	2.2	14.8	7.8	6.4	3	99.0	56
856			1524	162.0	165.4	3.3	15.5	7.4	5.1	3	99.0	56
857	8.8	54.5	1418	162.0	165.4	3.7	15.5	7.3	5.1	3	99.0	57
858	9.7	54.8	1599	162.0	165.4	5.8	16.2	9.4	5.8	3	99.0	57
859	9.4	54.9	1541	162.0	165.4	7.2	15.8	9.1	6.0	3	99.0	57
860	9.4	53.5	1545	162.0	165.4	6.4	15.6	9.1	6.8	3	99.0	57
861			1546	162.0	165.4	6.1	15.4	8.1	6.2	3	99.0	57
862			1545	162.0	165.4	4.6	15.2	8.5	7.1	3	99.0	57
863			1520	162.0	165.4	3.9	15.2	8.1	7.3	3	99.0	57
864	8.7	53.5	1409	162.0	165.4	3.2	15.4	7.0	6.4	3	99.0	57
865			1580	162.0	165.4	4.4	15.9	8.9	6.0	3	99.0	57
866			1565	162.0	165.4	5.2	15.9	8.5	6.9	3	99.0	57
867			1567	162.0	165.4	6.0	15.9	8.5	6.8	3	99.0	57
868	9.7	54.1	1556	162.0	165.4	6.4	15.7	9.4	7.2	3	99.0	57
869	9.9	53.6	1558	162.0	165.4	6.1	15.7	9.6	7.4	3	99.0	57
870			1542	162.0	165.4	5.7	15.4	8.4	6.8	3	99.0	57
871			1514	162.0	165.4	3.8	15.1	8.2	6.8	3	99.0	57
872	9.1	53.2	1488	162.0	165.4	3.4	15.4	8.5	8.3	3	99.0	57
873			1567	162.0	165.4	3.9	15.7	7.5	8.1	3	99.0	57
874			1566	162.0	165.4	4.6	15.7	7.7	7.7	3	99.0	57
875			1571	162.0	165.4	5.4	15.9	8.4	7.6	3	99.0	56
876			1545	162.0	165.4	4.7	15.5	8.3	7.4	3	99.0	56
877			1540	162.0	165.4	4.0	15.4	8.0	8.0	3	99.0	56
878	8.5	53.8	1356	162.0	165.4	3.1	15.4	6.6	7.8	3	99.0	56
879	9.0	54.6	1465	162.0	165.4	3.3	15.6	7.0	7.5	3	99.0	56
880			1510	162.0	165.4	3.4	15.6	6.3	7.0	3	99.0	56

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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	9.4	53.7	1545	162.0	165.4	3.5	15.6	9.1	7.3	3	99.0	56
882	9.1	53.5	1486	162.0	165.4	3.4	15.6	8.5	6.8	3	99.0	56
883	8.7	53.5	1408	162.0	165.4	3.5	15.5	8.0	6.2	3	99.0	56
884	8.7	54.0	1409	162.0	165.4	2.9	15.4	7.5	6.4	3	99.0	56
885			1507	162.0	165.4	3.4	15.6	7.8	7.7	3	99.0	56
886	8.5	53.7	1356	162.0	165.4	3.2	15.5	7.6	7.2	3	99.0	56
887	8.5	53.9	1350	162.0	165.4	2.9	15.4	6.8	8.0	3	99.0	56
888	8.9	53.8	1444	162.0	165.4	2.8	15.5	8.0	7.6	3	99.0	56
889	8.4	53.7	1314	162.0	165.4	3.1	15.3	7.9	8.7	3	99.0	56
890	8.6	53.2	1368	162.0	165.4	2.8	15.3	7.3	6.7	3	99.0	56
891	8.2	54.0	1270	162.0	165.4	3.0	15.0	7.5	4.7	3	99.0	56
892	8.0	52.9	1206	162.0	165.4	2.3	14.7	7.8	6.5	3	99.0	56
893	8.2	52.6	1266	162.0	165.4	2.2	15.0	7.3	7.3	3	99.0	56
894	8.8	53.5	1427	162.0	165.4	2.9	15.5	8.8	7.4	3	99.0	57
895	8.6	53.4	1384	162.0	165.4	3.2	15.5	8.2	7.1	3	99.0	57
896	8.5	53.8	1349	162.0	165.4	2.7	15.3	7.2	6.6	3	99.0	57
897	8.5	53.8	1355	162.0	165.4	2.6	15.4	7.4	6.6	3	99.0	57
898	8.6	53.9	1380	162.0	165.4	2.9	15.4	7.8	6.7	3	99.0	57
899			1560	162.0	165.4	3.7	15.7	8.4	5.4	3	99.0	56
900	9.5	54.0	1587	162.0	165.4	5.8	16.1	9.3	5.1	3	99.0	56
901			1556	162.0	165.4	6.8	15.9	8.2	5.3	3	99.0	56
902			1545	162.0	165.4	6.0	15.6	8.6	5.5	3	99.0	56
903			1547	162.0	165.4	5.4	15.4	8.2	6.1	3	99.0	56
904			1548	162.0	165.4	4.5	15.3	7.9	5.7	3	99.0	57
905	8.8	53.2	1415	162.0	165.4	3.3	15.3	7.3	5.4	3	99.0	57
906			1555	162.0	165.4	3.6	15.7	7.9	6.2	3	99.0	57
907			1566	162.0	165.4	4.5	15.7	7.4	7.1	3	99.0	57
908	9.4	53.5	1555	162.0	165.4	3.6	15.6	9.1	6.3	3	99.0	57
909			1581	162.0	165.4	4.4	16.0	8.4	6.4	3	99.0	57
910	9.4	54.3	1566	162.0	165.4	5.9	16.0	9.1	6.4	3	99.0	57
911	9.6	54.0	1551	162.0	165.4	5.4	15.7	9.4	5.8	3	99.0	57
912	9.4	53.6	1558	162.0	165.4	6.0	15.7	9.1	5.7	3	99.0	57
913	9.4	53.2	1544	162.0	165.4	5.0	15.4	9.1	6.0	3	99.0	57
914			1506	162.0	165.4	3.7	15.2	7.2	7.9	3	99.0	57
915			1578	162.0	165.4	4.0	15.6	7.5	7.5	3	99.0	57
916			1555	162.0	165.4	4.1	15.5	8.0	7.1	3	99.0	57
917			1568	162.0	165.4	3.6	15.6	8.2	6.8	3	99.0	57
918			1575	162.0	165.4	4.5	15.8	8.3	7.4	3	99.0	57
919	9.8	53.8	1545	162.0	165.4	4.7	15.6	9.5	7.5	3	99.0	57
920	9.3	53.6	1499	162.0	165.4	3.4	15.5	9.1	7.0	3	99.0	57
921	8.4	53.9	1318	162.0	165.4	3.1	15.3	7.3	7.8	3	99.0	57
922	8.1	53.2	1242	162.0	165.4	2.7	14.9	6.6	6.4	3	99.0	57
923	7.8	52.7	1137	162.0	165.4	2.2	14.4	7.4	7.6	3	99.0	57
924	7.8	52.0	1157	162.0	165.4	2.0	14.4	7.7	7.0	3	99.0	57
925			1595	162.0	165.4	5.0	15.7	8.5	7.3	3	99.0	57
926	10.4	53.9	1589	162.0	165.4	7.0	16.0	10.1	7.0	3	99.0	57
927	11.1	54.5	1560	162.0	165.4	7.3	15.8	10.8	6.4	3	99.0	57
928			1550	162.0	165.4	7.1	15.6	8.9	5.3	3	99.0	57
929	9.6	53.5	1551	162.0	165.4	6.0	15.4	9.3	5.8	3	99.0	56
930			1559	162.0	165.4	5.5	15.4	7.4	5.4	3	99.0	56
931			1577	162.0	165.4	5.7	15.6	8.6	7.0	3	99.0	56
932	10.7	53.9	1573	162.0	165.4	7.0	15.7	10.4	7.6	3	99.0	56
933	9.3	53.8	1551	162.0	165.4	5.9	15.5	9.1	7.4	3	99.0	56
934			1549	162.0	165.4	4.5	15.3	7.8	7.6	3	99.0	56
935			1567	162.0	165.4	4.0	15.3	7.6	6.8	3	99.0	56
936			1578	162.0	165.4	4.8	15.6	8.5	5.7	3	99.0	56
937			1564	162.0	165.4	5.0	15.6	9.0	5.0	3	99.0	56
938			1570	162.0	165.4	4.7	15.6	7.6	4.5	3	99.0	56
939			1565	162.0	165.4	4.9	15.6	7.2	5.5	3	99.0	56
940			1570	162.0	165.4	5.3	15.7	7.6	5.4	3	99.0	56
941			1552	162.0	165.4	4.9	15.5	7.9	5.3	3	99.0	57
942			1568	162.0	165.4	5.2	15.6	8.4	5.3	3	99.0	57
943			1565	162.0	165.4	5.3	15.6	8.9	5.7	3	99.0	57
944	10.6	53.9	1569	162.0	165.4	5.8	15.7	10.3	6.4	3	99.0	57
945			1546	162.0	165.4	5.0	15.4	8.2	6.9	3	99.0	57
946	9.7	54.0	1547	162.0	165.4	5.7	15.7	9.5	6.8	3	99.0	57
947	9.0	53.8	1481	162.0	165.4	4.9	15.3	9.1	6.5	3	99.0	56
948			1510	162.0	165.4	4.5	15.4	8.8	6.2	3	99.0	56
949	9.7	53.2	1512	162.0	165.4	4.9	15.5	9.4	5.7	3	99.0	56
950	9.2	53.5	1496	162.0	165.4	4.3	15.9	9.1	6.5	3	99.0	57
951	9.1	54.2	1483	162.0	165.4	5.8	15.9	8.8	6.4	3	99.0	57
952	8.7	53.4	1408	162.0	165.4	3.7	15.1	6.8	5.9	3	99.0	57
953	8.5	52.6	1354	162.0	165.4	2.6	15.3	6.8	6.0	3	99.0	57
954	8.9	53.7	1462	162.0	165.4	3.3	15.6	8.2	6.4	3	99.0	57
955			1508	162.0	165.4	3.6	15.6	7.1	6.4	3	99.0	57
956	9.5	53.6	1569	162.0	165.4	4.2	15.8	9.2	5.0	3	99.0	57
957			1571	162.0	165.4	4.8	15.8	8.9	5.2	3	99.0	57
958			1562	162.0	165.4	5.1	15.8	8.6	5.2	3	99.0	57
959			1558	162.0	165.4	5.5	15.7	9.0	5.0	3	99.0	57
960			1558	162.0	165.4	5.2	15.6	8.6	5.3	3	99.0	57
961			1511	162.0	165.4	3.9	15.2	8.2	4.8	3	99.0	58
962	8.9	53.3	1445	162.0	165.4	3.3	15.4	8.2	5.4	3	99.0	58
963	8.8	53.7	1430	162.0	165.4	3.3	15.5	8.0	5.2	3	99.0	58
964	8.5	53.6	1336	162.0	165.4	3.2	15.4	7.8	4.7	3	99.0	58
965	8.3	53.2	1296	162.0	165.4	2.7	15.1	7.7	4.8	3	99.0	58
966	8.9	53.3	1445	162.0	165.4	3.1	15.5	8.0	5.5	3	99.0	58
967	9.1	53.9	1485	162.0	165.4	3.4	15.6	7.0	4.6	3	99.0	58
968			1536	162.0	165.4	3.6	15.6	8.5	6.0	3	99.0	58

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

Data Point #	Standardized Wind Speed	LAeq	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	10.0	53.8	1575	162.0	165.4	4.2	15.8	9.7	5.2	3	99.0	58
970			1569	162.0	165.4	5.1	15.9	7.8	5.5	3	99.0	58
971			1546	162.0	165.4	4.7	15.6	7.0	6.1	3	99.0	58
972			1565	162.0	165.4	4.1	15.6	8.5	6.0	3	99.0	57
973	9.3	53.8	1576	162.0	165.4	6.0	15.9	9.1	7.5	3	99.0	57
974	10.6	53.7	1564	162.0	165.4	6.4	15.8	10.3	6.9	3	99.0	57
975	10.2	53.2	1540	162.0	165.4	5.5	15.4	9.9	6.3	3	99.0	57
976	8.5	52.7	1338	162.0	165.4	3.5	15.1	9.2	7.3	3	99.0	57
977	8.2	52.8	1269	162.0	165.4	2.6	15.1	7.8	6.8	3	99.0	57
978	8.1	52.4	1240	162.0	165.4	2.6	14.9	6.6	6.1	3	99.0	56
979	8.5	52.9	1352	162.0	165.4	2.7	15.3	8.9	6.2	3	99.0	56
980	9.0	54.0	1479	162.0	165.4	3.6	15.6	8.9	7.4	3	99.0	56
981	8.9	53.5	1460	162.0	165.4	3.8	15.5	8.4	7.5	3	99.0	56
982	9.1	53.3	1487	162.0	165.4	3.4	15.6	8.8	6.8	3	99.0	56
983	9.2	53.0	1491	162.0	165.4	3.5	15.6	9.2	5.7	3	99.0	56
984	8.9	53.4	1448	162.0	165.4	3.5	15.5	8.0	4.8	3	99.0	57
985			1561	162.0	165.4	3.7	15.7	8.8	4.9	3	99.0	57
986	9.8	53.7	1566	162.0	165.4	4.6	15.8	9.5	5.7	3	99.0	57
987			1550	162.0	165.4	4.1	15.5	8.9	5.9	3	99.0	57
988			1556	162.0	165.4	3.5	15.5	8.5	5.5	3	99.0	57
989			1548	162.0	165.4	3.6	15.6	8.9	5.4	3	99.0	57
990			1570	162.0	165.4	3.7	15.7	8.4	5.8	3	99.0	57
991	9.5	53.9	1580	162.0	165.4	5.3	16.0	9.3	6.0	3	99.0	57
992			1550	162.0	165.4	5.6	15.8	8.6	5.2	3	99.0	57
993	8.9	52.9	1448	162.0	165.4	4.4	15.4	8.3	5.8	3	99.0	57
994	8.4	53.1	1317	162.0	165.4	4.6	15.0	7.6	5.0	3	99.0	57
995	8.0	52.5	1198	162.0	165.4	4.5	14.6	7.3	5.5	3	99.0	57
996	7.8	52.0	1129	162.0	165.4	4.5	14.3	7.6	6.0	3	99.0	57
997	7.8	51.7	1135	162.0	165.4	4.5	14.4	7.3	5.4	3	99.0	57
998	8.6	52.6	1378	162.0	165.4	3.3	15.3	8.8	5.5	3	99.0	57
999	8.9	53.6	1449	162.0	165.4	3.2	15.5	7.7	5.6	3	99.0	57
1000	9.0	53.7	1466	162.0	165.4	3.6	15.6	7.6	6.2	3	99.0	57
1001	8.6	53.8	1362	162.0	165.4	3.2	15.5	7.4	6.4	3	99.0	57
1002	8.7	53.8	1406	162.0	165.4	2.9	15.5	9.3	6.2	3	99.0	57
1003	8.8	53.8	1426	162.0	165.4	3.1	15.6	8.4	5.8	3	99.0	56
1004	9.1	54.1	1485	162.0	165.4	3.4	15.6	8.8	6.2	3	99.0	56
1005			1560	162.0	165.4	3.7	15.7	8.5	6.3	3	99.0	56
1006			1564	162.0	165.4	3.8	15.7	8.5	6.8	3	99.0	56
1007			1552	162.0	165.4	3.7	15.6	8.7	6.0	3	99.0	56
1008	10.0	53.4	1564	162.0	165.4	3.6	15.7	9.7	6.4	3	99.0	57
1009			1535	162.0	165.4	4.1	15.7	8.7	7.8	3	99.0	57
1010	8.6	53.2	1386	162.0	165.4	4.0	15.4	7.8	8.0	3	99.0	57
1011	8.3	53.1	1294	162.0	165.4	4.0	14.9	7.9	7.5	3	99.0	57
1012	8.3	52.9	1289	162.0	165.4	3.7	15.1	9.3	7.3	3	99.0	57
1013	8.0	52.7	1227	162.0	165.4	4.0	14.7	7.7	6.9	3	99.0	57
1014	7.9	52.2	1180	162.0	165.4	3.9	14.6	8.9	6.3	3	99.0	56
1015	9.0	52.5	1478	162.0	165.4	3.8	15.4	8.7	5.7	3	99.0	55
1016			1564	162.0	165.4	4.3	15.6	9.0	5.5	3	99.0	55
1017			1561	162.0	165.4	4.1	15.5	8.3	6.6	3	99.0	55
1018	9.5	53.4	1540	162.0	165.4	3.5	15.5	9.2	6.1	3	99.0	55
1019	8.7	53.3	1390	162.0	165.4	3.2	15.5	8.0	6.3	3	99.0	55
1020	8.7	53.6	1404	162.0	165.4	3.0	15.5	7.1	5.4	3	99.0	56
1021	8.6	53.7	1379	162.0	165.4	3.0	15.5	7.7	5.9	3	99.0	56
1022	8.7	53.8	1406	162.0	165.4	3.7	15.4	7.5	5.7	3	99.0	56
1023	8.7	53.5	1393	162.0	165.4	3.6	15.4	7.4	5.4	3	99.0	56
1024	8.8	53.3	1414	162.0	165.4	3.5	15.4	8.6	5.8	3	99.0	56
1025	8.8	53.1	1420	162.0	165.4	3.7	15.5	8.9	5.9	3	99.0	56
1026	8.9	53.3	1444	162.0	166.2	3.5	15.5	8.0	6.6	3	99.0	56
1027			1541	162.0	170.8	3.6	15.6	8.2	6.7	3	99.0	56
1028	8.6	53.8	1377	162.0	171.2	3.2	15.5	8.1	6.5	3	99.0	56
1029	8.6	53.9	1368	162.0	171.2	2.8	15.4	7.5	6.4	3	99.0	56
1030	8.7	53.5	1399	162.0	171.2	2.8	15.5	8.0	6.2	3	99.0	56
1031	9.2	53.8	1491	162.0	171.2	3.2	15.6	8.0	5.8	3	99.0	56
1032	10.3	53.7	1566	162.0	171.2	3.7	15.7	10.0	5.6	3	99.0	56
1033	9.3	53.8	1582	162.0	171.2	5.1	16.0	9.0	5.7	3	99.0	56
1034	9.3	54.0	1555	162.0	171.2	5.8	15.8	9.0	5.9	3	99.0	56
1035			1546	162.0	171.2	4.6	15.5	8.6	5.3	3	99.0	56
1036			1562	162.0	171.2	4.4	15.5	7.9	5.2	3	99.0	56
1037	9.3	53.5	1564	162.0	171.2	4.9	15.6	9.1	5.4	3	99.0	56
1038			1559	162.0	171.2	4.3	15.5	8.7	5.0	3	99.0	57
1039			1584	162.0	171.2	5.6	15.8	8.8	5.1	3	99.0	57
1040	10.0	54.4	1574	162.0	171.2	6.8	15.9	9.7	6.8	3	99.0	57
1041	9.4	53.9	1553	162.0	171.2	6.8	15.7	9.1	6.4	3	99.0	57
1042			1553	162.0	171.2	6.3	15.5	8.5	6.0	3	99.0	57
1043			1553	162.0	171.2	5.7	15.4	8.6	6.5	3	99.0	57
1044			1569	162.0	171.2	6.0	15.6	8.2	6.4	3	99.0	56
1045			1574	162.0	171.2	6.5	15.7	8.9	6.0	3	99.0	56
1046	9.7	53.9	1555	162.0	171.2	6.3	15.5	9.5	5.7	3	99.0	56
1047	9.9	53.5	1553	162.0	171.2	5.3	15.4	9.6	6.2	3	99.0	56
1048	10.0	53.5	1574	162.0	171.2	5.6	15.6	9.8	6.6	3	99.0	56
1049	9.6	53.7	1564	162.0	171.2	5.7	15.6	9.4	6.3	3	99.0	56
1050	9.4	53.9	1556	162.0	171.2	5.2	15.5	9.1	6.4	3	99.0	57
1051			1535	162.0	171.2	3.8	15.2	8.3	6.4	3	99.0	57
1052			1568	162.0	171.2	3.7	15.6	8.5	6.2	3	99.0	57
1053			1560	162.0	171.2	4.3	15.6	7.9	5.7	3	99.0	57
1054			1577	162.0	171.2	4.7	15.8	8.6	5.6	3	99.0	57
1055			1559	162.0	171.2	4.9	15.7	8.8	6.1	3	99.0	57
1056			1556	162.0	171.2	4.7	15.6	8.4	5.8	3	99.0	57

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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			1568	162.0	171.2	5.0	15.7	8.2	6.0	3	99.0	57
1058	10.4	53.8	1572	162.0	171.2	5.4	15.8	10.1	5.7	3	99.0	57
1059			1509	162.0	171.2	5.3	15.6	7.2	5.4	3	99.0	57
1060	9.9	53.7	1581	162.0	171.2	5.7	15.9	9.6	5.2	3	99.0	57
1061	9.4	54.1	1561	162.0	171.2	6.8	15.8	9.2	5.5	3	99.0	57
1062	9.7	53.7	1559	162.0	171.2	6.8	15.7	9.4	5.7	3	99.0	57
1063			1551	162.0	171.2	6.4	15.5	8.8	5.4	3	99.0	57
1064			1556	162.0	171.2	6.0	15.4	8.7	5.7	3	99.0	57
1065			1549	162.0	171.2	4.6	15.2	7.9	5.6	3	99.0	57
1066			1571	162.0	171.2	4.4	15.4	8.3	5.5	3	99.0	57
1067			1542	162.0	171.2	4.1	15.4	8.1	5.4	3	99.0	57
1068	9.2	53.3	1491	162.0	171.2	3.3	15.5	7.4	6.6	3	99.0	57
1069			1527	162.0	171.2	3.5	15.6	8.2	5.2	3	99.0	57
1070			1553	162.0	171.2	3.7	15.7	7.9	6.3	3	99.0	57
1071			1555	162.0	171.2	3.8	15.7	8.6	6.6	3	99.0	57
1072			1542	162.0	171.2	3.6	15.7	8.8	8.2	3	99.0	57
1073	9.7	53.9	1568	162.0	171.2	4.1	15.8	9.4	7.8	3	99.0	57
1074	9.8	54.1	1569	162.0	171.2	4.9	15.8	9.5	6.9	3	99.0	56
1075	9.3	53.8	1558	162.0	171.2	5.1	15.7	9.0	7.0	3	99.0	56
1076			1553	162.0	171.2	4.8	15.6	7.5	6.5	3	99.0	56
1077	10.5	53.5	1571	162.0	171.2	5.0	15.7	10.2	6.9	3	99.0	56
1078	10.0	54.1	1559	162.0	171.2	5.9	15.7	9.7	7.3	3	99.0	56
1079			1566	162.0	171.2	5.5	15.6	8.5	6.0	3	99.0	56
1080	10.6	54.0	1564	162.0	171.2	6.2	15.7	10.3	6.9	3	99.0	56
1081	9.4	53.6	1564	162.0	171.2	6.3	15.7	9.1	7.0	3	99.0	56
1082	9.5	54.0	1575	162.0	171.2	8.1	15.9	9.2	6.6	3	99.0	56
1083	10.3	54.4	1544	162.0	171.2	7.8	15.6	10.0	6.3	3	99.0	56
1084			1559	162.0	171.2	7.0	15.5	8.4	6.3	3	99.0	56
1085	9.3	53.3	1554	162.0	171.2	6.4	15.4	9.0	6.3	3	99.0	56
1086			1556	162.0	171.2	5.3	15.3	8.0	5.9	3	99.0	56
1087			1571	162.0	171.2	4.9	15.4	8.2	5.5	3	99.0	56
1088			1578	162.0	171.2	5.7	15.6	8.6	6.0	3	99.0	56
1089			1570	162.0	171.2	5.5	15.6	8.5	6.5	3	99.0	56
1090	9.3	54.0	1569	162.0	171.2	6.1	15.7	9.1	7.1	3	99.0	56
1091			1549	162.0	171.2	5.4	15.5	7.7	6.9	3	99.0	56
1092			1544	162.0	171.2	3.9	15.2	7.7	7.6	3	99.0	56
1093	9.9	53.4	1579	162.0	171.2	4.2	15.5	9.6	7.0	3	99.0	56
1094			1552	162.0	171.2	3.8	15.4	8.3	6.2	3	99.0	56
1095	9.4	53.5	1573	162.0	171.2	3.8	15.6	9.1	5.8	3	99.0	56
1096			1582	162.0	171.2	4.9	15.9	8.8	6.1	3	99.0	56
1097	9.9	54.5	1571	162.0	171.2	6.3	15.9	9.6	6.6	3	99.0	56
1098			1559	162.0	171.2	6.4	15.8	8.7	6.4	3	99.0	56
1099			1553	162.0	171.2	6.1	15.6	8.8	6.3	3	99.0	56
1100	10.4	53.8	1569	162.0	171.2	7.4	15.8	10.1	5.7	3	99.0	56
1101	9.8	54.1	1555	162.0	171.2	7.4	15.6	9.6	5.8	3	99.0	56
1102			1549	162.0	171.2	6.3	15.4	8.3	5.7	3	99.0	56
1103			1562	162.0	171.2	5.8	15.4	8.4	5.4	3	99.0	56
1104			1573	162.0	171.2	5.9	15.5	8.5	5.6	3	99.0	57
1105			1564	162.0	171.2	6.1	15.5	7.1	5.5	3	98.9	57
1106	9.5	53.5	1578	162.0	171.2	6.5	15.7	9.2	5.1	3	99.0	57
1107			1556	162.0	171.2	7.0	15.6	8.6	4.6	3	98.9	57
1108	10.0	53.5	1554	162.0	171.2	5.8	15.4	9.7	4.9	3	99.0	57
1109			1556	162.0	171.2	5.3	15.4	8.4	4.9	3	98.9	57
1110			1572	162.0	171.2	5.2	15.5	8.9	5.5	3	99.0	57
1111			1573	162.0	171.2	5.9	15.7	8.7	5.8	3	99.0	57
1112			1575	162.0	171.2	6.7	15.8	8.9	6.6	3	99.0	57
1113			1554	162.0	171.2	6.5	15.6	8.7	6.7	3	99.0	57
1114			1550	162.0	171.2	5.3	15.4	8.2	8.2	3	99.0	57
1115			1575	162.0	171.2	6.2	15.7	8.5	7.5	3	98.9	57
1116			1564	162.0	171.2	6.4	15.6	8.5	6.4	3	98.9	56
1117	9.7	53.7	1578	162.0	171.2	7.8	15.9	9.4	5.5	3	98.9	56
1118	10.2	53.7	1555	162.0	171.2	7.7	15.6	9.9	6.0	3	98.9	56
1119	9.5	53.1	1554	162.0	171.2	7.0	15.5	9.2	6.1	3	99.0	56
1120			1552	162.0	171.2	6.0	15.3	7.2	5.7	3	99.0	56
1121			1557	162.0	171.2	5.0	15.2	7.5	6.1	3	98.9	56
1122			1588	162.0	171.2	5.6	15.6	8.2	6.0	3	99.0	57
1123			1553	162.0	171.2	5.6	15.5	7.5	6.4	3	98.9	57
1124			1551	162.0	171.2	3.7	15.2	6.7	6.7	3	99.0	57
1125	10.2	53.5	1594	162.0	171.2	5.1	15.8	9.9	6.7	3	98.9	57
1126			1571	162.0	171.2	6.7	15.9	8.9	7.2	3	98.9	57
1127	9.5	53.9	1562	162.0	171.2	6.3	15.7	9.3	6.8	3	98.9	57
1128			1548	162.0	171.2	6.0	15.5	8.5	6.0	3	99.0	56
1129			1546	162.0	171.2	4.7	15.2	8.3	4.9	3	98.9	56
1130			1577	162.0	171.2	4.9	15.5	9.0	5.2	3	98.9	56
1131			1586	162.0	171.2	6.7	15.9	8.5	5.3	3	98.9	56
1132	11.3	54.0	1572	162.0	171.2	7.4	15.9	11.0	6.0	3	98.9	56
1133	11.2	54.0	1565	162.0	171.2	8.6	15.9	10.9	6.4	3	98.9	56
1134	12.2	54.3	1559	162.0	171.2	9.2	15.7	11.9	6.7	3	99.0	56
1135	11.4	54.1	1556	162.0	171.2	9.2	15.6	11.0	7.6	3	98.9	56
1136	10.7	53.4	1554	162.0	171.2	7.9	15.4	10.4	6.8	3	98.9	56
1137			1564	162.0	171.2	7.1	15.4	8.8	6.1	3	98.9	56
1138	10.1	53.2	1572	162.0	171.2	7.5	15.6	9.8	5.6	3	98.9	56
1139	10.0	53.2	1564	162.0	171.2	7.5	15.5	9.7	5.9	3	98.9	56
1140			1552	162.0	171.2	6.3	15.4	8.8	5.1	3	99.0	56
1141	9.4	53.5	1569	162.0	171.2	5.6	15.4	9.1	5.0	3	99.0	56
1142	9.3	53.7	1579	162.0	171.2	6.9	15.7	9.0	6.5	3	99.0	56
1143	10.7	53.7	1560	162.0	171.2	6.9	15.6	10.4	6.4	3	99.0	56
1144			1556	162.0	171.2	5.9	15.5	8.0	6.6	3	99.0	56

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

Data Point #	Standardized Wind Speed	LAeq	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			1566	162.0	171.2	6.0	15.6	8.1	7.4	3	99.0	56
1146			1567	162.0	171.2	6.4	15.6	8.8	6.9	3	99.0	56
1147	10.2	52.9	1568	162.0	171.2	6.6	15.6	9.9	6.5	3	99.0	55
1148			1549	162.0	171.2	5.8	15.4	8.8	5.9	3	99.0	55
1149			1564	162.0	171.2	5.2	15.4	8.2	5.8	3	99.0	55
1150	9.4	52.8	1563	162.0	171.2	5.2	15.4	9.1	5.3	3	99.0	55
1151	9.4	53.0	1573	162.0	171.2	5.0	15.5	9.1	5.4	3	99.0	55
1152			1575	162.0	171.2	6.1	15.8	8.2	5.4	3	99.0	57
1153	9.3	53.9	1570	162.0	171.2	6.5	15.7	9.1	6.2	3	99.0	57
1154			1563	162.0	171.2	7.0	15.7	9.0	5.3	3	99.0	57
1155	9.5	53.3	1553	162.0	171.2	6.6	15.6	9.2	5.8	3	99.0	57
1156			1552	162.0	171.2	5.6	15.4	7.9	6.1	3	99.0	57
1157			1568	162.0	171.2	5.7	15.5	8.8	5.9	3	99.0	57
1158			1555	162.0	171.2	4.9	15.3	7.6	5.9	3	99.0	57
1159			1577	162.0	171.2	5.2	15.6	8.3	6.1	3	99.0	57
1160	9.9	53.9	1573	162.0	171.2	6.0	15.7	9.6	6.3	3	99.0	57
1161	10.0	53.4	1565	162.0	171.2	5.9	15.6	9.7	5.6	3	99.0	57
1162	10.3	53.7	1565	162.0	171.2	6.4	15.7	10.0	5.8	3	99.0	57
1163			1559	162.0	171.2	6.1	15.6	8.5	6.9	3	99.0	57
1164	10.9	53.5	1564	162.0	171.2	6.1	15.6	10.6	7.8	3	99.0	56
1165	10.2	53.6	1568	162.0	171.2	6.9	15.7	9.9	7.0	3	99.0	56
1166	9.9	53.7	1560	162.0	171.2	6.8	15.6	9.6	6.2	3	99.0	56
1167	9.8	53.3	1558	162.0	171.2	6.3	15.5	9.5	6.6	3	99.0	56
1168			1548	162.0	171.2	5.1	15.3	8.4	6.3	3	99.0	56
1169			1565	162.0	171.2	4.7	15.4	8.6	5.7	3	99.0	56
1170			1565	162.0	171.2	4.4	15.4	8.7	7.0	3	99.0	56
1171	9.5	53.5	1592	162.0	171.2	5.5	15.8	9.2	6.3	3	99.0	56
1172	10.2	54.3	1568	162.0	171.2	6.8	15.8	9.9	6.9	3	99.0	56
1173			1565	162.0	171.2	6.8	15.8	8.7	5.9	3	99.0	56
1174	9.5	53.4	1547	162.0	171.2	6.5	15.5	9.2	6.8	3	99.0	56
1175			1563	162.0	171.2	5.9	15.5	8.9	7.2	3	99.0	56
1176			1569	162.0	171.2	6.6	15.7	8.9	6.6	3	99.0	56
1177			1568	162.0	171.2	7.1	15.7	9.0	7.2	3	99.0	56
1178			1560	162.0	171.2	6.8	15.6	8.6	6.7	3	99.0	56
1179			1558	162.0	171.2	6.8	15.5	8.4	6.4	3	99.0	56
1180			1563	162.0	171.2	6.1	15.5	8.9	6.7	3	99.0	56
1181	10.9	53.5	1576	162.0	171.2	7.2	15.7	10.6	6.0	3	99.0	56
1182	9.3	53.9	1557	162.0	171.2	7.2	15.6	9.0	6.9	3	99.0	56
1183			1555	162.0	171.2	6.2	15.4	8.5	6.8	3	99.0	56
1184	9.9	53.4	1578	162.0	171.2	8.0	15.8	9.6	6.0	3	99.0	56
1185	10.1	54.2	1561	162.0	171.2	8.4	15.7	9.8	6.6	3	99.0	56
1186	10.3	53.7	1558	162.0	171.2	8.1	15.6	10.0	7.2	3	99.0	56
1187	11.0	53.5	1564	162.0	171.2	8.4	15.6	10.7	6.6	3	99.0	56
1188			1558	162.0	171.2	7.7	15.5	8.9	6.7	3	98.9	56
1189			1563	162.0	171.2	7.2	15.5	8.8	7.0	3	98.9	56
1190			1559	162.0	171.2	6.6	15.4	8.4	7.9	3	98.9	56
1191			1556	162.0	171.2	5.5	15.3	7.4	7.6	3	98.9	56
1192			1578	162.0	171.2	5.8	15.5	8.1	7.7	3	98.9	56
1193	9.3	53.8	1570	162.0	171.2	6.3	15.6	9.1	7.7	3	98.9	56
1194	9.3	53.6	1582	162.0	171.2	7.3	15.8	9.1	7.7	3	98.9	55
1195			1558	162.0	171.2	7.9	15.7	8.9	7.4	3	98.9	55
1196			1566	162.0	171.2	8.2	15.7	8.6	7.0	3	98.9	55
1197	9.7	53.9	1550	162.0	171.2	7.9	15.5	9.5	6.3	3	98.9	55
1198	10.3	53.4	1565	162.0	171.2	8.0	15.6	10.0	6.2	3	98.9	55
1199	9.6	53.3	1562	162.0	171.2	7.8	15.5	9.4	6.2	3	98.9	55
1200	10.9	53.5	1567	162.0	171.2	8.3	15.6	10.6	6.9	3	98.9	56
1201	9.4	53.4	1560	162.0	171.2	8.0	15.5	9.1	6.2	3	98.9	56
1202	10.0	53.0	1561	162.0	171.2	7.6	15.5	9.8	7.5	3	98.9	56
1203	9.3	53.1	1549	162.0	171.2	6.3	15.3	9.0	6.4	3	98.9	56
1204	9.4	52.4	1574	162.0	171.2	5.9	15.4	9.1	7.3	3	98.9	56
1205			1554	162.0	171.2	5.5	15.4	8.7	7.2	3	98.9	56
1206			1573	162.0	171.2	4.9	15.4	8.0	7.6	3	98.9	56
1207			1574	162.0	171.2	6.2	15.7	8.3	7.4	3	98.9	56
1208			1576	162.0	171.2	6.6	15.8	8.2	7.2	3	98.9	56
1209	10.1	54.5	1561	162.0	171.2	7.3	15.7	9.8	7.0	3	98.9	56
1210			1550	162.0	171.2	6.5	15.5	8.5	7.5	3	98.9	56
1211			1555	162.0	171.2	5.4	15.3	7.6	8.0	3	98.9	56
1212			1580	162.0	171.2	7.1	15.8	8.2	6.8	3	98.9	56
1213	9.9	54.0	1562	162.0	171.2	7.4	15.6	9.6	7.4	3	98.9	56
1214	10.0	53.5	1566	162.0	171.2	7.4	15.7	9.7	7.2	3	98.9	56
1215	10.3	53.9	1565	162.0	171.2	8.4	15.7	10.0	7.4	3	98.9	56
1216	9.7	54.0	1557	162.0	171.2	8.2	15.6	9.4	7.5	3	98.9	56
1217			1560	162.0	171.2	7.6	15.5	8.6	7.0	3	98.9	56
1218	9.9	53.8	1565	162.0	171.2	7.8	15.6	9.6	6.9	3	98.9	56
1219			1555	162.0	171.2	6.9	15.4	8.7	8.3	3	98.9	56
1220			1575	162.0	171.2	7.1	15.6	8.9	8.2	3	98.9	56
1221	9.8	54.2	1567	162.0	171.2	7.8	15.7	9.6	7.9	3	98.9	56
1222	10.7	53.6	1569	162.0	171.2	8.6	15.7	10.4	7.4	3	98.9	56
1223	11.0	54.2	1560	162.0	171.2	8.8	15.6	10.7	7.0	3	98.9	56
1224	10.4	53.8	1550	162.0	171.2	7.8	15.4	10.1	7.9	3	98.9	55
1225			1557	162.0	171.2	6.1	15.3	7.5	8.3	3	98.9	55
1226	9.7	53.8	1588	162.0	171.2	7.5	15.7	9.4	7.6	3	98.9	55
1227	10.0	54.6	1567	162.0	171.2	8.8	15.7	9.7	7.1	3	98.9	55
1228	10.2	54.1	1559	162.0	171.2	8.3	15.6	9.9	6.3	3	98.9	55
1229	9.6	53.7	1566	162.0	171.2	8.2	15.6	9.3	6.4	3	98.9	55
1230	9.7	54.1	1563	162.0	171.2	9.4	15.7	9.5	6.2	3	98.9	56
1231	10.1	53.2	1561	162.0	171.2	8.8	15.6	9.9	7.3	3	98.9	56
1232	9.4	53.3	1560	162.0	171.2	8.4	15.5	9.1	7.5	3	98.9	56

Table E.01 Measurement data - Turbine ON

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
1233			1566	162.0	171.2	7.8	15.5	8.7	6.7	3	98.9	56
1234	11.2	54.0	1569	162.0	171.2	8.8	15.7	10.9	6.1	3	98.9	56
1235	10.0	54.6	1562	162.0	171.2	8.3	15.5	9.7	7.1	3	98.9	56
1236	10.2	53.9	1566	162.0	171.2	8.6	15.6	9.9	7.5	3	98.9	56
1237			1554	162.0	171.2	8.0	15.5	7.7	6.7	3	98.9	56
1238			1570	162.0	171.2	7.5	15.5	8.4	7.6	3	98.9	56
1239	10.5	54.0	1572	162.0	171.2	9.0	15.7	10.2	6.0	3	98.9	56
1240	10.5	54.1	1552	162.0	171.2	8.5	15.5	10.2	6.1	3	98.9	56
1241	10.1	53.5	1563	162.0	171.2	7.2	15.4	9.8	7.1	3	98.9	56
1242	9.8	54.2	1577	162.0	167.3	8.8	15.8	9.5	7.3	3	98.9	56
1243			1556	162.0	165.4	8.5	15.5	8.9	7.9	3	98.9	56
1244	10.4	53.8	1564	162.0	165.4	7.9	15.5	10.1	6.8	3	98.9	56
1245	10.4	53.9	1563	162.0	165.4	8.1	15.5	10.1	7.2	3	98.9	56
1246	10.1	53.7	1563	162.0	165.4	8.2	15.6	9.9	8.3	3	98.9	56
1247	10.2	53.3	1566	162.0	165.4	7.6	15.5	9.9	9.1	3	98.9	56
1248	11.1	54.3	1567	162.0	165.4	8.7	15.7	10.8	8.1	3	98.9	55
1249	10.1	54.4	1563	162.0	165.4	8.6	15.6	9.8	7.8	3	98.9	55
1250	10.5	54.5	1562	162.0	165.4	8.7	15.6	10.2	7.4	3	98.9	55
1251	9.8	53.8	1554	162.0	165.4	7.6	15.4	9.5	8.8	3	98.9	55
1252			1558	162.0	165.4	6.2	15.3	8.5	8.0	3	98.9	55
1253			1573	162.0	165.4	6.3	15.5	7.7	6.8	3	98.9	55
1254	11.1	53.9	1585	162.0	165.4	7.6	15.8	10.8	6.8	3	98.9	55
1255	10.4	54.4	1546	162.0	165.4	7.1	15.5	10.1	6.8	3	98.9	55
1256	10.1	53.8	1569	162.0	165.4	7.3	15.6	9.8	6.3	3	98.9	55
1257			1554	162.0	165.4	6.6	15.4	8.4	6.5	3	98.9	55
1258	9.3	53.3	1562	162.0	165.4	6.7	15.5	9.0	6.5	3	98.9	55
1259			1568	162.0	165.4	6.1	15.5	8.3	6.0	3	98.9	55
1260	10.6	54.0	1574	162.0	165.4	7.4	15.7	10.3	6.2	3	98.9	55
1261	9.6	53.9	1554	162.0	165.4	6.9	15.5	9.3	6.6	3	98.9	55
1262			1550	162.0	165.4	5.6	15.3	8.0	6.4	3	98.9	55
1263			1576	162.0	165.4	6.1	15.6	8.6	7.1	3	98.9	55
1264	10.2	53.5	1569	162.0	165.4	6.3	15.6	9.9	6.7	3	98.9	55
1265			1548	162.0	165.4	5.9	15.4	8.3	6.8	3	98.9	55
1266	9.9	53.4	1554	162.0	165.4	4.8	15.5	9.7	7.3	3	98.9	55
1267			1543	162.0	165.4	5.3	15.7	8.5	6.7	3	98.9	54
1268	9.9	53.8	1571	162.0	165.4	6.2	15.8	9.6	6.2	3	98.9	54
1269	9.8	53.6	1562	162.0	165.4	6.9	15.8	9.5	6.0	3	98.9	54
1270	10.4	53.7	1554	162.0	165.4	6.6	15.6	10.1	6.3	3	98.9	54
1271			1561	162.0	165.4	6.6	15.6	8.8	6.1	3	98.9	54
1272			1561	162.0	165.4	6.7	15.6	8.9	6.0	3	98.9	56
1273			1559	162.0	165.4	6.3	15.5	8.8	6.3	3	99.0	56
1274	9.8	53.2	1564	162.0	165.4	6.3	15.5	9.5	5.9	3	99.0	56
1275	9.8	53.8	1564	162.0	165.4	6.3	15.5	9.5	5.9	3	99.0	56
1276	9.8	54.0	1566	162.0	165.4	6.1	15.6	9.6	5.7	3	99.0	56
1277	9.4	53.9	1556	162.0	165.4	5.6	15.4	9.2	5.8	3	99.0	56
1278			1566	162.0	165.4	5.2	15.5	8.2	6.2	3	99.0	56
1279	10.1	53.5	1553	162.0	165.4	5.2	15.6	9.8	5.4	3	99.0	56
1280	10.2	53.8	1571	162.0	165.4	5.9	15.7	10.0	5.9	3	99.0	56
1281	9.6	53.6	1557	162.0	165.4	5.4	15.5	9.3	5.7	3	99.0	56
1282	10.7	53.7	1571	162.0	165.4	5.8	15.7	10.4	5.9	3	99.0	56
1283	10.1	53.7	1557	162.0	165.4	6.2	15.6	9.9	5.5	3	99.0	56
1284			1554	162.0	165.4	4.9	15.5	8.5	6.5	3	98.9	56
1285			1574	162.0	165.4	5.4	15.8	8.8	6.6	3	98.9	56
1286	9.4	54.2	1571	162.0	165.4	6.6	15.9	9.1	6.1	3	98.9	56
1287	10.1	54.0	1556	162.0	165.4	6.9	15.7	9.9	5.5	3	98.9	56
1288	10.2	53.5	1558	162.0	165.4	6.6	15.6	9.9	6.2	3	98.9	56
1289	9.5	53.4	1541	162.0	165.4	5.5	15.3	9.2	5.9	3	98.9	56
1290			1575	162.0	165.4	5.4	15.5	8.8	5.9	3	98.9	56
1291	10.3	53.5	1574	162.0	165.4	6.9	15.8	10.0	6.0	3	98.9	55
1292			1553	162.0	165.4	6.2	15.5	8.0	5.3	3	98.9	55
1293	9.3	53.1	1539	162.0	165.4	5.0	15.4	9.0	5.4	3	98.9	55
1294			1537	162.0	165.4	4.8	15.5	8.7	5.4	3	98.9	55
1295	10.1	53.4	1558	162.0	165.4	5.1	15.7	9.8	5.7	3	98.9	55
1296	11.0	53.7	1576	162.0	165.4	6.6	15.9	10.7	5.4	3	98.9	56
1297	10.3	53.9	1551	162.0	165.4	6.3	15.6	10.0	5.1	3	99.0	56
1298	9.3	53.3	1555	162.0	165.4	5.6	15.5	9.0	5.7	3	99.0	56
1299	9.8	53.3	1564	162.0	165.4	6.0	15.6	9.5	5.3	3	99.0	56
1300	10.7	53.5	1569	162.0	165.4	6.0	15.6	10.4	5.1	3	99.0	56
1301	10.2	53.6	1560	162.0	165.4	6.5	15.6	9.9	4.9	3	98.9	56
1302			1547	162.0	165.4	5.2	15.3	8.6	5.0	3	99.0	57
1303	9.5	53.0	1543	162.0	165.4	4.3	15.4	9.2	6.2	3	98.9	57
1304	10.0	53.5	1571	162.0	165.4	5.5	15.7	9.7	5.4	3	99.0	57
1305	9.9	53.3	1562	162.0	165.4	5.1	15.6	9.6	5.7	3	99.0	57
1306	9.5	53.3	1566	162.0	165.4	5.3	15.7	9.2	5.5	3	99.0	57
1307			1560	162.0	165.4	5.1	15.6	8.8	5.6	3	99.0	57
1308	9.0	53.3	1468	162.0	165.4	4.7	15.4	8.7	5.6	3	98.9	57
1309	8.8	53.1	1413	162.0	165.4	4.5	15.5	7.3	5.3	3	99.0	56

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

Data Point #	Standardized Wind Speed	LAeq	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 (%)
1321												
1322												
1323												
1324												
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Table E.02 Measurement data - Background

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

***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 (%)
1	6.4	44.3	0.4	5.1	0	99.2	59
2	7.3	42.9	0.5	5.8	0	99.2	59
3	7.0	42.4	0.4	5.5	0	99.2	59
4	7.4	42.4	0.4	5.9	0	99.2	59
5	7.1	42.5	0.4	5.6	0	99.2	59
6	6.3	42.2	0.4	5.0	0	99.2	58
7	6.7	41.6	0.4	5.3	0	99.2	58
8	8.3	42.3	0.4	6.6	0	99.2	58
9	7.2	41.9	0.4	5.7	0	99.2	58
10	6.6	42.4	0.4	5.2	0	99.2	58
11	7.0	43.1	0.3	5.5	0	99.2	58
12	6.4	43.0	0.3	5.1	0	99.2	58
13	4.9	42.7	0.2	3.9	0	99.2	58
14	5.0	42.3	0.2	3.9	0	99.2	58
15	5.3	42.1	0.2	4.2	0	99.2	58
16	5.9	42.8	0.3	4.6	0	99.2	58
17	6.3	42.8	0.3	5.0	0	99.2	58
18	7.2	42.8	0.3	5.7	0	99.2	59
19	6.7	42.6	0.3	5.3	0	99.2	59
20	6.2	42.4	0.3	4.9	0	99.2	59
21	6.1	42.2	0.3	4.8	0	99.2	59
22	5.9	41.7	0.3	4.7	0	99.2	59
23	6.3	41.9	0.3	5.0	0	99.2	59
24	6.3	42.6	0.2	4.9	0	99.2	59
25	6.2	43.2	0.3	4.9	0	99.2	59
26	6.4	42.8	0.4	5.1	0	99.2	59
27	6.3	42.4	0.4	5.0	0	99.2	59
28	7.3	41.2	0.4	5.8	0	99.2	59
29	7.2	34.7	0.4	5.7	0	99.2	59
30	7.2	32.7	0.4	5.7	0	99.2	58
31	5.7	34.9	0.5	4.5	0	99.2	58
32	6.6	35.5	0.4	5.2	0	99.2	58
33	8.4	34.0	0.3	6.6	0	99.2	58
34	8.3	34.2	0.4	6.6	0	99.2	58
35	7.8	35.0	0.3	6.1	0	99.2	58
36	7.8	32.4	0.3	6.2	0	99.2	59
37	7.4	33.5	0.3	5.9	0	99.2	59
38	6.5	34.0	0.3	5.1	0	99.2	59
39	6.8	33.1	0.3	5.4	0	99.2	59
40	6.6	34.1	0.3	5.2	0	99.2	59
41	6.3	34.6	0.2	5.0	0	99.2	59
42	6.9	34.8	0.3	5.4	0	99.2	59
43	7.2	33.0	0.2	5.7	0	99.2	59
44	7.1	33.2	0.2	5.6	0	99.2	59
45	7.3	31.8	0.3	5.8	0	99.2	59
46	7.5	33.0	0.4	5.9	0	99.2	59
47	7.0	34.3	0.3	5.5	0	99.2	59
48	6.3	34.8	0.3	5.0	0	99.2	57
49	6.5	34.4	0.3	5.2	0	99.2	57
50	7.5	34.2	0.3	6.0	0	99.2	57
51	6.9	33.9	0.3	5.4	0	99.2	57
52	7.3	33.6	0.3	5.8	0	99.2	57
53	7.9	37.2	0.4	6.2	0	99.2	57
54	7.7	38.6	0.3	6.1	0	99.2	57
55	8.1	39.4	0.3	6.4	0	99.2	57
56	7.5	45.2	0.3	6.0	0	99.2	57
57	8.2	43.0	0.4	6.5	0	99.2	57
58	8.1	43.4	0.6	6.4	0	99.2	57
59	7.6	42.6	0.5	6.0	0	99.2	57
60	7.3	44.0	0.4	5.8	0	99.2	56
61	6.9	44.6	0.4	5.5	0	99.2	56
62	7.3	43.9	0.3	5.8	0	99.2	56
63	8.2	42.0	0.3	6.5	0	99.2	56
64	8.7	38.2	0.3	6.9	0	99.2	56
65	8.3	36.4	0.3	6.6	0	99.2	56
66	7.7	38.8	0.3	6.1	0	99.2	57
67	6.7	36.1	0.3	5.3	0	99.2	57
68	6.3	38.7	0.3	5.0	0	99.2	57
69	6.6	36.8	0.3	5.2	0	99.2	57
70	6.9	32.1	0.4	5.5	0	99.2	57
71	7.4	31.9	0.4	5.9	0	99.2	57
72	8.2	32.0	0.4	6.5	0	99.2	57
73	7.3	33.6	0.3	5.8	0	99.2	57
74	6.7	33.6	0.2	5.3	0	99.2	57
75	7.5	33.9	0.2	5.9	0	99.2	57
76	6.9	34.4	0.2	5.5	0	99.2	57
77	6.0	34.2	0.3	4.7	0	99.2	57
78	6.5	34.3	0.3	5.2	0	99.2	58
79	6.9	38.1	0.3	5.5	0	99.2	58
80			0.2	4.9	0	99.2	58
81			0.3	4.9	0	99.2	58
82			0.2	4.6	0	99.2	58
83			0.3	4.4	0	99.2	58

***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 (%)
84	5.0	37.3	0.3	3.9	0	99.2	57
85	5.4	33.4	0.3	4.2	0	99.2	57
86	4.7	35.2	0.3	3.8	0	99.2	57
87	5.6	37.7	0.3	4.5	0	99.2	57
88	6.2	45.3	0.3	4.9	0	99.2	57
89	8.0	39.0	0.3	6.3	0	99.2	57
90	6.5	35.1	0.3	5.2	0	99.2	58
91	6.3	35.0	0.3	5.0	0	99.2	58
92	6.5	31.6	0.3	5.2	0	99.2	58
93	6.1	38.0	0.4	4.8	0	99.2	58
94	6.0	34.3	0.4	4.7	0	99.2	58
95	5.5	35.3	0.4	4.3	0	99.2	58
96	4.6	36.5	0.4	3.6	0	99.2	58
97	4.5	41.8	0.4	3.5	0	99.2	58
98	4.5	44.9	0.4	3.6	0	99.2	58
99			0.4	3.6	0	99.2	58
100			0.3	3.5	0	99.2	58
101			0.3	3.6	0	99.2	58
102			0.3	3.9	0	99.2	60
103	4.5	38.4	0.3	3.6	0	99.2	60
104	4.1	37.7	0.3	3.2	0	99.2	60
105	5.3	38.9	0.3	4.2	0	99.2	60
106	6.5	35.3	0.3	5.1	0	99.2	60
107	6.5	37.1	0.2	5.1	0	99.2	60
108	5.8	33.8	0.2	4.6	0	99.2	59
109	5.6	36.0	0.3	4.4	0	99.2	59
110	5.7	38.2	0.3	4.5	0	99.2	59
111	5.5	41.9	0.3	4.3	0	99.2	59
112	7.0	37.6	0.2	5.5	0	99.2	59
113	6.7	40.3	0.2	5.3	0	99.2	59
114	6.4	37.9	0.3	5.1	0	99.2	59
115	6.3	41.0	0.2	5.0	0	99.2	59
116	5.6	41.5	0.2	4.5	0	99.2	59
117	5.3	46.4	0.2	4.2	0	99.2	59
118	5.3	43.9	0.3	4.2	0	99.2	59
119	5.2	45.7	0.3	4.1	0	99.2	59
120			0.2	3.8	0	99.2	58
121	5.1	41.2	0.2	4.0	0	99.2	57
122			0.2	3.9	0	99.2	57
123			0.2	4.3	0	99.2	57
124			0.2	4.5	0	99.2	57
125			0.1	4.5	0	99.2	57
126			0.1	3.8	0	99.2	58
127			0.2	3.5	0	99.2	58
128	4.3	44.5	0.2	3.4	0	99.2	58
129	4.9	44.4	0.3	3.8	0	99.2	58
130	3.8	43.6	0.3	3.0	0	99.2	58
131	4.8	43.9	0.4	3.8	0	99.2	58
132			0.3	4.6	0	99.2	59
133			0.3	3.7	0	99.2	59
134			0.2	2.6	0	99.2	59
135			0.1	3.5	0	99.2	59
136	4.8	38.5	0.0	3.8	0	99.2	59
137	5.9	38.3	0.0	4.7	0	99.2	59
138	6.1	35.5	0.0	4.8	0	99.2	59
139	6.1	34.8	0.2	4.8	0	99.2	59
140	6.3	36.0	0.4	5.0	0	99.2	59
141	6.0	40.2	0.4	4.8	0	99.2	59
142	5.7	36.8	0.4	4.5	0	99.2	59
143	4.8	38.0	0.4	3.8	0	99.2	59
144	5.6	40.0	0.4	4.4	0	99.2	58
145	5.2	42.9	0.4	4.1	0	99.2	58
146	4.6	38.0	0.3	3.6	0	99.2	58
147	6.4	37.3	0.2	5.0	0	99.2	58
148	5.8	37.7	0.2	4.6	0	99.2	58
149	7.3	38.6	0.0	5.7	0	99.2	58
150	7.2	39.9	0.0	5.7	0	99.2	58
151	5.3	39.2	0.0	4.2	0	99.2	57
152	5.2	36.4	0.0	4.1	0	99.2	57
153	6.5	35.4	0.0	5.1	0	99.2	57
154	6.4	36.3	0.0	5.0	0	99.2	57
155	5.6	35.0	0.2	4.4	0	99.2	57
156	5.6	36.4	0.4	4.4	0	99.2	58
157	5.1	36.9	0.4	4.0	0	99.2	58
158	5.5	36.4	0.3	4.4	0	99.2	58
159	5.4	36.9	0.3	4.3	0	99.2	58
160	4.4	38.6	0.3	3.5	0	99.2	58
161	4.1	38.1	0.2	3.2	0	99.2	58
162	5.1	40.7	0.3	4.0	0	99.2	59
163			0.3	3.8	0	99.2	59
164			0.4	3.8	0	99.2	59
165			0.4	3.8	0	99.2	59
166			0.4	4.6	0	99.2	59

***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 (%)
167			0.3	4.3	0	99.2	59
168			0.3	5.0	0	99.2	59
169			0.0	5.0	0	99.2	59
170			0.0	4.3	0	99.2	59
171			0.0	3.9	0	99.2	59
172			0.2	4.1	0	99.2	59
173			0.2	3.7	0	99.2	59
174			0.2	2.9	0	99.2	59
175			0.2	2.6	0	99.2	59
176			0.3	3.1	0	99.2	59
177			0.4	4.2	0	99.2	59
178			0.4	5.4	0	99.2	59
179			0.3	5.2	0	99.2	59
180			0.3	4.9	0	99.2	60
181			0.3	4.7	0	99.2	60
182			0.2	5.0	0	99.2	60
183			0.3	5.7	0	99.2	60
184	6.8	45.4	0.3	5.4	0	99.2	60
185	7.8	44.8	0.3	6.2	0	99.2	60
186	7.6	41.6	0.3	6.0	0	99.2	58
187	6.9	40.4	0.4	5.5	0	99.2	58
188	7.6	38.0	0.4	6.0	0	99.2	58
189	7.3	34.9	0.4	5.8	0	99.2	58
190	6.9	34.1	0.3	5.5	0	99.2	58
191	7.8	35.0	0.3	6.2	0	99.2	58
192	9.2	35.6	0.3	7.3	0	99.2	58
193	8.9	35.0	0.4	7.1	0	99.2	58
194	9.8	37.1	0.4	7.7	0	99.2	58
195	9.7	36.3	0.4	7.6	0	99.2	58
196	9.6	35.8	0.4	7.6	0	99.2	58
197	9.0	37.6	0.4	7.1	0	99.2	58
198	7.9	40.1	0.4	6.2	0	99.2	56
199	8.3	40.3	0.4	6.6	0	99.2	56
200	7.8	42.4	0.3	6.2	0	99.2	56
201	8.1	40.6	0.3	6.4	0	99.2	56
202	8.1	39.0	0.4	6.4	0	99.2	56
203	7.1	38.3	0.4	5.6	0	99.2	56
204	6.9	37.3	0.4	5.5	0	99.2	58
205	6.6	37.6	0.3	5.2	0	99.2	58
206	8.0	35.3	0.3	6.3	0	99.2	58
207	9.4	35.3	0.3	7.5	0	99.2	58
208	7.6	35.1	0.3	6.0	0	99.2	58
209	7.3	36.4	0.3	5.8	0	99.2	58
210	6.9	37.4	0.2	5.5	0	99.2	58
211	6.8	37.7	0.3	5.4	0	99.2	58
212	6.5	38.6	0.3	5.1	0	99.2	58
213	5.3	37.7	0.4	4.2	0	99.2	58
214	6.4	36.2	0.4	5.1	0	99.2	58
215	6.7	34.7	0.4	5.3	0	99.2	58
216	6.7	35.9	0.3	5.3	0	99.2	56
217	5.9	36.4	0.4	4.7	0	99.2	56
218	6.3	34.3	0.3	5.0	0	99.2	56
219	6.8	34.5	0.3	5.4	0	99.2	56
220	5.9	35.0	0.3	4.7	0	99.2	56
221	5.3	34.7	0.2	4.2	0	99.2	56
222	5.1	34.6	0.2	4.0	0	99.2	57
223	4.9	34.3	0.2	3.8	0	99.2	57
224	4.6	34.8	0.2	3.6	0	99.2	57
225	4.4	34.5	0.3	3.4	0	99.2	57
226	5.3	34.0	0.3	4.2	0	99.2	57
227	6.4	34.3	0.3	5.0	0	99.2	57
228	6.1	35.3	0.2	4.8	0	99.2	57
229	5.7	33.6	0.2	4.5	0	99.2	57
230	5.3	32.5	0.3	4.2	0	99.2	57
231	5.6	31.0	0.3	4.4	0	99.2	57
232	5.5	31.3	0.3	4.3	0	99.2	57
233	5.7	30.8	0.3	4.5	0	99.2	57
234	5.3	31.6	0.3	4.2	0	99.2	59
235	5.0	31.4	0.3	4.0	0	99.2	59
236	7.4	30.9	0.2	5.9	0	99.2	59
237	7.8	29.9	0.2	6.2	0	99.2	59
238	7.4	32.3	0.2	5.9	0	99.2	59
239	6.7	32.5	0.2	5.3	0	99.2	59
240	6.1	33.2	0.2	4.8	0	99.2	57
241	6.5	33.8	0.3	5.1	0	99.2	57
242	7.0	36.1	0.2	5.5	0	99.2	57
243	6.6	36.0	0.2	5.2	0	99.2	57
244	6.0	34.2	0.2	4.8	0	99.2	57
245	6.7	34.0	0.2	5.3	0	99.2	57
246	5.8	34.6	0.2	4.6	0	99.2	57
247	8.1	34.9	0.3	6.4	0	99.2	57
248	8.5	34.7	0.3	6.7	0	99.2	57
249	6.5	33.9	0.3	5.2	0	99.2	57

Table E.02 Measurement data - Background

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

***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	6.9	32.6	0.3	5.4	0	99.2	57
251	8.3	33.0	0.2	6.5	0	99.2	57
252	7.7	32.5	0.3	6.1	0	99.2	55
253	7.4	33.0	0.3	5.9	0	99.2	55
254	7.5	34.1	0.3	5.9	0	99.2	55
255	8.2	34.7	0.4	6.5	0	99.2	55
256	7.7	32.9	0.4	6.1	0	99.2	55
257	8.1	34.2	0.3	6.4	0	99.2	55
258	7.3	36.6	0.3	5.8	0	99.2	56
259	7.2	35.2	0.4	5.7	0	99.2	56
260	7.0	35.9	0.3	5.5	0	99.2	56
261	6.3	36.1	0.3	5.0	0	99.2	56
262	7.2	34.3	0.3	5.7	0	99.2	56
263	6.7	34.8	0.3	5.3	0	99.2	56
264	6.5	35.4	0.3	5.1	0	99.2	56
265	5.3	36.4	0.3	4.2	0	99.2	56
266	6.3	35.4	0.2	5.0	0	99.2	56
267	5.4	35.7	0.2	4.3	0	99.2	56
268	5.2	34.2	0.3	4.1	0	99.2	56
269	6.3	33.2	0.3	5.0	0	99.2	56
270	7.4	33.1	0.3	5.8	0	99.2	57
271	7.1	32.7	0.3	5.6	0	99.2	57
272	8.4	32.3	0.3	6.7	0	99.2	57
273	8.0	32.1	0.3	6.3	0	99.2	57
274	7.2	31.7	0.3	5.7	0	99.2	57
275	6.8	31.7	0.2	5.4	0	99.2	57
276	6.7	34.5	0.3	5.3	0	99.2	56
277	6.4	36.6	0.3	5.1	0	99.2	56
278	7.0	35.0	0.3	5.5	0	99.2	56
279	6.7	33.7	0.2	5.3	0	99.2	56
280	6.4	31.8	0.2	5.0	0	99.2	56
281	6.9	31.5	0.2	5.5	0	99.2	56
282	6.7	31.3	0.2	5.3	0	99.2	56
283	6.8	30.8	0.2	5.4	0	99.2	56
284	5.6	31.7	0.2	4.4	0	99.2	56
285	5.2	30.9	0.2	4.1	0	99.2	56
286	5.2	31.0	0.3	4.1	0	99.2	56
287	5.8	31.8	0.3	4.6	0	99.2	56
288	6.4	35.7	0.3	5.0	0	99.2	58
289	5.5	36.5	0.2	4.4	0	99.2	58
290	5.7	36.0	0.2	4.5	0	99.2	58
291	4.7	36.6	0.2	3.7	0	99.2	58
292	5.5	32.7	0.0	4.3	0	99.2	58
293	5.9	34.6	0.0	4.7	0	99.2	58
294	6.5	35.3	0.1	5.1	0	99.2	57
295	6.3	33.2	0.2	5.0	0	99.2	57
296	6.5	34.3	0.3	5.1	0	99.2	57
297	5.6	36.1	0.3	4.4	0	99.2	57
298	5.9	32.9	0.3	4.7	0	99.2	57
299	5.4	32.9	0.3	4.3	0	99.2	57
300	5.9	33.2	0.3	4.6	0	99.2	57
301	7.6	32.2	0.3	6.0	0	99.2	57
302	7.2	35.2	0.3	5.7	0	99.2	57
303	7.2	31.5	0.3	5.7	0	99.2	57
304	7.3	30.8	0.3	5.8	0	99.2	57
305	6.4	30.9	0.2	5.1	0	99.2	57
306	5.7	31.1	0.2	4.5	0	99.2	57
307	5.2	29.9	0.1	4.1	0	99.2	57
308	4.8	30.9	0.0	3.8	0	99.2	57
309	4.7	30.8	0.0	3.7	0	99.2	57
310	5.3	31.0	0.0	4.2	0	99.2	57
311	5.7	31.2	0.0	4.5	0	99.2	57
312	5.0	32.7	0.1	4.0	0	99.2	57
313	4.6	31.0	0.3	3.6	0	99.2	57
314	4.9	31.9	0.4	3.9	0	99.2	57
315	5.0	34.8	0.3	4.0	0	99.2	57
316	3.8	35.7	0.3	3.0	0	99.2	57
317	4.2	33.3	0.3	3.3	0	99.2	57
318	5.0	32.1	0.0	4.0	0	99.2	58
319	4.6	31.3	0.0	3.6	0	99.2	58
320	4.9	33.4	0.0	3.8	0	99.2	58
321	4.9	32.2	0.0	3.9	0	99.2	58
322	4.9	31.5	0.1	3.8	0	99.2	58
323	4.6	31.0	0.1	3.6	0	99.2	58
324	6.6	32.6	0.2	5.2	0	99.2	58
325	6.7	32.7	0.3	5.3	0	99.2	58
326	7.3	32.7	0.3	5.8	0	99.2	58
327	6.5	31.4	0.4	5.1	0	99.2	58
328	6.8	32.7	0.5	5.4	0	99.2	58
329	6.9	32.6	0.5	5.4	0	99.2	58
330	6.5	31.6	0.5	5.1	0	99.2	57
331	6.4	33.0	0.5	5.1	0	99.2	57
332	6.2	38.5	0.5	4.9	0	99.2	57

***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	6.1	38.0	0.4	4.8	0	99.2	57
334	6.1	35.9	0.3	4.8	0	99.2	57
335	6.4	33.8	0.3	5.1	0	99.2	57
336	6.3	32.4	0.3	5.0	0	99.2	58
337	7.0	31.5	0.4	5.5	0	99.2	58
338	7.3	31.9	0.3	5.7	0	99.2	58
339	6.8	31.7	0.3	5.4	0	99.2	58
340	7.5	31.9	0.3	5.9	0	99.2	58
341	8.0	35.4	0.3	6.3	0	99.2	58
342	7.7	33.8	0.3	6.1	0	99.2	57
343	6.8	32.2	0.3	5.4	0	99.2	57
344	5.7	33.3	0.3	4.5	0	99.2	57
345	6.2	34.8	0.3	4.9	0	99.2	57
346	6.3	34.0	0.3	5.0	0	99.2	57
347	6.3	33.8	0.3	5.0	0	99.2	57
348	6.0	31.8	0.2	4.7	0	99.2	57
349	6.4	30.8	0.3	5.1	0	99.2	57
350	6.4	30.6	0.3	5.0	0	99.2	57
351	6.4	31.2	0.2	5.1	0	99.2	57
352	6.4	31.0	0.3	5.1	0	99.2	57
353	5.6	30.8	0.3	4.4	0	99.2	57
354	5.5	29.8	0.3	4.3	0	99.2	57
355	6.2	30.8	0.3	4.9	0	99.2	57
356	5.8	30.7	0.3	4.6	0	99.2	57
357	5.7	32.3	0.3	4.5	0	99.2	57
358	5.5	32.1	0.1	4.3	0	99.2	57
359	6.1	32.9	0.0	4.8	0	99.2	57
360	6.3	30.0	0.0	5.0	0	99.2	58
361	11.3	41.6	0.5	8.9	3	99.0	56
362	12.7	44.1	0.5	10.1	3	99.0	56
363	11.1	40.2	0.4	8.8	3	99.0	56
364	9.9	47.9	0.5	7.9	3	99.0	56
365	11.7	49.0	0.6	9.3	3	99.0	56
366	11.8	45.7	0.7	9.3	3	99.0	56
367	13.2	42.9	0.6	10.4	3	99.0	55
368	13.2	40.6	0.6	10.4	3	99.0	55
369	13.4	46.0	0.5	10.6	3	99.0	55
370	12.9	44.6	0.6	10.2	3	99.0	55
371	12.3	42.9	0.6	9.7	3	99.0	55
372	13.7	45.2	0.6	10.8	3	99.0	55
373	12.9	42.3	0.5	10.2	3	99.0	55
374	13.7	42.7	0.3	10.8	3	99.0	55
375	12.7	45.6	0.4	10.1	3	99.0	55
376	11.4	42.3	0.5	9.0	3	99.0	55
377	10.1	43.2	0.5	8.0	3	99.0	55
378	10.2	39.7	0.5	8.1	3	99.0	55
379	10.8	40.8	0.6	8.5	3	99.0	55
380	9.4	40.9	0.5	7.4	3	99.0	55
381	8.8	47.5	0.6	7.0	3	99.0	55
382	8.8	39.7	0.6	6.9	3	99.0	55
383	9.4	47.0	0.7	7.4	3	99.0	55
384	8.5	41.9	0.5	6.7	3	99.0	55
385	8.0	39.2	0.6	6.3	3	99.0	56
386	7.9	41.5	0.5	6.3	3	99.0	56
387	9.0	44.3	0.6	7.1	3	99.0	56
388	10.5	41.0	0.7	8.3	3	99.0	56
389	10.9	46.5	0.6	8.6	3	99.0	56
390	11.6	46.6	0.7	9.2	3	99.0	56
391	10.0	46.9	0.6	7.9	3	99.0	56
392	9.4	47.4	0.5	7.4	3	99.0	56
393	9.6	45.6	0.4	7.6	3	99.0	56
394	10.3	46.6	0.7	8.2	3	99.0	56
395	10.8	46.2	0.6	8.5	3	99.0	56
396	10.1	47.4	0.5	8.0	3	99.0	56
397	12.7	45.4	0.6	10.0	3	99.0	55
398	12.3	44.2	0.5	9.7	3	99.0	55
399	11.2	43.3	0.4	8.8	3	99.0	55
400	11.2	39.9	0.5	8.8	3	99.0	55
401	10.2	38.3	0.4	8.0	3	99.0	55
402	9.2	36.7	0.4	7.3	3	99.0	56
403	9.5	37.3	0.7	7.5	3	99.0	56
404	10.4	37.5	0.5	8.2	3	99.0	56
405	12.0	38.6	0.4	9.5	3	99.0	56
406	11.3	38.2	0.5	8.9	3	99.0	56
407	11.8	37.9	0.4	9.3	3	99.0	56
408	11.2	36.9	0.4	8.9	3	99.0	56
409	12.3	45.7	0.5	9.7	3	99.0	55
410	11.8	44.8	0.5	9.3	3	99.0	55
411	10.9	42.1	0.5	8.6	3	99.0	55
412	10.0	38.0	0.4	7.9	3	99.0	55
413	8.8	40.7	0.4	7.0	3	99.0	55
414	8.2	37.2	0.6	6.5	3	99.0	56
415	8.4	39.9	0.5	6.6	3	99.0	57

***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	8.8	36.2	0.5	7.0	3	99.0	57
417	9.1	37.4	0.6	7.2	3	99.0	57
418	9.7	37.8	0.7	7.6	3	99.0	57
419	9.6	38.0	0.6	7.6	3	99.0	57
420	8.2	38.4	0.6	6.5	3	99.0	57
421	8.4	39.4	0.4	6.6	3	99.0	56
422	9.5	37.8	0.6	7.5	3	99.0	56
423	11.7	39.3	0.6	9.3	3	99.0	56
424	11.8	41.8	0.6	9.4	3	99.0	56
425	12.3	43.6	0.6	9.7	3	99.0	56
426	10.3	42.9	0.6	8.1	3	99.0	56
427	9.3	39.0	0.6	7.4	3	99.0	56
428	10.0	35.7	0.5	7.9	3	99.0	56
429	10.1	37.0	0.6	8.0	3	99.0	56
430	11.6	39.9	0.6	9.2	3	99.0	56
431	10.6	43.2	0.6	8.4	3	99.0	56
432	8.9	43.7	0.8	7.1	3	99.0	56
433	9.7	37.0	0.6	7.7	3	99.0	56
434	10.1	37.8	0.5	8.0	3	99.0	56
435	9.7	36.7	0.6	7.6	3	99.0	56
436	10.0	39.6	0.7	7.9	3	99.0	56
437	9.2	37.6	0.6	7.3	3	99.0	56
438	10.1	36.5	0.7	8.0	3	99.0	57
439	9.0	39.1	0.7	7.1	3	99.0	57
440	7.5	44.3	0.5	5.9	3	99.0	57
441	7.5	38.1	0.4	5.9	3	99.0	57
442	7.8	36.8	0.4	6.2	3	99.0	57
443	7.8	36.0	0.4	6.1	3	99.0	57
444	8.9	38.6	0.5	7.1	3	99.0	57
445	11.1	37.9	0.5	8.8	3	99.0	58
446	12.4	38.7	0.6	9.8	3	99.0	58
447	11.7	37.1	0.5	9.3	3	99.0	58
448	9.8	37.9	0.5	7.8	3	99.0	58
449	9.4	38.9	0.5	7.4	3	99.0	58
450	10.2	38.0	0.5	8.1	3	99.0	57
451	9.2	36.6	0.6	7.3	3	99.0	56
452	8.5	42.3	0.6	6.7	3	99.0	56
453	9.8	42.9	0.5	7.8	3	99.0	56
454	9.3	38.0	0.6	7.4	3	99.0	56
455	9.7	37.4	0.6	7.7	3	99.0	56
456	10.6	39.2	0.6	8.3	3	99.0	57
457	10.3	37.9	0.5	8.1	3	99.0	57
458	9.2	39.4	0.5	7.3	3	99.0	57
459	9.4	40.9	0.7	7.4	3	99.0	57
460	9.4	38.0	0.6	7.4	3	99.0	57
461	8.8	39.6	0.5	6.9	3	99.0	57
462	9.2	37.6	0.6	7.2	3	99.0	57
463	9.2	39.6	0.6	7.2	3	99.0	57
464	8.3	40.2	0.7	6.6	3	99.0	57
465	8.7	36.2	0.6	6.8	3	99.0	57
466	10.4	36.1	0.5	8.2	3	99.0	57
467	10.4	38.5	0.6	8.2	3	99.0	57
468	9.9	38.5	0.6	7.8	3	99.0	57
469	10.2	40.3	0.5	8.1	3	99.0	57
470	9.3	38.0	0.6	7.3	3	99.0	57
471	9.2	37.7	0.4	7.3	3	99.0	57
472	8.7	38.3	0.4	6.9	3	99.0	57
473	8.9	38.6	0.5	7.1	3	99.0	57
474	8.7	38.3	0.6	6.9	3	99.0	57
475	9.9	35.4	0.6	7.8	3	99.0	57
476	9.7	37.0	0.5	7.7	3	99.0	57
477	10.8	36.0	0.4	8.6	3	99.0	57
478	9.9	36.0	0.5	7.8	3	99.0	57
479	9.6	35.7	0.5	7.6	3	99.0	57
480	8.6	35.2	0.4	6.8	3	99.0	57
481	8.5	35.6	0.4	6.7	3	99.0	57
482	9.1	36.3	0.5	7.2	3	99.0	57
483	8.8	36.0	0.6	6.9	3	99.0	57
484	9.1	36.7	0.5	7.2	3	99.0	57
485	9.1	37.2	0.5	7.2	3	99.0	57
486	8.9	38.9	0.5	7.1	3	99.0	57
487	8.3	38.1	0.5	6.5	3	99.0	57
488	8.7	38.6	0.4	6.9	3	99.0	57
489	8.8	40.9	0.4	6.9	3	99.0	57
490	8.4	38.7	0.5	6.6	3	99.0	57
491	9.1	37.9	0.5	7.2	3	99.0	57
492	8.5	39.0	0.5	6.7	3	99.0	57
493	8.0	40.5	0.5	6.3	3	99.0	57
494	8.3	38.7	0.5	6.5	3	99.0	57
495	8.2	36.9	0.6	6.5	3	99.0	57
496	9.2	36.5	0.5	7.3	3	99.0	57
497	9.3	36.6	0.5	7.3	3	99.0	57
498	11.5	37.0	0.5	9.1	3	99.0	57

Table E.02 Measurement data - Background

Project: Goshen Wind Farm - Turbine T52 - IEC 61400-11 Measurement

Report ID: 14461.02.T52.RP2

Created on: 11/1/2017

***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	10.0	37.2	0.6	7.9	3	99.0	57
500	8.7	37.1	0.5	6.9	3	99.0	57
501	8.1	40.9	0.5	6.4	3	99.0	57
502	8.5	38.2	0.5	6.7	3	99.0	57
503	9.5	38.4	0.5	7.5	3	99.0	57
504	9.2	36.4	0.6	7.3	3	99.0	57
505	8.8	35.8	0.5	7.0	3	99.0	58
506	8.4	36.3	0.6	6.6	3	99.0	58
507	8.1	36.0	0.6	6.4	3	99.0	58
508	8.5	36.1	0.5	6.7	3	99.0	58
509	9.0	43.1	0.5	7.1	3	99.0	58
510	9.4	34.3	0.5	7.4	3	99.0	57
511	8.8	35.9	0.5	7.0	3	99.0	57
512	9.3	35.3	0.5	7.4	3	99.0	57
513	10.1	36.0	0.5	8.0	3	99.0	57
514	10.1	35.4	0.5	8.0	3	99.0	57
515	11.0	37.2	0.4	8.7	3	99.0	57
516	11.1	37.4	0.3	8.8	3	99.0	57
517	10.6	38.2	0.4	8.4	3	99.0	56
518	11.2	39.0	0.5	8.9	3	99.0	56
519	10.4	39.1	0.5	8.2	3	99.0	56
520	11.0	36.7	0.5	8.7	3	99.0	56
521	10.2	38.6	0.5	8.1	3	99.0	56
522	11.3	36.9	0.5	8.9	3	99.0	56
523	10.7	34.5	0.5	8.5	3	99.0	56
524	9.8	35.4	0.5	7.8	3	99.0	56
525	9.8	36.9	0.4	7.8	3	99.0	56
526	9.0	36.7	0.5	7.1	3	99.0	56
527	10.1	37.2	0.6	8.0	3	99.0	56
528	9.9	36.8	0.5	7.8	3	99.0	56
529	8.9	37.0	0.4	7.0	3	99.0	56
530	7.3	37.5	0.4	5.8	3	99.0	56
531	7.4	37.0	0.5	5.8	3	99.0	56
532	6.8	40.7	0.5	5.4	3	99.0	56
533	8.2	39.2	0.5	6.5	3	99.0	56
534	9.8	39.3	0.7	7.7	3	99.0	56
535	9.8	38.9	0.7	7.7	3	99.0	57
536	8.8	43.9	0.6	6.9	3	99.0	57
537	8.8	46.6	0.5	6.9	3	99.0	57
538	9.4	40.3	0.5	7.4	3	99.0	57
539	8.1	39.2	0.6	6.4	3	99.0	57
540	8.7	38.3	0.5	6.9	3	99.0	57
541	10.0	39.1	0.7	7.9	3	99.0	57
542	9.4	39.0	0.6	7.4	3	99.0	57
543	9.2	39.7	0.5	7.3	3	99.0	57
544	8.4	36.5	0.6	6.7	3	99.0	57
545	8.3	34.9	0.6	6.6	3	99.0	57
546	7.5	36.3	0.4	6.0	3	99.0	58

***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							
583							
584							
585							
586							
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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	LAeq	Rotor RPM	10m Anemometer Wind Speed (m/s)	Air Temperature (·C)	Pressure (kPa)	Relative Humidity (%)
665							
666							
667							
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Appendi xF
Note on anemometer position with IEC 61400-11 Ed 2.1 and Ed 3.0

Note N6.040.17

Note on anemometer position with IEC 61400-11 editions 2.1 and 3.0

Author: Bo Søndergaard

Project number: 35.6539.01
Date: 7/11/2017
Project manager: Bo Søndergaard
Controlled by: -

To : Aercoustics Engineering Limited
Att.: Payam Ashtiani

From : Bo Søndergaard

1. Purpose

In the capacity of convenor for Maintenance Team 11, the workgroup in charge of IEC 61400-11, since 2006, I have been asked to provide background information, and comment on the consequences of changing the anemometer position when going from edition 2.1 to edition 3, and the recommended method for using measurements based on edition 2.1 for an analysis with edition 3.

2. Comment

There are several differences between IEC 61400-11 standard edition 2.1 (November 2006) and edition 3.0 (November 2012). In particular, the general data treatment procedures for noise levels, and the tonality assessment were changed to keep up with the changes in wind turbine design at the time.

However, since edition 1.0 (1998), very few changes have been made to the IEC 61400-11 standard with respect to the measurement setup. In edition 1.0 the prescribed position of the anemometer was upwind (2 to 4 rotor diameters) as it was allowed to use the anemometer for determination of the standardized wind speed with the wind turbine running. At that time the distances were smaller and this setup is maintained in Annex F on small wind turbines in edition 3. Editions 2.0 and 2.1, still allowed such use of the anemometer

In Germany, modified versions of IEC 61400-11 edition 2 were introduced by the FGW. In revision 15 (from 2004), using the power for determination of the standardized wind speed was mandatory. In revision 16 (from 2005), it was stated that the position of the anemometer can deviate from the requirements in IEC 61400-11 edition 2, without specifying position requirements. Germany has had a strong influence on the development of the IEC 61400-11 standard through the experience from several measuring companies and German authorities. The decision to allow alternative positions for the anemometer is very representative of the situation. It is difficult to set up general requirements for the position of the anemometer that works at all sites. As such, it makes sense to allow for an expert

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judgement on the anemometer position in a given situation. In the Danish regulations, it is stated that the anemometer has to be close to the wind turbine in a position where neither the wind turbine nor objects in the terrain is expected to influence the wind speed measurements.

The German and Danish considerations on the position of the anemometer is based on the fact that the dominating background noise at the microphone position can be more or less dependent on wind speed; and can be generated by vegetation upwind, downwind or to the side of the wind turbine. This is often reflected in background noise with a weak dependence on wind speed.

Maintenance Team 11, responsible for revising IEC 61400-11, discussed this issue and there was a strong support from the measurement institutes for using the nacelle anemometer for background noise measurements. In most cases, this would give a reasonable correlation between wind speed and background noise. The nacelle anemometer is not influenced by terrain and represents, to a reasonable degree, the wind in the surroundings. However, the manufacturers argued that the nacelle anemometer might not be a part of future designs and could not be guaranteed. There was a general agreement that it was difficult to decide on an optimum position, but in most cases, downwind and to the side would make sense, resulting in Figure 5 of edition 3.0. The position of the anemometer is not considered an important issue and the wording is “guidance” and “acceptable” and not a stronger wording like “shall”. This is a deliberate decision by the Maintenance Team 11 to ensure flexibility when other choices make more sense.

The recommended method when using measurements made according to IEC 61400-11 edition 2.1 for analysis with IEC 61400-11 edition 3.0 is to use the nacelle anemometer for the background noise. This will work well in most cases. Alternatively, to use the measured wind speed at 10 m height if there is no strong influence from the background noise (e.g. when signal to noise ratio is better than 6 dB).

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End of Report