Marri Wind Farm

Background Noise Assessment

P240130RP3 Revision A

Wednesday, 15 October 2025

Resonate

Document Information

Project	Marri Wind Farm
Client	Aurecon Australasia Pty Ltd
Report title	Background Noise Assessment
Project Number	P240130

Revision Table

Report revision	Date	Description	Author	Reviewer
0	13 October 2025	For Issue	Alec Kuoch	Tom Evans
A	15 October 2025	Minor Amendments	Alec Kuoch	Tom Evans

Glossary

A-weighting	A spectrum adaption that is applied to measured noise levels to represent human hearing. A-weighted levels are used as human hearing does not respond equally at all frequencies.
dB	Decibel—a unit of measurement used to express sound level. It is based on a logarithmic scale which means a sound that is 3 dB higher has twice as much energy. We typically perceive a 10 dB increase in sound as a doubling of that sound level.
Frequency (Hz)	The number of times a vibrating object oscillates (moves back and forth) in one second. Fast movements produce high frequency sound (high pitch/tone), but slow movements mean the frequency (pitch/tone) is low. 1 Hz is equal to 1 cycle per second.
IEC 61400-11	IEC 61400-11 *Wind turbine generator systems – Part 11: Acoustic noise measurement techniques*, Edition 3.1 (2018).
Involved stakeholder	Noise sensitive receiver with an agreement with the wind farm to allow for increased noise criteria, for example as part of an agreement to host wind turbines.
L_{A90}	A-weighted noise level exceeded for 90% of the measurement period. The L_{90} metric is used to quantify background noise and wind farm noise at residences because it is much less susceptible to short-term extraneous noise.
L_{Aeq}	Equivalent A-weighted Noise Level. It is the energy averaged noise level over the measurement time.
Noise Regulations	*Environmental Protection (Noise) Regulations 1997*
Noise sensitive location	Noise sensitive receiver without an agreement with the wind farm to allow for increased noise criteria.
Rated power wind speed	Lowest hub height wind speed at which the WTG reaches its rated power.
SA Guidelines	*Wind Farms – Environmental Noise Guidelines, November 2021 Update* issued by the South Australia Environment Protection Authority.
Tonal audibility, ΔL_A	A measure of tonality. Values greater or equal to 0 dB indicate that the tone is detectable to the average human ear. Tonal audibility for wind farm noise is determined using the assessment method defined in IEC 61400-11.

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1 Introduction

Marri WF Pty Ltd as trustee for the Marri WF Unit Trust (the Proponent), a wholly owned subsidiary of Alinta Energy Pty Ltd (Alinta Energy), is seeking approval to develop Marri Wind Farm (the Proposal) located approximately 20 kilometres (km) south of the township of Dandaragan within the Shire of Dandaragan. The Proposal, referred to herein as the Marri Project, is proposed to consist of across 82 wind turbine generators (WTGs) within a Project boundary covering areas in the settlements of Yathroo and Regans Ford in the Shire of Dandaragan in Western Australia (WA). The wind energy component will be supported by ancillary infrastructure comprising of a connection substation, wind farm substation, transmission infrastructure and a Battery Energy Storage System (BESS).

Resonate has been commissioned to undertake background noise monitoring at seven sites around the Marri Project.

This report presents a background noise assessment of the Marri Project, including:

- identification of applicable legislation, policies and guidelines relating to noise emissions from wind farms
- measured background noise levels
- implications for applicable noise criteria.

The background noise assessment of the Marri Project has been conducted considering relevant guidance from WA regulatory authorities as to wind turbine noise emissions. This includes reference to:

- Regulation 7 and 8 of the Western Australian *Environmental Protection (Noise) Regulations 1997* (Noise Regulations)
- South Australian Environment Protection Authority (EPA) *Wind Farms Environmental Noise Guidelines November 2021 update* (SA Guidelines).

It is noted that, at the time of this revision, background noise monitoring has been completed at six of the seven background noise monitoring sites. A future revision will be issued once background noise monitoring and analysis has occurred at the seventh site.

2 Project description

2.1 Site description

The Marri Project site is located across agricultural land coving areas in the settlements of Yathroo and Regans Ford, located in the Shire of Dandaragan. The township of Dandaragan is located approximately 20 km to the north of the Proposed Development Envelope, whilst the township of Gingin is situated approximately 42 km to the south.

The Marri Project is proposed to consist of:

- up to 82 WTGs providing a capacity of up to 550 MW
- tip height of up to 275 m above ground level
- rotor diameter of up to 182 m
- hub height of up to 184 m above ground level
- associated ancillary infrastructure including a connection substation, wind farm substation and battery energy storage system (BESS)
- access roads.

The Marri Project boundary, proposed WTG locations are shown in Figure 1. The WTG coordinates are detailed in Appendix A.

2.2 Noise-sensitive locations

Aurecon has provided information on identified noise-sensitive dwelling locations around the site as well as involved stakeholder locations (involved landowners that will have a financial agreement to host wind farm infrastructure with Marri Project) within the site as shown in Figure 1, with coordinates tabulated in Appendix B.

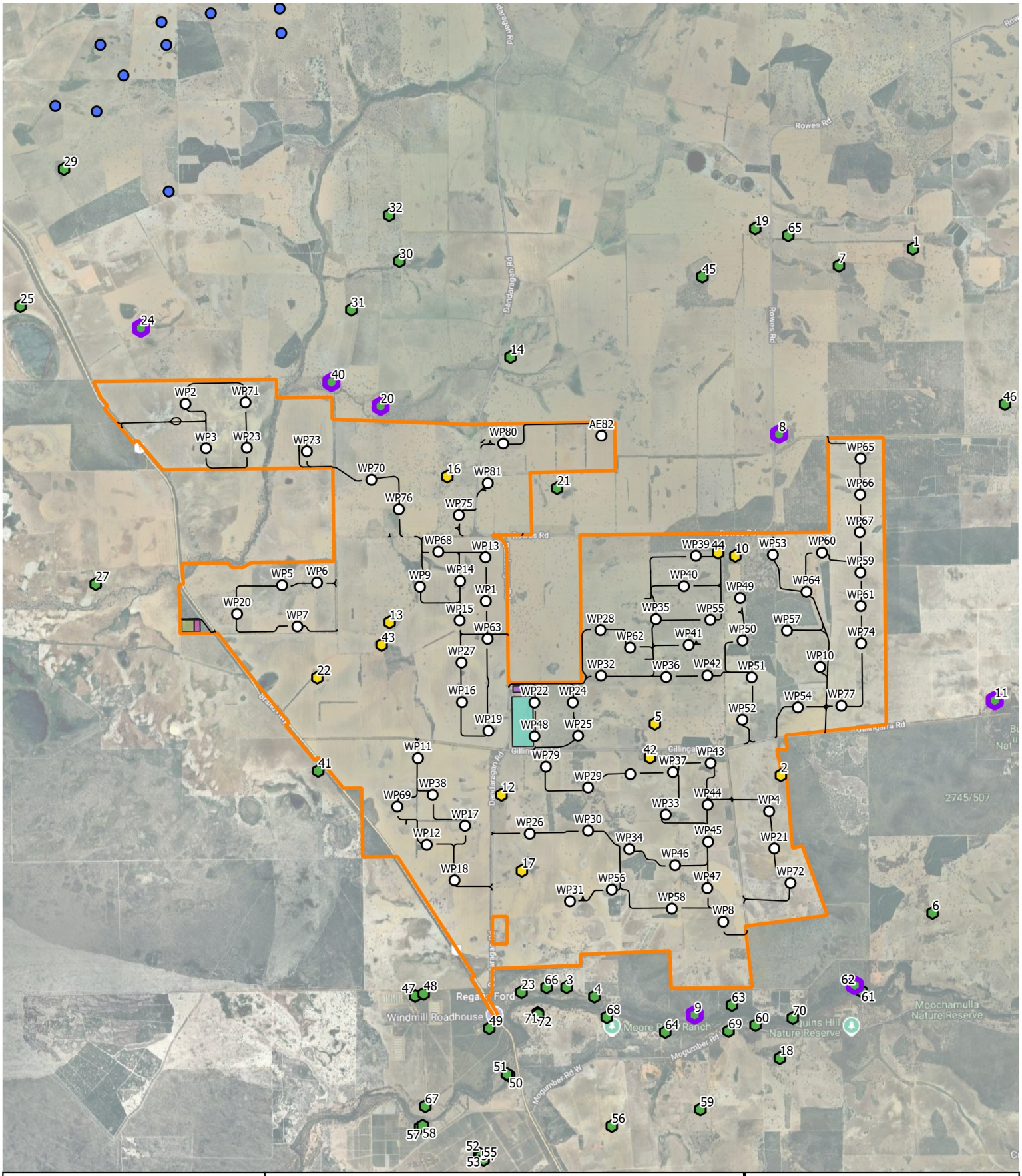
The noise-sensitive locations and involved stakeholder locations are all dwellings that are located within a Rural Zone as defined by the Shire of Dandaragan Planning Scheme.

2.3 Background noise monitoring locations

Based on a review of the site, the nearest noise-sensitive uses and landowner consultation carried out by the Proponent, seven background noise monitoring locations were nominated as per Table 1 and as shown on Figure 1.

Table 1 Background noise monitoring locations

Location	Coordinates in UTM GDA2020 MGA Zone 50	
	Easting	Northing
8	382288	6584482
9	380445	6571791
11	387001	6578660
20	373581	6585096
24	368346	6586800
40	372506	6585618
62	383940	6572439



Marri Wind Farm

Figure 1: Project Layout and Receiver Locations

Project Number	P240130
Drawn by	TE
Checked by	JC
Date Issued	10/2025
Client	Aurecon
Aerial Imagery	(c) Google

Legend

- Project Footprint
- WTG
- WF Substation Option A
- WF Substation Option B
- BESS
- Connection Substation
- Access Road

Receiver locations

- Involved stakeholder
- Noise sensitive location
- Background monitoring

0 2 4 km

Datum GDA2020, Projection MGA ZONE 50

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3 Assessment criteria

3.1 Overview

In WA, the applicable statutory requirements for noise emissions are contained within the *Environmental Protection Act 1986* (the Act) and the Noise Regulations.

The Noise Regulations require that noise emitted from any premises must comply with assigned noise levels when received at any other premises and be free of the intrusive characteristics of tonality, modulation and impulsiveness. In addition, the noise emissions must not "significantly contribute" to an exceedance of the assigned levels. A noise emission is understood to "significantly contribute" if a level of noise that exceeds a value which is 5 dB below the assigned level at the point of reception.

Historically in WA, the Noise Regulations have not been applied to wind turbine noise as measurement procedures for wind farm noise differ to normal industrial noise. Instead, in WA, it has been normal for wind turbine noise to be assessed using the SA Guidelines. Importantly, however, the base limit for wind farm noise in WA is set at 35 dB (rather than the 40 dB that normally applies in South Australia (SA)) for consistency with the Noise Regulations assigned noise levels for rural areas.

Recent advice from DWER, however, has been that consideration is required to the Noise Regulations, specifically Regulation 7 and Regulation 8, when assessing wind turbine noise. Therefore, this assessment considers both the Noise Regulations and SA Guidelines for wind turbine noise.

3.2 WAPC Position Statement

In 2020, the Department of Planning, Land and Heritage prepared a *Position Statement: Renewable energy facilities* on behalf of the Western Australian Planning Commission (WAPC). With respect to noise assessments for new wind farm proposals, the WAPC Position Statement sets out the following:

> Noise emissions from renewable energy facilities, including wind turbines, are required to meet the standards prescribed under the *Environmental Protection (Noise) Regulations 1997*. The South *Australian Environmental Protection Authority – Wind Farms Environmental Noise Guidelines (2009)* should also be referenced for assessment purposes. These guidelines acknowledge the potential for operation in the presence of higher wind-induced background noise levels.

The WAPC Position Statement is consistent with the approach adopted within this assessment to consider both the Noise Regulations and SA Guidelines.

3.3 SA Guidelines

3.3.1 Noise-sensitive locations

The SA Guidelines, as updated in November 2021 and applicable in WA, state that wind farm noise levels at noise sensitive locations must not exceed:

- 35 dB, or
- the background noise level plus 5 dB

whichever is the greater for each integer wind speed from the cut-in speed of the wind turbines to the speed at which the WTGs reach rated power.

Under the SA Guidelines, both background and wind farm noise levels are measured using the L_{A90} metric, due to the difficulties associated with accurately measuring L_{Aeq} noise levels over extended periods in windy conditions. The SA Guidelines considering that the measured L_{A90} wind farm noise levels appropriately represent the L_{Aeq} noise level. This

reflects the fact that there is only a small difference between L_{A90} and L_{Aeq} for operational wind turbine noise, being 2 dB or lower.

If wind farm noise levels at noise sensitive locations exhibit tonality, then a 5 dB penalty applies to the measured noise levels. The tonality assessment procedure is not clearly defined by the SA Guidelines, but the application of the tonal audibility measurement procedure detailed in IEC 61400-11 *Wind turbines – Acoustic noise measurement techniques* is suggested. The guidelines provide additional clarity that, in order for a 5 dB tonal penalty to be applied to the measured noise level at a given integer wind speed, an audible tone must be present for 10% of all data points in that integer wind speed bin

3.3.2 Involved stakeholders

Involved stakeholders are defined as private land whose owners have entered into an agreement with the wind farm developers. For the Marri Project this is the dwellings within the defined Project Boundary as shown on Figure 1.

The existence of an agreement will affect the consideration of whether noise is unreasonable in a given situation. The SA Guidelines state that it is unlikely that there will be unreasonable interference if:

- a formal agreement is documented between the parties
- the agreement clearly outlines to the landowner the expected impact of the noise from the wind farm and its effect upon the landowner's amenity
- the likely impact of exposure will not result in adverse health impacts (e.g. the level does not result in sleep disturbance or provides sufficient amenity outdoors).

For involved receivers, the SA Guidelines recommend:

- Daytime amenity is protected on the basis of the indicative noise criteria set out in the South Australian *Environment Protection (Commercial & Industrial Noise) Policy 2023* (the Noise Policy). In SA, this results in a daytime criterion of 52 dB for rural farming areas.
- A night time internal noise criterion of 30 dB based on the World Health Organization (WHO) *Guidelines for community noise (1999)*. For dwellings without specific acoustic treatment, this is typically converted to an external noise level of 45 dB to account for typical residential building acoustic performance and allowing for a window left open for ventilation.

For the purposes of this assessment, the more conservative night time criterion of 45 dB has been adopted for involved stakeholders at all times. It is noted that this is consistent with the approach taken by Yathroo Wind Farm for involved stakeholders as documented in the Yathroo Wind Farm Development Application Report.

3.4 Noise Regulations

Recent consultation with DWER has confirmed that the Marri Project should also demonstrate compliance with the assigned noise levels under the Noise Regulations.

3.4.1 Noise-sensitive locations

Regulation 8 of the Noise Regulations sets out the assigned noise levels that apply. The assigned levels are specified according to the type of premises receiving the noise. There are different assigned levels for noise sensitive, commercial and industrial premises. The assigned levels for noise sensitive premises vary depending on the time of the day. The assigned noise levels always apply at the premises receiving the noise.

For noise sensitive premises, the assigned levels are adjusted by the addition of an influencing factor (IF) to account for the existing acoustic environment. The IF increases with the amount of commercial and industrial areas in the vicinity of the noise sensitive receiver as well as the presence of any major or secondary roads. This is calculated by

considering areas within 100 m and 450 m radius of the noise sensitive receiver location. Considering the location of the Marri Project, no IF applies.

The table of assigned levels, shown in Table 2 shows the assigned noise levels as an L_{A10} level, measured using a 'Slow' time weighting over a representative assessment period suitable for the source. DWER has previously advised that a 4 hour assessment period would be appropriate for wind turbine noise although it is noted that this requires some interpretation as to how wind turbine noise is assessed over a 4 hour period.

Table 2 Assigned noise levels for non-involved receivers

Time of day	Assigned level in dB L_{A10}
7 am to 7 pm Monday to Saturday	45
9 am to 7 pm Sunday & public holiday	40
7 pm to 10 pm All days	40
10 pm on any day to 7 am Monday to Saturday and 9 am Sunday and public holidays	35

DWER has advised that, where the background noise levels exceed the assigned noise levels, then any assessment of wind turbine noise levels that are above the assigned noise levels could have regard to the higher background noise level. This would only apply in cases where the background noise level can be justifiably shown to be sufficiently high in accordance with procedures acceptable to DWER, which may differ from those applied under the SA Guidelines. Further discussion on this is provided in Section 3.4.4.

3.4.2 Involved stakeholders

DWER has not provided any formal advice for the Marri Project with respect to involved stakeholders. While it is understood that involved stakeholders may be exposed to higher wind turbine noise levels due to their proximity to the WTGs, DWER has advised that they would still need to have regard to the Noise Regulations in the event of a complaint from an involved stakeholder.

In the absence of specific advice from DWER for the Marri Project, a noise criterion of 45 dB has been adopted for involved stakeholders on the basis that:

- this is consistent with the approach under the SA Guidelines as set out in Section 3.3.2
- this is consistent with the approach taken to involved stakeholders by the Yathroo Wind Farm Development Application Report, offering consistency with the neighbouring proposed wind farm
- a level of 45 dB is consistent with the assigned noise level for daytime periods under the Noise Regulations.

3.4.3 Intrusive or dominant characteristics

Regulation 9 of the Noise Regulations also requires that penalties are applied for intrusive or dominant characteristics, of which tonality and modulation are considered relevant to the assessment of wind turbine noise:

- Modulation – a variation in the emission of noise that:
  - is more than 3 dB L_{AFast} or is more than 3 dB L_{AFast} in any one-third octave band: and
  - is present for at least 10% of the representative assessment period; and
  - is regular, cyclic and audible.
- Tonality – the presence in the noise emission of tonal characteristics where the difference between:
  - the A-weighted sound pressure level in any one-third octave band; and
  - the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{ASlow} levels.

An adjustment of +5 dB is added to the source noise level for each of the characteristics that are present at the receiver.

3.4.4 Background noise analysis

Through consultation with DWER, information on their expectations with respect to background noise levels that could be considered when assessing against the assigned noise levels under the Noise Regulations was obtained. DWER has advised that any background noise analysis for these purposes generally follow the processes as listed in the SA Guidelines with the exception that the analysis should:

- only consider periods between the hours of 7 pm and 7 am the following day
- determine the representative background noise level in each wind speed bin as the lowest 10th percentile of the broadband $L_{A90,10min}$ noise data.

It is noted that this will result in lower background noise levels than under the SA Guidelines, which consider average background noise levels as determined over all 24 hours within a day.

4 Monitoring details

4.1 Monitoring equipment

Table summarises the details of the noise monitoring equipment used at the site. The noise monitor utilised was a Class 1 sound level meter, suitable for the assessment of wind farm noise under the SA Guidelines. The monitor was setup to record noise levels, including L_{A90} levels as required by the SA Guidelines, in 10-minute intervals. The sound level meter also recorded an audio signal to assist with identification of noise sources, where necessary.

Table Noise monitoring equipment details

Location	Equipment	Serial number	Dates	Last calibration date
Sound Level Meters				
8[1]	Svantek 977	167962	16 September - TBC	11 June 2025
9	Svantek 977	98082	23 July – 16 September 2025	3 July 2025
11	Svantek 977	168040	23 July – 23 August 2025[2]	11 June 2025
20	Svantek 977	98808	23 July – 16 September 2025	7 February 2024
24	Svantek 977	99039	23 July – 16 September 2025	31 July 2024
40	Svantek 977	167964	23 July – 16 September 2025	11 June 2025
62	Svantek 977	59621	23 July – 16 September 2025	2 July 2025
Calibrator				
All	GRAS	42AG	23 July – 16 September 2025	14 May 2025

(1) Location 8 noise monitoring is currently being undertaken

(2) Noise monitor experienced a power failure

The noise monitors were fitted with 150 mm diameter windshields to reduce wind-induced noise across the microphone. Photographs of the noise monitoring equipment installed on site are included in Appendix B.

The monitor carries current calibration certificates from a National Association of Testing Authorities (NATA) accredited laboratory. The calibration of the monitor was field checked at the start and conclusion of the monitoring and no significant drift in calibration (0.5 dB or more) was observed. Copies of the calibration certificates for the noise monitor and acoustic calibrator are available upon request.

4.2 Wind data

Wind speed and direction data for the monitoring period was provided by the Proponent at the time of noise monitoring for the site meteorological mast. The data was measured in 10-minute intervals at the 121 m mast installed at the site, which has anemometers at 60 m, 80 m, 110 m, 116m and 121m above ground. Wind directional vanes were also installed at 60 m, 80 m and 116 m, with direction obtained at 116 m used where required in the analysis.

In order to obtain hub height wind data as required by the SA Guidelines, the wind speeds measured at the different heights have been used to determine wind shear values for each 10-minute period. An average wind shear coefficient was determined based on the wind shear values calculated between 60 and 116 m. Wind shear describes the change in wind speed with height above ground and the wind shear value (α) relates wind speed at one height (V_{h1}) to wind speed at a second height (V_{h2}) according to the following relationship:

$$V_{h1} = V_{h2} \times \left(\frac{h1}{h2}\right)^{\alpha}$$

The wind shear value determined for each 10-minute period was used to convert the measured 60 m height wind speed for that period to a 184 m hub height wind speed. This data was used in the analysis of the measured background noise levels at each residence.

4.3 Background noise monitoring results

4.3.1 Data points and data exclusion

Collected noise data was excluded for each residence where:

- Rain was recorded at the Bureau of Meteorology monitoring site at Lancelin Defence (009280)
- Data was obviously affected by extraneous noise such as bird or insect noise.
- The hub height wind speed fell outside of the wind speed range of 3 to 14 m/s, which was selected as the typical range of wind speeds from cut-in to rated power.

Table 3 summarises the total, excluded and resulting valid data points for each location. The overall number of data points captured under all wind directions is presented, as well as those captured under the worst-case wind direction. This represents the wind direction bin 45 degrees either side of the direction when the monitoring location will be downwind of the nearest WTG or group of WTGs. The captured downwind data is not analysed for the purposes of establishing background noise levels for criteria but may need to be used when assessing compliance of operational noise levels from the site.

Table 3 Data points for each residence

Location	Worst-case (downwind) direction, Degrees	Number of data points			
		Total	Valid	Valid down-wind	Excluded[1]
8	288	-[2]	-[2]	-[2]	-[2]
9	199	4151	2997	1891	1545
11	113	3145	1988	572	1157
20	8	4152	3163	1226	989
24	269	4152	3454	1267	914
40	19	4145	2987	947	1158
62	148	4145	3006	705	1139

(1) Excluded due to rain or extraneous bird or insect noise, or outside the relevant wind speed range.

(2) Monitoring at location 8 is currently being conducted

It can be seen that the SA Guidelines minimum requirement of 2,000 data points was significantly exceeded for each location and that at least 500 data points were obtained at each site for the worst-case wind direction sector, as is required by the SA Guidelines.

5 Measured noise levels for SA Guidelines

This section presents the A-weighted measured background noise levels for each monitoring location alongside the average background noise levels determined by bin analysis for each integer wind speed bin from 3 to 14 m/s in accordance with the SA Guidelines.

5.1 Location 9

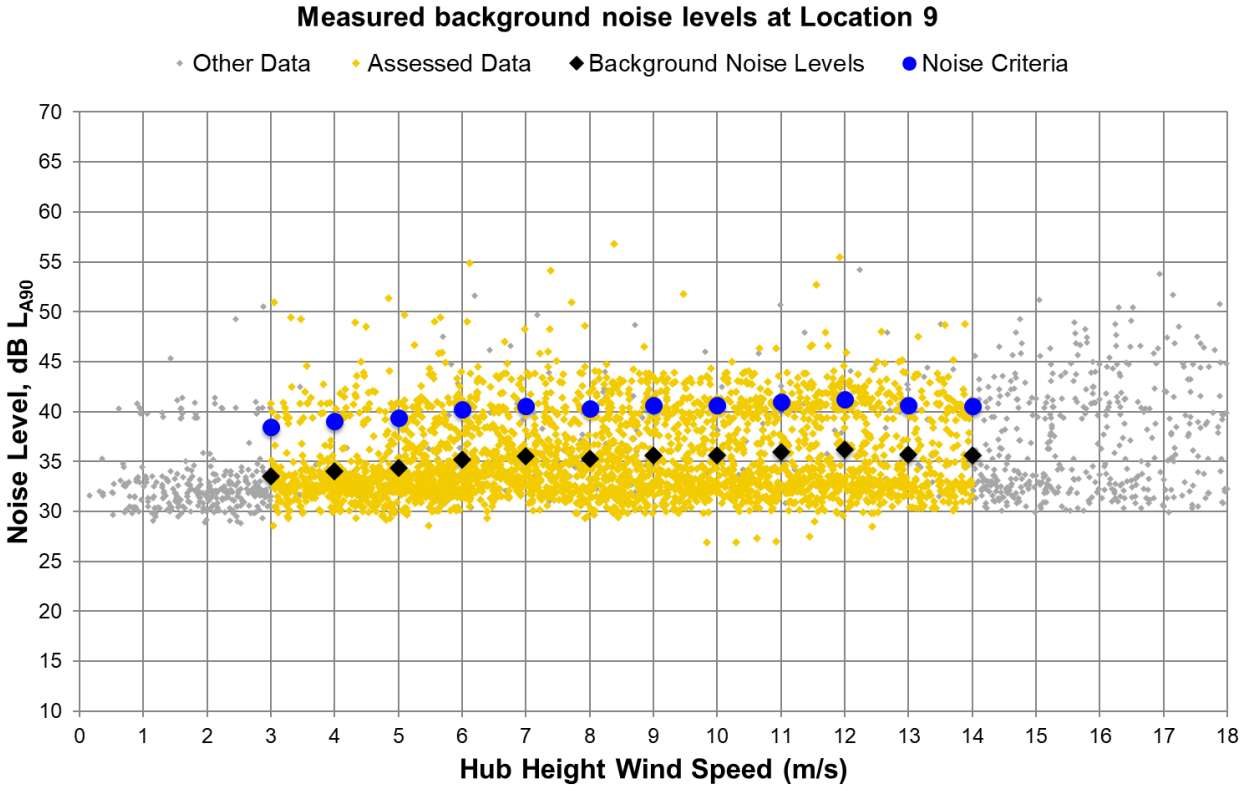

Figure 2 Measured background noise level at Location 9

Table 4 Measured background noise levels and noise criteria at Location 9

Location 9	**Measured background noise level in dB L_{A90} at hub height wind speed in m/s**											
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
Non-involved												
Background	33	34	34	35	36	35	36	36	36	36	36	36
Noise criteria (SA Guidelines)	**38**	**39**	**39**	**40**	**41**	**40**	**41**	**41**	**41**	**41**	**41**	**41**

5.2 Location 11

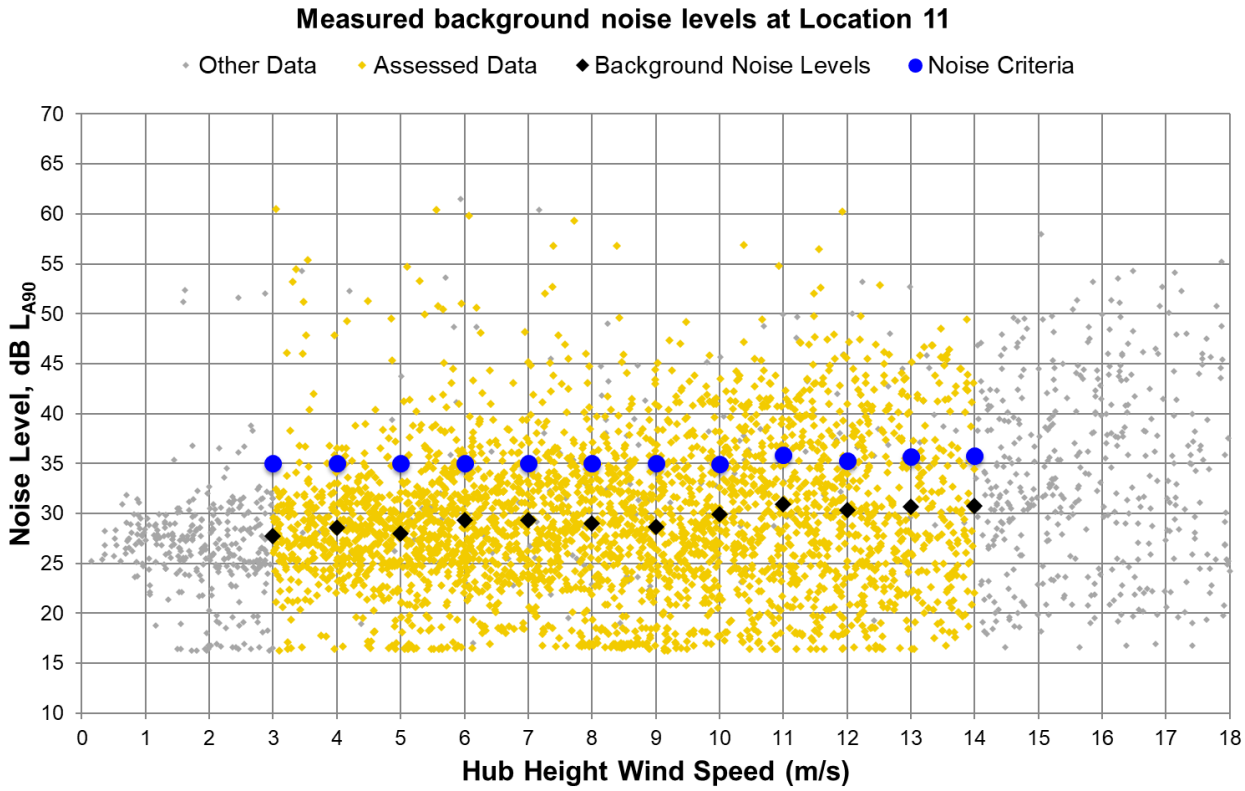

Figure 3 Measured background noise level at Location 11

Table 5 Measured background noise levels and noise criteria at Location 11

Location 11	Measured noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
Non-involved												
Background	28	29	28	29	29	29	29	30	31	30	31	31
Noise criteria (SA Guidelines)	**35**	**35**	**35**	**35**	**35**	**35**	**35**	**35**	**36**	**35**	**36**	**36**

5.3 Location 20

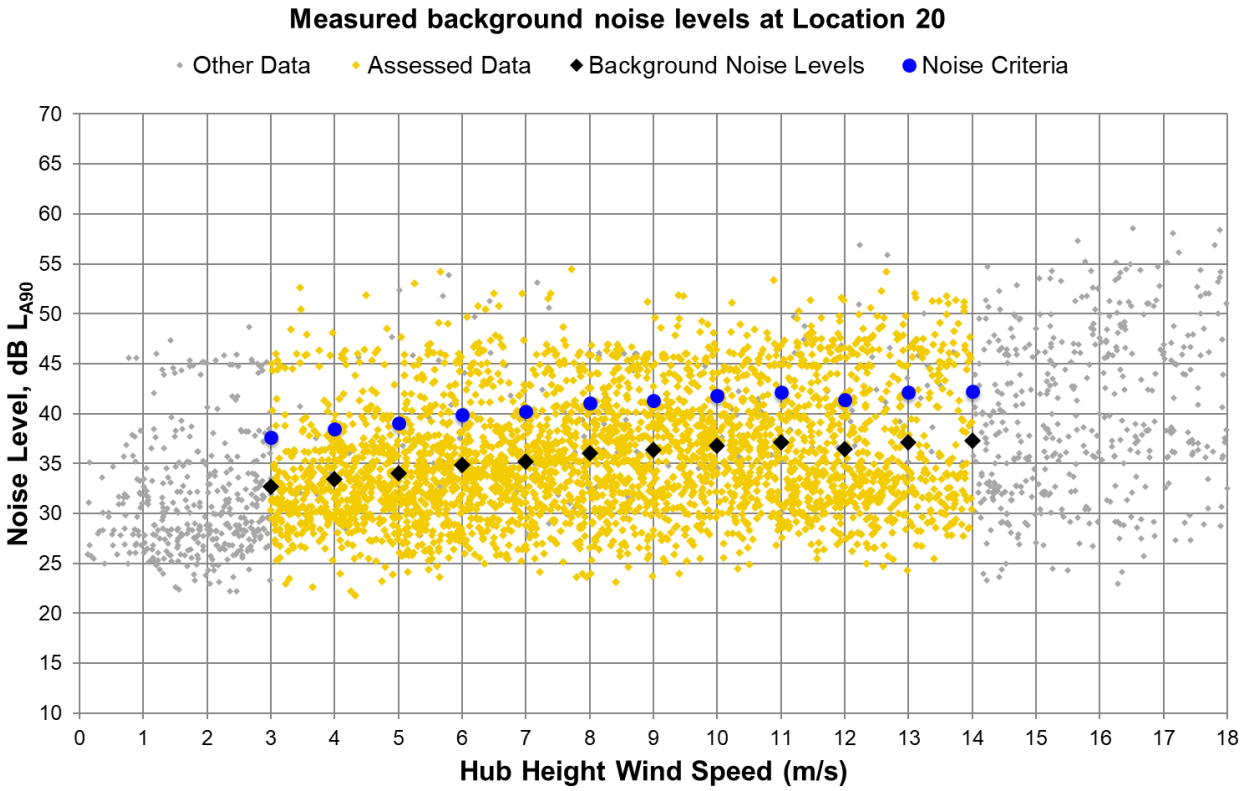

Figure 4 Measured background noise level at Location 20

Table 6 Measured background noise levels and noise criteria at Location 20

Location 20	Measured noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
Non-involved												
Background	33	33	34	35	35	36	36	37	37	36	37	37
Noise criteria (SA Guidelines)	**38**	**38**	**39**	**40**	**40**	**41**	**41**	**42**	**42**	**41**	**42**	**42**

5.4 Location 24

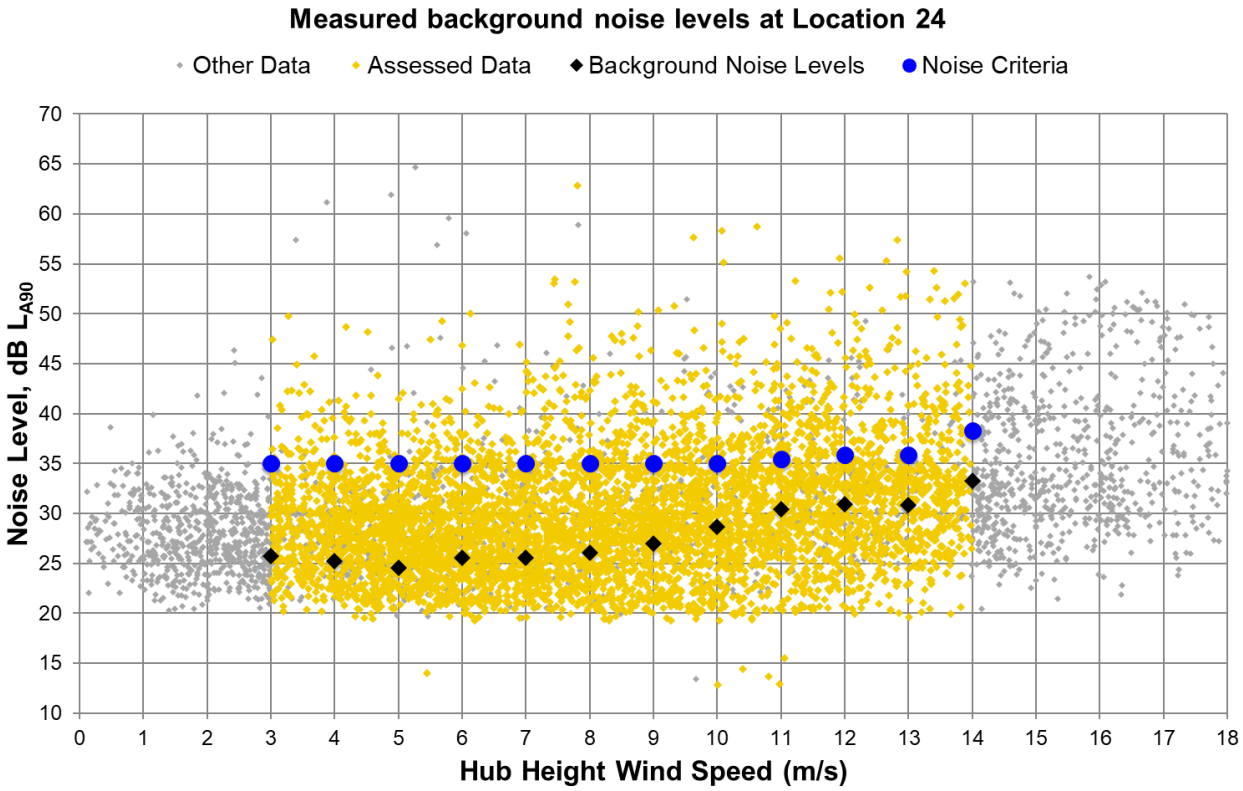

Figure 5 Measured background noise level at Location 24

Table 7 Measured background noise levels and noise criteria at Location 24

Location 24	Measured noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
Non-involved												
Background	26	25	25	26	26	26	27	29	30	31	31	33
Noise criteria (SA Guidelines)	**35**	**35**	**35**	**35**	**35**	**35**	**35**	**35**	**35**	**36**	**36**	**38**

5.5 Location 40

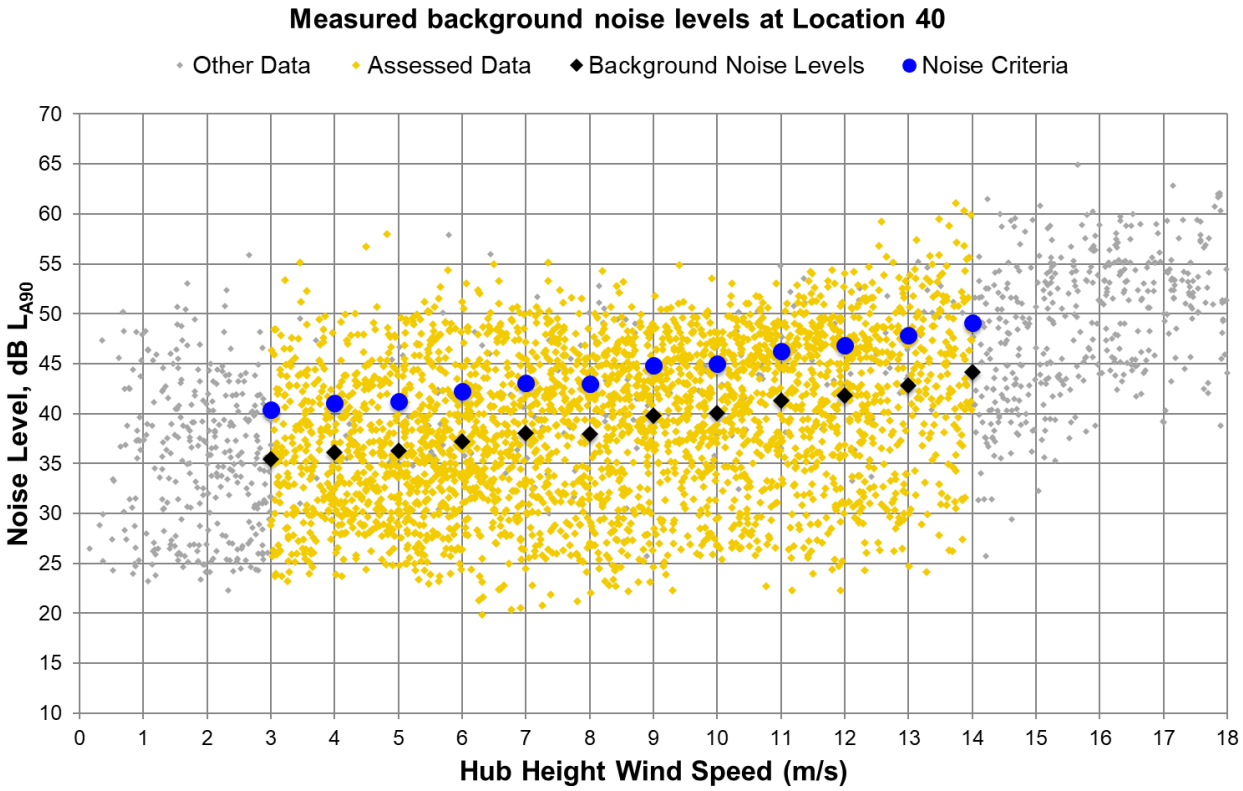

Figure 6 Measured background noise level at Location 40

Table 8 Measured background noise levels and noise criteria at Location 40

Location 40	Measured noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
Non-involved												
Background	35	36	36	37	38	38	40	40	41	42	43	44
Noise criteria (SA Guidelines)	**40**	**41**	**41**	**42**	**43**	**43**	**45**	**45**	**46**	**47**	**48**	**49**

5.6 Location 62

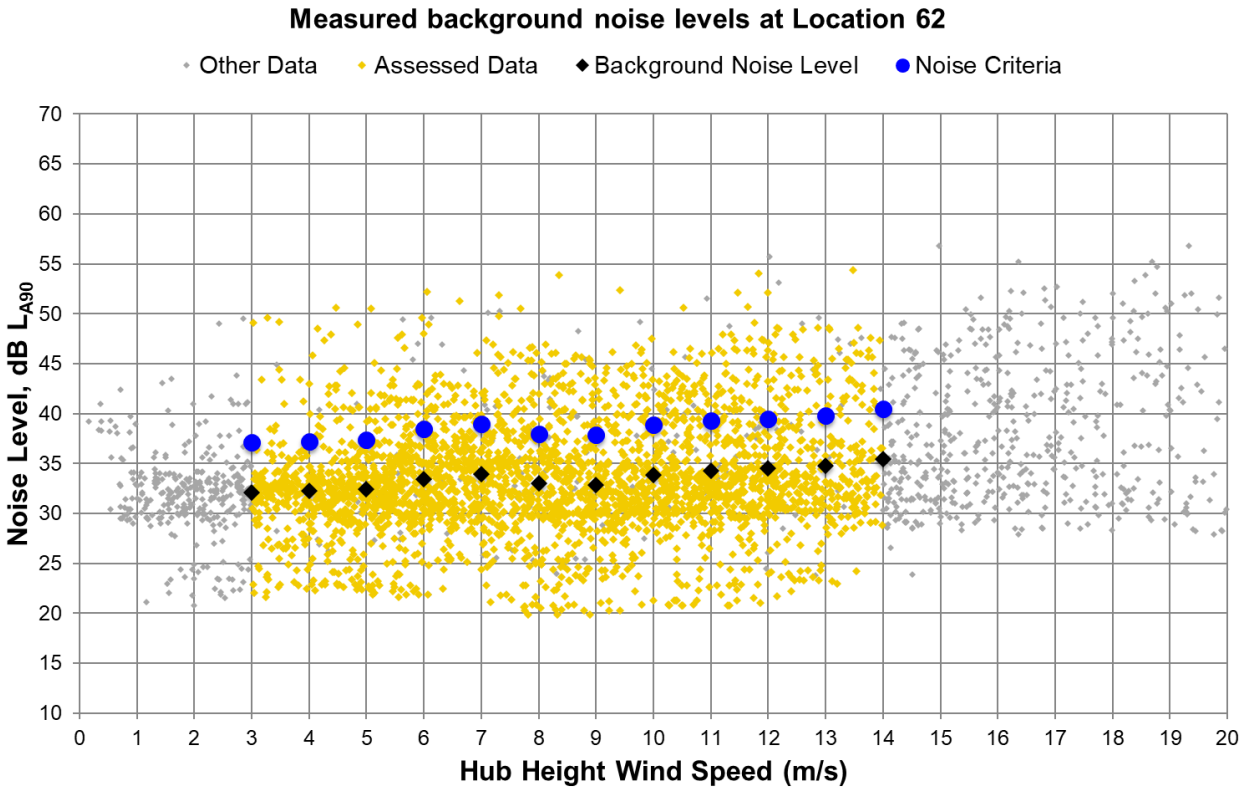

Figure 7 Measured background noise level at Location 62

Table 9 Measured background noise levels and noise criteria at Location 62

Location 62	Measured noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
Non-involved												
Background	32	32	32	33	34	33	33	34	34	34	35	35
Noise criteria (SA Guidelines)	**37**	**37**	**37**	**38**	**39**	**38**	**38**	**39**	**39**	**39**	**40**	**40**

6 DWER background noise level analysis

This section presents an additional analysis of background noise levels as per the procedures in Section 3.4.4. Note that, in this section, “night-time” refers to the period from 7 pm to 7 am each day.

6.1 Location 9

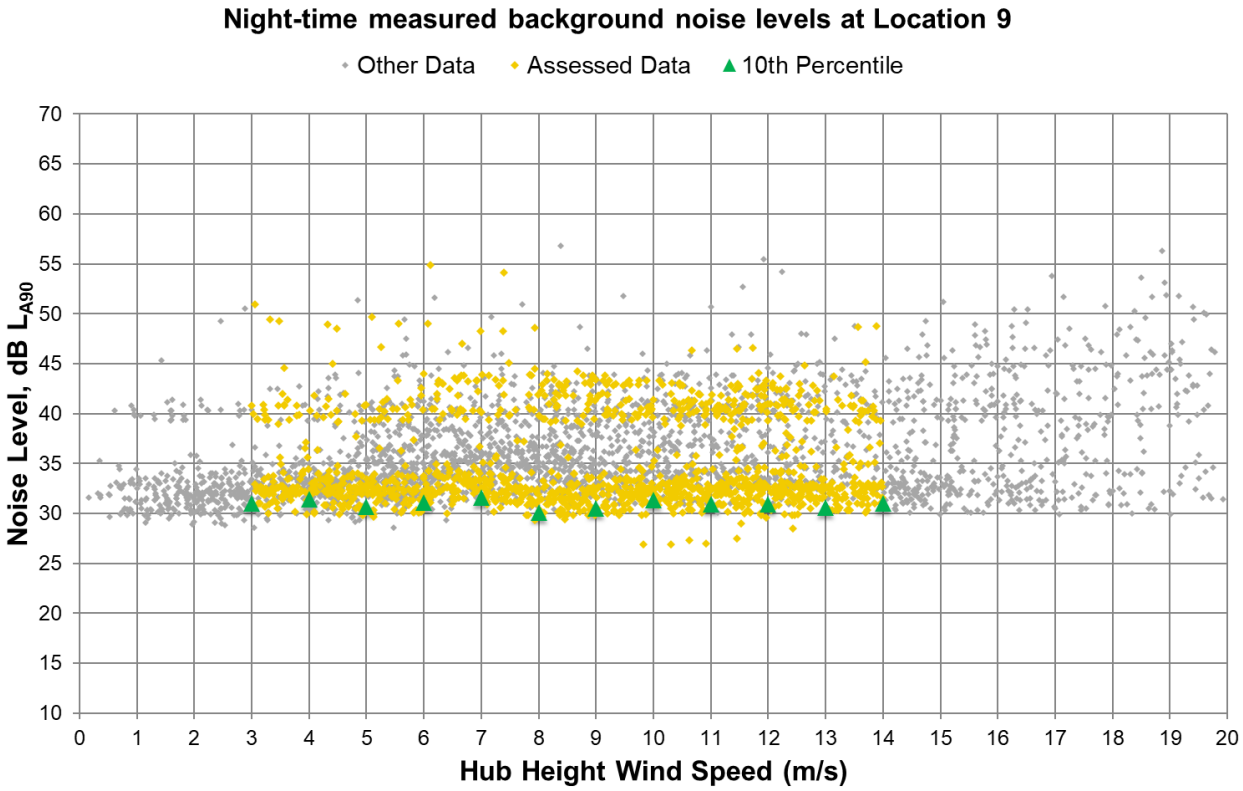

Figure 8 Night-time measured background noise level & 10th percentile levels at Location 9

Table 10 Measured night-time noise levels and 10th percentile levels at Location 9

Location	Measured night-time noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
10th percentile of $L_{A90,10min}$	31	31	31	31	32	30	31	31	31	31	31	31
Valid Data Points	*54*	*107*	*115*	*102*	*120*	*119*	*131*	*153*	*162*	*171*	*113*	*58*

6.2 Location 11

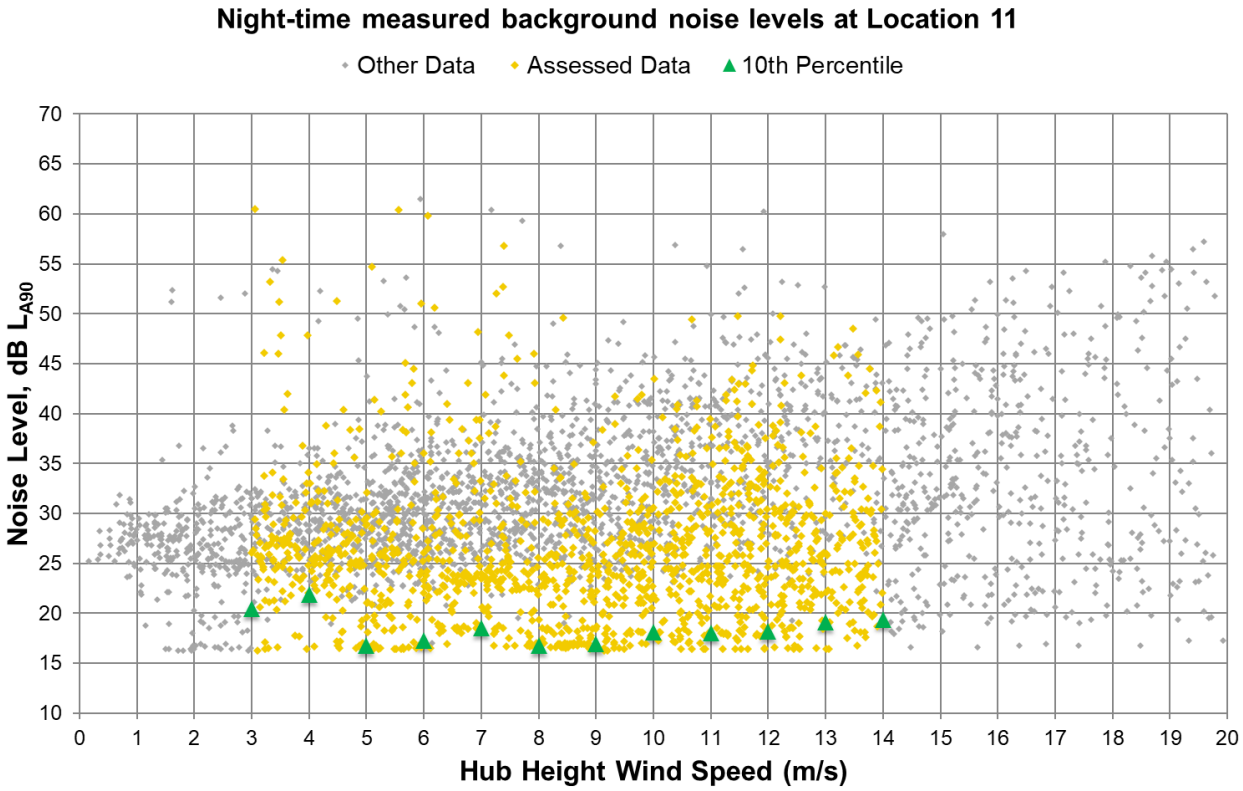

Figure 9 Night-time measured background noise level & 10th percentile levels at Location 11

Table 11 Measured night-time noise levels and 10th percentile levels at Location 11

Location	Measured night-time noise level in dB L_{A90} at hub height wind speed in m/s											
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
10th percentile of $L_{A90,10min}$	20	22	17	17	19	17	17	18	18	18	19	19
Valid Data Points	*54*	*107*	*115*	*103*	*122*	*121*	*131*	*153*	*162*	*171*	*113*	*58*

6.3 Location 20

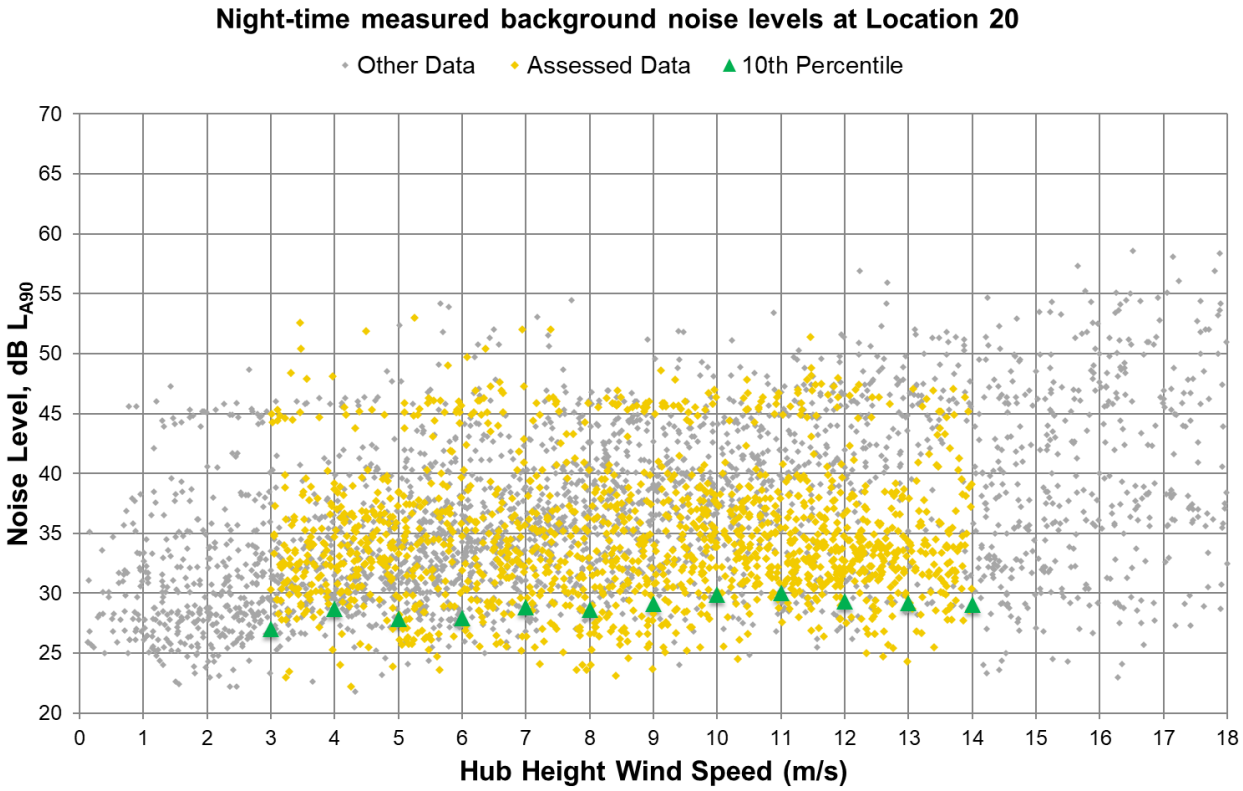

Figure 10 Night-time measured background noise level & 10th percentile levels at Location 20

Table 12 Measured night-time noise levels and 10th percentile levels at Location 20

Location	Measured night-time noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
10th percentile of $L_{A90,10min}$	27	29	28	28	29	29	29	30	30	29	29	29
Valid Data Points	*54*	*107*	*115*	*103*	*122*	*121*	*131*	*153*	*162*	*171*	*113*	*58*

6.4 Location 24

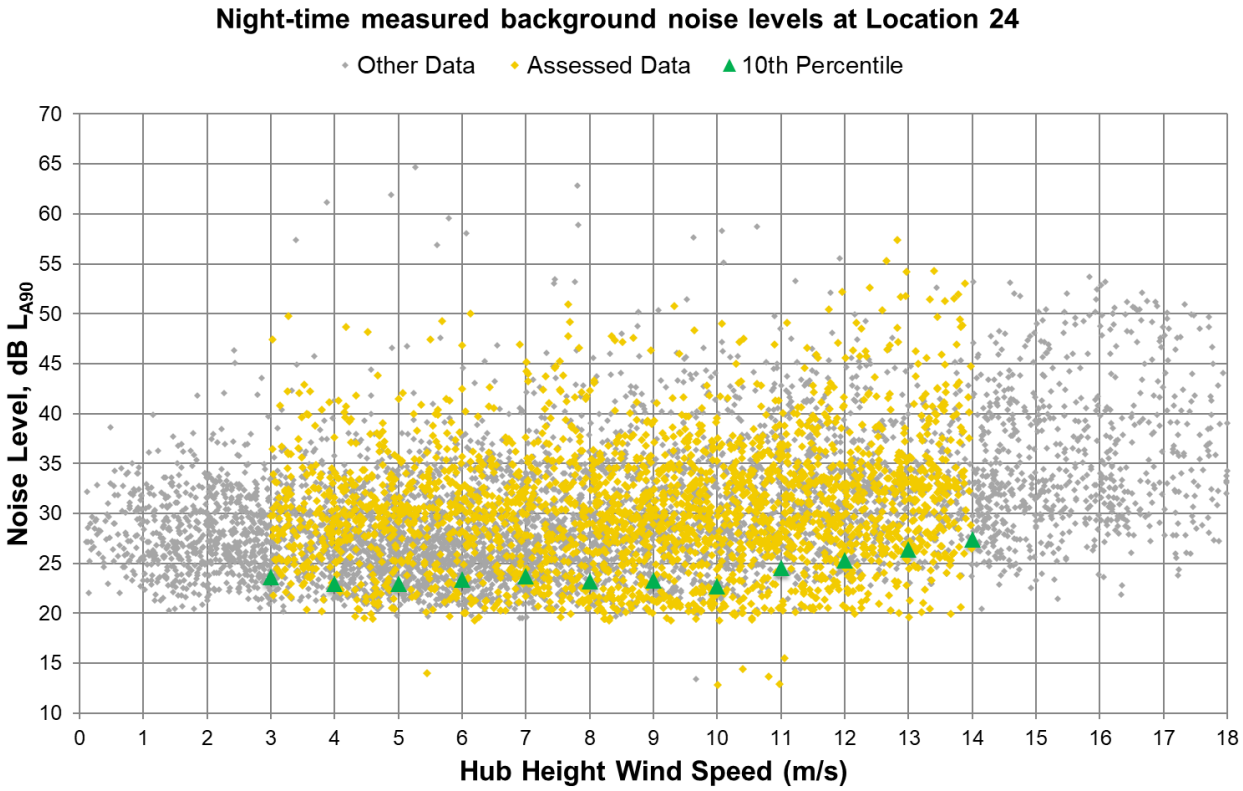

Figure 11 Night-time measured background noise level & 10th percentile levels at Location 24

Table 13 Measured night-time noise levels and 10th percentile levels at Location 24

Location	Measured night-time noise level in dB L_{A90} at hub height wind speed in m/s											
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
10th percentile of $L_{A90,10min}$	24	23	23	23	24	23	23	23	25	25	26	27
Valid Data Points	*58*	*110*	*146*	*135*	*107*	*128*	*122*	*114*	*131*	*112*	*63*	*39*

6.5 Location 40

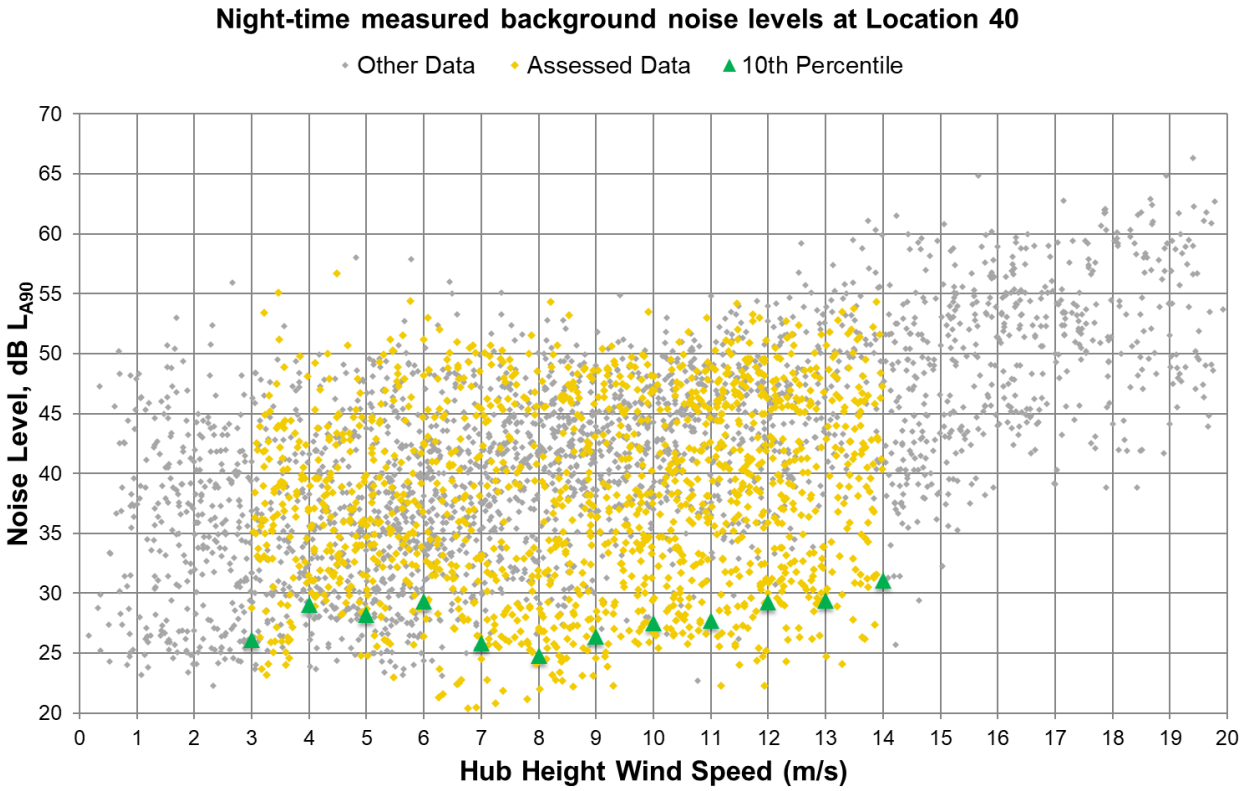

Figure 12 Night-time measured background noise level & 10th percentile levels at Location 40

Table 14 Measured night-time noise levels and 10th percentile levels at Location 40

Location	Measured night-time noise level in dB L_{A90} at hub height wind speed in m/s											
	3	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**
10th percentile of $L_{A90,10min}$	26	29	28	29	26	25	26	28	28	29	29	31
Valid Data Points	*54*	*107*	*115*	*103*	*122*	*121*	*131*	*153*	*162*	*171*	*113*	*58*

6.6 Location 62

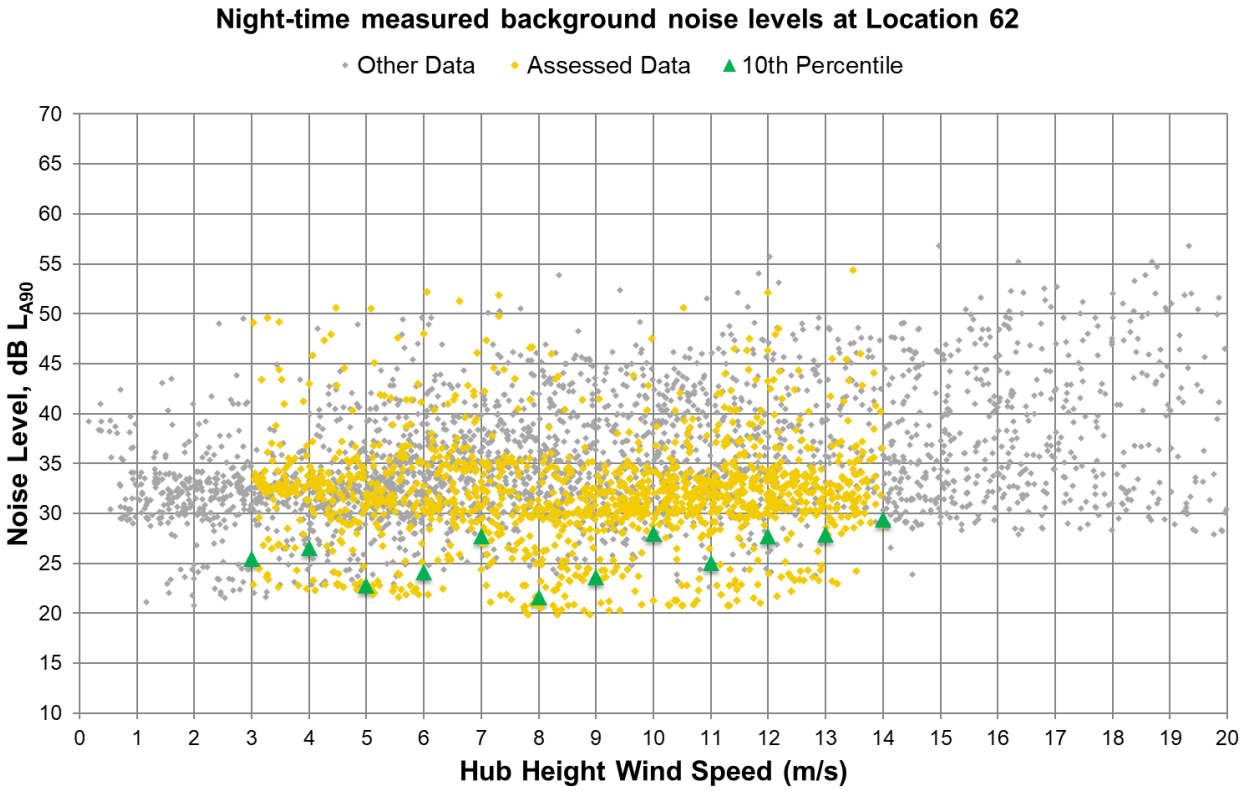

Figure 13 Night-time measured background noise level & 10th percentile levels at Location 62

Table 15 Measured night-time noise levels and 10th percentile levels at Location 62

Location	Measured night-time noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
10th percentile of $L_{A90,10min}$	26	27	23	24	28	22	24	28	25	28	28	29
Valid Data Points	*56*	*102*	*122*	*102*	*119*	*127*	*130*	*157*	*172*	*166*	*113*	*45*

7 Conclusion

This report presents the outcomes of background noise monitoring conducted at locations around the proposed Marri Project. Background noise monitoring was conducted between the 23 July to 16 September 2025, with an additional monitoring location current being undertaken for which results will be presented in an updated revision of this report.

The background noise levels measured during the monitoring period have been analysed based on both the SA Guidelines, which are typically used to assess wind farm noise in Western Australia, as well as using an alternative method based on advice from DWER when considering assessment against the Noise Regulations.

The measured background noise levels and applicable noise criteria determined using the methods set out in the SA Guidelines are shown in Table 16.

Table 16 Summary of measured background noise levels measured as per SA Guidelines

Location	Measured background noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
Location 9												
Background	33	34	34	35	36	35	36	36	36	36	36	36
Noise criteria	*38*	*39*	*39*	*40*	*41*	*40*	*41*	*41*	*41*	*41*	*41*	*41*
Location 11												
Background	28	29	28	29	29	29	29	30	31	30	31	31
Noise criteria	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*36*	*35*	*36*	*36*
Location 20												
Background	33	33	34	35	35	36	36	37	37	36	37	37
Noise criteria	*38*	*38*	*39*	*40*	*40*	*41*	*41*	*42*	*42*	*41*	*42*	*42*
Location 24												
Background	26	25	25	26	26	26	27	29	30	31	31	33
Noise criteria	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*35*	*36*	*36*	*38*
Location 40												
Background	35	36	36	37	38	38	40	40	41	42	43	44
Noise criteria	*40*	*41*	*41*	*42*	*43*	*43*	*45*	*45*	*46*	*47*	*48*	*49*
Location 62												
Background	32	32	32	33	34	33	33	34	34	34	35	35
Noise criteria	*37*	*37*	*37*	*38*	*39*	*38*	*38*	*39*	*39*	*39*	*40*	*40*

The measured background noise levels determined using the method applied following consultation with DWER are summarised in Table 17.

Table 17 Summary of measured background noise levels measured based on DWER method

Location	Measured background 10th percentile noise level in dB L_{A90} at hub height wind speed in m/s											
	3	4	5	6	7	8	9	10	11	12	13	14
Location 9												
Background 10th percentile L_{A90}	31	31	31	31	32	30	31	31	31	31	31	31
Location 11												
Background 10th percentile L_{A90}	20	22	17	17	19	17	17	18	18	18	19	19
Location 20												
Background 10th percentile L_{A90}	27	29	28	28	29	29	29	30	30	29	29	29
Location 24												
Background 10th percentile L_{A90}	24	23	23	23	24	23	23	23	25	25	26	27
Location 40												
Background 10th percentile L_{A90}	26	29	28	29	26	25	26	28	28	29	29	31
Location 62												
Background 10th percentile L_{A90}	26	27	23	24	28	22	24	28	25	28	28	29

Appendix A – Wind turbine layout coordinates

Table 18 Marri Project WTG locations

Turbine	Coordinates (GDA2020 MGA Zone 50)		Turbine	Coordinates (GDA2020 MGA Zone 50)	
ID	Easting (m)	Northing (m)	ID	Easting (m)	Northing (m)
WP1	375880	6580830	WP30	378114	6575812
WP2	369318	6585145	WP31	377718	6574271
WP3	369765	6584168	WP32	378396	6579204
WP4	382071	6576236	WP33	379813	6576163
WP5	371429	6581177	WP34	379013	6575410
WP6	372190	6581235	WP35	379597	6580436
WP7	371763	6580276	WP36	379821	6579173
WP8	381069	6573822	WP37	379971	6577090
WP9	374443	6581143	WP38	374720	6576594
WP10	383184	6579392	WP39	380471	6581820
WP11	374398	6577395	WP40	380209	6581156
WP12	374591	6575505	WP41	380314	6579872
WP13	375872	6581788	WP42	380723	6579207
WP14	375318	6581269	WP43	380793	6577286
WP15	375308	6580411	WP44	380729	6576378
WP16	375360	6578625	WP45	380739	6575571
WP17	375426	6575920	WP46	380017	6575059
WP18	375197	6574728	WP47	380720	6574560
WP19	375938	6577998	WP48	376944	6577877
WP20	370445	6580551	WP49	381438	6580899
WP21	382184	6575424	WP50	381491	6579970
WP22	376942	6578616	WP51	381690	6579167
WP23	370657	6584180	WP52	381486	6578240
WP24	377779	6578618	WP53	382153	6581842
WP25	377896	6577888	WP54	382699	6578510
WP26	376839	6575745	WP55	380786	6580422
WP27	375350	6579488	WP56	378630	6574526
WP28	378385	6580198	WP57	382459	6580188
WP29	378113	6576753	WP58	379946	6574111

Turbine	Coordinates (GDA2020 MGA Zone 50)		Turbine	Coordinates (GDA2020 MGA Zone 50)	
ID	Easting (m)	Northing (m)	ID	Easting (m)	Northing (m)
WP59	384063	6581455	WP71	370629	6585176
WP60	383225	6581889	WP72	382537	6574670
WP61	384071	6580723	WP73	371968	6584100
WP62	379031	6579815	WP74	384080	6579907
WP63	375919	6580007	WP75	375293	6582707
WP64	382886	6581033	WP76	373981	6582835
WP65	384067	6583946	WP77	383648	6578547
WP66	384059	6583157	WP78	379037	6577047
WP67	384050	6582336	WP79	377192	6577209
WP68	374844	6581909	WP80	376260	6584272
WP69	373947	6576339	WP81	375923	6583406
WP70	373379	6583479	AE82	378404	6584448

Appendix B - Photographs of noise monitor

Location 9 monitoring location

Table 19 Location 9 dwelling and noise monitor coordinates

Location	Coordinates in GDA2020 MGA Zone 50	
	Easting	Northing
Dwelling 9	380445	6571791

Table 20 Location 9 monitoring installation photos

Photo 1	Photo 2
	
Photo 3	
	

Location 11 monitoring location

Table 21 Location 11 dwelling and noise monitor coordinates

Location	Coordinates in GDA2020 MGA Zone 50	
	Easting	Northing
Dwelling 11	380445	6571791

Table 22 Location 11 monitoring installation photos

Photo 1	Photo 2
	
Photo 3	
	

Location 20 monitoring location

Table 23 Location 20 dwelling and noise monitor coordinates

Location	Coordinates in GDA2020 MGA Zone 50	
	Easting	Northing
Dwelling 20	373581	6585096

Table 24 Location 20 monitoring installation photos

Photo 1	Photo 2
	
Photo 3	
	

Location 24 monitoring location

Table 25 Location 24 dwelling and noise monitor coordinates

Location	Coordinates in GDA2020 MGA Zone 50	
	Easting	Northing
Dwelling 24	368346	6586800

Table 26 Location 24 monitoring installation photos

Photo 1	Photo 2
	
Photo 3	
	

Location 40 monitoring location

Table 27 Location 40 dwelling and noise monitor coordinates

Location	Coordinates in GDA2020 MGA Zone 50	
	Easting	Northing
Dwelling 40	372506	6585618

Table 28 Location 40 monitoring installation photos

Photo 1	Photo 2
	
Photo 3	**Photo 4**
	

Location 62 monitoring location

Table 29 Location 62 dwelling and noise monitor coordinates

Location	Coordinates in GDA2020 MGA Zone 50	
	Easting	Northing
Dwelling 62	383940	6572439

Table 30 Location 62 monitoring installation photos

Photo 1