

## APPENDIX 1

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### **Crudine Ridge Wind Farm Environmental Noise Assessment – Supplementary Analysis**

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# **Crudine Ridge Wind Farm**

## **Environmental Noise Assessment**

### **Supplementary Analysis**

Prepared For  
**Wind Prospect CWP**  
45 Hunter Street, Newcastle NSW 2300

**S3736C7**  
**July 2013**



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## INTRODUCTION

An environmental noise assessment has been made of the proposed Crudine Ridge Wind Farm, located 45km south of Mudgee and 45km north of Bathurst, New South Wales. The assessment is detailed in the Sonus Report, *Crudine Ridge Wind Farm – Environmental Noise Assessment*, S3736C5, dated October 2012 (the 2012 Report).

Upon request from the NSW Department of Planning and Infrastructure, additional analysis has been conducted to supplement the environmental noise assessment. This document provides information and results of the supplementary analysis conducted.

The supplementary analysis has included the following:

1. Correlation of the background noise logging data collected in 2011 with the corresponding wind speed data referenced at hub height for all seven logging locations; and,
2. Prediction of the noise levels at residences based on noise data referenced at hub height wind speed and comparison with the relevant noise criteria.

The analysis has assumed a hub height of 80m above ground level.



## **CORRELATIONS WITH HUB HEIGHT WIND SPEED**

The correlations and resultant background noise levels presented in the 2012 Report have been based on wind speed data referenced at 10m above ground level (AGL). The analysis in the 2012 Report went beyond the requirements of the South Australian Environment Protection Authority's *Wind Farms – Environmental Noise Guidelines 2003* (the SA Guidelines) by using the two highest anemometer locations and shearing down to the 10m reference height, rather than relying directly on the measured wind speeds at the 10m height.

Notwithstanding this approach, the supplementary analysis considers the wind speed data referenced directly at an 80m hub height.

### **Analysis Method**

The analysis method and technique detailed in the 2012 Report have been adopted in this supplementary analysis. This includes the 24 hour data analysis as required by the SA Guidelines, and the separated daytime and night-time analysis as required by the Department of Planning and Infrastructure.

### **Hub Height Wind Speed Data**

The hub height wind speed data was taken directly from measured wind speed at a height of 80m AGL at the closest wind mast. Where the wind speed was not measured at 80m AGL (i.e., at wind mast SOF 1), the hub wind speed was derived using measurements at different heights, sheared using the power law wind shear equation.

### **Correlation Results**

The background noise logging in 2011 was conducted at seven monitored locations. The collected noise data has been analysed using hub height wind speeds and the resultant regression curves are provided in Appendix A. Based on the regression analysis, the background noise level ( $L_{A90,10}$ ) at a range of wind speeds within the operating range of the turbines is provided in Table 1.

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Where the background noise level could not be determined from the regression analysis due to insufficient data, generally at higher wind speeds, a conservative assumption was made that the background noise level does not increase with wind speed. This is indicated in Table 1 using ***bold italic***.

**Table 1: Background noise levels (dB(A)) from regression analysis.**

Residence ID	Background Noise Level (dB(A)) by Hub Height (80m) Wind Speed													
	3 m/s	4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 m/s	14 m/s	15 m/s	16 m/s
<b>24 Hour Period</b>														
CR14	28	28	29	29	30	31	33	34	36	37	39	41	43	<b>43</b>
CR18	27	28	29	29	30	30	31	32	33	35	37	39	42	<b>42</b>
CR28	22	22	22	23	24	25	27	29	31	33	36	38	40	<b>40</b>
CR33	25	25	26	27	28	30	32	35	37	40	42	45	47	50
HER04	24	24	24	25	27	28	30	31	33	34	35	36	<b>36</b>	<b>36</b>
HER07	28	28	29	30	32	34	36	38	40	41	41	<b>41</b>	<b>41</b>	<b>41</b>
SFR05	27	27	28	29	30	32	34	36	38	39	41	41	<b>41</b>	<b>41</b>
<b>Daytime Period (7am to 10pm)</b>														
CR14	29	30	32	33	34	35	36	37	38	39	41	42	44	<b>44</b>
CR18	28	29	30	31	31	32	33	33	35	36	38	40	43	<b>43</b>
CR28	23	24	24	25	27	28	30	32	34	35	37	38	40	<b>40</b>
CR33	25	26	28	29	31	33	35	37	40	42	44	47	49	51
HER04	26	26	26	28	29	30	32	34	35	36	36	36	<b>36</b>	<b>36</b>
HER07	30	30	31	32	34	36	38	40	42	42	42	<b>42</b>	<b>42</b>	<b>42</b>
SFR05	29	29	30	31	33	34	36	37	38	39	39	<b>39</b>	<b>39</b>	<b>39</b>
<b>Night-time Period (10pm to 7am)</b>														
CR14	25	24	24	24	25	27	28	30	32	34	36	37	<b>37</b>	<b>37</b>
CR18	27	26	26	27	27	28	29	30	31	33	34	35	<b>35</b>	<b>35</b>
CR28	20	19	19	19	20	21	23	25	28	31	34	37	<b>37</b>	<b>37</b>
CR33	23	23	23	23	24	25	27	29	31	34	37	41	44	<b>44</b>
HER04	22	21	21	22	23	24	26	28	30	32	<b>32</b>	<b>32</b>	<b>32</b>	<b>32</b>
HER07	25	24	25	26	28	31	33	35	37	38	<b>38</b>	<b>38</b>	<b>38</b>	<b>38</b>
SFR05	25	24	24	25	26	28	31	34	37	41	<b>41</b>	<b>41</b>	<b>41</b>	<b>41</b>

The environmental noise criteria for each residence derived from the background noise levels in Table 1 are provided in Appendices A and B. It is noted that where background noise monitoring had not occurred at a residence, the measured background levels at the closest monitoring location located on the same side of the wind farm as the residence have been used to derive the criteria.



## ASSESSMENT

### Wind Farm Noise Predictions

#### Turbine Layout and Noise Data

The noise from the wind farm has been assessed based on two planning layouts as detailed in the 2012 Report. The assessment considered the following turbine models with a hub height of 80m for each layout:

- Planning Layout A – 106 Acciona AW77 turbines; and,
- Planning Layout B – 77 Siemens SWT2.3-101 turbines.

The predictions of noise from the turbines have been based on the sound power level data from the manufacturers as considered in the 2012 Report. Prior to the predictions, the spectral data were interpolated to obtain octave band sound power levels referenced to integer hub height wind speeds. Tables 2 and 3 contain the resultant sound power levels used in the predictions.

**Table 2: Acciona AW77 sound power levels.**

Octave Band Centre Frequency (Hz)	Sound Power Levels (dB(A)) by Hub Height (80m) Wind Speed									
	3 to 4 m/s	5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 m/s	11 m/s	12 m/s	13 to 16 m/s
63	76.6	77.8	79.2	80.6	82.0	82.8	83.3	83.4	83.4	83.5
125	84.1	85.3	86.7	88.2	89.5	90.4	90.8	90.9	91.0	91.0
250	90.9	92.1	93.6	95.0	96.4	97.2	97.7	97.7	97.8	97.8
500	92.6	93.8	95.3	96.7	98.1	98.9	99.4	99.4	99.5	99.5
1000	93.9	95.1	96.5	98.0	99.3	100.2	100.6	100.7	100.8	100.8
2000	86.0	87.2	88.6	90.1	91.4	92.3	92.7	92.8	92.9	92.9
4000	81.2	82.4	83.9	85.3	86.7	87.5	88.0	88.0	88.1	88.1
8000	67.8	69.0	70.4	71.8	73.2	74.0	74.5	74.6	74.6	74.7
<b>Total</b>	98.0	99.2	100.7	102.1	103.5	104.3	104.8	104.8	104.9	104.9



**Table 3: Siemens SWT2.3-101 sound power levels.**

Octave Band Centre Frequency (Hz)	Sound Power Levels (dB(A)) by Hub Height (80m) Wind Speed					
	3 to 5 m/s	6 m/s	7 m/s	8 m/s	9 m/s	10 to 16 m/s
<b>63</b>	71.1	72.5	75.9	79.3	81.4	82.5
<b>125</b>	82.3	83.7	87.1	90.5	92.5	93.4
<b>250</b>	86.4	87.8	91.2	94.6	96.4	97.1
<b>500</b>	90.0	91.4	94.8	98.2	100.2	101.1
<b>1000</b>	90.2	91.6	95.0	98.4	100.3	101.1
<b>2000</b>	86.8	88.2	91.6	95.0	96.8	97.4
<b>4000</b>	79.4	80.8	84.2	87.6	89.5	90.2
<b>8000</b>	75.1	76.5	79.9	83.3	85.3	86.2
<b>Total</b>	95.1	96.6	99.9	103.4	105.2	106.0

The predictions have been conducted without a penalty for the presence of tonal characteristics.

#### Noise Propagation Model and Inputs

The noise predictions were conducted using the propagation model and inputs as detailed in the 2012 Report

#### Predicted Noise Levels and Comparison with Established Criteria

The noise levels at the residences in the vicinity of the wind farm from turbines have been predicted and compared against the established environmental noise criteria.

#### ***Assessment against the SA Guidelines***

Appendix C provides the predicted noise levels at residences from turbines for both layouts and the criteria in accordance with the SA Guidelines for each residence at each relevant wind speed.

Based on the predicted noise levels, the 106 Acciona AW77 turbines arranged in accordance with Layout A and the 77 Siemens SWT2.3-101 turbines arranged in



accordance with Layout B, will comply with the relevant criteria at all residences (both with and without an agreement) for all wind speeds.

***Assessment against the Separated Criteria for Daytime and Night Periods***

Appendix D provides the predicted noise levels at residences from turbines for both layouts and the night-time criteria for each residence at each relevant wind speed. It is noted that the derived night-time criteria are more stringent than the daytime criteria.

Based on the predicted noise levels, the 106 Acciona AW77 turbines arranged in accordance with Layout A and the 77 Siemens SWT2.3-101 turbines arranged in accordance with Layout B, will comply with the relevant night-time criteria at all residence (both with and without an agreement) for all wind speeds, except at CR34.

At CR34, the predicted noise level exceed the criteria at 9m/s to 11m/s wind speeds by up to 2 dB(A) for the Layout A arrangement; and at 10m/s wind speed by 1 dB(A) for the Layout B arrangement. These exceedances are highlighted yellow in Appendix D.

**Noise Reduction Strategies**

In order to meet compliance with the criteria at all residences, noise reduction options have been considered consisting of a low noise operating strategy to certain turbines during certain wind speeds.

The potential noise reduction strategies for the two planning layouts based on the proposed turbines models are summarised below:

***Layout A – 106 Acciona AW77 Turbines***

The Acciona AW77 turbine has the capacity to operate in low noise modes with reductions in the maximum noise level of 2 to 6 dB(A). In order to achieve compliance at all residences, several operating scenarios have been determined as summarised in Table 4. The noise reduction operating strategy is to be applied during wind speeds of 9m/s to 11 m/s.



**Table 4: Noise reduction mode scenarios.**

Turbine ID	Coordinates		Noise Reduction Mode		
	Easting	Northing	Scenario 1	Scenario 2	Scenario 3
A87	744607	6345442	- 5 dB	- 4 dB	- 2 dB
A89	744563	6345251	- 5 dB	- 4 dB	- 2 dB
A83	744447	6346218	- 5 dB	- 4 dB	- 2 dB
A85	744529	6345707	- 5 dB	- 4 dB	- 2 dB
A84	744407	6345956	- 5 dB	- 4 dB	- 2 dB
A82	744318	6346529	- 5 dB	- 4 dB	- 2 dB
A73	744287	6347414	- 5 dB	- 4 dB	- 2 dB
A94	744469	6344920	- 5 dB	- 4 dB	- 2 dB
A71	744411	6347845	- 5 dB	- 4 dB	- 2 dB
A58	746109	6348909	- 3 dB	- 4 dB	- 2 dB
A66	745052	6348607	0	- 4 dB	- 2 dB
A68	744607	6348365	0	- 2 dB	- 2 dB
A95	744267	6344662	0	0	- 2 dB
A86	744169	6345618	0	0	- 2 dB
A79	744105	6346867	0	0	- 2 dB
A88	744205	6345429	0	0	- 2 dB
A90	744234	6345142	0	0	- 2 dB
A78	744169	6347131	0	0	- 2 dB
A72	743956	6347620	0	0	- 2 dB
A57	746267	6349169	0	0	- 2 dB
A67	744631	6348563	0	0	- 2 dB
A69	744556	6348109	0	0	- 2 dB
A76	743780	6347316	0	0	- 2 dB

Note: The -6 dB operating mode was not considered to allow for a contingency strategy.

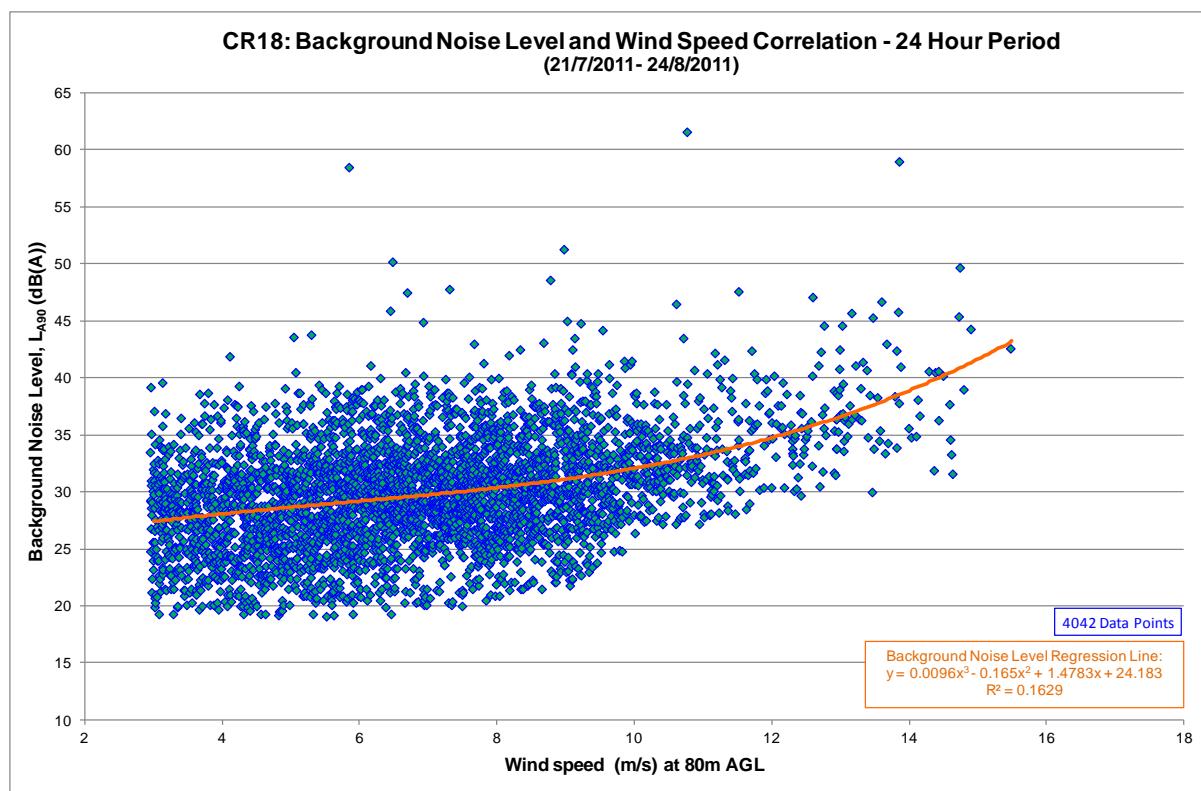
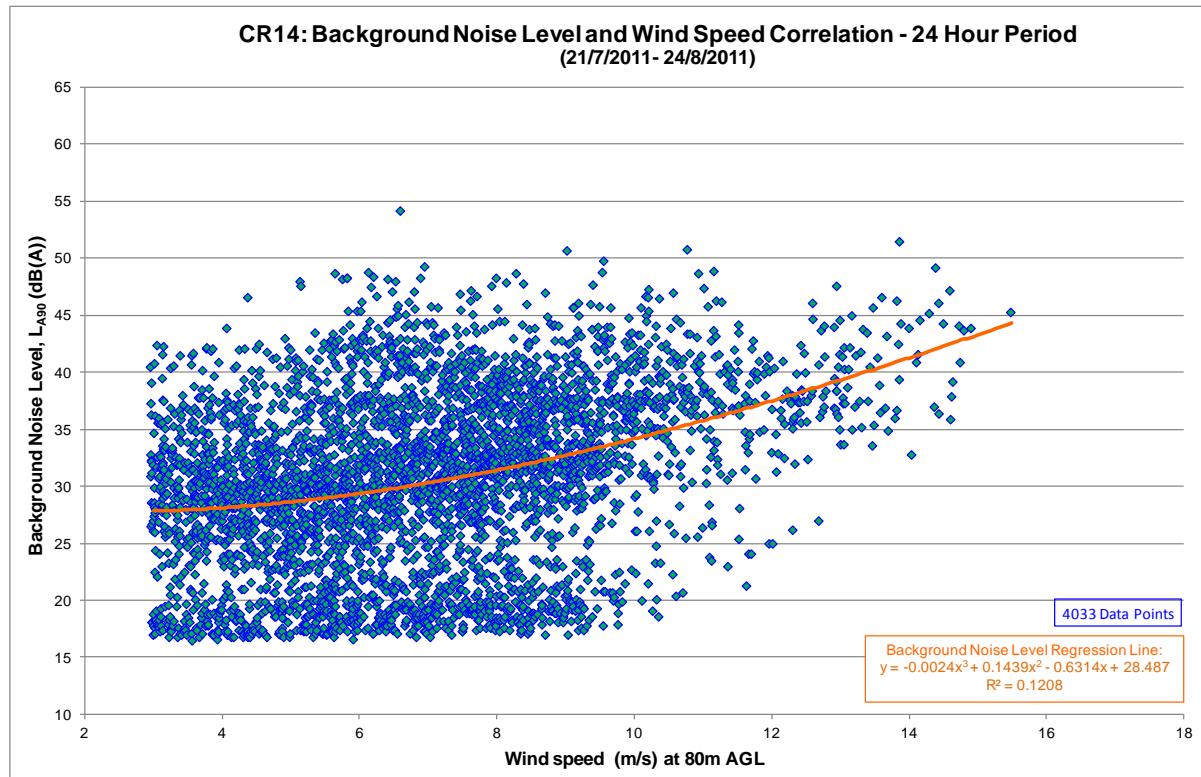
#### **Layout B – 77 Siemens SWT2.3-101 Turbines**

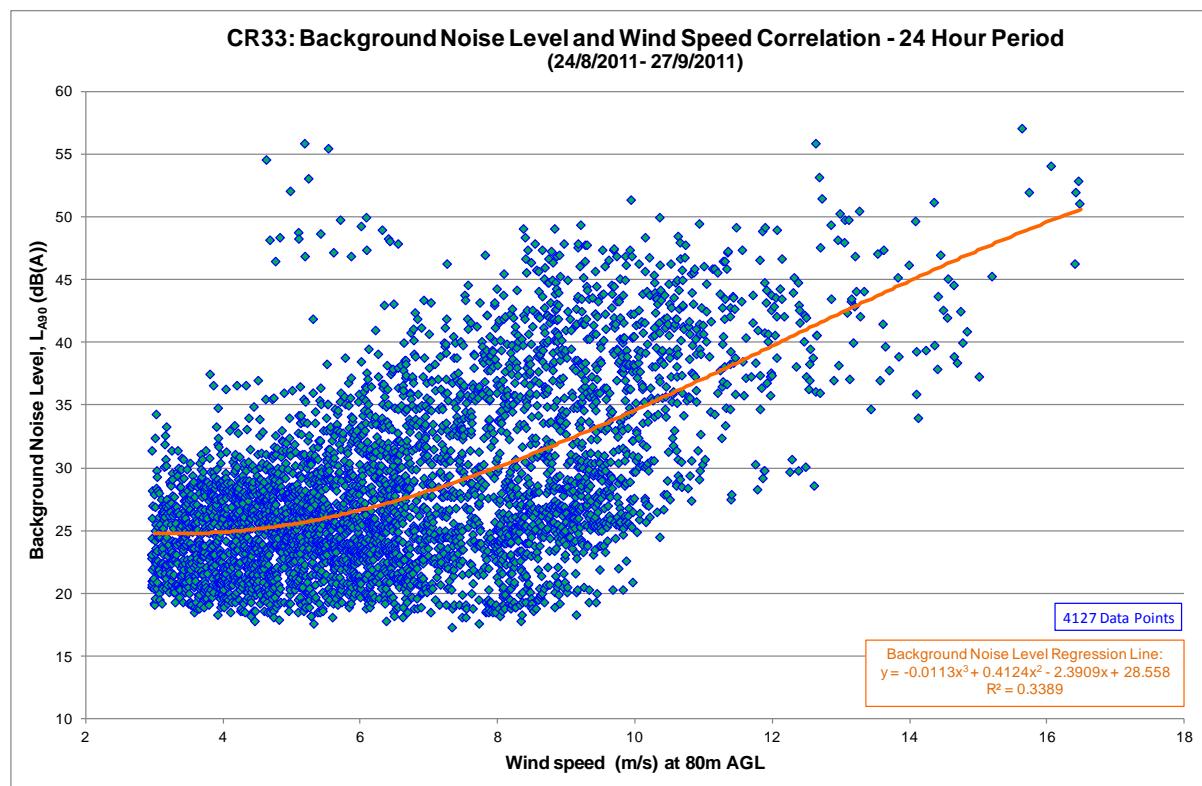
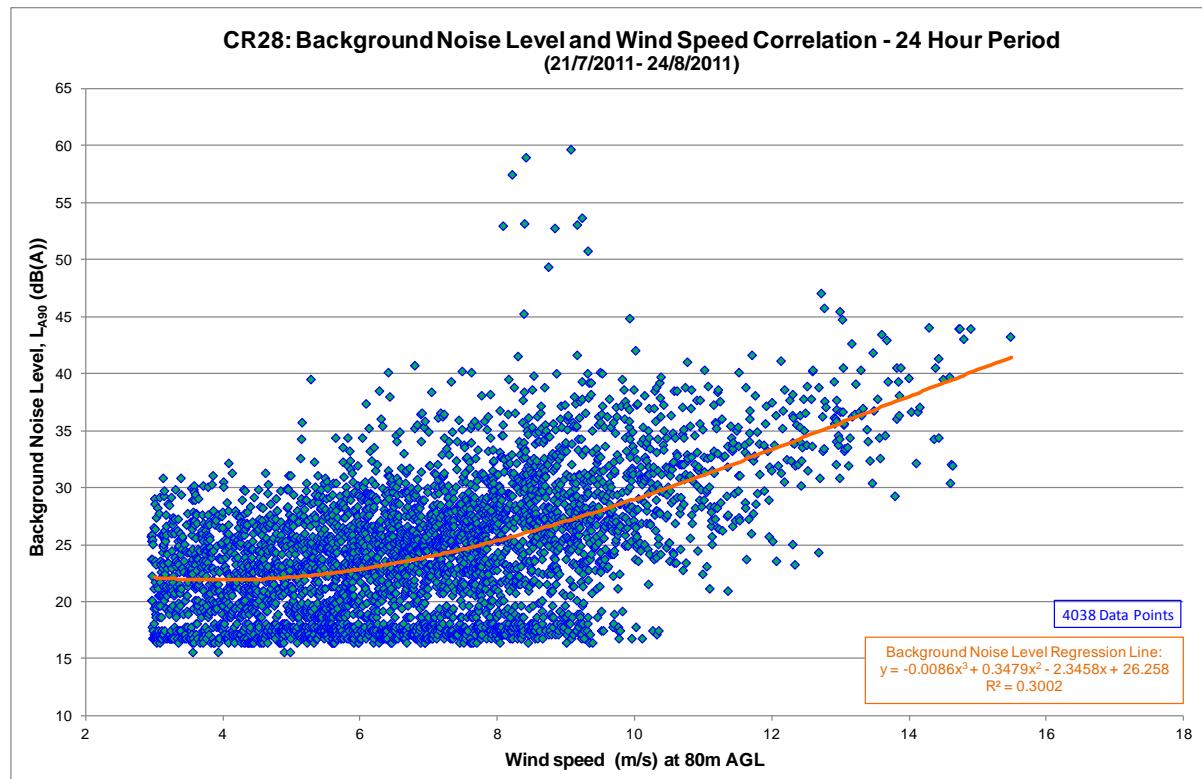
The SWT2.3-101 turbine has the ability to operate in low noise modes with a reduction in the maximum noise level of 1 dB(A) at wind speeds above 6m/s. An operating scenario at 10m/s wind speed has been determined and provided in Table 5. With the operating strategy implemented, the noise from the wind farm is predicted to achieve compliance at all residences.

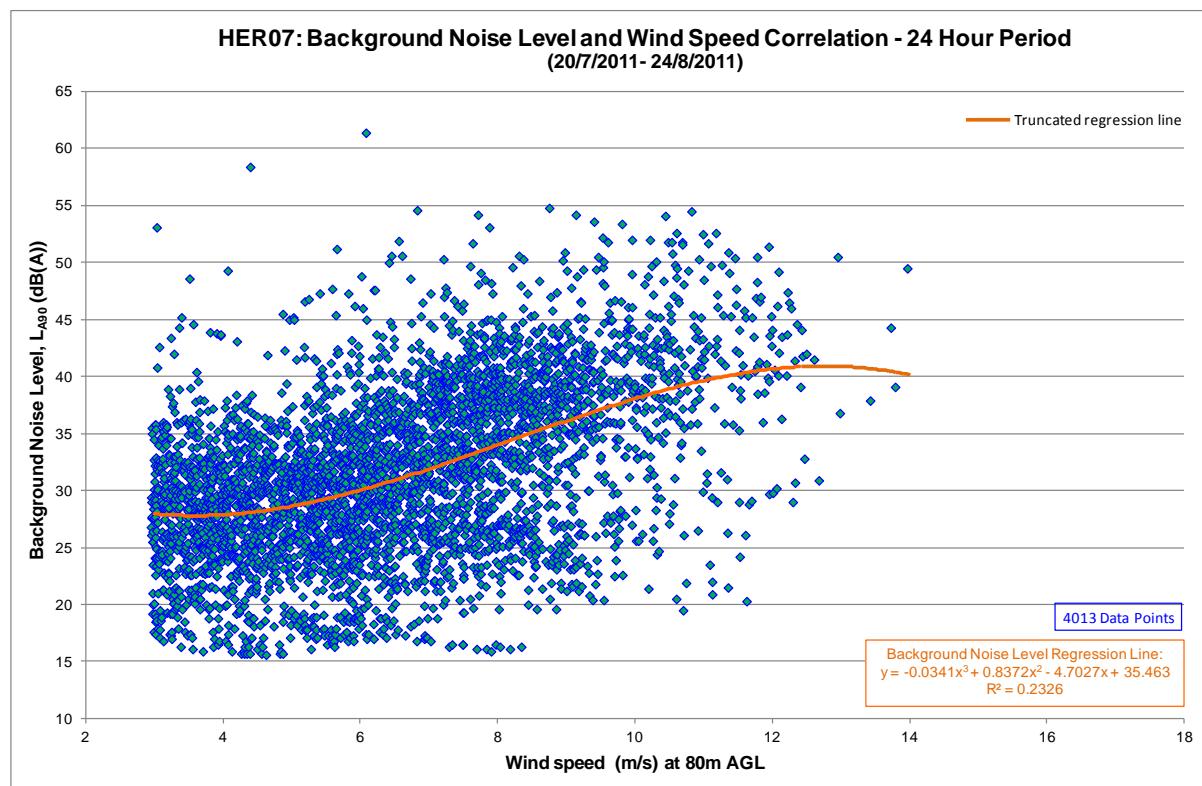
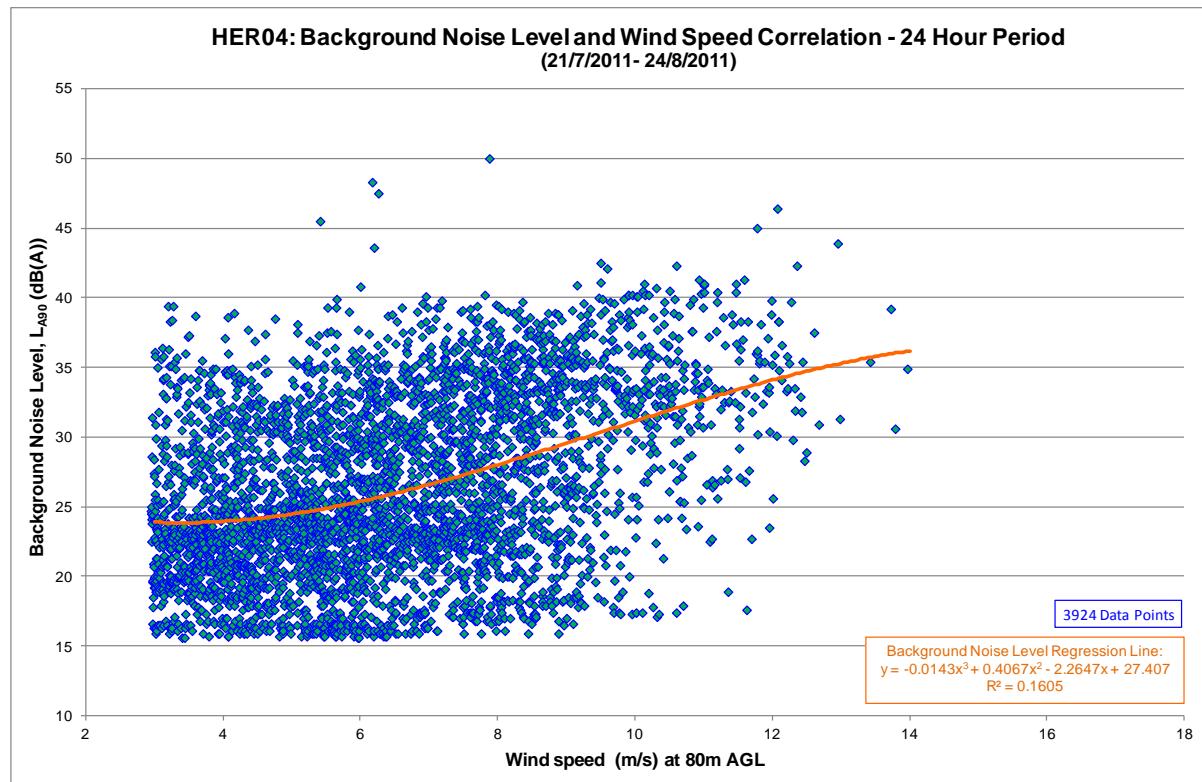
**Table 5: Noise reduction mode scenario.**

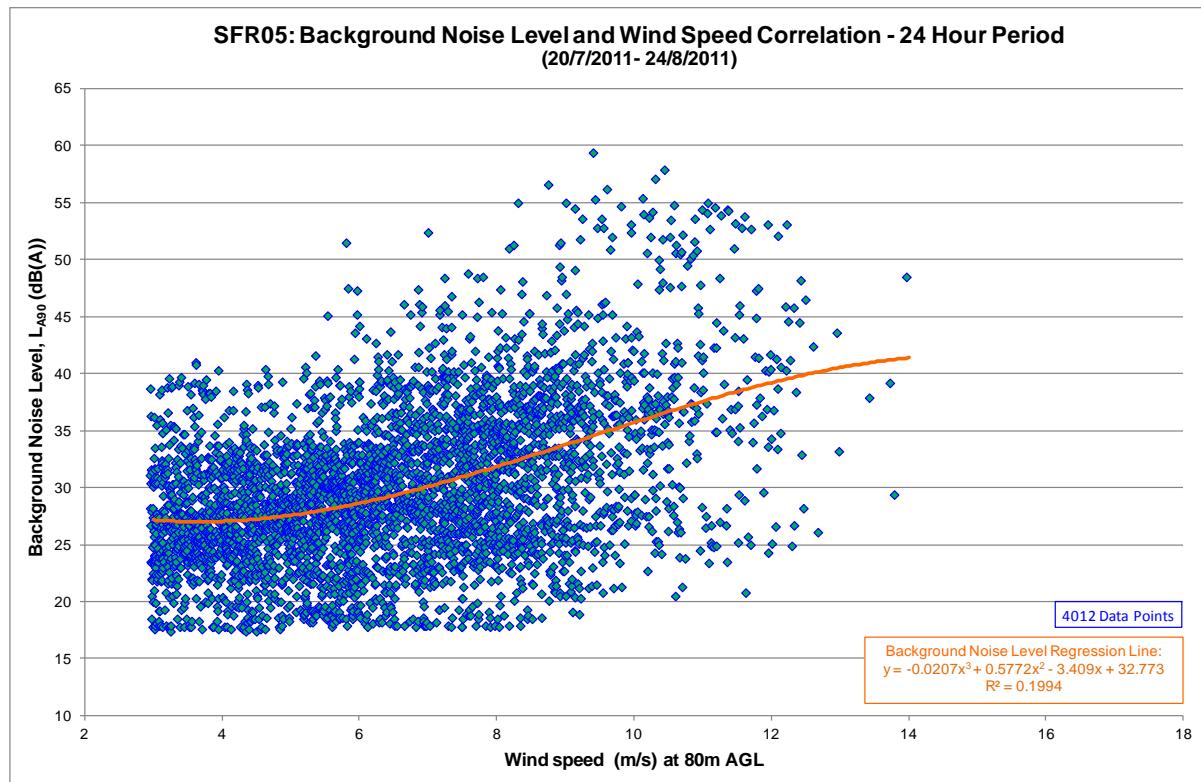
Turbine ID	Coordinates		Noise Reduction Mode
	Easting	Northing	
B63	744619	6345394	- 1 dB
B58	744319	6346519	- 1 dB
B60	744444	6346194	- 1 dB
B61	744519	6345719	- 1 dB
B53	744294	6347394	- 1 dB
B65	744466	6344947	- 1 dB
B51	744444	6347869	- 1 dB
B42	746094	6348894	- 1 dB
B48	745069	6348569	- 1 dB
B49	744594	6348194	- 1 dB
B68	744269	6344644	- 1 dB
B56	744089	6346883	- 1 dB
B47	744644	6348469	- 1 dB
B62	744144	6345494	- 1 dB
B41	746292	6349221	- 1 dB

## APPENDIX A: CORRELATIONS AND REGRESSION ANALYSIS – 24 HOUR PERIOD



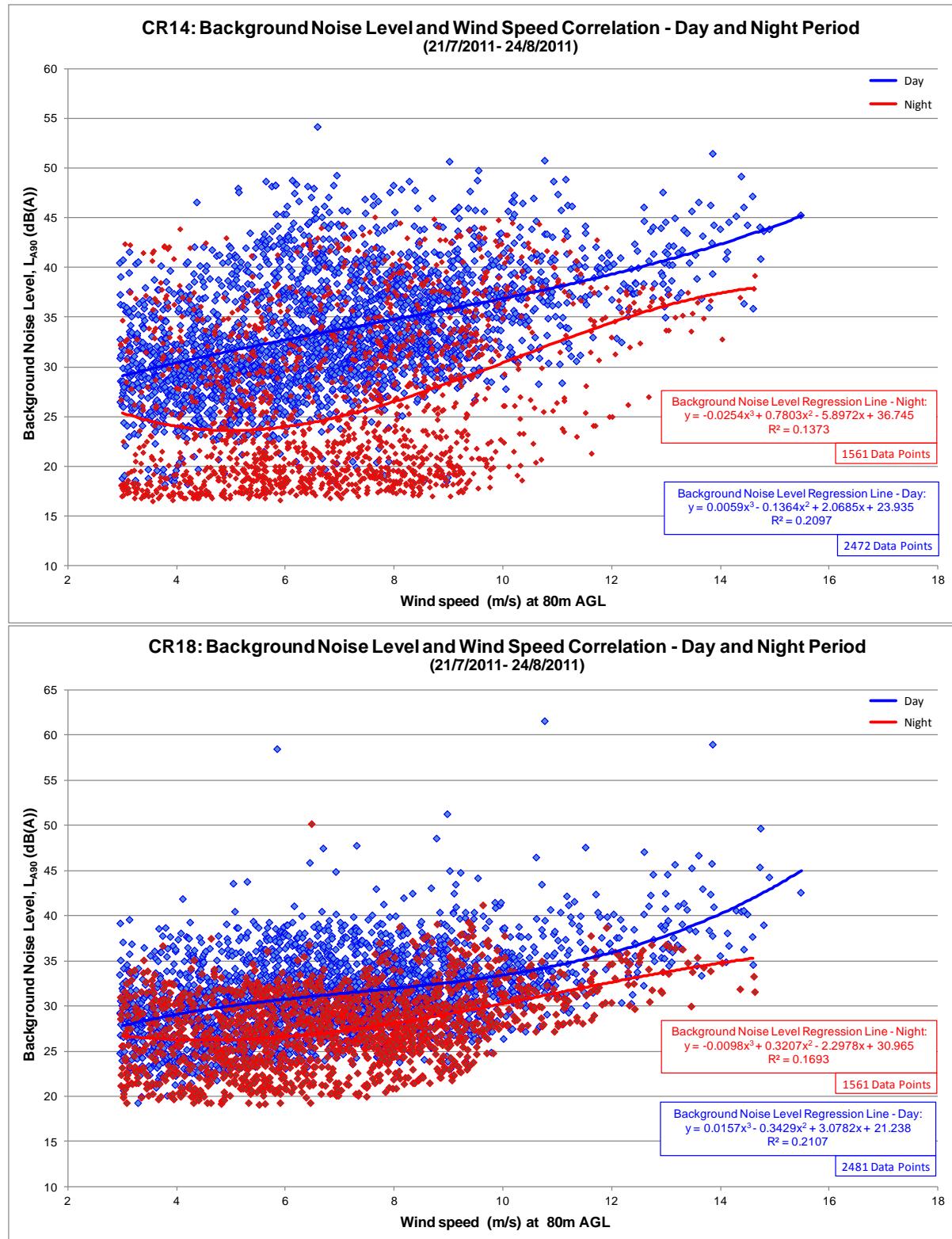


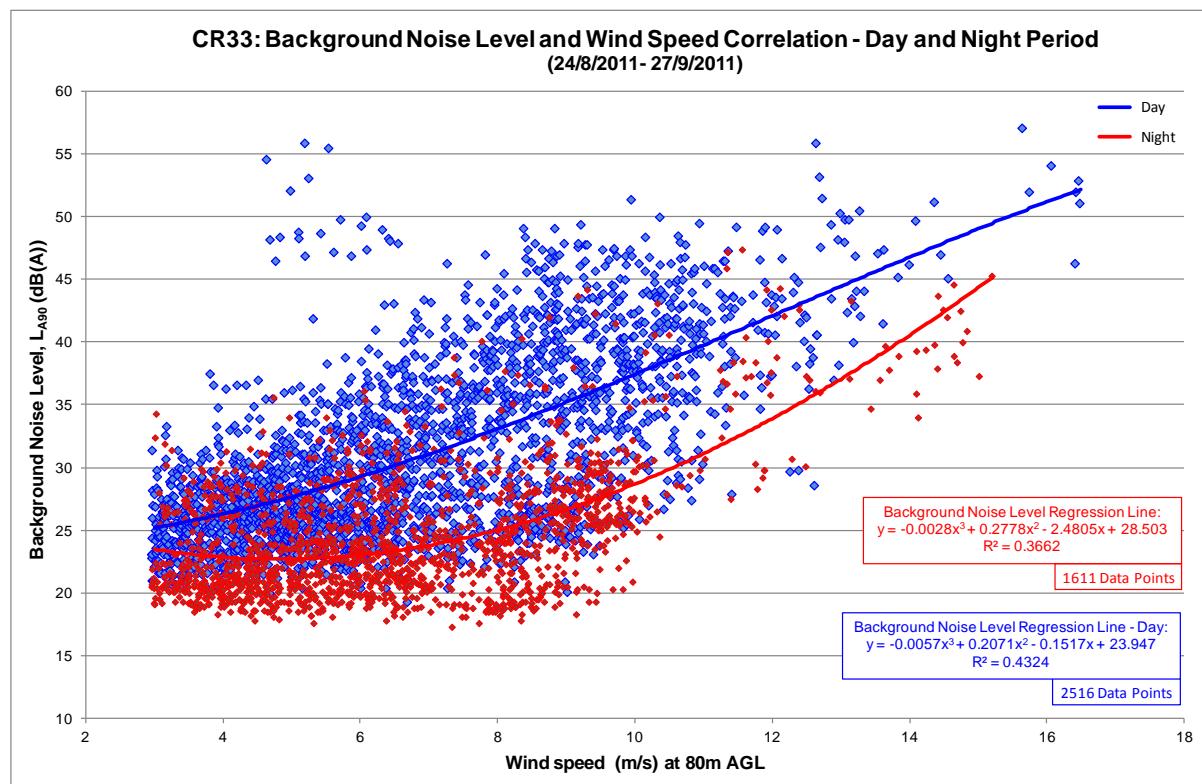
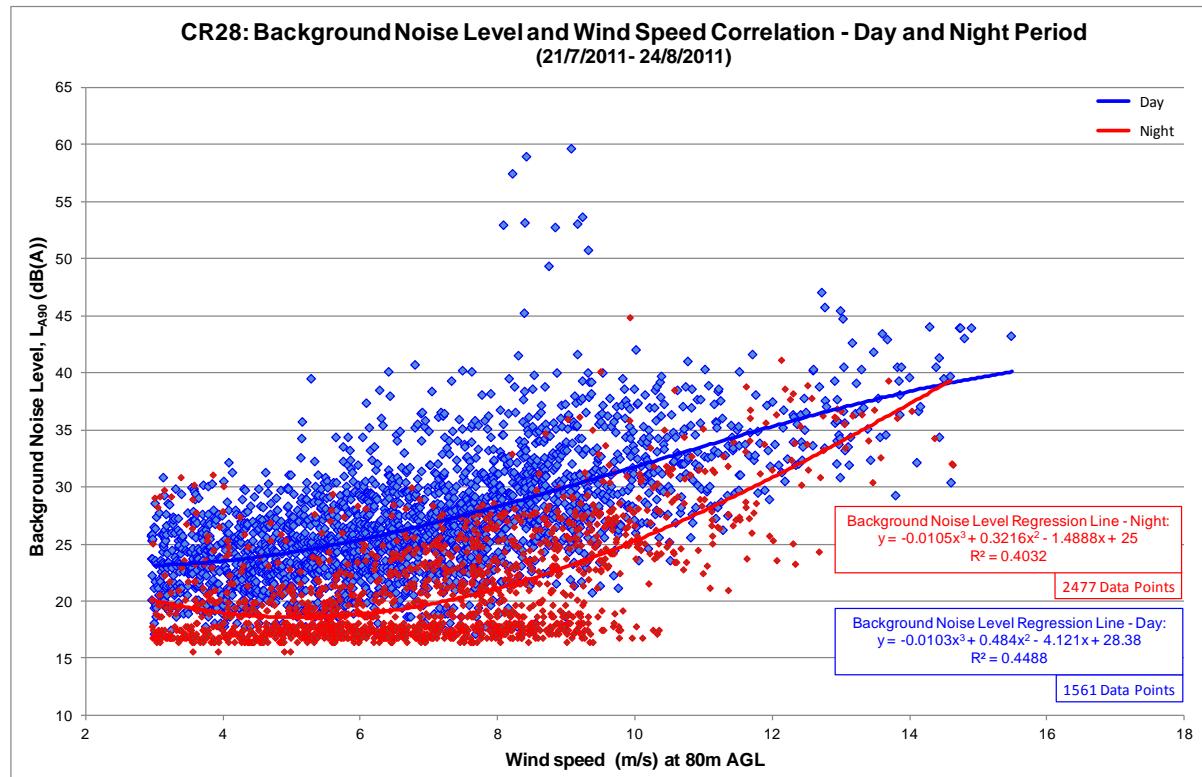






## APPENDIX B: CORRELATIONS AND REGRESSION ANALYSIS – DAY AND NIGHT PERIODS



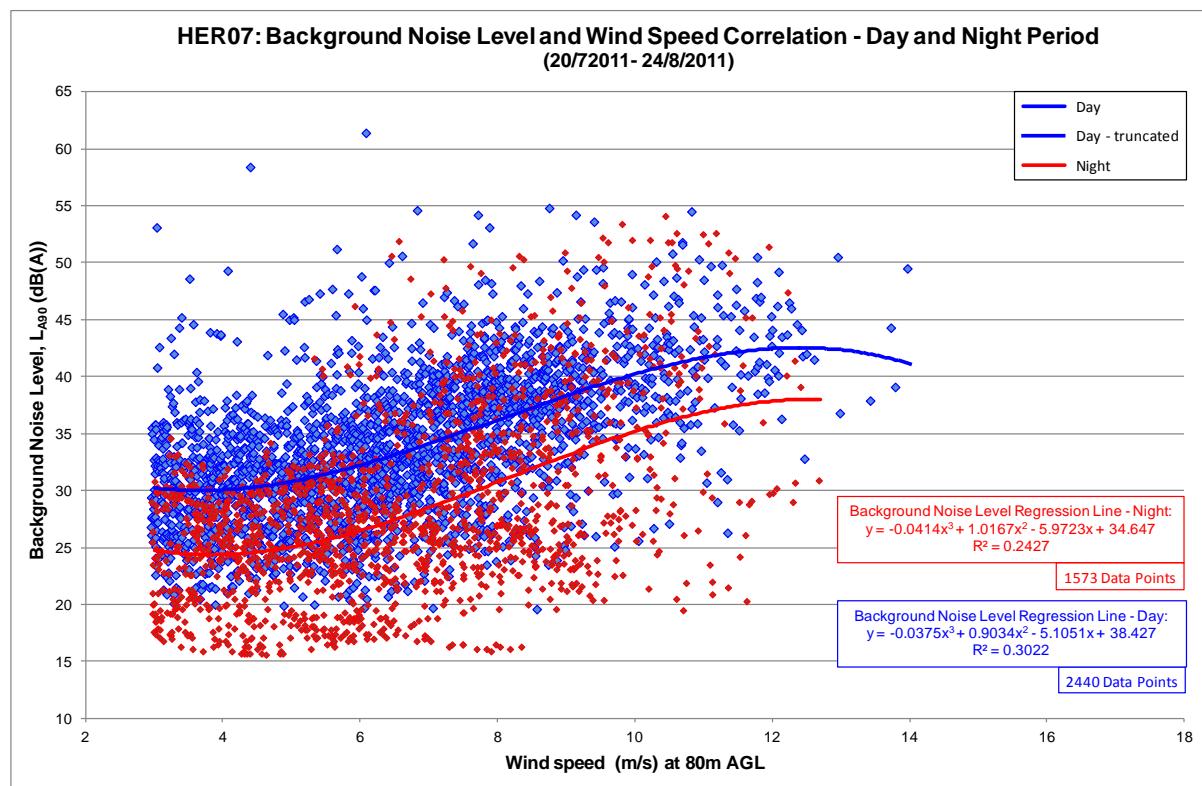
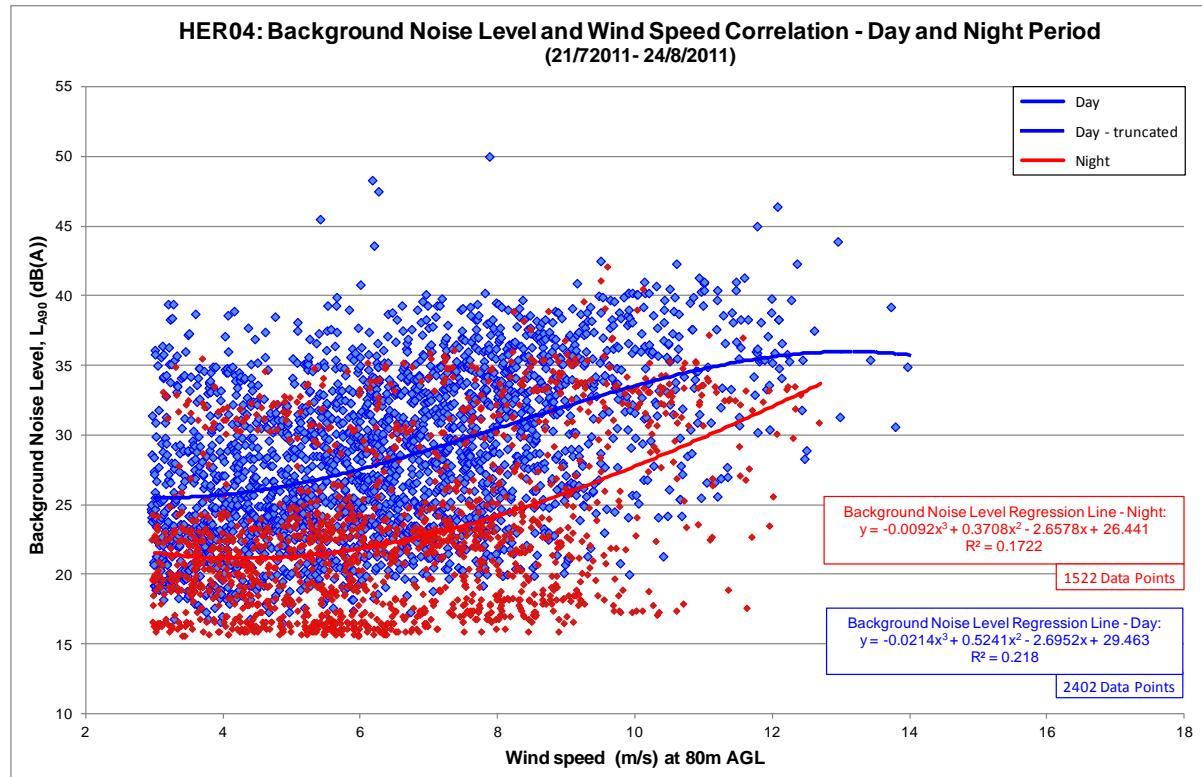


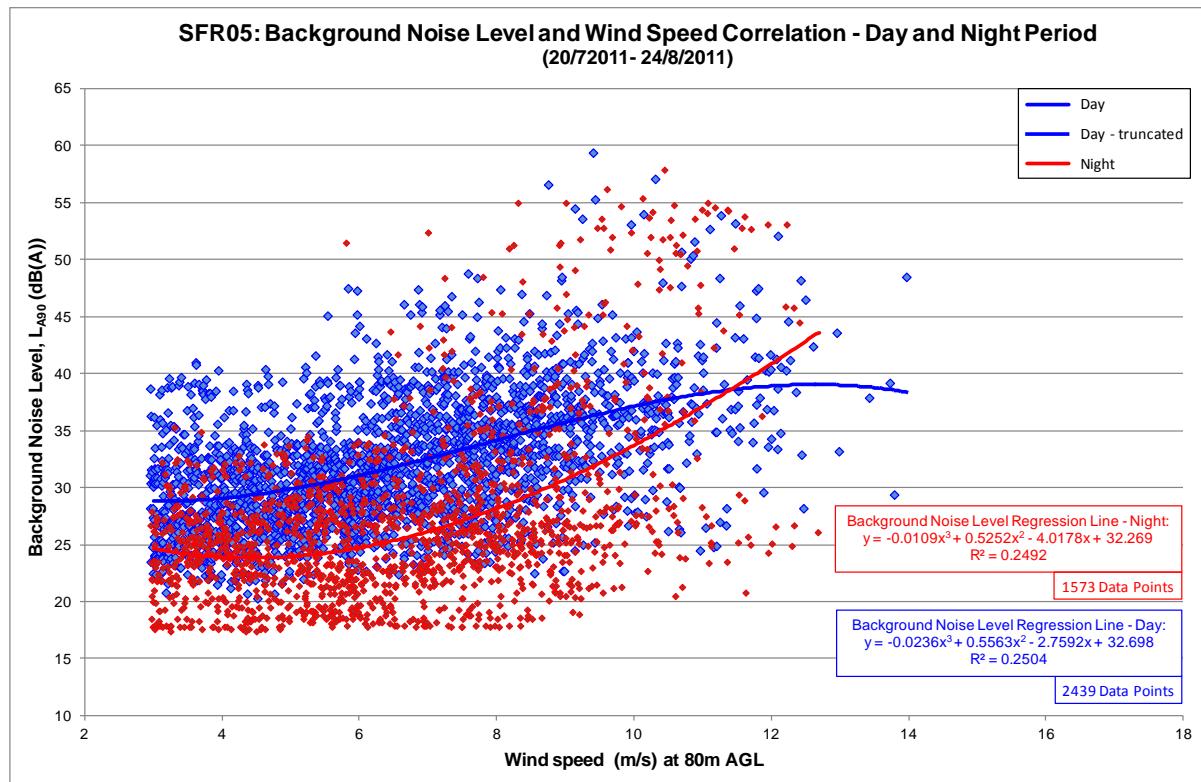
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## **APPENDIX C: NOISE CRITERIA (SA GUIDELINES) AND PREDICTED NOISE LEVELS**

## Planning Layout A with 106 Acciona AW77 WTGs – 24 Hour Period

Residence ID	Representative Logging Location	Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)														Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)													
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16
APR02	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	21	21	22	23	25	26	27	28	28	28	28	28	28	
APR03	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	21	21	22	24	25	27	27	28	28	28	28	28	28	
APR04	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	21	21	23	24	25	27	28	28	28	28	28	28	28	
APR05	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	21	21	22	24	25	27	28	28	28	28	28	28	28	
APR06	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	22	22	23	24	26	27	28	28	28	28	28	28	28	
APR07	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	20	20	22	23	24	26	27	27	27	27	27	27	27	
APR08	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	19	19	21	22	24	25	26	26	26	26	26	26	26	
APR09	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	19	19	20	22	23	25	25	26	26	26	26	26	26	
APR10	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	20	20	21	23	24	26	27	27	27	27	27	27	27	
CR10	CR14	45	45	45	45	45	45	45	45	45	45	45	46	48	48	18	18	19	20	22	23	24	24	25	25	25	25	25	
CR12	CR14	45	45	45	45	45	45	45	45	45	45	45	46	48	48	19	19	21	22	23	25	26	26	26	26	26	26	26	
CR13	CR14	45	45	45	45	45	45	45	45	45	45	45	46	48	48	28	28	29	31	32	34	34	35	35	35	35	35	35	
CR14	CR14	45	45	45	45	45	45	45	45	45	45	45	46	48	48	29	29	30	32	33	34	35	36	36	36	36	36	36	
CR15	CR14	35	35	35	35	35	36	38	39	41	42	44	46	48	48	29	29	30	31	33	34	35	36	36	36	36	36	36	
CR16	CR18	35	35	35	35	35	35	36	37	38	40	42	44	47	47	28	28	29	31	32	34	34	35	35	35	35	35	35	
CR18	CR18	35	35	35	35	35	35	36	37	38	40	42	44	47	47	28	28	29	30	32	33	34	34	35	35	35	35	35	
CR19	CR18	35	35	35	35	35	35	36	37	38	40	42	44	47	47	28	28	29	30	32	33	34	34	35	35	35	35	35	
CR20	CR18	35	35	35	35	35	35	36	37	38	40	42	44	47	47	27	27	29	30	32	33	34	34	34	34	34	34	34	
CR21	CR18	35	35	35	35	35	35	36	37	38	40	42	44	47	47	27	27	29	30	31	33	34	34	34	34	34	34	34	
CR24	CR18	35	35	35	35	35	35	36	37	38	40	42	44	47	47	26	26	27	28	30	31	32	33	33	33	33	33	33	
CR25	CR28	45	45	45	45	45	45	45	45	45	45	45	45	45	45	28	28	29	31	32	34	34	35	35	35	35	35	35	



Residence ID	Representative Logging Location	Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
CR26	CR28	35	35	35	35	35	35	35	35	36	38	41	43	45	45	27	27	28	30	31	33	33	34	34	34	34	34	34			
CR27	CR28	35	35	35	35	35	35	35	35	36	38	41	43	45	45	26	26	28	29	31	32	33	33	33	33	33	33	33			
CR28	CR28	35	35	35	35	35	35	35	35	36	38	41	43	45	45	28	28	29	31	32	33	34	35	35	35	35	35	35			
CR32	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	27	27	28	29	31	32	33	33	33	33	33	33	33			
CR33	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	28	28	29	30	32	33	34	35	35	35	35	35	35			
CR34	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	30	30	31	33	34	35	36	37	37	37	37	37	37			
CR35	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	27	27	28	29	31	32	33	33	33	33	33	33	33			
CR36	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	28	28	29	30	32	33	34	34	34	34	34	34	34			
CR37	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	23	23	24	26	27	28	29	30	30	30	30	30	30			
HER02	HER04	45	45	45	45	45	45	45	45	45	45	45	45	45	45	22	22	23	25	26	27	28	29	29	29	29	29	29			
HER03	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	25	25	26	27	29	30	31	31	31	32	32	32	32			
HER04	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	26	26	27	29	30	32	32	33	33	33	33	33	33			
HER06	HER07	45	45	45	45	45	45	45	45	45	46	46	46	46	46	27	27	29	30	32	33	34	34	34	34	34	34	34			
HER07	HER07	45	45	45	45	45	45	45	45	45	46	46	46	46	46	27	27	28	30	31	33	34	34	34	34	34	34	34			
HER08	HER07	45	45	45	45	45	45	45	45	46	46	46	46	46	46	27	27	28	29	31	32	33	33	33	33	33	33	33			
HER10	HER07	35	35	35	35	37	39	41	43	45	46	46	46	46	46	20	20	21	23	24	25	26	27	27	27	27	27	27			
HER11	HER07	35	35	35	35	37	39	41	43	45	46	46	46	46	46	19	19	21	22	24	25	26	26	26	26	26	26	26			
HER12	HER07	45	45	45	45	45	45	45	45	46	46	46	46	46	46	32	32	33	35	36	38	39	39	39	39	39	39	39			
HER13	HER07	35	35	35	35	37	39	41	43	45	46	46	46	46	46	23	23	24	25	27	28	29	30	30	30	30	30	30			
PL01	SFR05	35	35	35	35	35	37	39	41	43	44	44	46	46	46	22	22	23	25	26	28	28	29	29	29	29	29	29			
PL02	SFR05	35	35	35	35	35	37	39	41	43	44	44	46	46	46	23	23	24	26	27	29	29	30	30	30	30	30	30			
PL03	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	24	24	25	26	28	29	30	30	30	30	30	30	30			
PL04	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	31	31	32	33	35	36	37	38	38	38	38	38	38			
PR01	SFR05	35	35	35	35	35	37	39	41	43	44	44	46	46	46	18	18	19	21	22	24	24	25	25	25	25	25	25			



Residence ID	Representative Logging Location	Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
PR03	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	19	20	21	23	24	24	24	24	24	24	24			
PR04	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	18	20	21	23	24	24	24	24	24	24	24			
PR05	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	17	17	18	20	21	23	24	24	24	24	24	24	24			
PR06	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	17	17	18	20	21	23	24	24	24	24	24	24	24			
PR07	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	17	17	18	20	21	23	23	24	24	24	24	24	24			
PR09	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	18	20	21	23	23	24	24	24	24	24	24			
PR10	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	18	20	21	22	23	24	24	24	24	24	24			
PR11	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	18	19	21	22	23	23	23	23	23	23	23			
PR12	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	17	17	19	20	21	23	24	24	24	24	24	24	24			
PR13	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	20	20	21	23	24	25	26	27	27	27	27	27	27			
SFR01	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	23	23	25	26	28	29	30	30	30	30	30	30	30			
SFR04	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	28	28	29	31	32	34	34	35	35	35	35	35	35			
SFR05	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	28	28	29	31	32	34	34	35	35	35	35	35	35			
SFR06	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	27	27	28	29	31	32	33	33	33	34	34	34	34			
SFR07	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	24	24	25	26	28	29	30	31	31	31	31	31	31			
SFR08	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	24	24	25	26	28	29	30	31	31	31	31	31	31			
SFR09	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	23	23	24	26	27	29	29	30	30	30	30	30	30			
SFR10	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	20	20	21	23	24	25	26	27	27	27	27	27	27			
SFR11	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	22	22	24	25	27	28	29	29	29	29	29	29	29			
SFR12	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	22	22	23	25	26	28	29	29	29	29	29	29	29			
SFR13	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	19	19	20	21	23	24	25	26	26	26	26	26	26			
SFR16	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	21	21	22	23	25	26	27	27	27	28	28	28	28			
SFR17	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	21	21	22	23	25	26	27	27	27	27	27	27	27			
SFR18	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	21	21	22	23	25	26	27	27	27	28	28	28	28			



Residence ID	Representative Logging Location	Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
SFR19	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	21	21	23	24	26	27	28	28	28	28	28	28	28			
TR01	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	19	19	20	22	23	25	25	26	26	26	26	26	26			
TR02	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	19	19	20	22	23	24	25	26	26	26	26	26	26			
TR03	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	17	17	18	20	21	23	23	24	24	24	24	24	24			
TR05	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	17	17	18	20	21	22	23	24	24	24	24	24	24			
TR06	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	16	16	18	19	21	22	23	23	23	23	23	23	23			

Planning Layout B with 77 Siemens SWT2.3-101 WTGs – 24 Hour Period

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Residence ID	Representative Logging Location	Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
CR28	CR28	35	35	35	35	35	35	35	35	36	38	41	43	45	45	23	23	23	24	28	31	33	34	34	34	34	34	34			
CR32	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	21	21	21	23	26	30	31	32	32	32	32	32	32			
CR33	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	23	23	23	24	28	31	33	34	34	34	34	34	34			
CR34	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	25	25	25	25	27	30	33	35	36	36	36	36	36			
CR35	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	22	22	22	24	27	30	32	33	33	33	33	33	33			
CR36	CR33	35	35	35	35	35	35	37	40	42	45	47	50	52	55	23	23	23	24	28	31	33	34	34	34	34	34	34			
CR37	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	19	19	19	20	24	27	29	30	30	30	30	30	30			
HER02	HER04	45	45	45	45	45	45	45	45	45	45	45	45	45	45	18	18	18	19	22	26	28	29	29	29	29	29	29			
HER03	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	20	20	20	22	25	29	31	31	31	31	31	31	31			
HER04	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	22	22	22	23	27	30	32	33	33	33	33	33	33			
HER06	HER07	45	45	45	45	45	45	45	45	45	46	46	46	46	46	23	23	23	25	28	32	33	34	34	34	34	34	34			
HER07	HER07	45	45	45	45	45	45	45	45	45	46	46	46	46	46	23	23	23	24	27	31	33	33	33	33	33	33	33			
HER08	HER07	45	45	45	45	45	45	45	45	45	46	46	46	46	46	22	22	22	23	27	30	32	33	33	33	33	33	33			
HER10	HER07	35	35	35	35	37	39	41	43	45	46	46	46	46	46	15	15	15	16	20	23	25	26	26	26	26	26	26			
HER11	HER07	35	35	35	35	37	39	41	43	45	46	46	46	46	46	15	15	15	16	19	23	25	26	26	26	26	26	26			
HER12	HER07	45	45	45	45	45	45	45	45	45	46	46	46	46	46	28	28	28	29	32	36	38	39	39	39	39	39	39			
HER13	HER07	35	35	35	35	37	39	41	43	45	46	46	46	46	46	18	18	18	19	23	26	28	29	29	29	29	29	29			
PL01	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	18	18	18	19	22	26	28	29	29	29	29	29	29			
PL02	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	19	19	19	20	23	27	29	30	30	30	30	30	30			
PL03	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	19	19	19	21	24	27	29	30	30	30	30	30	30			
PL04	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	26	26	26	27	31	34	36	37	37	37	37	37	37			
PR01	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	13	13	13	15	18	22	24	24	24	24	24	24	24			
PR03	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	13	13	13	14	18	21	23	24	24	24	24	24	24			
PR04	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			



Residence ID	Representative Logging Location	Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
PR05	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR06	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR07	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR09	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	12	12	12	14	17	21	23	23	23	23	23	23	23			
PR10	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	12	12	12	14	17	20	22	23	23	23	23	23	23			
PR11	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	12	12	12	13	17	20	22	23	23	23	23	23	23			
PR12	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR13	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	15	15	15	17	20	24	25	26	26	26	26	26	26			
SFR01	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	18	18	18	20	23	27	29	29	29	29	29	29	29			
SFR04	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	23	23	23	24	28	31	33	34	34	34	34	34	34			
SFR05	SFR05	45	45	45	45	45	45	45	45	45	45	46	46	46	46	23	23	23	24	28	31	33	34	34	34	34	34	34			
SFR06	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	21	21	21	23	26	30	32	32	32	32	32	32	32			
SFR07	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	19	19	19	20	23	27	29	30	30	30	30	30	30			
SFR08	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	19	19	19	20	24	27	29	30	30	30	30	30	30			
SFR09	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	18	18	18	19	23	26	28	29	29	29	29	29	29			
SFR10	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	15	15	15	16	20	23	25	26	26	26	26	26	26			
SFR11	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	17	19	22	25	27	28	28	28	28	28	28			
SFR12	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	17	18	22	25	27	28	28	28	28	28	28			
SFR13	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	14	14	14	15	18	22	24	25	25	25	25	25	25			
SFR16	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	16	16	16	17	21	24	26	27	27	27	27	27	27			
SFR17	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	16	16	16	17	21	24	26	27	27	27	27	27	27			
SFR18	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	16	16	16	17	21	24	26	27	27	27	27	27	27			
SFR19	SFR05	35	35	35	35	35	37	39	41	43	44	46	46	46	46	17	17	17	18	22	25	27	28	28	28	28	28	28			
TR01	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	15	15	15	16	19	23	25	26	26	26	26	26	26			

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Residence ID	Representative Logging Location	Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)														Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)													
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TR02	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	14	14	14	14	16	19	23	24	25	25	25	25	25	
TR03	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	13	13	13	13	14	17	21	23	24	24	24	24	24	
TR05	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	12	12	12	12	14	17	21	23	23	23	23	23	23	
TR06	HER04	35	35	35	35	35	35	35	36	38	39	40	41	41	41	12	12	12	12	13	17	20	22	23	23	23	23	23	



#### APPENDIX D: NOISE CRITERIA (NIGHT-TIME PERIOD) AND PREDICTED NOISE LEVELS

##### Planning Layout A with 106 Acciona AW77 WTGs – Night-time Period

Residence ID	Representative Logging Location	Night-time Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
APR02	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	21	21	22	23	25	26	27	28	28	28	28	28	28			
APR03	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	21	21	22	24	25	27	27	28	28	28	28	28	28			
APR04	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	21	21	23	24	25	27	28	28	28	28	28	28	28			
APR05	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	21	21	22	24	25	27	28	28	28	28	28	28	28			
APR06	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	22	22	23	24	26	27	28	28	28	28	28	28	28			
APR07	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	20	20	22	23	24	26	27	27	27	27	27	27	27			
APR08	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	19	19	21	22	24	25	26	26	26	26	26	26	26			
APR09	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	19	19	20	22	23	25	25	26	26	26	26	26	26			
APR10	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	20	20	21	23	24	26	27	27	27	27	27	27	27			
CR10	CR14	45	45	45	45	45	45	45	45	45	45	45	45	45	45	18	18	19	20	22	23	24	24	25	25	25	25	25			
CR12	CR14	45	45	45	45	45	45	45	45	45	45	45	45	45	45	19	19	21	22	23	25	26	26	26	26	26	26	26			
CR13	CR14	45	45	45	45	45	45	45	45	45	45	45	45	45	45	28	28	29	31	32	34	34	35	35	35	35	35	35			
CR14	CR14	45	45	45	45	45	45	45	45	45	45	45	45	45	45	29	29	30	32	33	34	35	36	36	36	36	36	36			
CR15	CR14	35	35	35	35	35	35	35	35	37	39	41	42	42	42	29	29	30	31	33	34	35	36	36	36	36	36	36			
CR16	CR18	35	35	35	35	35	35	35	35	36	38	39	40	40	40	28	28	29	31	32	34	34	35	35	35	35	35	35			
CR18	CR18	35	35	35	35	35	35	35	35	36	38	39	40	40	40	28	28	29	30	32	33	34	34	35	35	35	35	35			
CR19	CR18	35	35	35	35	35	35	35	35	36	38	39	40	40	40	28	28	29	30	32	33	34	34	35	35	35	35	35			
CR20	CR18	35	35	35	35	35	35	35	35	36	38	39	40	40	40	27	27	29	30	32	33	34	34	34	34	34	34	34			
CR21	CR18	35	35	35	35	35	35	35	35	36	38	39	40	40	40	27	27	29	30	31	33	34	34	34	34	34	34	34			
CR24	CR18	35	35	35	35	35	35	35	35	36	38	39	40	40	40	26	26	27	28	30	31	32	33	33	33	33	33	33			
CR25	CR28	45	45	45	45	45	45	45	45	45	45	45	45	45	45	28	28	29	31	32	34	34	35	35	35	35	35	35			



Residence ID	Representative Logging Location	Night-time Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
CR26	CR28	35	35	35	35	35	35	35	35	35	36	39	42	42	42	27	27	28	30	31	33	33	34	34	34	34	34	34			
CR27	CR28	35	35	35	35	35	35	35	35	35	36	39	42	42	42	26	26	28	29	31	32	33	33	33	33	33	33	33			
CR28	CR28	35	35	35	35	35	35	35	35	35	36	39	42	42	42	28	28	29	31	32	33	34	35	35	35	35	35	35			
CR32	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	27	27	28	29	31	32	33	33	33	33	33	33	33			
CR33	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	28	28	29	30	32	33	34	35	35	35	35	35	35			
CR34	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	30	30	31	33	34	35	36	37	37	37	37	37	37			
CR35	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	27	27	28	30	31	32	33	34	34	34	34	34	34			
CR36	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	28	28	29	30	32	33	34	34	34	34	34	34	34			
CR37	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	23	23	24	26	27	28	29	30	30	30	30	30	30			
HER02	HER04	45	45	45	45	45	45	45	45	45	45	45	45	45	45	22	22	23	25	26	27	28	29	29	29	29	29	29			
HER03	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	25	25	26	27	29	30	31	31	31	32	32	32	32			
HER04	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	26	26	27	29	30	32	32	33	33	33	33	33	33			
HER06	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	27	27	29	30	32	33	34	34	34	34	34	34	34			
HER07	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	27	27	28	30	31	33	34	34	34	34	34	34	34			
HER08	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	27	27	28	29	31	32	33	33	33	33	33	33	33			
HER10	HER07	35	35	35	35	35	36	38	40	42	43	43	43	43	43	20	20	21	23	24	25	26	27	27	27	27	27	27			
HER11	HER07	35	35	35	35	35	36	38	40	42	43	43	43	43	43	19	19	21	22	24	25	26	26	26	26	26	26	26			
HER12	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	32	32	33	35	36	38	39	39	39	39	39	39	39			
HER13	HER07	35	35	35	35	35	36	38	40	42	43	43	43	43	43	23	23	24	25	27	28	29	30	30	30	30	30	30			
PL01	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	22	22	23	25	26	28	28	29	29	29	29	29	29			
PL02	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	23	23	24	26	27	29	29	30	30	30	30	30	30			
PL03	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	24	24	25	26	28	29	30	30	30	30	30	30	30			
PL04	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	31	31	32	33	35	36	37	38	38	38	38	38	38			
PR01	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	18	18	19	21	22	24	24	25	25	25	25	25	25			



Residence ID	Representative Logging Location	Night-time Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
PR03	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	19	20	21	23	24	24	24	24	24	24	24			
PR04	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	18	20	21	23	24	24	24	24	24	24	24			
PR05	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	17	17	18	20	21	23	24	24	24	24	24	24	24			
PR06	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	17	17	18	20	21	23	24	24	24	24	24	24	24			
PR07	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	17	17	18	20	21	23	23	24	24	24	24	24	24			
PR09	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	18	20	21	23	23	24	24	24	24	24	24			
PR10	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	18	20	21	22	23	24	24	24	24	24	24			
PR11	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	18	19	21	22	23	23	23	23	23	23	23			
PR12	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	17	17	19	20	21	23	24	24	24	24	24	24	24			
PR13	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	20	20	21	23	24	25	26	27	27	27	27	27	27			
SFR01	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	23	23	25	26	28	29	30	30	30	30	30	30	30			
SFR04	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	28	28	29	31	32	34	34	35	35	35	35	35	35			
SFR05	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	28	28	29	31	32	34	34	35	35	35	35	35	35			
SFR06	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	27	27	28	29	31	32	33	33	33	34	34	34	34			
SFR07	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	24	24	25	26	28	29	30	31	31	31	31	31	31			
SFR08	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	24	24	25	26	28	29	30	31	31	31	31	31	31			
SFR09	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	23	23	24	26	27	29	29	30	30	30	30	30	30			
SFR10	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	20	20	21	23	24	25	26	27	27	27	27	27	27			
SFR11	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	22	22	24	25	27	28	29	29	29	29	29	29	29			
SFR12	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	22	22	23	25	26	28	29	29	29	29	29	29	29			
SFR13	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	19	19	20	21	23	24	25	26	26	26	26	26	26			
SFR16	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	21	21	22	23	25	26	27	27	27	28	28	28	28			
SFR17	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	21	21	22	23	25	26	27	27	27	27	27	27	27			
SFR18	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	21	21	22	23	25	26	27	27	27	28	28	28	28			



Residence ID	Representative Logging Location	Night-time Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
SFR19	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	21	21	23	24	26	27	28	28	28	28	28	28	28			
TR01	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	19	19	20	22	23	25	25	26	26	26	26	26	26			
TR02	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	19	19	20	22	23	24	25	26	26	26	26	26	26			
TR03	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	17	17	18	20	21	23	23	24	24	24	24	24	24			
TR05	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	17	17	18	20	21	22	23	24	24	24	24	24	24			
TR06	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	16	16	18	19	21	22	23	23	23	23	23	23	23			

Planning Layout B with 77 Siemens SWT2.3-101 WTGs – Night-time Period



Residence ID	Representative Logging Location	Night-time Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
CR28	CR28	35	35	35	35	35	35	35	35	35	36	39	42	42	42	23	23	23	24	28	31	33	34	34	34	34	34	34			
CR32	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	21	21	21	23	26	30	31	32	32	32	32	32	32			
CR33	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	23	23	23	24	28	31	33	34	34	34	34	34	34			
CR34	CR33	35	35	35	35	35	35	35	35	35	36	39	42	46	49	49	25	25	25	25	27	30	33	35	36	36	36	36			
CR35	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	22	22	22	24	27	30	32	33	33	33	33	33	33			
CR36	CR33	35	35	35	35	35	35	35	35	36	39	42	46	49	49	23	23	23	24	28	31	33	34	34	34	34	34	34			
CR37	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	19	19	19	20	24	27	29	30	30	30	30	30	30			
HER02	HER04	45	45	45	45	45	45	45	45	45	45	45	45	45	45	18	18	18	19	22	26	28	29	29	29	29	29	29			
HER03	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	20	20	20	22	25	29	31	31	31	31	31	31	31			
HER04	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	22	22	22	23	27	30	32	33	33	33	33	33	33			
HER06	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	23	23	23	25	28	32	33	34	34	34	34	34	34			
HER07	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	23	23	23	24	27	31	33	33	33	33	33	33	33			
HER08	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	22	22	22	23	27	30	32	33	33	33	33	33	33			
HER10	HER07	35	35	35	35	35	36	38	40	42	43	43	43	43	43	15	15	15	16	20	23	25	26	26	26	26	26	26			
HER11	HER07	35	35	35	35	35	36	38	40	42	43	43	43	43	43	15	15	15	16	19	23	25	26	26	26	26	26	26			
HER12	HER07	45	45	45	45	45	45	45	45	45	45	45	45	45	45	28	28	28	29	32	36	38	39	39	39	39	39	39			
HER13	HER07	35	35	35	35	35	36	38	40	42	43	43	43	43	43	18	18	18	19	23	26	28	29	29	29	29	29	29			
PL01	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	18	18	18	19	22	26	28	29	29	29	29	29	29			
PL02	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	19	19	19	20	23	27	29	30	30	30	30	30	30			
PL03	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	19	19	19	21	24	27	29	30	30	30	30	30	30			
PL04	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	26	26	26	27	31	34	36	37	37	37	37	37	37			
PR01	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	13	13	13	15	18	22	24	24	24	24	24	24	24			
PR03	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	13	13	13	14	18	21	23	24	24	24	24	24	24			
PR04	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			



Residence ID	Representative Logging Location	Night-time Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
PR05	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR06	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR07	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR09	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	12	12	12	14	17	21	23	23	23	23	23	23	23			
PR10	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	12	12	12	14	17	20	22	23	23	23	23	23	23			
PR11	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	12	12	12	13	17	20	22	23	23	23	23	23	23			
PR12	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	13	13	13	14	17	21	23	24	24	24	24	24	24			
PR13	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	15	15	15	17	20	24	25	26	26	26	26	26	26			
SFR01	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	18	18	18	20	23	27	29	29	29	29	29	29	29			
SFR04	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	23	23	23	24	28	31	33	34	34	34	34	34	34			
SFR05	SFR05	45	45	45	45	45	45	45	45	45	46	46	46	46	46	23	23	23	24	28	31	33	34	34	34	34	34	34			
SFR06	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	21	21	21	23	26	30	32	32	32	32	32	32	32			
SFR07	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	19	19	19	20	23	27	29	30	30	30	30	30	30			
SFR08	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	19	19	19	20	24	27	29	30	30	30	30	30	30			
SFR09	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	18	18	18	19	23	26	28	29	29	29	29	29	29			
SFR10	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	15	15	15	16	20	23	25	26	26	26	26	26	26			
SFR11	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	17	19	22	25	27	28	28	28	28	28	28			
SFR12	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	17	18	22	25	27	28	28	28	28	28	28			
SFR13	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	14	14	14	15	18	22	24	25	25	25	25	25	25			
SFR16	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	16	16	16	17	21	24	26	27	27	27	27	27	27			
SFR17	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	16	16	16	17	21	24	26	27	27	27	27	27	27			
SFR18	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	16	16	16	17	21	24	26	27	27	27	27	27	27			
SFR19	SFR05	35	35	35	35	35	35	36	39	42	46	46	46	46	46	17	17	17	18	22	25	27	28	28	28	28	28	28			
TR01	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	15	15	15	16	19	23	25	26	26	26	26	26	26	26		

**Crudine Ridge Wind Farm**  
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Residence ID	Representative Logging Location	Night-time Criteria (dB(A)) by Hub Height (80m) Wind Speed (m/s)															Predicted Noise Level (dB(A)) by Hub Height (80m) Wind Speed (m/s)														
		3	4	5	6	7	8	9	10	11	12	13	14	15	16	3	4	5	6	7	8	9	10	11	12	13	14	15	16		
TR02	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	14	14	14	16	19	23	24	25	25	25	25	25	25			
TR03	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	13	13	13	14	17	21	23	24	24	24	24	24	24			
TR05	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	12	12	12	14	17	21	23	23	23	23	23	23	23			
TR06	HER04	35	35	35	35	35	35	35	35	35	37	37	37	37	37	12	12	12	13	17	20	22	23	23	23	23	23	23			