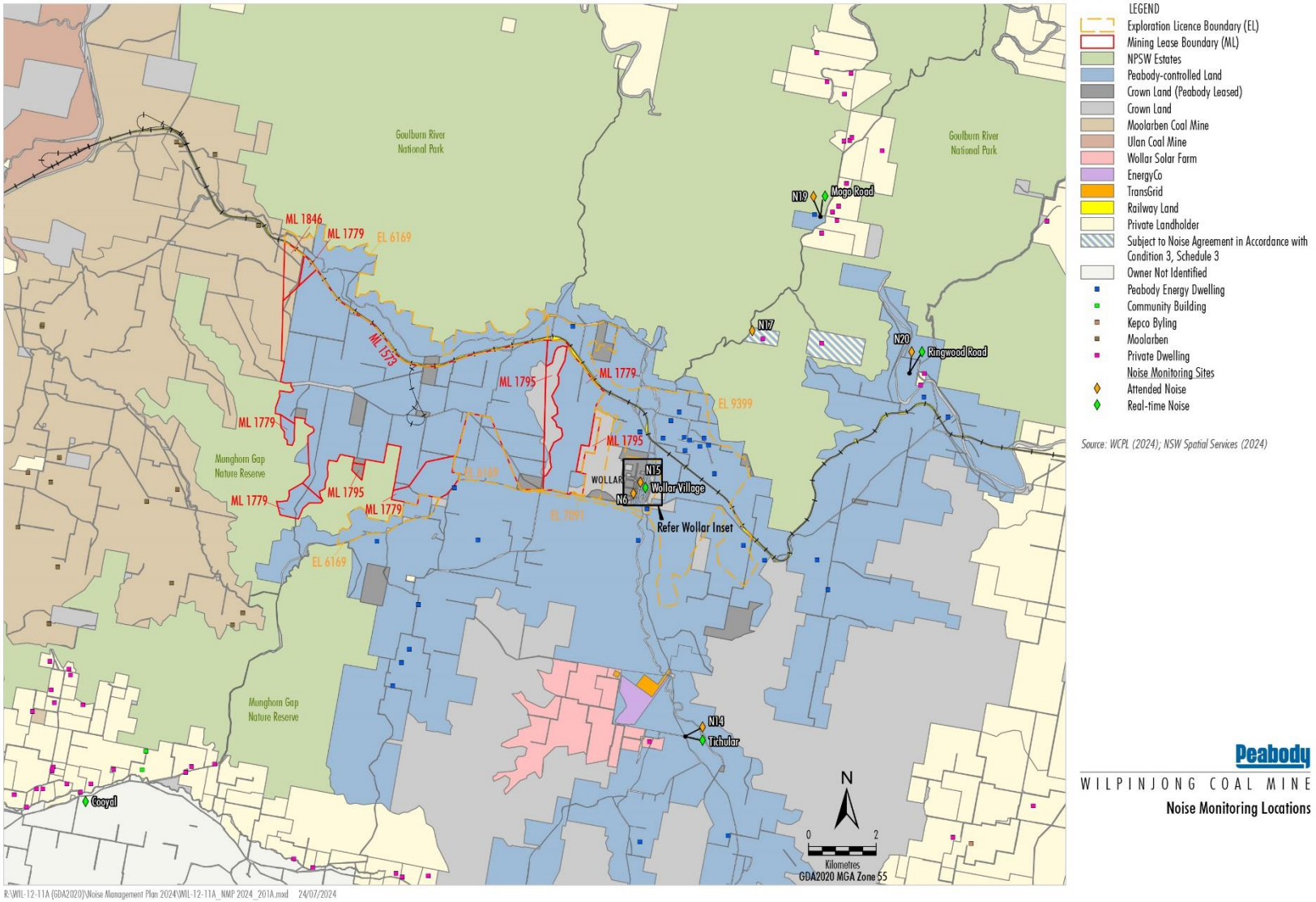
APPENDIX 3F

NOISE MONITORING DATA

Noise Monitoring Locations



Noise Monitoring Locations (Wollar)

Noise Monitoring Reports

Wilpinjong Coal

Annual environmental noise monitoring report 2024

Prepared for Wilpinjong Coal Pty Ltd

March 2025

Wilpinjong Coal

Annual environmental noise monitoring report 2024

Wilpinjong Coal Pty Ltd

E231296 RP13

March 2025

Version	Date	Prepared by	Reviewed by	Comments
1	20/01/2025	Will Moore	Jesse Tribby	Draft
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Executive Summary

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal (WCP) Pty Ltd to provide an annual noise review (ANR) for the 2024 calendar year. The purpose of the ANR is to satisfy annual review reporting requirements detailed in the WCP development consent. This includes comparison of attended noise monitoring results against relevant criteria and predictions in the most recently approved noise model for WCP.

This report summarises monthly attended noise monitoring surveys conducted for WCP during the reporting period 1 January to 31 December 2024. The purpose of the surveys was to quantify and describe the acoustic environment around the site and compare results with specified limits. The duration of each measurement was 15 minutes.

A.1 January to December 2024 compliance

During 2024 attended noise monitoring, noise levels from WCP complied with relevant noise limits at all monitoring locations.

A.2 Long-term noise trends

For the 5-year period ending December 2024, site-only L_{Aeq} noise levels were low (either IA, NM, or less than 30 dB) for a large majority of measurements at all monitoring locations. During the 5-year period ending December 2024:

- At N6 and N15, site-only L_{Aeq} noise levels decreased slightly over the 5-year period.
- At N14, N19, and N20, site-only L_{Aeq} noise levels remained very low throughout the 5-year period.
- At N17, site-only L_{Aeq} noise levels remained consistent during the 5-year period.

Over the life of the project, site-only L_{Aeq} noise levels were low (either IA, NM, or less than 30 dB) for a large majority of measurements at all monitoring locations. Over the life of the project:

- At N6, site-only L_{Aeq} noise levels increased to 2021 and decreased from 2022 to 2024.
- At N14, N19, and N20, site-only L_{Aeq} noise levels remained very low throughout the life of the project.
- At N15, site-only L_{Aeq} noise levels increased to 2023 and decreased in 2024.
- At N17, site-only L_{Aeq} noise levels increased during the life of the project.

A.3 Noise model comparison

When comparable, measured noise levels were lower than predicted noise levels under corresponding meteorological conditions at all locations during all measurements with two exceptions:

- During the July measurement at N6, the measured site-only $L_{A1,1minute}$ was 1 dB higher than predicted under strong inversion conditions.
- During the June measurement at N20, the measured site-only $L_{A1,1minute}$ was 3 dB higher than predicted under strong inversion conditions.

While measured $L_{A1,1minute}$ noise levels were slightly higher than predicted in these two instances, they remained below the $L_{A1,1minute}$ limit of 45 dB.

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1 Background

EMM Consulting Pty Limited (EMM) was engaged by Wilpinjong Coal (WCP) Pty Ltd to provide an annual noise review (ANR) for the 2024 calendar year. The purpose of the ANR is to satisfy annual review reporting requirements detailed in the WCP development consent. This includes comparison of attended noise monitoring results against relevant criteria and predictions in the most recently approved noise model for WCP

This report summarises monthly attended noise monitoring surveys conducted around WCP during the reporting period 1 January to 31 December 2024. The purpose of the surveys was to quantify and describe the acoustic environment around the site and compare results with specified limits.

1.1 Monitoring locations

Monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows the actual monitoring positions, not the location of residences.

Table 1.1 Attended monitoring locations

NMP descriptor	Monitoring Location
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular
N15	Track off Barigan Street near Wollar Public School, Wollar Village
N17	Mogo Road, off Araluen Road, Wollar
N19	North Mogo Road, Mogo
N20	Ringwood Road, off Wollar Road, Wollar

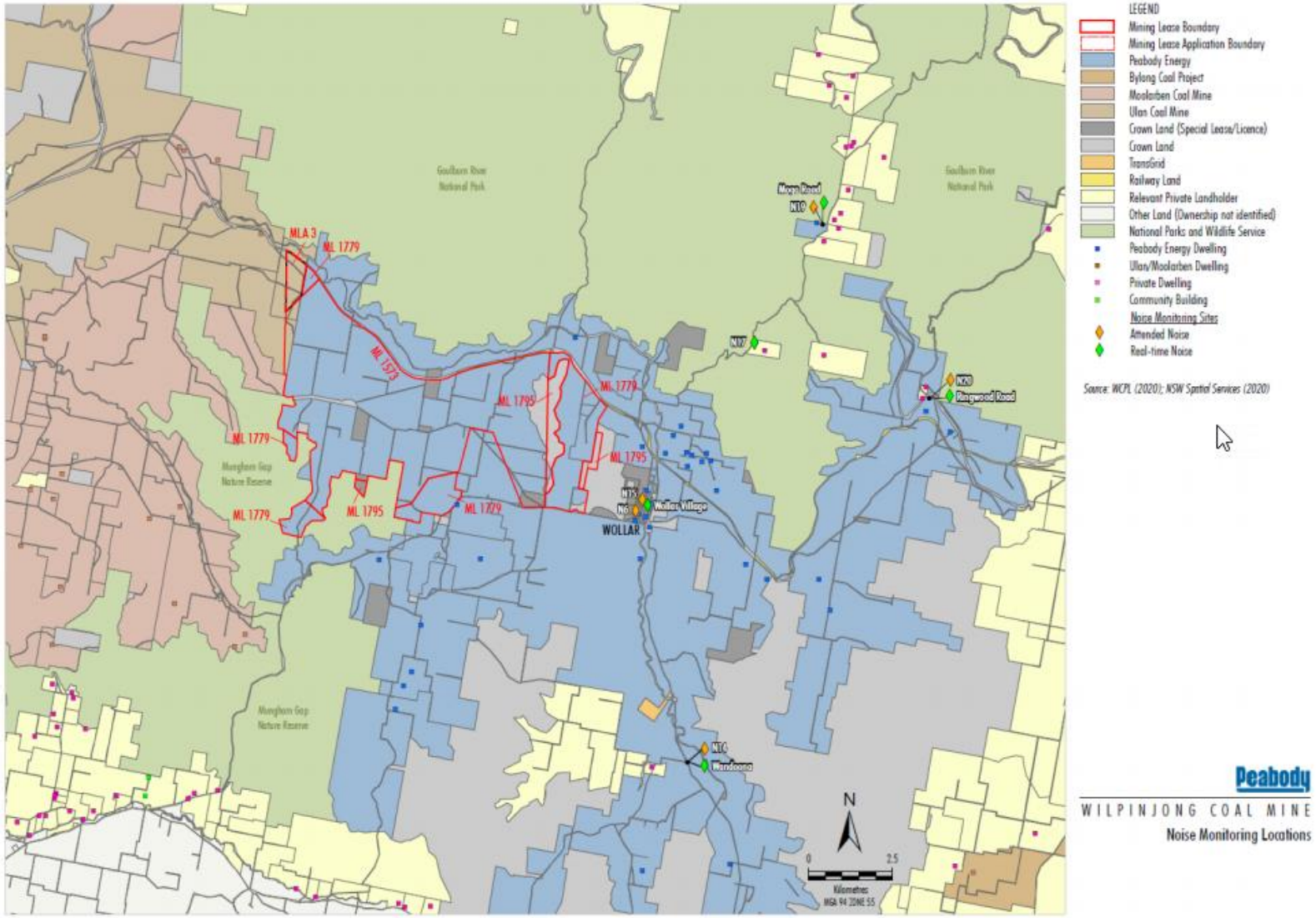

Figure 1.1 Wilpinjong noise monitoring locations

1.2 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to describe human response to noise.
L_{Amax}	The maximum A-weighted noise level over a time period.
L_{A1}	The noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The noise level which is exceeded for 10% of the time.
L_{Aeq}	The average noise A-weighted energy during a measurement period.
L_{A50}	The noise level which is exceeded for 50% of the time and the median noise level during a measurement period.
L_{A90}	The level exceeded for 90% of the time. The L_{A90} level is often referred to as the "background" noise level and is commonly used to determine noise criteria for assessment purposes.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micro pascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
SC	Stability class (or category) is determined from measured wind speed and either sigma-theta or VTG.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	This is the period 7:00 am to 6:00 pm.
Evening	This is the period 6:00 pm to 10:00 pm.
Night	This is the period 10:00 pm to 7:00 am.

2 Statutory requirements and criteria

2.1 Development consents

The current development consent for WCP is the 'Wilpinjong Extension Project SSD-6764' (MOD 4, September 2024). Schedule 3 and Appendix 6 of the consent details specific conditions relating to noise generated by WCP.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the NSW Environment Protection Authority (EPA), most recently issued in March 2023.

2.3 Noise monitoring program

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in January 2023.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Methodology for assessment of low-frequency modifying factors is consistent between Fact Sheet C of the NPfI and Appendix 6 of the development consent. Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source.

3.4 Attended real-time noise monitoring comparison

WCP-only noise levels from four attended monitoring locations are compared to results from nearby Sentinex units. Start times of attended and real-time measurements do not directly overlap. Real-time measurements that have the most overlap with corresponding attended monitoring measurements are selected for comparison.

Attended monitoring locations and the real-time monitoring locations they represent are listed in Table 3.1.

Table 3.1 Attended and real-time monitoring locations for comparison

NMP descriptor	Real-time monitor ID	Monitoring location
N15	SX33-N1	Wollar Village
N19	SX32-N1	North Mogo Road
N20	SX30-N1	Ringwood Road, off Wollar Road
N14	SX31-N1	'Tichular', intersection of Tichular and Barigan Roads, Tichular

3.5 Comparison with model predictions

A noise and blasting assessment was prepared in November 2015 as part of the EIS to support the development consent application. The report assessed noise and blasting impacts associated with ongoing operations. As part of the modelling assessment, noise levels from WCP were predicted for representative operating scenarios, time periods and weather conditions. Predicted noise levels for "Year 2024" most closely aligned with the 2024 reporting year and have been compared with measured levels from attended compliance monitoring under corresponding meteorological conditions.

Table 11 of the noise and blasting assessment lists modelled meteorological conditions and is reproduced below.

Table 11 INP Assessable Meteorological Noise Modelling Parameters

Period	Meteorological Parameter	Air Temperature	Relative Humidity	Wind Speed and Direction	Temperature Gradient
Daytime	Calm	20ºC	50%	0 m/s	0°C/100 m
	Autumn Wind 30% (occurrence)	19ºC	55%	E 3 m/s	0°C/100 m
Evening	Calm	19ºC	56%	0 m/s	0°C/100 m
	Autumn Wind 30% (occurrence)	18ºC	63%	ESE 3 m/s	0°C/100 m
	Winter Wind 30% (occurrence)	10ºC	71%	WNW, NW 3 m/s	0°C/100 m
Night-time	Calm	14ºC	76%	0 m/s	0°C/100 m
	Summer Wind > 30% (occurrence)	19ºC	68%	ESE, SE, E 3 m/s	0°C/100 m
	Strong Inversion (10% exceedance)[1]	6ºC	86%	0 m/s	5.2°C/100 m

Note 1: Winter evening/night-time 10% exceedance temperature gradient in accordance with INP Appendix E Table 4.
Note 2: m/s = metres per second.

The following rules were used to allocate meteorological parameter bounds for each condition:

- For night-time "calm" atmospheric conditions, wind speeds less than 0.5 metres per second (m/s), all wind directions, and temperature gradients in the range -1.5° and 1.5°C/100 m were included. This vertical temperature gradient range corresponds with Stability Categories D and E according to Table D2 of the NPfI.

- For night “summer wind” atmospheric conditions, wind speeds in the range 0.5 to 3.0 m/s and vertical temperature gradients in the range -1.5° and 1.5°C/100 m were included. This vertical temperature gradient range corresponds with Stability Categories D and E according to Table D2 of the NPfI. The modelled wind directions were E (90 degrees), ESE (112.5 degrees), and SE (135 degrees). Wind directions 22.5 degrees either side of the modelled directions were included.

- For “strong inversion” atmospheric conditions with no wind, wind speeds up to 0.5 m/s and vertical temperature gradients in the range 3.0° to 5.2°C/100 m were included. This vertical temperature gradient range corresponds with Stability Category F according to Table D2 of the NPfI.

Meteorological parameter bounds used to identify corresponding meteorological conditions during attended monitoring are outlined in Table 3.2.

Table 3.2 Meteorological condition definitions

Parameter	Night		
	Calm	Summer wind	Strong inversion
Wind speed (m/s)	0.0–0.5	0.5–3.0	0.0–0.5
Wind direction (°)	All	67.5°–157.5°	All
Stability category	D and E	D and E	F and G

4 Results

4.1 January 2024

4.1.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1.

Table 4.1 Total measured noise levels, dB – January 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	24/01/2024 22:50	44	42	40	38	38	36	31
N14	24/01/2024 23:45	59	55	53	49	47	43	38
N15	24/01/2024 23:15	48	44	34	33	31	29	27
N17	24/01/2024 22:23	46	42	40	39	39	37	36
N19	24/01/2024 22:00	41	40	39	38	38	37	33
N20	25/01/2024 00:15	47	36	31	30	29	27	25

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.1.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.1.3 Monitoring results

Table 4.2 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.2 Site noise levels and limits – January 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	24/01/2024 22:50	0.9	315	F	Yes	37	45	<20	<20	Nil	Nil
N14	24/01/2024 23:45	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil
N15	24/01/2024 23:15	0.6	357	F	Yes	37	45	28	33	Nil	Nil
N17	24/01/2024 22:23	0.0	-	G	No	38	45	<20	<20	N/A	N/A
N19	24/01/2024 22:00	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil
N20	25/01/2024 00:15	0.7	296	F	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.1.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.3. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.3 Real-time and attended noise levels – January 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	24/01/2024 23:45	24/01/2024 23:45	33	29	25	22	43	IA
N15/SX33	24/01/2024 23:15	24/01/2024 23:15	41	37	32	27	29	28
N19/SX32	24/01/2024 22:00	24/01/2024 22:00	40	39	15	14	37	IA
N20/SX30	25/01/2024 00:15	25/01/2024 00:15	40	36	25	16	27	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.2 February 2024

4.2.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.4.

Table 4.4 Total measured noise levels, dB – February 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	6/02/2024 00:27	42	40	37	35	34	32	29
N14	5/02/2024 23:30	51	48	43	38	33	30	26
N15	5/02/2024 23:00	47	46	43	38	34	31	28
N17	5/02/2024 22:23	50	44	40	38	37	36	34
N19	5/02/2024 22:00	51	45	42	38	35	29	26
N20	6/02/2024 00:00	44	42	40	37	36	34	30

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.2.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.3 Monitoring results

Table 4.5 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.5 Site noise levels and limits – February 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	6/02/2024 00:27	3.0	51	D	Yes	37	45	IA	IA	Nil	Nil
N14	5/02/2024 23:30	1.6	13	D	Yes	35	45	IA	IA	Nil	Nil
N15	5/02/2024 23:00	3.0	42	D	Yes	37	45	IA	IA	Nil	Nil
N17	5/02/2024 22:23	3.8	43	D	No	38	45	IA	IA	N/A	N/A
N19	5/02/2024 22:00	4.6	61	D	No	35	45	IA	IA	N/A	N/A
N20	6/02/2024 00:00	2.7	33	D	Yes	35	45	IA	IA	Nil	Nil

Notes: 1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).

2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.

3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.

4. Degrees magnetic north, "-" indicates calm conditions.

4.2.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.6. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.6 Real-time and attended noise levels – February 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	5/02/2024 23:30	5/02/2024 23:30	45	42	27	23	30	IA
N15/SX33	5/02/2024 23:00	5/02/2024 23:00	37	33	29	22	31	IA
N19/SX32	5/02/2024 22:00	5/02/2024 22:00	36	34	26	19	29	IA
N20/SX30	6/02/2024 00:00	6/02/2024 00:00	44	42	21	21	34	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.3 March 2024

4.3.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.7.

Table 4.7 Total measured noise levels, dB – March 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	19/03/2024 22:48	48	47	44	42	41	40	39
N14	19/03/2024 23:45	43	41	40	39	39	38	37
N15	19/03/2024 23:15	53	50	44	43	42	40	38
N17	19/03/2024 22:22	39	31	28	26	25	24	23
N19	19/03/2024 22:00	49	36	28	27	25	24	23
N20	20/03/2024 00:15	54	34	33	32	31	30	27

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.3.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.3.3 Monitoring results

Table 4.8 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.8 Site noise levels and limits – March 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	19/03/2024 22:48	1.3	96	E	Yes	37	45	IA	IA	Nil	Nil
N14	19/03/2024 23:45	0.8	118	D	Yes	35	45	IA	IA	Nil	Nil
N15	19/03/2024 23:15	1.4	138	D	Yes	37	45	IA	IA	Nil	Nil
N17	19/03/2024 22:22	2.0	80	E	Yes	38	45	IA	IA	Nil	Nil
N19	19/03/2024 22:00	2.5	79	E	Yes	35	45	IA	IA	Nil	Nil
N20	20/03/2024 00:15	0.0	-	A	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.3.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.9. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.9 Real-time and attended noise levels – March 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	19/03/2024 23:45	19/03/2024 23:45	53	52	26	25	38	IA
N15/SX33	19/03/2024 23:15	19/03/2024 23:15	50	47	39	21	40	IA
N19/SX32	19/03/2024 22:00	19/03/2024 22:00	29	25	17	16	24	IA
N20/SX30	20/03/2024 00:15	20/03/2024 00:15	42	39	15	12	30	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.4 April 2024

4.4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.10.

Table 4.10 Total measured noise levels, dB – April 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	16/04/2024 22:49	39	28	24	23	22	21	20
N14	16/04/2024 23:45	52	48	46	42	37	32	28
N15	16/04/2024 23:15	56	50	45	40	27	20	19
N17	16/04/2024 22:22	38	31	26	24	23	21	19
N19	16/04/2024 22:00	40	32	29	25	23	21	19
N20	17/04/2024 00:15	48	40	35	32	28	26	23

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.4.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.4.3 Monitoring results

Table 4.11 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.11 Site noise levels and limits – April 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	16/04/2024 22:49	0.0	-	G	No	37	45	IA	IA	N/A	N/A
N14	16/04/2024 23:45	0.0	-	G	No	35	45	IA	IA	N/A	N/A
N15	16/04/2024 23:15	0.0	-	G	No	37	45	IA	IA	N/A	N/A
N17	16/04/2024 22:22	0.0	-	G	No	38	45	IA	IA	N/A	N/A
N19	16/04/2024 22:00	0.0	-	G	No	35	45	IA	IA	N/A	N/A
N20	17/04/2024 00:15	0.0	-	G	No	35	45	IA	IA	N/A	N/A

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.4.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.12. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.12 Real-time and attended noise levels – April 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	16/04/2024 23:45	16/04/2024 23:45	41	34	24	21	32	IA
N15/SX33	16/04/2024 23:15	16/04/2024 23:15	43	24	42	18	20	IA
N19/SX32	16/04/2024 22:00	16/04/2024 22:00	27	21	23	15	21	IA
N20/SX30	17/04/2024 00:15	17/04/2024 00:15	24	21	21	15	26	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.5 May 2024

4.5.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.13.

Table 4.13 Total measured noise levels, dB – May 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	8/05/2024 22:47	49	36	31	28	26	23	21
N14	8/05/2024 23:45	51	49	46	43	43	37	25
N15	8/05/2024 23:15	50	44	31	31	25	21	19
N17	8/05/2024 22:22	39	31	28	25	23	20	18
N19	8/05/2024 22:00	48	36	32	29	27	24	22
N20	9/05/2024 00:15	50	46	32	32	27	23	20

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.5.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.5.3 Monitoring results

Table 4.14 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.14 Site noise levels and limits – May 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	8/05/2024 22:47	1.7	76	E	Yes	37	45	IA	IA	Nil	Nil
N14	8/05/2024 23:45	2.2	93	E	Yes	35	45	IA	IA	Nil	Nil
N15	8/05/2024 23:15	2.1	65	E	Yes	37	45	IA	IA	Nil	Nil
N17	8/05/2024 22:22	1.9	67	E	Yes	38	45	IA	IA	Nil	Nil
N19	8/05/2024 22:00	1.8	76	D	Yes	35	45	IA	IA	Nil	Nil
N20	9/05/2024 00:15	1.9	91	E	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.5.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.15. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.15 Real-time and attended noise levels – May 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data [2]				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	8/05/2024 23:45	8/05/2024 23:45	NR	NR	NR	NR	37	IA
N15/SX33	8/05/2024 23:15	8/05/2024 23:15	33	24	27	18	21	IA
N19/SX32	8/05/2024 22:00	8/05/2024 22:00	31	28	25	21	24	IA
N20/SX30	9/05/2024 00:15	9/05/2024 00:15	26	22	23	16	23	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

2. NR – no Sentinex data recorded for this period.

4.6 June 2024

4.6.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.16.

Table 4.16 Total measured noise levels, dB – June 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	18/06/2024 22:47	45	33	30	27	27	24	22
N14	18/06/2024 23:45	46	38	31	29	27	25	22
N15	18/06/2024 23:15	37	33	31	28	28	26	23
N17	18/06/2024 22:22	44	38	35	32	31	29	25
N19	18/06/2024 22:00	43	28	24	23	22	20	18
N20	19/06/2024 00:15	43	34	29	26	23	21	20

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.6.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.6.3 Monitoring results

Table 4.17 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.17 Site noise levels and limits – June 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	18/06/2024 22:47	1.5	222	E	Yes	37	45	27	35	Nil	Nil
N14	18/06/2024 23:45	0.8	250	E	Yes	35	45	<20	<20	Nil	Nil
N15	18/06/2024 23:15	0.9	296	E	Yes	37	45	28	37	Nil	Nil
N17	18/06/2024 22:22	1.9	229	F	Yes	38	45	32	44	Nil	Nil
N19	18/06/2024 22:00	1.9	224	F	Yes	35	45	<20	<20	Nil	Nil
N20	19/06/2024 00:15	0.0	-	F	Yes	35	45	<25	35	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.6.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.18. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.18 Real-time and attended noise levels – June 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	18/06/2024 23:45	18/06/2024 23:45	21	15	19	17	25	<20
N15/SX33	18/06/2024 23:15	18/06/2024 23:15	47	28	45	28	26	28
N19/SX32	18/06/2024 22:00	18/06/2024 22:00	26	23	22	18	20	<20
N20/SX30	19/06/2024 00:15	19/06/2024 00:15	30	22	23	18	21	<25

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.7 July 2024

4.7.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.19.

Table 4.19 Total measured noise levels, dB – July 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	23/07/2024 22:47	49	35	30	29	28	27	25
N14	23/07/2024 23:45	48	41	38	34	33	25	22
N15	23/07/2024 23:15	40	34	31	29	29	27	25
N17	23/07/2024 22:22	39	33	28	26	25	23	21
N19	23/07/2024 22:00	43	30	21	22	18	16	15
N20	24/07/2024 00:15	57	36	34	30	27	22	20

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.7.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.7.3 Monitoring results

Table 4.20 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.20 Site noise levels and limits – July 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	23/07/2024 22:47	0.0	-	F	Yes	37	45	26	41	Nil	Nil
N14	23/07/2024 23:45	0.0	-	F	Yes	35	45	<25	<25	Nil	Nil
N15	23/07/2024 23:15	0.0	-	F	Yes	37	45	29	40	Nil	Nil
N17	23/07/2024 22:22	0.0	-	F	Yes	38	45	26	34	Nil	Nil
N19	23/07/2024 22:00	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil
N20	24/07/2024 00:15	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.7.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.21. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.21 Real-time and attended noise levels – July 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	23/07/2024 23:45	23/07/2024 23:45	29	23	25	21	25	<25
N15/SX33	23/07/2024 23:15	23/07/2024 23:15	37	30	34	30	27	29
N19/SX32	23/07/2024 22:00	23/07/2024 22:00	22	14	19	12	16	IA
N20/SX30	24/07/2024 00:15	24/07/2024 00:15	32	23	30	18	22	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.8 August 2024

4.8.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.22.

Table 4.22 Total measured noise levels, dB – August 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	19/08/2024 22:47	48	41	39	37	36	34	32
N14	19/08/2024 23:45	56	53	52	50	49	47	42
N15	19/08/2024 23:15	55	53	48	42	33	31	29
N17	19/08/2024 22:22	51	29	24	23	21	20	18
N19	19/08/2024 22:00	45	29	26	24	24	22	20
N20	20/08/2024 00:15	51	48	46	43	41	39	34

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.8.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.8.3 Monitoring results

Table 4.23 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.23 Site noise levels and limits – August 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	19/08/2024 22:47	0.9	89	E	Yes	37	45	IA	IA	Nil	Nil
N14	19/08/2024 23:45	0.0	-	F	Yes	35	45	<30	<30	Nil	Nil
N15	19/08/2024 23:15	0.0	-	E	Yes	37	45	IA	IA	Nil	Nil
N17	19/08/2024 22:22	1.1	42	E	Yes	38	45	<20	<20	Nil	Nil
N19	19/08/2024 22:00	0.9	37	E	Yes	35	45	IA	IA	Nil	Nil
N20	20/08/2024 00:15	0.7	43	F	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.8.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.24. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.24 Real-time and attended noise levels – August 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	19/08/2024 23:45	19/08/2024 23:45	39	36	27	26	47	<30
N15/SX33	19/08/2024 23:15	19/08/2024 23:15	60	58	40	27	31	IA
N19/SX32	19/08/2024 22:00	19/08/2024 22:00	30	28	17	15	22	IA
N20/SX30	20/08/2024 00:15	20/08/2024 00:15	26	24	18	16	39	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.9 September 2024

4.9.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.25.

Table 4.25 Total measured noise levels, dB – September 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	10/09/2024 01:03	51	41	38	33	29	27	25
N14	9/09/2024 23:30	41	35	31	29	28	27	25
N15	9/09/2024 23:00	58	42	35	33	29	26	24
N17	9/09/2024 22:28	42	36	34	32	32	30	28
N19	9/09/2024 22:00	46	32	27	26	25	23	21
N20	10/09/2024 00:15	48	44	30	31	22	20	18

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.9.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.9.3 Monitoring results

Table 4.26 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.26 Site noise levels and limits – September 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	10/09/2024 01:03	0.0	-	G	No	37	45	<20	<20	N/A	N/A
N14	9/09/2024 23:30	0.0	-	F	Yes	35	45	<20	<20	Nil	Nil
N15	9/09/2024 23:00	0.5	179	F	Yes	37	45	<25	<25	Nil	Nil
N17	9/09/2024 22:28	0.4	215	F	Yes	38	45	32	38	Nil	Nil
N19	9/09/2024 22:00	0.6	190	F	Yes	35	45	<25	<25	Nil	Nil
N20	10/09/2024 00:15	0.0	-	F	Yes	35	45	<20	<20	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.9.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.27. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.27 Real-time and attended noise levels – September 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data [2]				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	9/09/2024 23:30	9/09/2024 23:30	40	31	22	21	27	<20
N15/SX33	9/09/2024 23:00	9/09/2024 23:00	45	32	44	25	26	<25
N19/SX32	9/09/2024 22:00	9/09/2024 22:00	27	25	26	NR	23	<25
N20/SX30	10/09/2024 00:15	10/09/2024 00:15	26	24	21	19	20	<20

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

2. NR – no Sentinex data recorded for this period.

4.10 October 2024

4.10.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.28.

Table 4.28 Total measured noise levels, dB – October 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	10/10/2024 22:48	53	51	45	40	30	28	26
N14	10/10/2024 23:45	63	56	47	44	36	29	25
N15	10/10/2024 23:15	41	30	26	24	23	22	21
N17	10/10/2024 22:22	44	29	24	22	21	19	18
N19	10/10/2024 22:00	53	45	25	31	21	19	16
N20	11/10/2024 00:15	58	54	43	41	24	21	19

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.10.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.10.3 Monitoring results

Table 4.29 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.29 Site noise levels and limits – October 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	10/10/2024 22:48	0.0	-	G	No	37	45	IA	IA	N/A	N/A
N14	10/10/2024 23:45	0.0	-	G	No	35	45	IA	IA	N/A	N/A
N15	10/10/2024 23:15	0.0	-	F	Yes	37	45	<20	<20	Nil	Nil
N17	10/10/2024 22:22	0.3	227	G	No	38	45	<20	<20	N/A	N/A
N19	10/10/2024 22:00	0.0	-	G	No	35	45	IA	IA	N/A	N/A
N20	11/10/2024 00:15	0.0	-	G	No	35	45	IA	IA	N/A	N/A

Notes: 1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).

2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.

3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.

4. Degrees magnetic north, "-" indicates calm conditions.

4.10.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.30. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.30 Real-time and attended noise levels – October 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	10/10/2024 23:45	10/10/2024 23:45	37	27	32	24	29	IA
N15/SX33	10/10/2024 23:15	10/10/2024 23:15	29	27	21	18	22	<20
N19/SX32	10/10/2024 22:00	10/10/2024 22:00	28	23	15	13	19	IA
N20/SX30	11/10/2024 00:15	11/10/2024 00:15	28	20	22	15	21	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.11 November 2024

4.11.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.31.

Table 4.31 Total measured noise levels, dB – November 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	6/11/2024 00:48	49	44	32	33	28	27	27
N14	5/11/2024 23:30	48	46	41	38	37	34	29
N15	5/11/2024 23:00	35	29	27	25	24	22	19
N17	5/11/2024 22:26	40	34	33	32	32	31	30
N19	5/11/2024 22:00	41	35	33	31	31	29	26
N20	6/11/2024 00:15	46	41	38	34	31	24	21

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.11.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.11.3 Monitoring results

Table 4.32 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.32 Site noise levels and limits – November 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	6/11/2024 00:48	1.3	97	E	Yes	37	45	<25	<25	Nil	Nil
N14	5/11/2024 23:30	1.9	63	D	Yes	35	45	24	28	Nil	Nil
N15	5/11/2024 23:00	2.0	58	D	Yes	37	45	<20	<20	Nil	Nil
N17	5/11/2024 22:26	2.6	48	D	Yes	38	45	26	32	Nil	Nil
N19	5/11/2024 22:00	2.2	50	D	Yes	35	45	25	30	Nil	Nil
N20	6/11/2024 00:15	1.4	83	D	Yes	35	45	<20	<20	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.11.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.33. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.33 Real-time and attended noise levels – November 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	5/11/2024 23:30	5/11/2024 23:30	46	43	24	23	34	24
N15/SX33	5/11/2024 23:00	5/11/2024 23:00	35	26	22	20	22	<20
N19/SX32	5/11/2024 22:00	5/11/2024 22:00	39	37	26	25	29	25
N20/SX30	6/11/2024 00:15	6/11/2024 00:15	38	32	34	20	24	<20

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

4.12 December 2024

4.12.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.34.

Table 4.34 Total measured noise levels, dB – December 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	9/12/2024 22:47	46	44	42	41	41	38	33
N14	9/12/2024 23:45	68	66	64	61	60	57	51
N15	9/12/2024 23:15	54	48	41	38	34	31	28
N17	9/12/2024 22:22	59	58	58	56	54	53	49
N19	9/12/2024 22:00	56	50	49	48	48	46	43
N20	10/12/2024 00:15	38	35	32	30	29	27	26

Notes: 1. Levels in this table are not necessarily the result of activity at site.

4.12.2 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.12.3 Monitoring results

Table 4.35 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site ASW. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.35 Site noise levels and limits – December 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	9/12/2024 22:47	2.0	45	D	Yes	37	45	IA	IA	Nil	Nil
N14	9/12/2024 23:45	2.1	103	C	Yes	35	45	IA	IA	Nil	Nil
N15	9/12/2024 23:15	1.1	55	D	Yes	37	45	IA	IA	Nil	Nil
N17	9/12/2024 22:22	1.3	24	D	Yes	38	45	<25	30	Nil	Nil
N19	9/12/2024 22:00	1.1	28	D	Yes	35	45	<25	27	Nil	Nil
N20	10/12/2024 00:15	1.2	86	D	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 m/s (at a height of 10 m).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

4.12.4 Comparison of real-time and attended noise results

A summary of attended monitoring data and that measured by the four real-time Sentinex units (omni-directional) is shown in Table 4.36. Low pass (<630 Hz) L_{Aeq} and L_{A90} are typically good indicators of mining noise levels.

Table 4.36 Real-time and attended noise levels – December 2024 [1]

Location/Sentinex	Attended start date and time	Sentinex start date and time	Sentinex data				Attended measurement	
			Total L_{Aeq} dB	Total L_{A90} dB	Low pass (<630Hz) L_{Aeq} dB	Low pass (<630Hz) L_{A90} dB	Total L_{A90} dB	WCP L_{Aeq} dB
N14/SX31	9/12/2024 23:45	9/12/2024 23:45	45	41	23	19	57	IA
N15/SX33	9/12/2024 23:15	9/12/2024 23:15	42	37	37	18	31	IA
N19/SX32	9/12/2024 22:00	9/12/2024 22:00	49	48	26	23	46	<25
N20/SX30	10/12/2024 00:15	10/12/2024 00:15	46	44	20	14	27	IA

Notes: 1. Levels in this table are not necessarily the result of activity at WCP.

5 Long term trends

Schedule 5, Condition 4(b) and 4(d) of the development consent require annual comparison of monitoring results to monitoring results of previous years and identification of any trends in the monitoring data over the life of the project, respectively.

To satisfy these conditions, site-only L_{Aeq} noise levels measured during monthly attended environmental noise monitoring have been collated and graphed to summarise WCP long-term noise performance over a 5-year period and over the life of the project.

Due to the qualitative nature of some attended noise monitoring descriptors, calculation of site noise statistics such as mean, median, and standard deviation is not always possible. Subsequently, site-only L_{Aeq} noise levels for each monitoring event have been grouped into one of three categories:

1. WCP-only L_{Aeq} was either inaudible (IA), not measurable (NM), or less than 30 dB, which together are represented by green bars
2. WCP-only L_{Aeq} was between 30 dB and the relevant impact assessment criterion (inclusive), represented by blue bars, or
3. WCP-only L_{Aeq} was greater than the impact assessment criterion for that location, represented by red bars.

For each calendar year, the percentage of occurrence for each of these categories is shown, as well as annual trend lines over the entire five-year period. Figures show site-only L_{Aeq} noise levels, including adjustments due to modifying factors, as defined by the NPfI. Meteorological conditions and applicability of noise criteria have not been considered.

5.1 Five-year monitoring data trends

5.1.1 Five-year noise trend graphs

In accordance with Schedule 5, Condition 4(b), site-only L_{Aeq} noise levels measured during attended environmental noise monitoring have been collated and graphed to summarise long-term noise trends over a 5-year period. Figure 5.1 to Figure 5.6 provide percentage occurrence information for WCP noise levels at six monitoring locations.

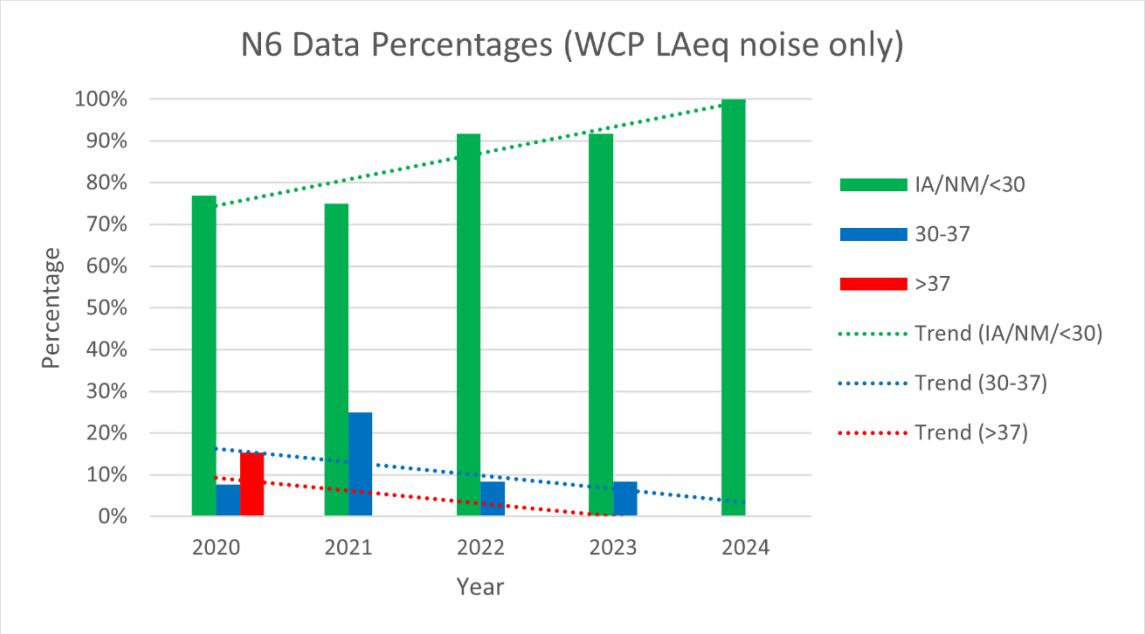

Figure 5.1 **Five-year noise trend, N6**

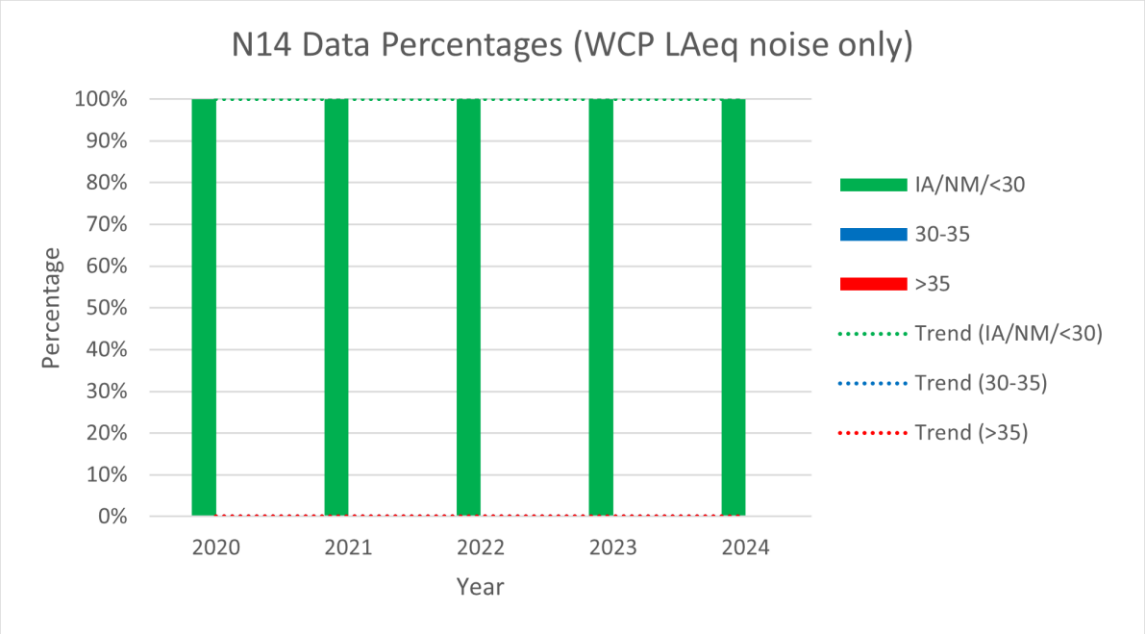

Figure 5.2 **Five-year noise trend, N14**

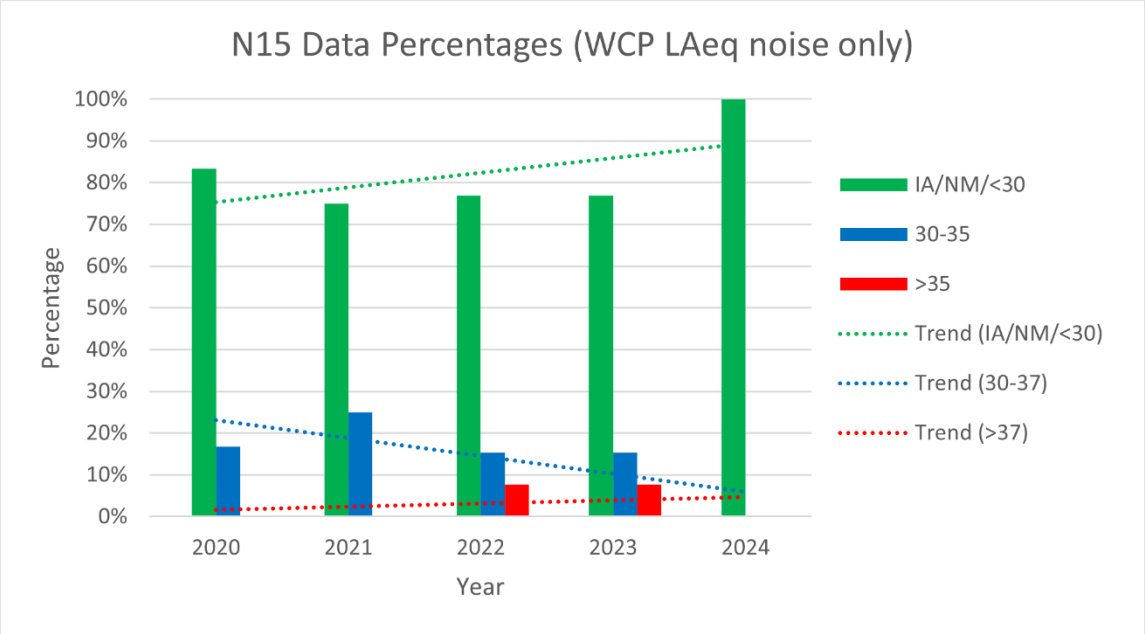

Figure 5.3 **Five-year noise trend, N15**

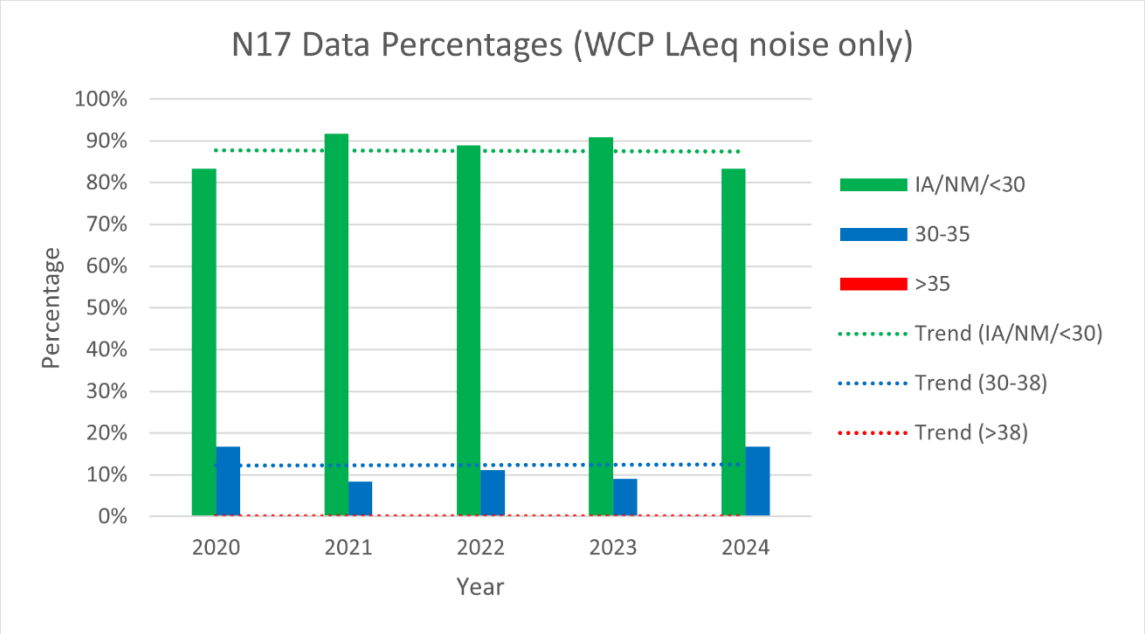

Figure 5.4 **Five-year noise trend, N17**

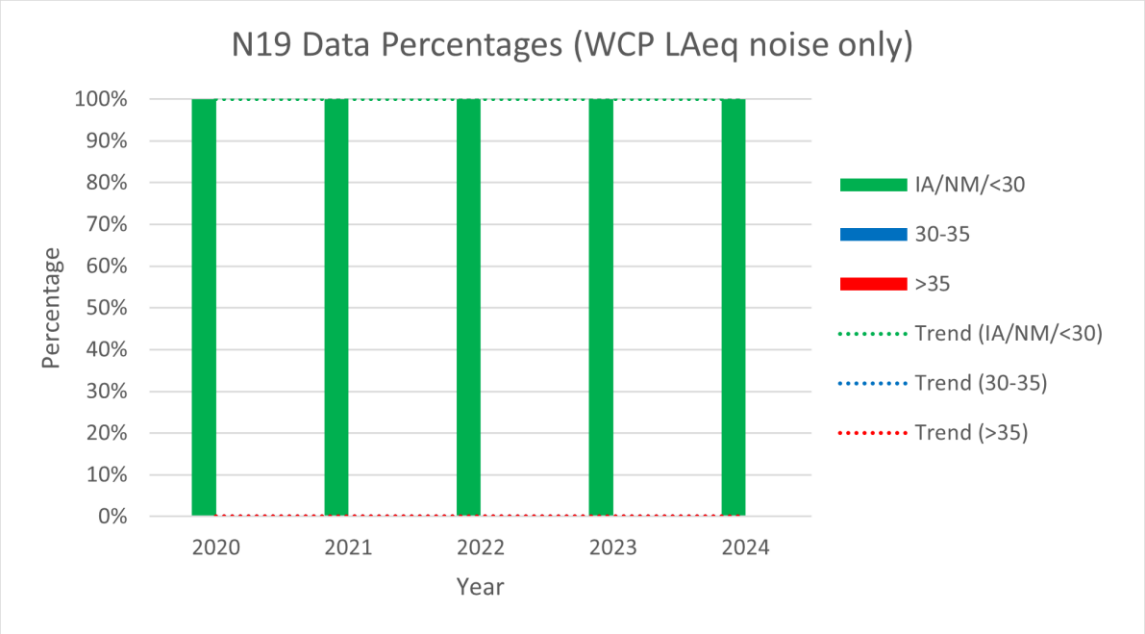

Figure 5.5 **Five-year noise trend, N19**

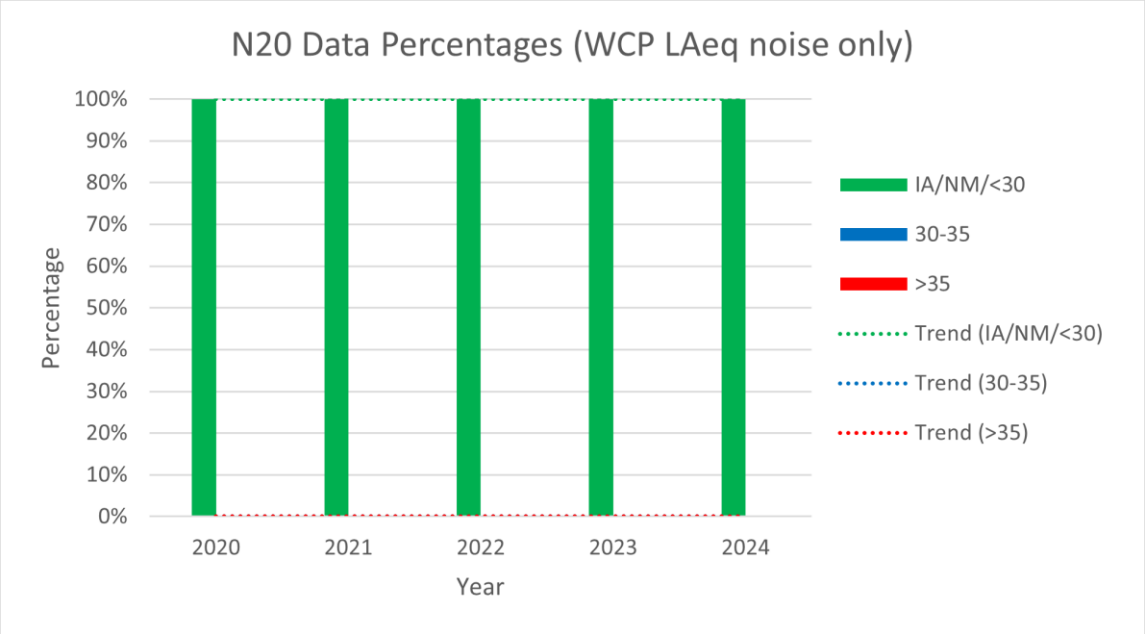

Figure 5.6 **Five-year noise trend, N20**

5.1.2 Discussion

For the five-year period ending December 2024, site-only L_{Aeq} noise levels were low (either IA, NM, or less than 30 dB) for a large majority of measurements at all monitoring locations.

Additional discussion of individual monitoring locations is provided below:

- At N6 and N15, site-only L_{Aeq} noise levels decreased slightly over the 5-year period.
- At N14, N19, and N20, site-only L_{Aeq} noise levels remained very low throughout the 5-year period.
- At N17, site-only L_{Aeq} noise levels remained consistent during the 5-year period.

5.2 Life of project monitoring data trends

5.2.1 Life of project noise trend graphs

In accordance with Schedule 5, Condition 4(d), site-only L_{Aeq} noise levels measured during attended environmental noise monitoring have been collated and graphed to summarise noise trends over the life of the project which began in 2017.

Figure 5.7 to Figure 5.12 provide percentage occurrence information for WCP noise levels at six monitoring locations over the life of the project.

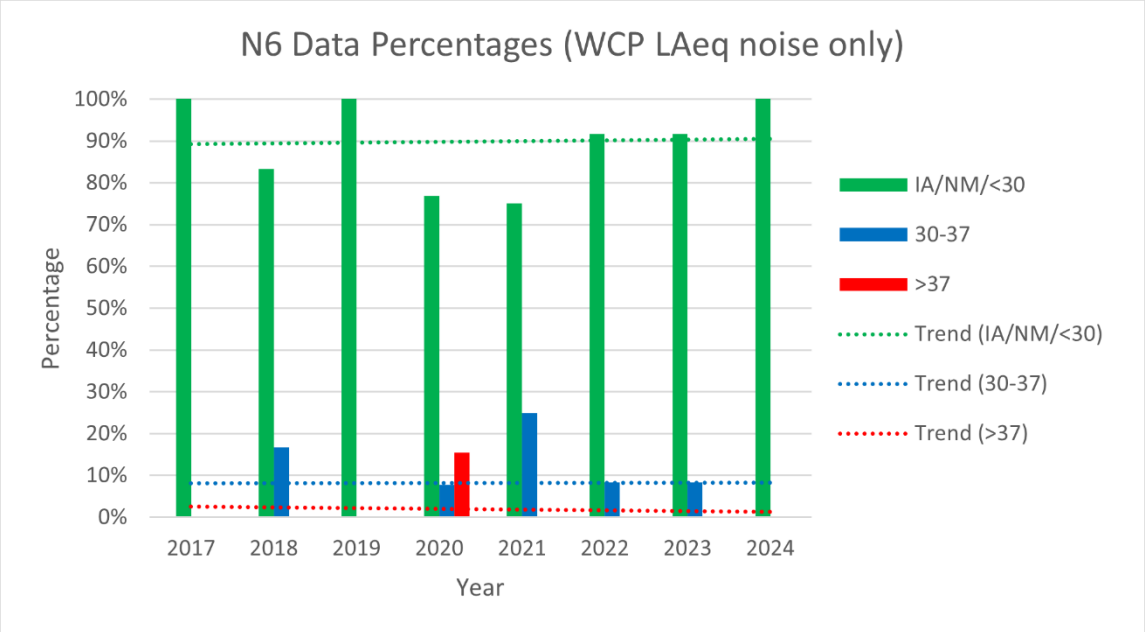

Figure 5.7 Life of project noise trend, N6

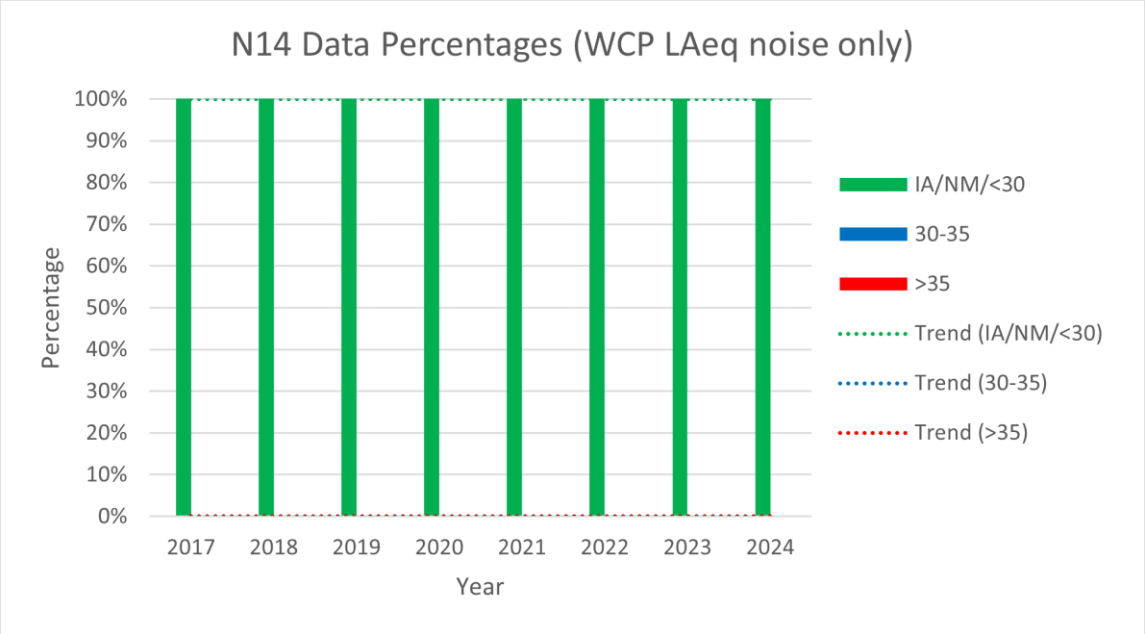

Figure 5.8 **Life of project noise trend, N14**

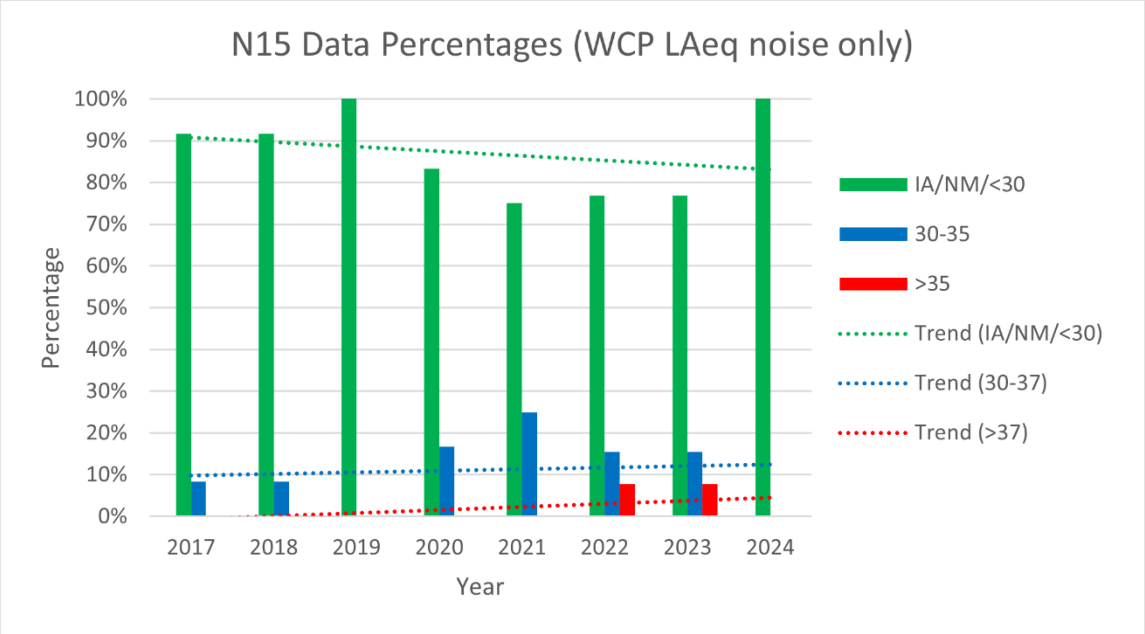

Figure 5.9 **Life of project noise trend, N15**

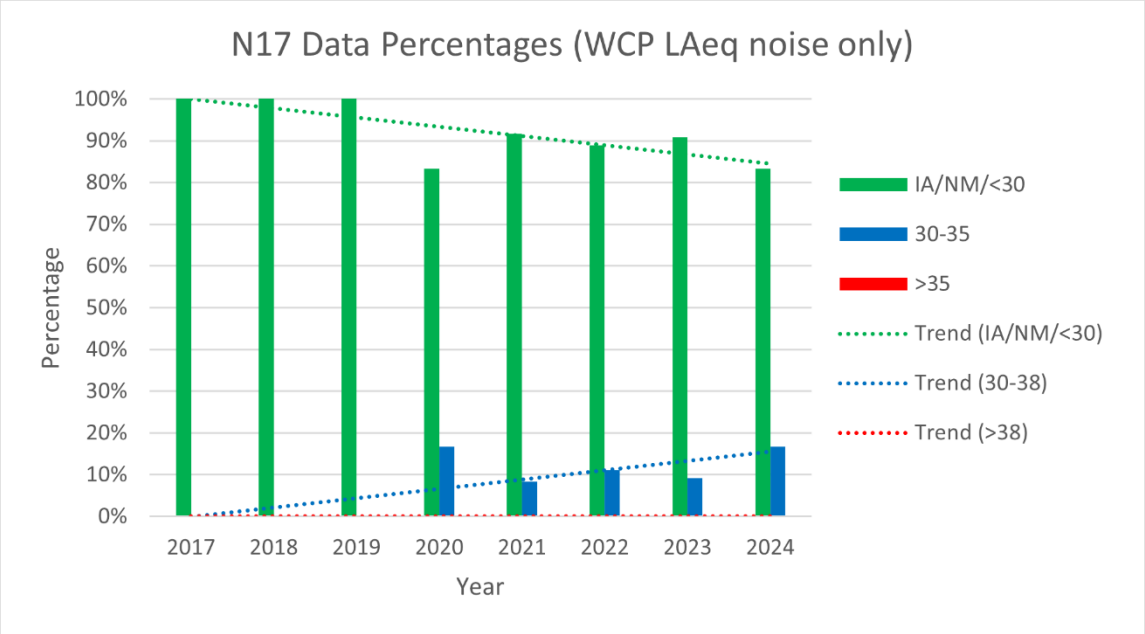

Figure 5.10 **Life of project noise trends, N17**

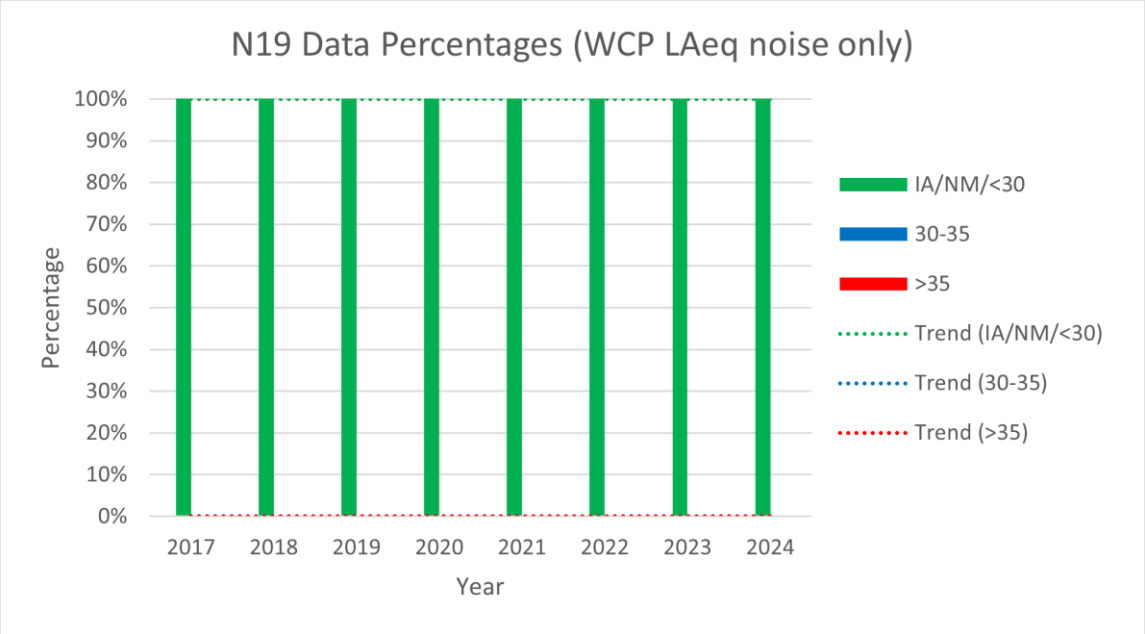

Figure 5.11 **Life of project noise trends, N19**

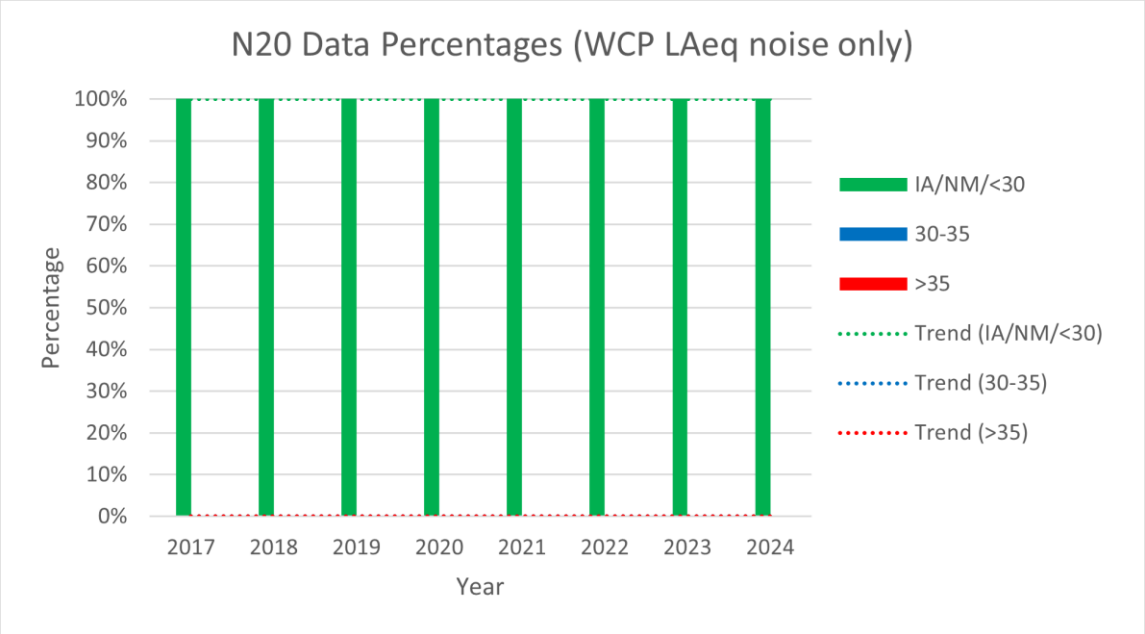

Figure 5.12 Life of project noise trends, N20

5.2.2 Discussion

Over the life of the project, site-only L_{Aeq} noise levels were low (either IA, NM, or less than 30 dB) for a large majority of measurements at all monitoring locations.

Additional discussion of individual monitoring locations is provided below:

- At N6, site-only L_{Aeq} noise levels increased to 2021 and decreased from 2022 to 2024.
- At N14, N19, and N20, site-only L_{Aeq} noise levels remained very low throughout the life of the project.
- At N15, site-only L_{Aeq} noise levels increased to 2023 and decreased in 2024.
- At N17, site-only L_{Aeq} noise levels increased during the life of the project.

6 Comparison with modelled predictions

A noise and blasting assessment was prepared in November 2015 as part of the EIS to support the development consent application. As part of the modelling assessment, noise levels from WCP were predicted for representative operating scenarios, time periods, and weather conditions.

Predicted noise levels for "Year 2024" most closely aligned with the 2024 reporting year and have been compared with measured levels from attended compliance monitoring under corresponding meteorological conditions. Table 6.1 summarises predicted noise levels for specific monitoring locations detailed in Table 26 and 27 of the noise and blasting assessment, under certain meteorological condition defined in Section 3.5 of this report.

Table 6.1 WCP operational predictions, Year 2024 - dB

NMP descriptor	Monitoring locations	Nearest property ID	Night $L_{Aeq,15minute}$ Calm	Night $L_{Aeq,15minute}$ Wind or Inversion	Night $L_{A1,1minute}$ Wind or Inversion
N6	St Laurence O'Toole Catholic Church	(903) [1]	18	33	40
N14	Tichular	(153) [1]	10	30	36
N15	Wollar Village	(933) [1]	17	35	41
N17	Mogo Road	102	21	34	41
N19	North Mogo Road	104	18	30	36
N20	Ringwood Road	160	8	26	32

Notes: 1. Monitoring location is not at residence in brackets. Noise predictions for the nearest residence have been used for comparison.

Table 6.2 to Table 6.7 of this report compare the measured operational levels to predicted noise levels in the EIS for Year 2024. A positive difference indicates the measured level is greater than the predicted level and a negative difference indicates the measured levels are less than predicted in the EIS.

When meteorological conditions during the attended monitoring measurement do not correspond with those that are modelled, the meteorological conditions are considered "not applicable" (NA) and no further analysis is undertaken. When meteorological conditions during the measurement correspond with modelled conditions, but measured WCP noise levels were not directly quantifiable, measured and modelled noise levels are "not comparable" (NC) and no further analysis is required.

6.1 Results

6.1.1 N6, St Laurance O'Toole Catholic Church

Table 6.2 Measured WCP $L_{Aeq,15minute}$ compared to predicted $L_{Aeq,15minute}$ at N6, dB(A)

Month	Applicable Meteorological Condition [1,2]	Measured WCP $L_{Aeq,15minute}$	Predicted WCP $L_{Aeq,15minute}$	Difference [2,3]	Measured WCP $L_{A1,1minute}$	Predicted WCP $L_{A1,1minute}$	Difference [2,3]
January	N/A	<20	-	NC	<20	-	NC
February	Wind	IA	33	NC	IA	40	NC
March	Wind	IA	33	NC	IA	40	NC
April	Inversion	IA	33	NC	IA	40	NC
May	Wind	IA	33	NC	IA	40	NC
June	N/A	27	-	N/A	35	-	N/A
July	Inversion	26	33	-7	41	40	+1
August	Wind	IA	33	NC	IA	40	NC
September	Inversion	<20	33	NC	<20	40	NC
October	Inversion	IA	33	NC	IA	40	NC
November	Wind	<25	33	NC	<25	40	NC
December	N/A	IA	-	N/A	IA	-	N/A

Notes: 1. Refer to Table 3.2 for applicable meteorological conditions.

2. N/A indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions and were not applicable for comparison.

3. NC indicated measured WCP noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" (e.g. Less than 30 dB), therefore measured and predicted noise levels were not comparable.

6.1.2 N14, Tichular

Table 6.3 Measured WCP $L_{Aeq,15minute}$ compared to predicted $L_{Aeq,15minute}$ at N14, dB(A)

Month	Applicable Meteorological Condition [1,2]	Measured WCP $L_{Aeq,15minute}$	Predicted WCP $L_{Aeq,15minute}$	Difference [2,3]	Measured WCP $L_{A1,1minute}$	Predicted WCP $L_{A1,1minute}$	Difference [2,3]
January	Inversion	IA	30	NC	IA	36	NC
February	N/A	IA	-	N/A	IA	-	N/A
March	Wind	IA	30	NC	IA	36	NC
April	Inversion	IA	30	NC	IA	36	NC
May	Wind	IA	30	NC	IA	36	NC
June	N/A	<20	-	N/A	<20	-	N/A
July	Inversion	<25	30	NC	<25	36	NC
August	Inversion	<30	30	NC	<30	36	NC
September	Inversion	<20	30	NC	<20	36	NC
October	Inversion	IA	30	NC	IA	36	NC
November	N/A	24	-	N/A	28	-	N/A
December	Inversion	IA	30	NC	IA	36	NC

Notes: 1. Refer to Table 3.2 for applicable meteorological conditions.

2. N/A indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions and were not applicable for comparison.

3. NC indicated measured WCP noise levels were inaudible (IA), not measurable (NM), or expressed as a “less than” (e.g. Less than 30 dB), therefore measured and predicted noise levels were not comparable.

6.1.3 N15, Wollar Village

Table 6.4 Measured WCP $L_{Aeq,15minute}$ compared to predicted $L_{Aeq,15minute}$ at N15, dB(A)

Month	Applicable Meteorological Condition [1,2]	Measured WCP $L_{Aeq,15minute}$	Predicted WCP $L_{Aeq,15minute}$	Difference [2,3]	Measured WCP $L_{A1,1minute}$	Predicted WCP $L_{A1,1minute}$	Difference [2,3]
January	N/A	28	-	N/A	33	-	N/A
February	N/A	IA	-	N/A	IA	-	N/A
March	Summer Wind	IA	35	NC	IA	41	NC
April	Strong Inversion	IA	35	NC	IA	41	NC
May	N/A	IA	-	N/A	IA	-	N/A
June	N/A	28	-	N/A	37	-	N/A
July	Strong Inversion	29	35	-6	40	41	-1
August	Calm	IA	17	NC	IA	-	N/A
September	Strong Inversion	<25	35	NC	<25	41	NC
October	Strong Inversion	<20	35	NC	<20	41	NC
November	N/A	<20	-	N/A	<20	-	N/A
December	N/A	IA	-	N/A	IA	-	N/A

Notes: 1. Refer to Table 3.2 for applicable meteorological conditions.

2. N/A indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions and were not applicable for comparison.

3. NC indicated measured WCP noise levels were inaudible (IA), not measurable (NM), or expressed as a "less than" (e.g. Less than 30 dB), therefore measured and predicted noise levels were not comparable.

6.1.4 N17, Mogo Road

Table 6.5 Measured WCP $L_{Aeq,15minute}$ compared to predicted $L_{Aeq,15minute}$ at N17, dB(A)

Month	Applicable Meteorological Condition [1,2]	Measured WCP $L_{Aeq,15minute}$	Predicted WCP $L_{Aeq,15minute}$	Difference [2,3]	Measured WCP $L_{A1,1minute}$	Predicted WCP $L_{A1,1minute}$	Difference [2,3]
January	Strong Inversion	<20	34	NC	<20	41	NC
February	N/A	IA	-	N/A	IA	-	N/A
March	Summer Wind	IA	34	NC	IA	41	NC
April	Strong Inversion	IA	34	NC	IA	41	NC
May	Summer Wind	IA	34	NC	IA	41	NC
June	N/A	32	-	N/A	44	-	N/A
July	Strong Inversion	26	34	-8	34	41	-7
August	N/A	<20	-	N/A	<20	-	N/A
September	Strong Inversion	32	34	-2	38	41	-3
October	Strong Inversion	<20	34	NC	<20	41	NC
November	N/A	26	-	N/A	32	-	N/A
December	Strong Inversion	<25	34	NC	30	41	-11

Notes: 1. Refer to Table 3.2 for applicable meteorological conditions.

2. N/A indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions and were not applicable for comparison.

3. NC indicated measured WCP noise levels were inaudible (IA), not measurable (NM), or expressed as a “less than” (e.g. Less than 30 dB), therefore measured and predicted noise levels were not comparable.

6.1.5 N19, North Mogo Road

Table 6.6 Measured WCP $L_{Aeq,15minute}$ compared to predicted $L_{Aeq,15minute}$ at N19, dB(A)

Month	Applicable Meteorological Condition [1,2]	Measured WCP $L_{Aeq,15minute}$	Predicted WCP $L_{Aeq,15minute}$	Difference [2,3]	Measured WCP $L_{A1,1minute}$	Predicted WCP $L_{A1,1minute}$	Difference [2,3]
January	Strong Inversion	IA	30	NC	IA	36	NC
February	N/A	IA	-	N/A	IA	-	N/A
March	Summer Wind	IA	30	NC	IA	36	NC
April	Strong Inversion	IA	30	NC	IA	36	NC
May	Summer Wind	IA	30	NC	IA	36	NC
June	N/A	<20	-	N/A	<20	-	N/A
July	Strong Inversion	IA	30	NC	IA	36	NC
August	N/A	IA	-	N/A	IA	-	N/A
September	N/A	<25	-	N/A	<25	-	N/A
October	Strong Inversion	IA	30	NC	IA	36	NC
November	N/A	25	-	N/A	30	-	N/A
December	Strong Inversion	<25	30	NC	27	36	-9

Notes: 1. Refer to Table 3.2 for applicable meteorological conditions.

2. N/A indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions and were not applicable for comparison.

3. NC indicated measured WCP noise levels were inaudible (IA), not measurable (NM), or expressed as a “less than” (e.g. Less than 30 dB), therefore measured and predicted noise levels were not comparable.

6.1.6 N20, Ringwood Road

Table 6.7 Measured WCP $L_{Aeq,15minute}$ compared to predicted $L_{Aeq,15minute}$ at N20, dB(A)

Month	Applicable Meteorological Condition [1,2]	Measured WCP $L_{Aeq,15minute}$	Predicted WCP $L_{Aeq,15minute}$	Difference [2,3]	Measured WCP $L_{A1,1minute}$	Predicted WCP $L_{A1,1minute}$	Difference [2,3]
January	N/A	IA	-	N/A	IA	-	N/A
February	N/A	IA	-	N/A	IA	-	N/A
March	N/A	IA	-	N/A	IA	-	N/A
April	Strong Inversion	IA	26	NC	IA	32	NC
May	Summer Wind	IA	26	NC	IA	32	NC
June	Strong Inversion	<25	26	NC	35	32	+3
July	Strong Inversion	IA	26	NC	IA	32	NC
August	N/A	IA	-	N/A	IA	-	N/A
September	Strong Inversion	<20	26	NC	<20	32	NC
October	Strong Inversion	IA	26	NC	IA	32	NC
November	Summer Wind	<20	26	NC	<20	32	NC
December	Summer Wind	IA	26	NC	IA	32	NC

Notes: 1. Refer to Table 3.2 for applicable meteorological conditions.

2. N/A indicates meteorological conditions during the measurement did not correspond with any modelled meteorological conditions and were not applicable for comparison.

3. NC indicated measured WCP noise levels were inaudible (IA), not measurable (NM), or expressed as a “less than” (e.g. Less than 30 dB), therefore measured and predicted noise levels were not comparable.

6.2 Discussion

When comparable, measured noise levels were lower than predicted noise levels under corresponding meteorological conditions at all locations during all measurements with two exceptions:

- During the July measurement at N6, the measured site-only $L_{A1,1minute}$ was 1 dB higher than predicted under strong inversion conditions.
- During the June measurement at N20, the measured site-only $L_{A1,1minute}$ was 3 dB higher than predicted under strong inversion conditions.

While measured $L_{A1,1minute}$ noise levels were slightly higher than predicted in these two instances, they remained below the $L_{A1,1minute}$ limit of 45 dB.

7 Summary

EMM was engaged by WCP to provide an ANR for the 2024 calendar year. The purpose of the ANR is to satisfy annual review reporting requirements detailed in the WCP development consent. This includes comparison of attended noise monitoring results against relevant criteria and predictions in the most recently approved noise model for WCP

This report summarises monthly attended noise monitoring surveys conducted around WCP during the reporting period 1 January to 31 December 2024. The purpose of the surveys was to quantify and describe the acoustic environment around the site and compare results with specified limits.

7.1 January to December 2024 compliance

During 2024 attended noise monitoring, noise levels from WCP complied with relevant noise limits at all monitoring locations.

7.2 Long term noise trends

For the 5-year period ending December 2024, site-only L_{Aeq} noise levels were low (either IA, NM, or less than 30 dB) for a large majority of measurements at all monitoring locations. During the 5-year period ending December 2024:

- At N6 and N15, site-only L_{Aeq} noise levels decreased slightly over the 5-year period.
- At N14, N19, and N20, site-only L_{Aeq} noise levels remained very low throughout the 5-year period.
- At N17, site-only L_{Aeq} noise levels remained consistent during the 5-year period.

Over the life of the project, site-only L_{Aeq} noise levels were low (either IA, NM, or less than 30 dB) for a large majority of measurements at all monitoring locations. Over the life of the project:

- At N6, site-only L_{Aeq} noise levels increased to 2021 and decreased from 2022 to 2024.
- At N14, N19, and N20, site-only L_{Aeq} noise levels remained very low throughout the life of the project.
- At N15, site-only L_{Aeq} noise levels increased to 2023 and decreased in 2024.
- At N17, site-only L_{Aeq} noise levels increased during the life of the project.

7.3 Noise model comparison

When comparable, measured noise levels were lower than predicted noise levels under corresponding meteorological conditions at all locations during all measurements with two exceptions:

- During the July measurement at N6, the measured site-only $L_{A1,1minute}$ was 1 dB higher than predicted under strong inversion conditions.
- During the June measurement at N20, the measured site-only $L_{A1,1minute}$ was 3 dB higher than predicted under strong inversion conditions.

While measured $L_{A1,1minute}$ noise levels were slightly higher than predicted in these two instances, they remained below the $L_{A1,1minute}$ limit of 45 dB.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

January 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP01

January 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	05/02/2024	Will Moore	Robert Kirwan	Final

Approved by

Robert Kirwan
Associate Acoustic Consultant
5 February 2024

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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 24 January 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

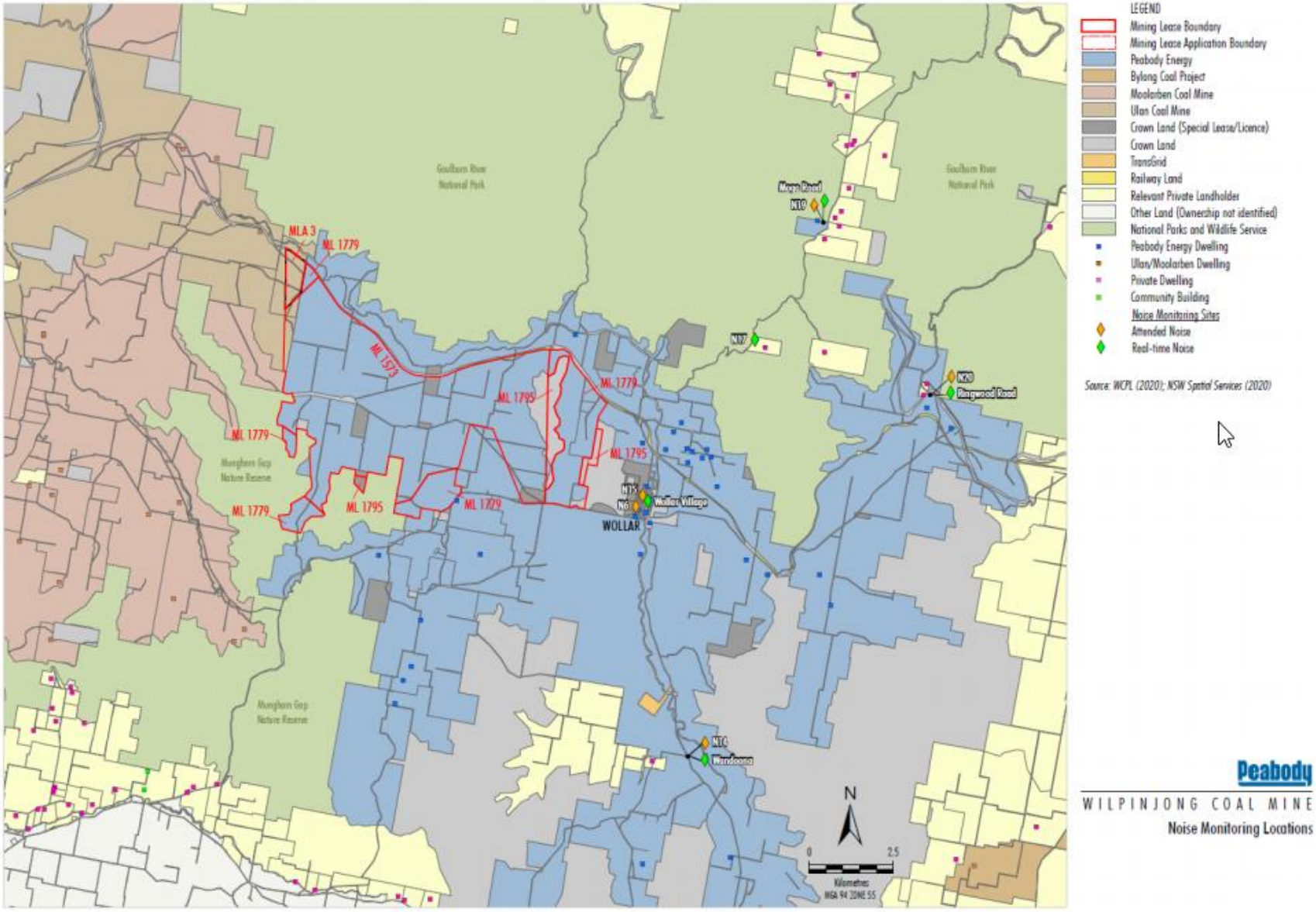

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in June 2021. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	30131882	25/01/2025	IEC 61672-1:2002
SVAN SV-36 acoustic calibrator	140737	06/09/2025	IEC 60942:2003

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – January 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	24/01/2024 22:50	44	42	40	38	38	36	31
N14	24/01/2024 23:45	59	55	53	49	47	43	38
N15	24/01/2024 23:15	48	44	34	33	31	29	27
N17	24/01/2024 22:23	46	42	40	39	39	37	36
N19	24/01/2024 22:00	41	40	39	38	38	37	33
N20	25/01/2024 00:15	47	36	31	30	29	27	25

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - January 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	24/01/2024 22:50	-	-	41	38	37	36	37	32	31	31	27	25
N14	24/01/2024 23:45	-	-	41	40	37	39	44	35	35	37	27	25
N15	24/01/2024 23:15	-	-	-	38	35	38	37	36	38	33	31	34
N17	24/01/2024 22:23	-	-	41	39	36	36	34	32	32	32	29	28
N19	24/01/2024 22:00	-	-	-	35	30	25	22	28	17	14	11	9
N20	25/01/2024 00:15	-	-	-	35	33	31	30	29	30	27	18	13

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – January 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	24/01/2024 22:50	23	<0.5	-	3
N14	24/01/2024 23:45	24	<0.5	-	2
N15	24/01/2024 23:15	25	<0.5	-	3
N17	24/01/2024 22:23	25	<0.5	-	2
N19	24/01/2024 22:00	26	<0.5	-	0
N20	25/01/2024 00:15	23	<0.5	-	2

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – January 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	24/01/2024 22:50	0.9	315	F	Yes	37	45	<20	<20	Nil	Nil
N14	24/01/2024 23:45	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil
N15	24/01/2024 23:15	0.6	357	F	Yes	37	45	28	33	Nil	Nil
N17	24/01/2024 22:23	0.0	-	G	No	38	45	<20	<20	N/A	N/A
N19	24/01/2024 22:00	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil
N20	25/01/2024 00:15	0.7	296	F	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 metres per second (at a height of 10 metres).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

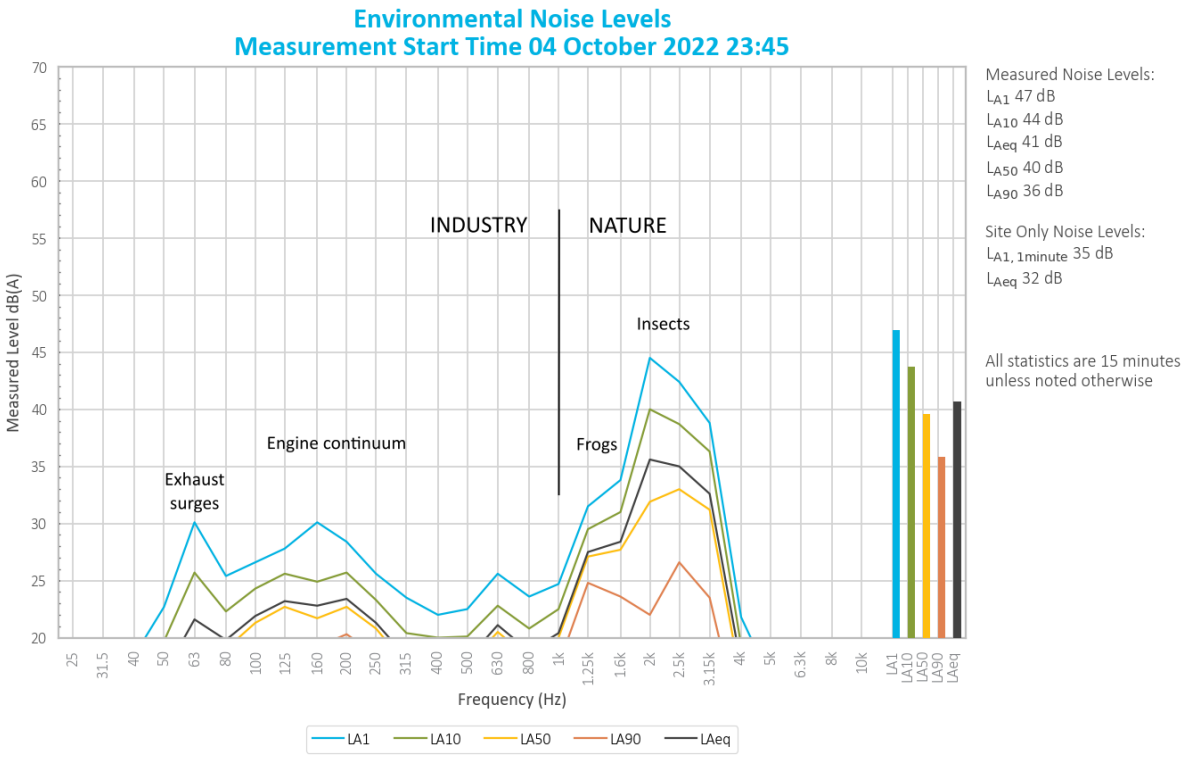

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

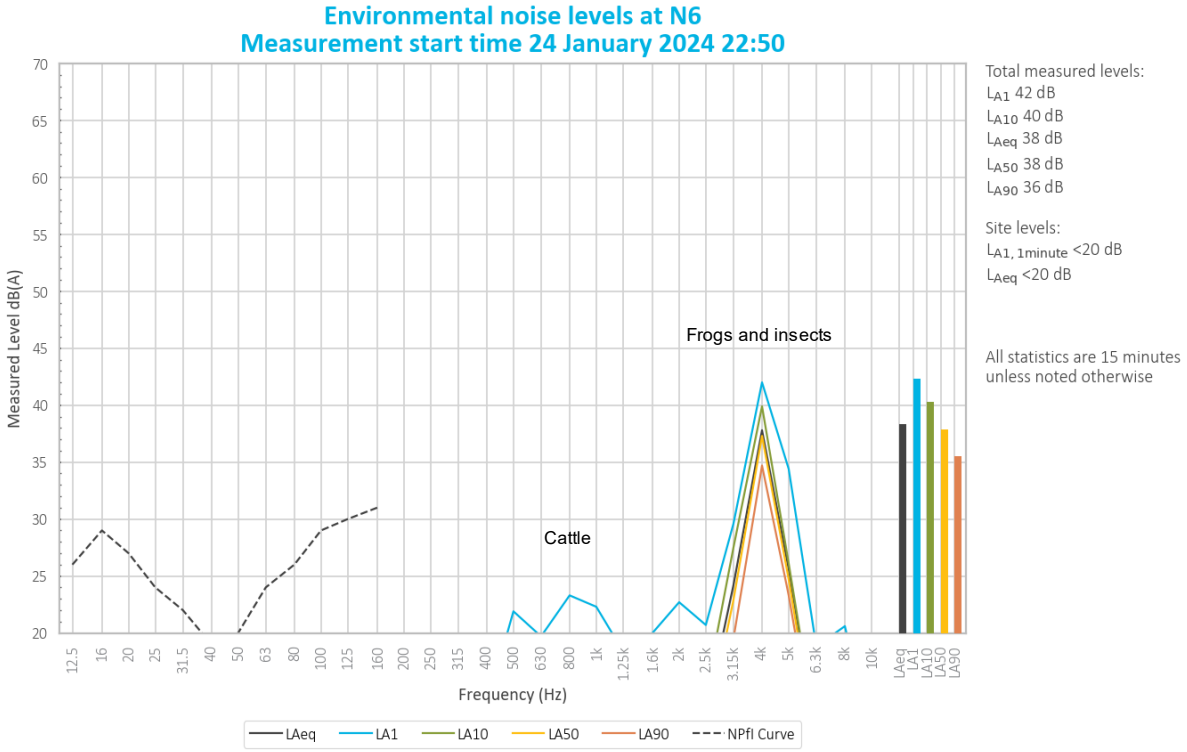

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Frogs and insects generated measured noise levels.

Noise from cattle was noted at low levels.

5.3 N14

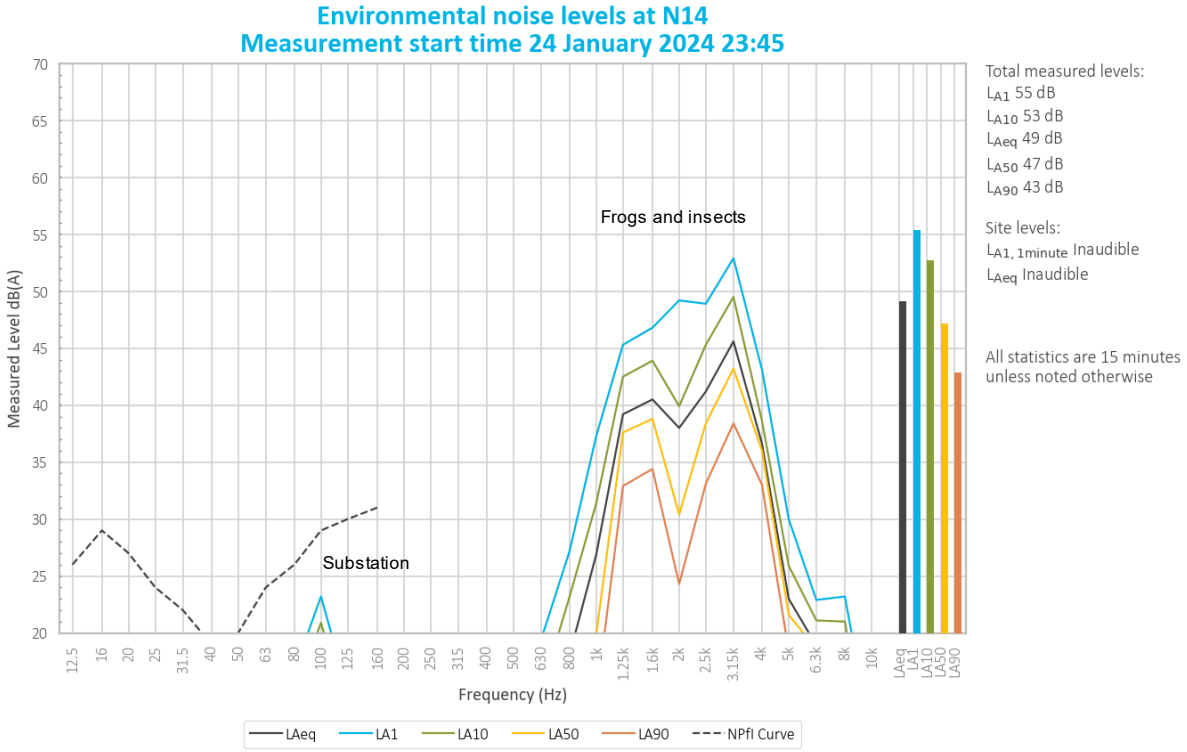

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

WCP was inaudible during the measurement.

Frogs and insects generated measured noise levels.

Local substation continuum and noise from birds and livestock was also noted.

5.4 N15

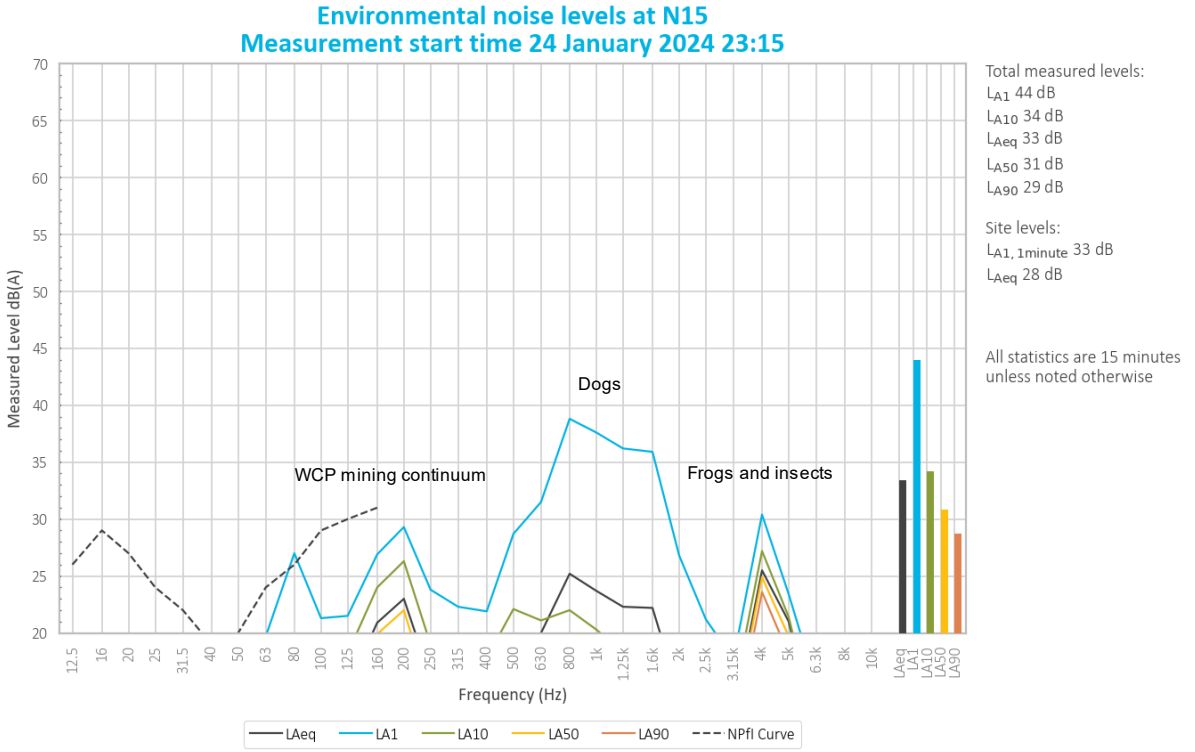

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 26 dB. Engine surges generated a site-only $L_{A1,1minute}$ of 33 dB. Track noise was also noted.

Frogs and insects primarily generated measured noise levels. Dogs generated the measured L_{A1}.

Noise form bats was also noted.

5.5 N17

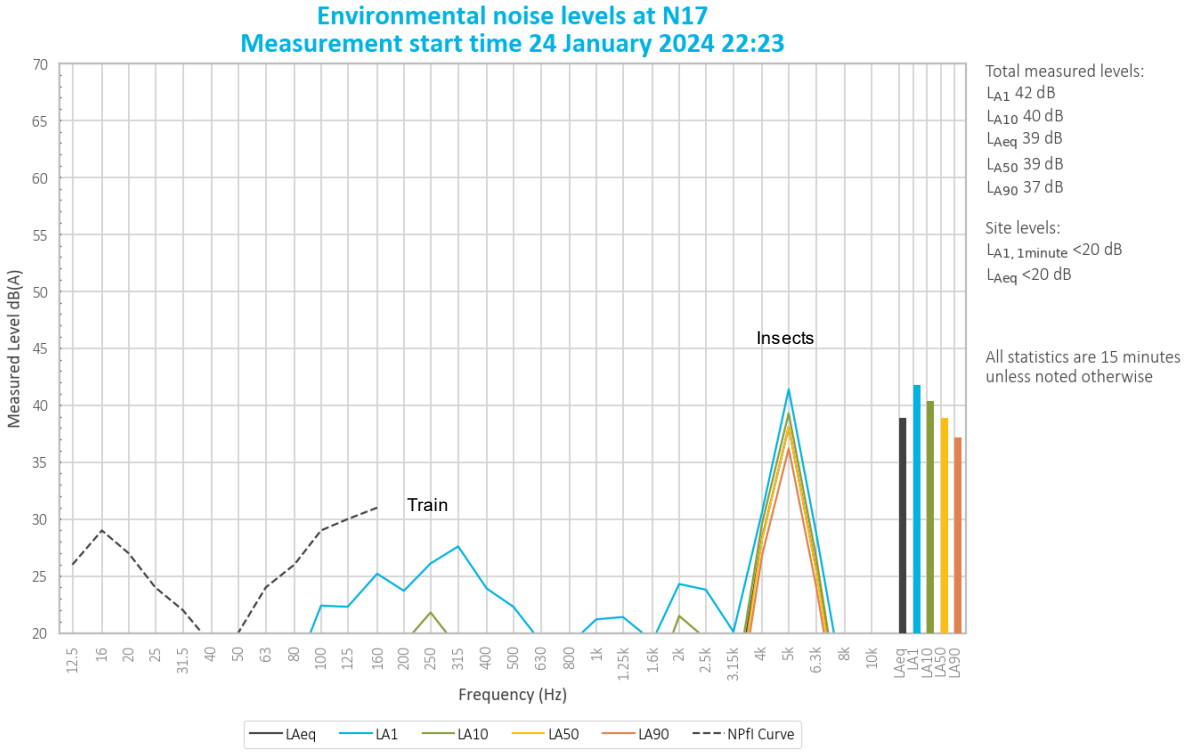

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Insects generated measured noise levels.

Noise from a train was noted at low levels.

5.6 N19

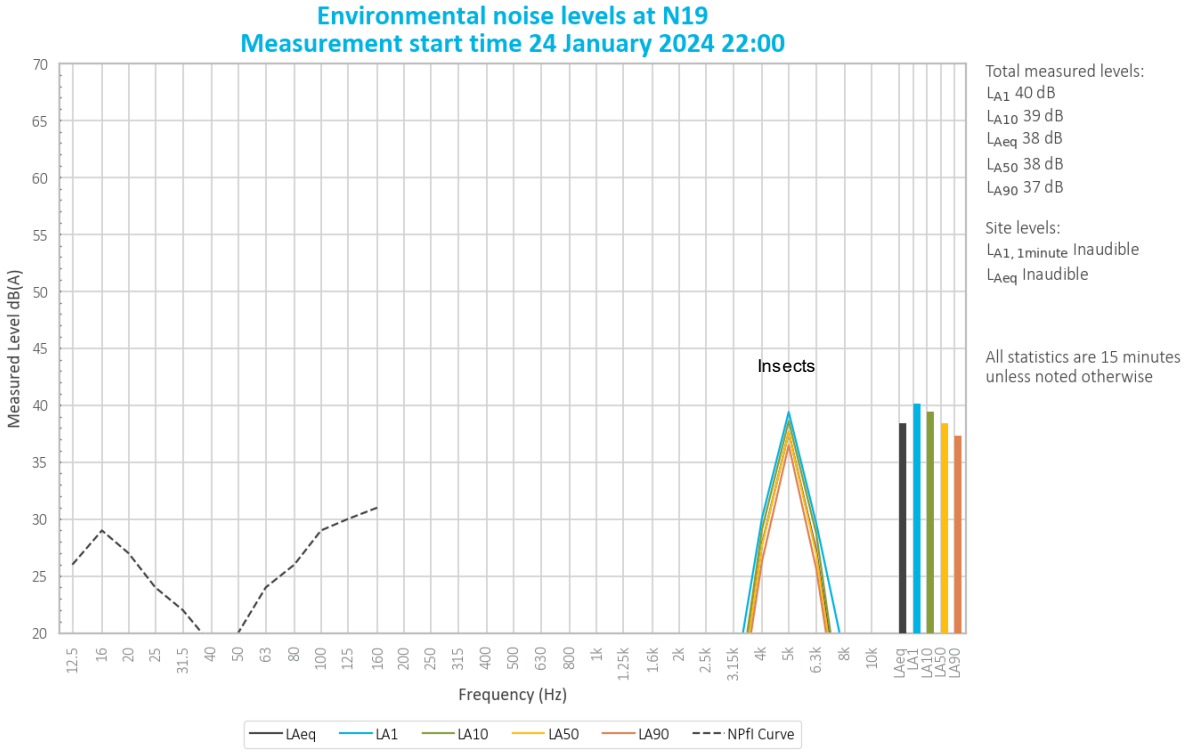

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

Insects generated measured noise levels.

5.7 N20

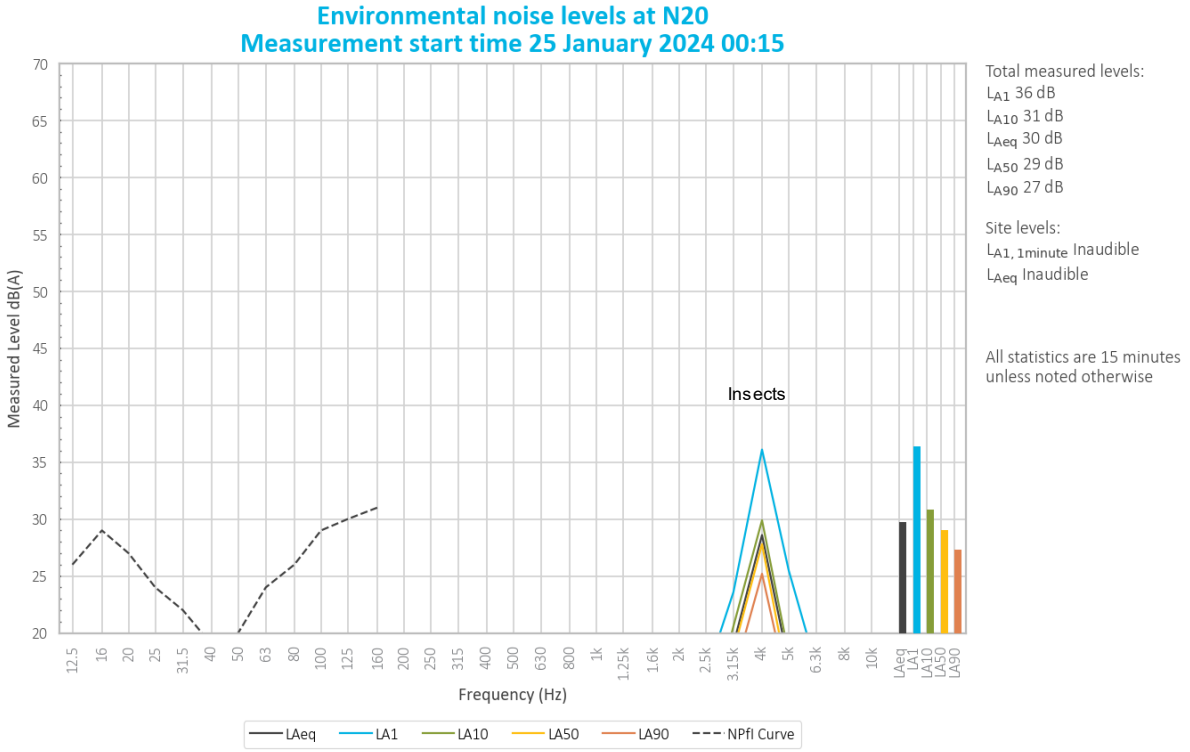

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Insects generated measured noise levels.

Noise from dogs was also noted at low levels.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 24 January 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the January 2024 survey.

Noise limits may not applicable due to meteorological conditions at the time of monitoring.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

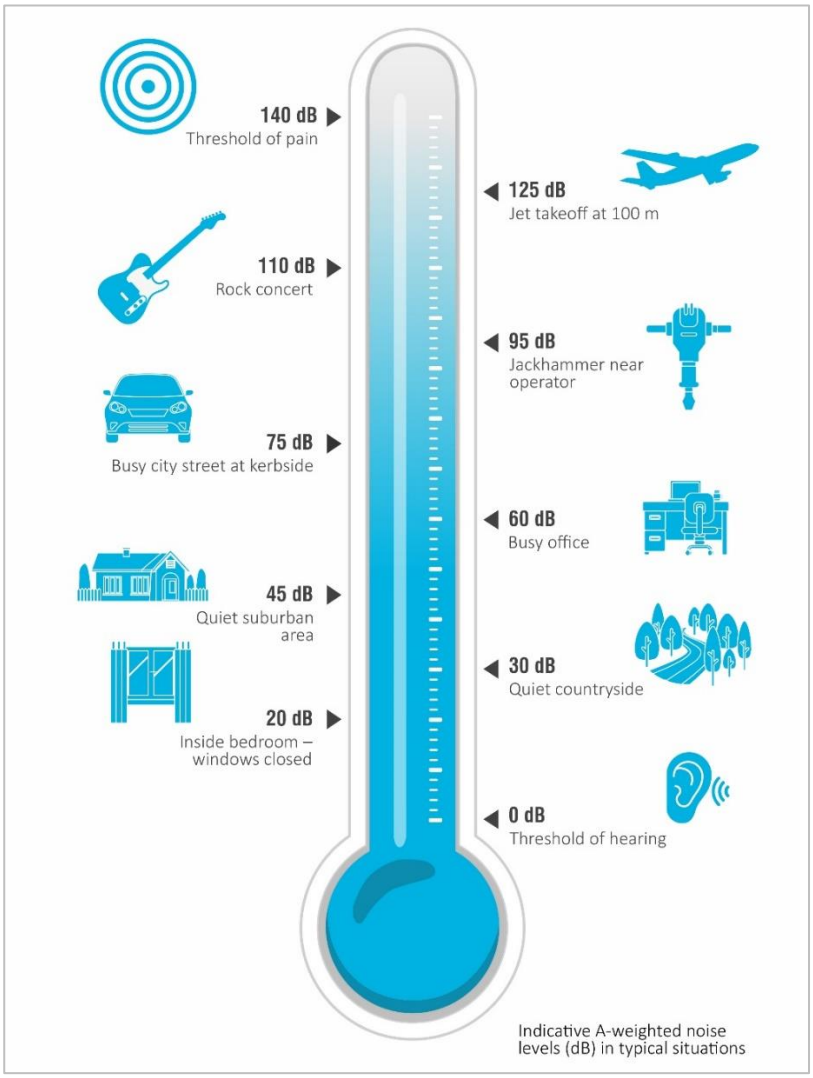

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

B.3 Noise management plan

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPIE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[4]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[4]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPIE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Wandoona may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians.

The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7**, **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5**, WCPL will report both results to DPIE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

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C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23032

Client Details	EMM Consulting Level 3/175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	24°C	**Ambient Temperature :**	23.5°C
Relative Humidity :	47.3%	**Relative Humidity :**	46.1%
Barometric Pressure :	100.14kPa	**Barometric Pressure :**	100.16kPa

Calibration Technician :	Shaheen Boaz	**Secondary Check:**	Dylan Selge
Calibration Date :	23 Jan 2023	**Report Issue Date :**	25 Jan 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C37305

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer:	Svantek
Type No:	SV36 **Serial No:** 140737
Class:	1
Owner:	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Tests Performed:	Measured Output Pressure level, Frequency & Distortion
Comments:	See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1005	hPa ±1 hPa	**Date of Receipt :**	06/09/2023
Temperature	24	°C ±1° C	**Date of Calibration :**	06/09/2023
Relative Humidity	35	% ±5%	**Date of Issue :**	06/09/2023

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: .....

AUTHORISED SIGNATURE: .....

Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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Acoustic and Vibration Measurements

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

February 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP02

February 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	07/02/2024	Will Moore	Robert Kirwan	Final

Approved by

Robert Kirwan
Associate Acoustic Consultant
9 February 2024

Level 3 175 Scott Street
Newcastle NSW 2300

TABLE OF CONTENTS

Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 5 February 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

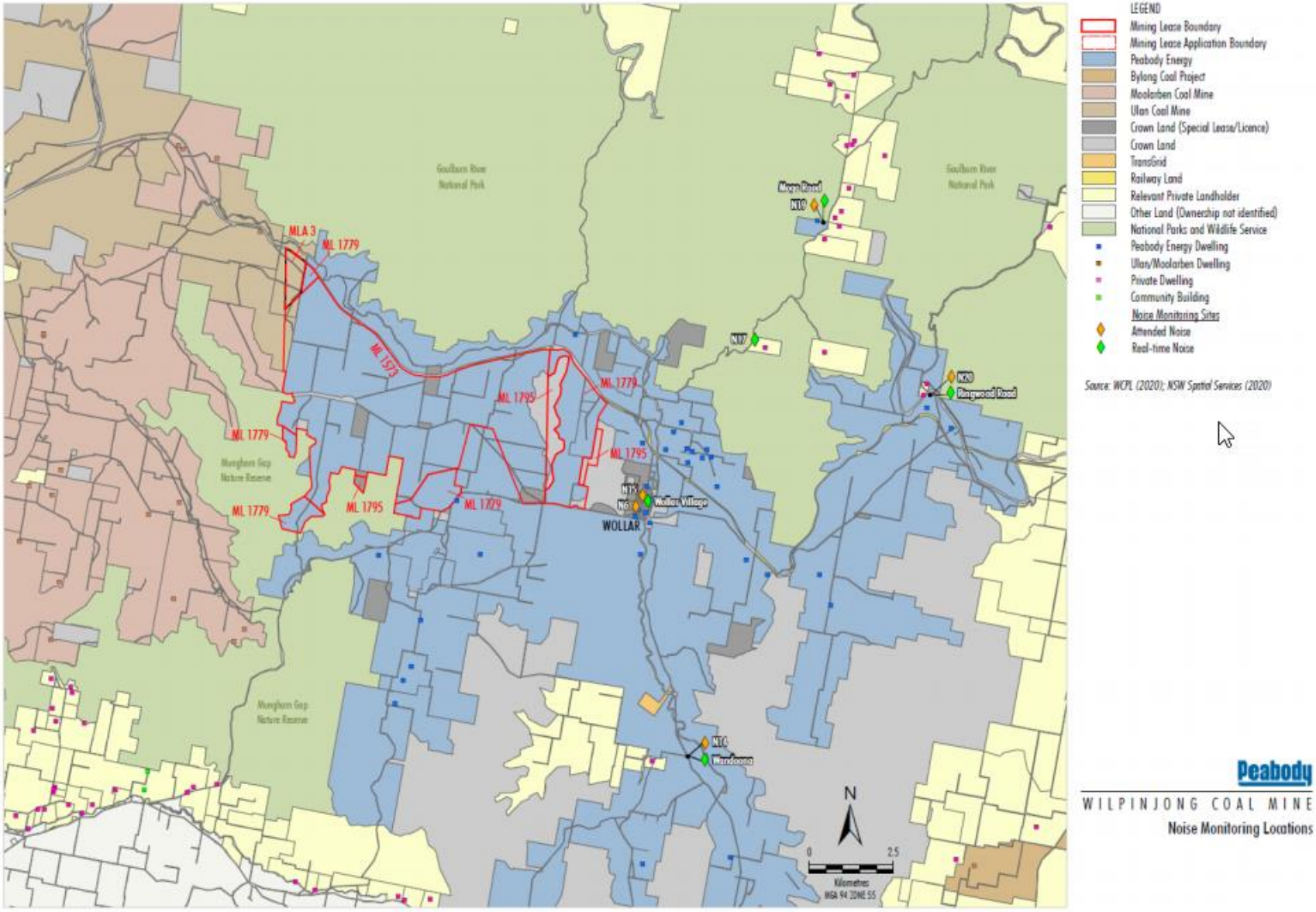

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in June 2021. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	30131882	25/01/2025	IEC 61672-1:2002
SVAN SV-36 acoustic calibrator	140737	06/09/2025	IEC 60942:2003

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – February 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	6/02/2024 00:27	42	40	37	35	34	32	29
N14	5/02/2024 23:30	51	48	43	38	33	30	26
N15	5/02/2024 23:00	47	46	43	38	34	31	28
N17	5/02/2024 22:23	50	44	40	38	37	36	34
N19	5/02/2024 22:00	51	45	42	38	35	29	26
N20	6/02/2024 00:00	44	42	40	37	36	34	30

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - February 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	6/02/2024 00:27	54	50	45	42	37	35	33	31	29	28	27	24
N14	5/02/2024 23:30	59	56	53	50	46	42	39	36	35	32	29	26
N15	5/02/2024 23:00	-	-	-	36	31	29	33	29	29	25	23	20
N17	5/02/2024 22:23	-	47	41	36	32	30	29	28	28	26	24	24
N19	5/02/2024 22:00	-	-	41	36	33	31	30	29	29	26	26	26
N20	6/02/2024 00:00	-	-	41	35	31	27	26	24	22	21	18	15

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – February 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	6/02/2024 00:27	30	<0.5	-	0
N14	5/02/2024 23:30	31	1.2	80	1
N15	5/02/2024 23:00	31	0.7	60	2
N17	5/02/2024 22:23	32	<0.5	-	6
N19	5/02/2024 22:00	32	0.7	60	6
N20	6/02/2024 00:00	32	<0.5	-	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – February 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	6/02/2024 00:27	3.0	51	D	Yes	37	45	IA	IA	Nil	Nil
N14	5/02/2024 23:30	1.6	13	D	Yes	35	45	IA	IA	Nil	Nil
N15	5/02/2024 23:00	3.0	42	D	Yes	37	45	IA	IA	Nil	Nil
N17	5/02/2024 22:23	3.8	43	D	No	38	45	IA	IA	N/A	N/A
N19	5/02/2024 22:00	4.6	61	D	No	35	45	IA	IA	N/A	N/A
N20	6/02/2024 00:00	2.7	33	D	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 metres per second (at a height of 10 metres).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

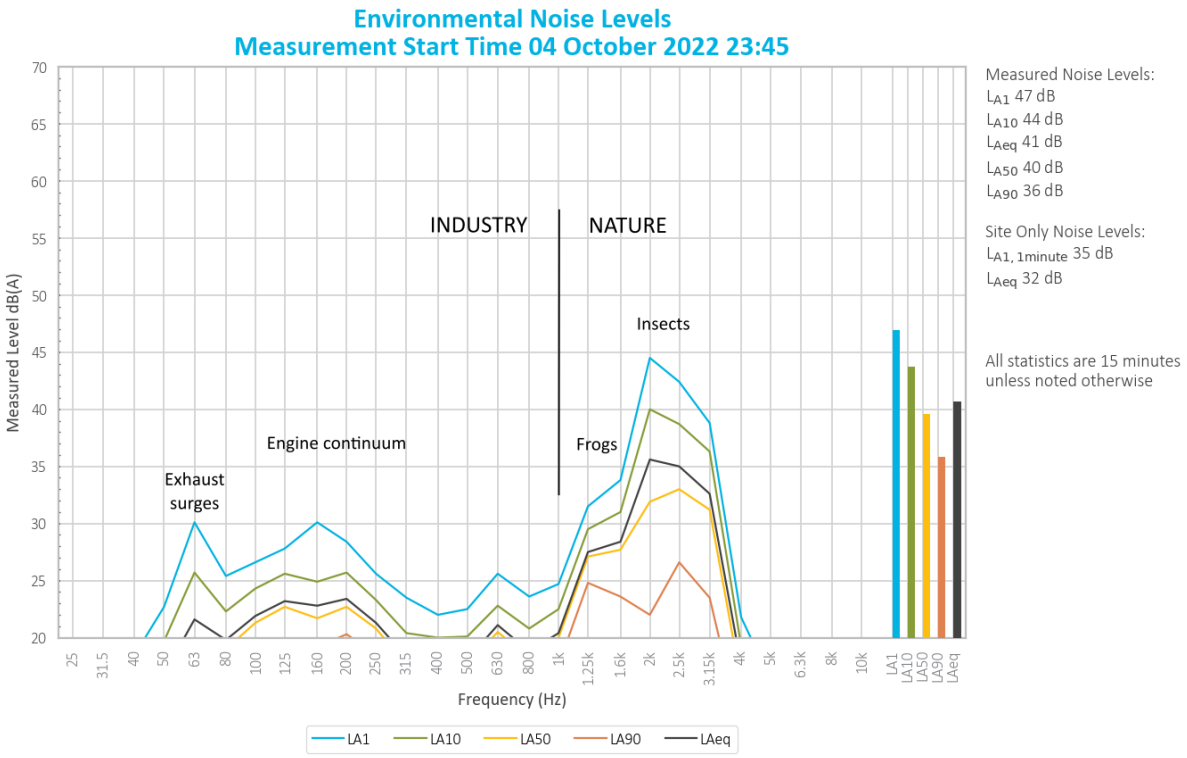

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

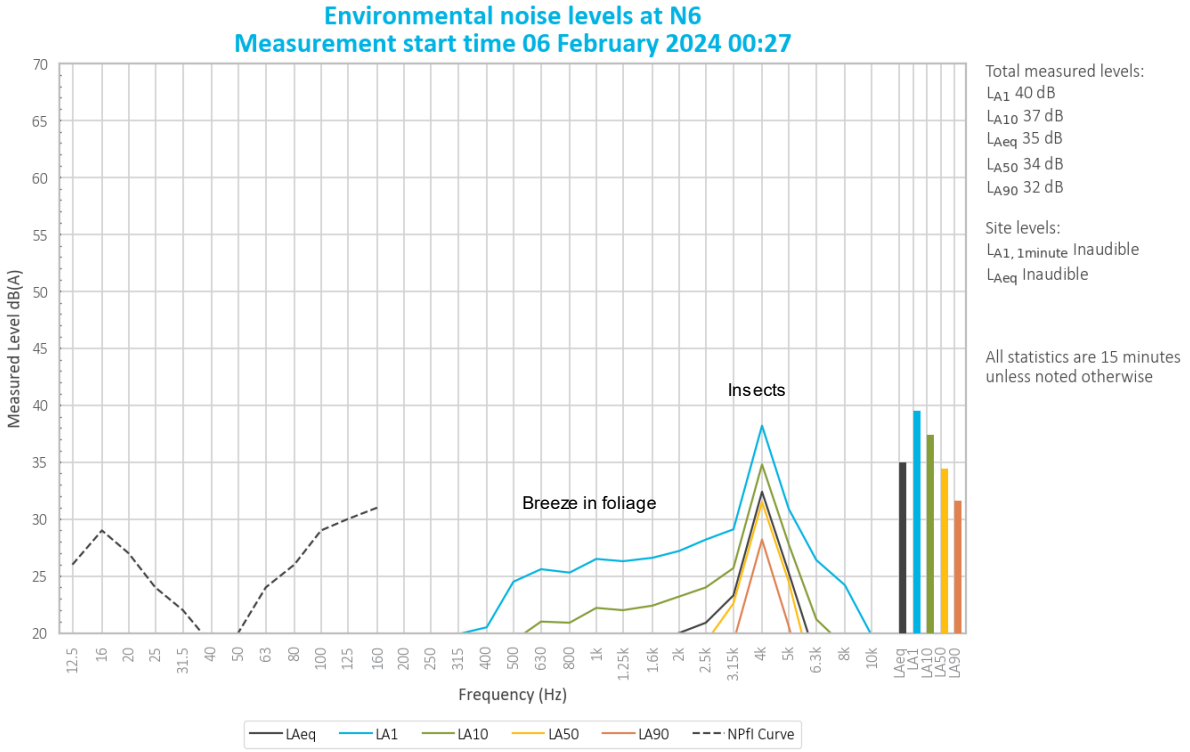

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

WCP was inaudible during the measurement.

Insects generated total measured levels.

Noise from breeze in foliage was also noted.

5.3 N14

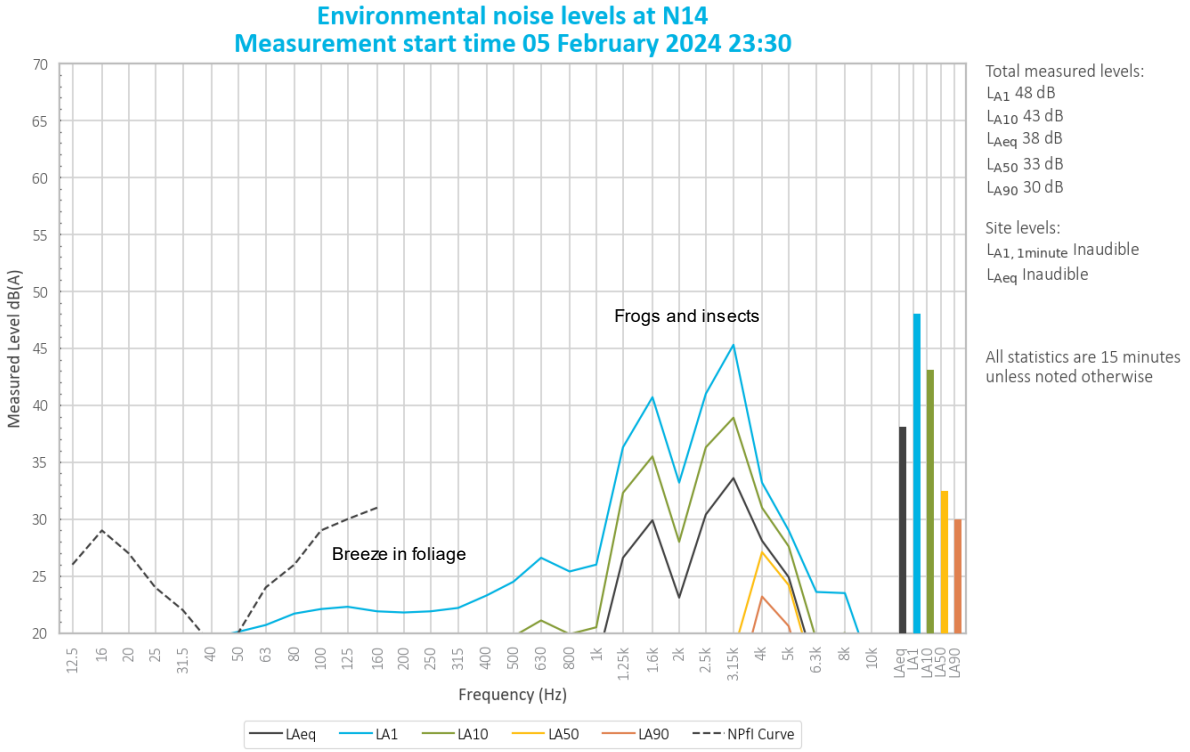

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels.

Local substation continuum and noise from birds, breeze in foliage and livestock was also noted.

5.4 N15

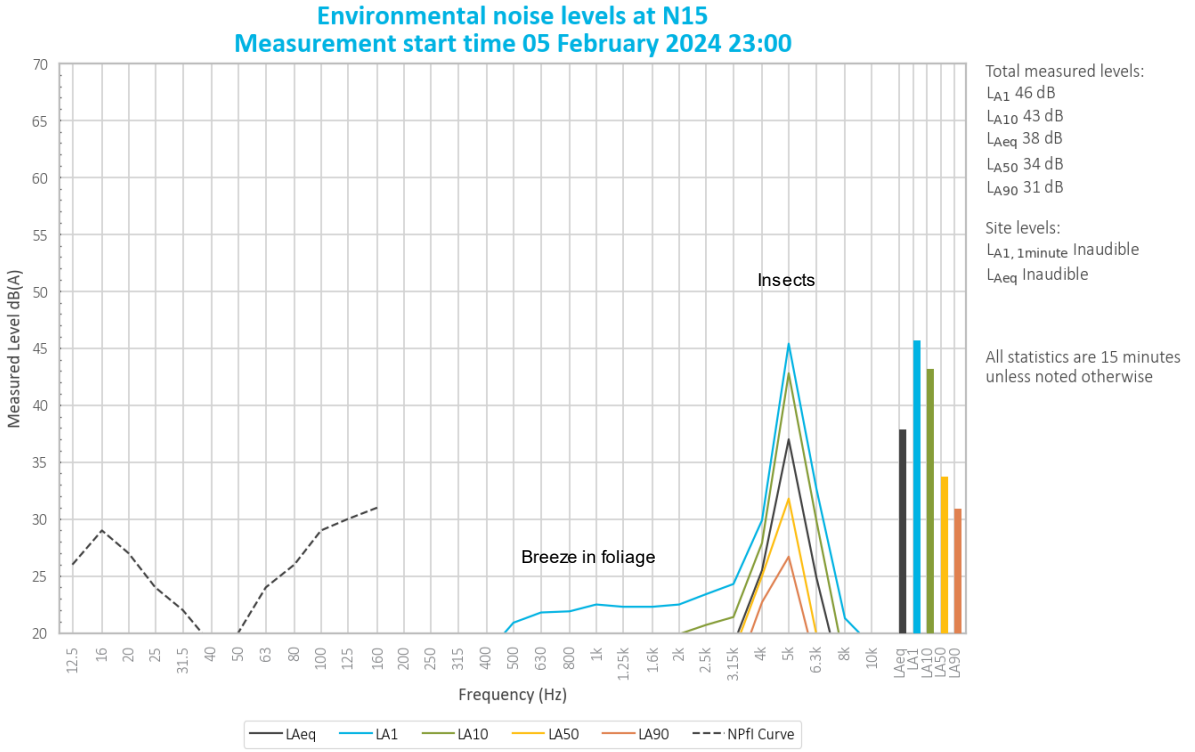

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

WCP was inaudible during the measurement.

Insects generated total measured levels.

Noise from breeze in foliage and a dog was also noted.

5.5 N17

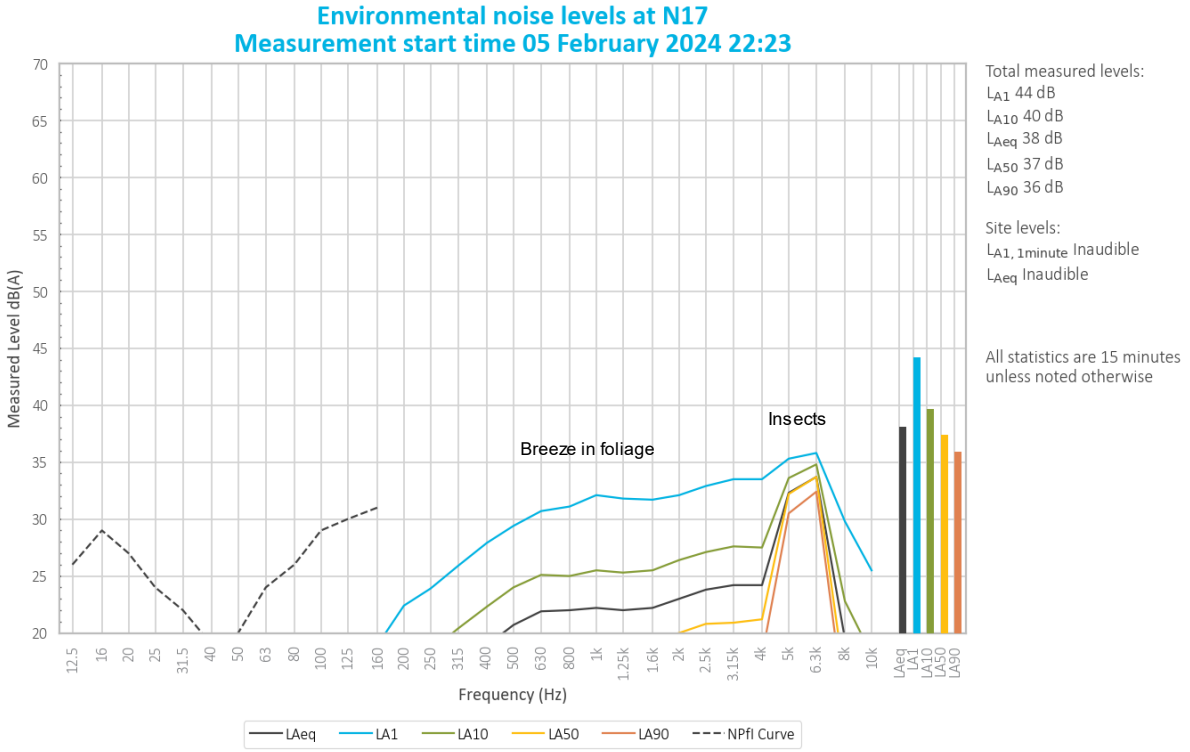

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

WCP was inaudible during the measurement.

Insects primarily generated total measured levels. Breeze in foliage contributed to the measured L_{A1}.

5.6 N19

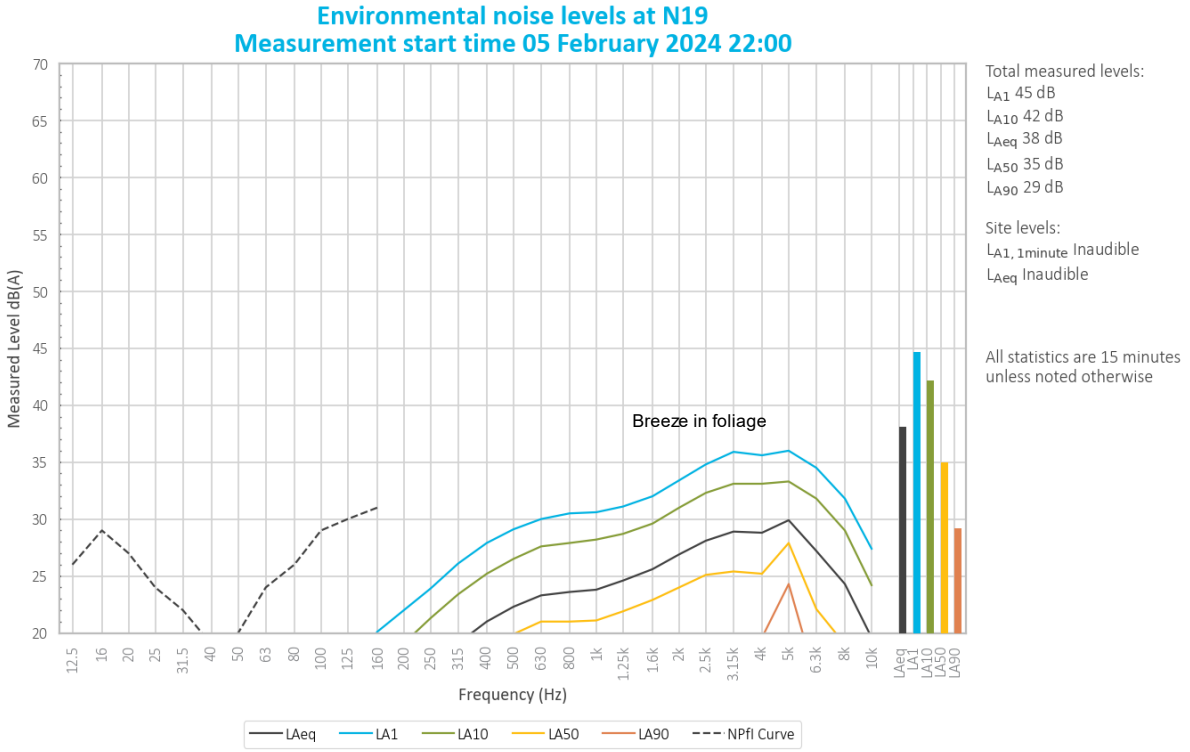

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

Breeze in foliage generated total measured levels.

Noise from insects was also noted.

5.7 N20

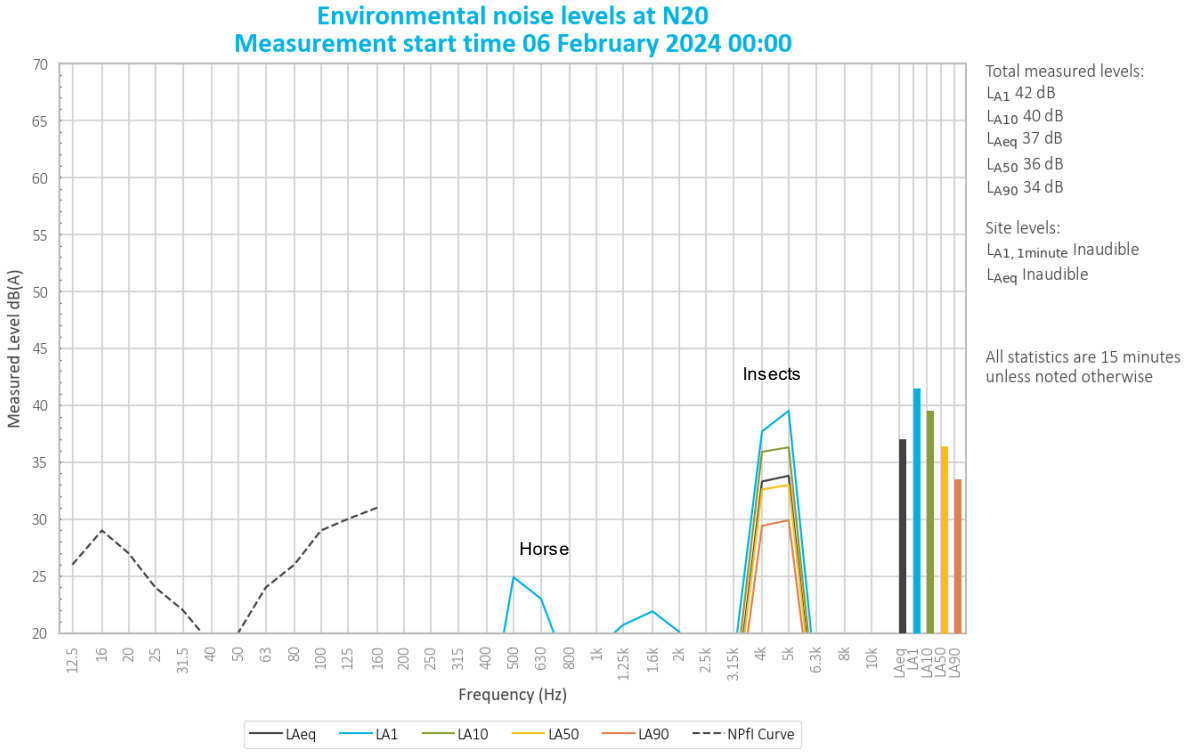

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Insects generated total measured levels.

Noise from a horse was also noted.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 5 February 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the February 2024 survey.

Noise limits may not applicable due to meteorological conditions at the time of monitoring.

Appendix A
Noise perception and examples

EMM
creating opportunities

A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

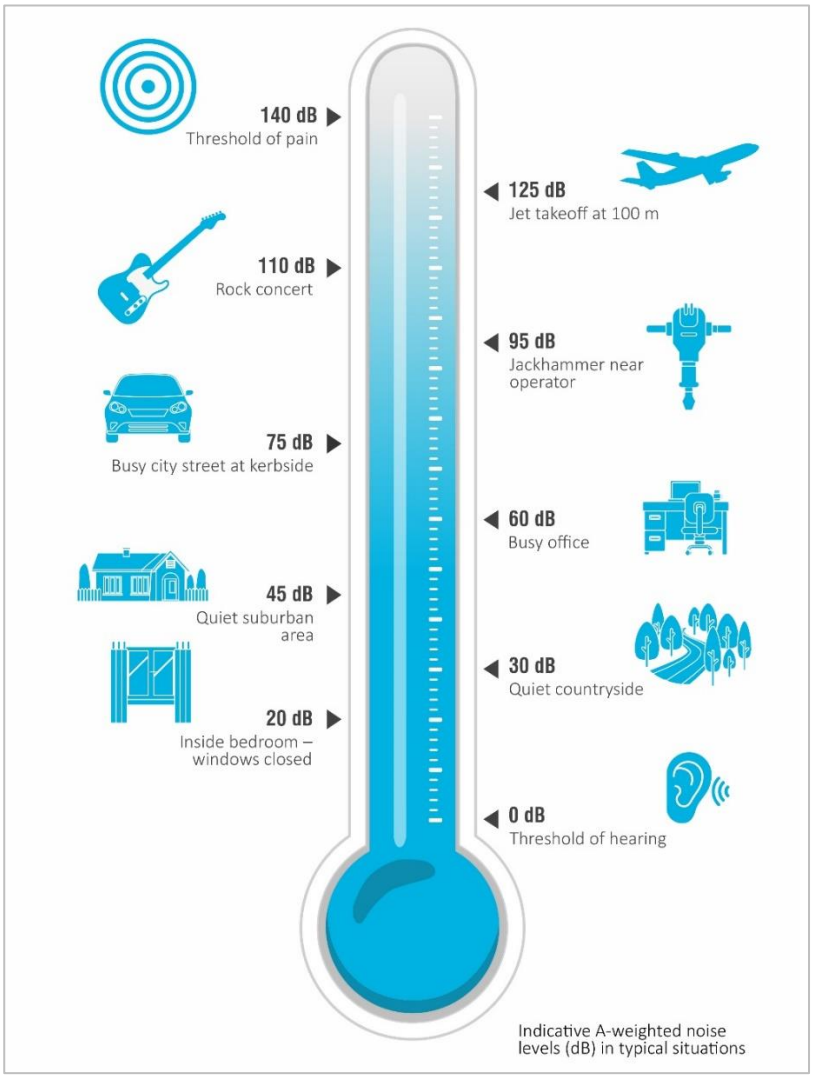

Figure A.1 Common noise levels

Appendix B
Regulator documents

EMM
creating opportunities

B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

B.3 Noise management plan

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPIE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[4]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[4]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPIE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Wandoona may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians.

The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7**, **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5**, WCPL will report both results to DPIE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23032

Client Details	EMM Consulting Level 3/175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	24°C	**Ambient Temperature :**	23.5°C
Relative Humidity :	47.3%	**Relative Humidity :**	46.1%
Barometric Pressure :	100.14kPa	**Barometric Pressure :**	100.16kPa

Calibration Technician :	Shaheen Boaz	**Secondary Check:**	Dylan Selge
Calibration Date :	23 Jan 2023	**Report Issue Date :**	25 Jan 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

NATA WORLD RECOGNISED ACCREDITATION

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C37305

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer:	Svantek
Type No:	SV36 **Serial No:** 140737
Class:	1
Owner:	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Tests Performed:	Measured Output Pressure level, Frequency & Distortion
Comments:	See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1005	hPa ±1 hPa	**Date of Receipt :**	06/09/2023
Temperature	24	°C ±1° C	**Date of Calibration :**	06/09/2023
Relative Humidity	35	% ±5%	**Date of Issue :**	06/09/2023

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: .....

AUTHORISED SIGNATURE: .....
Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

NATA
WORLD RECOGNISED ACCREDITATION
Accredited Lab No. 9262
Acoustic and Vibration Measurements

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

March 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP03

March 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	04/04/2024	Will Moore	Robert Kirwan	Final

Approved by

Robert Kirwan
Associate Acoustic Consultant
5 April 2024

Level 3 175 Scott Street
Newcastle NSW 2300

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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 19 March 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

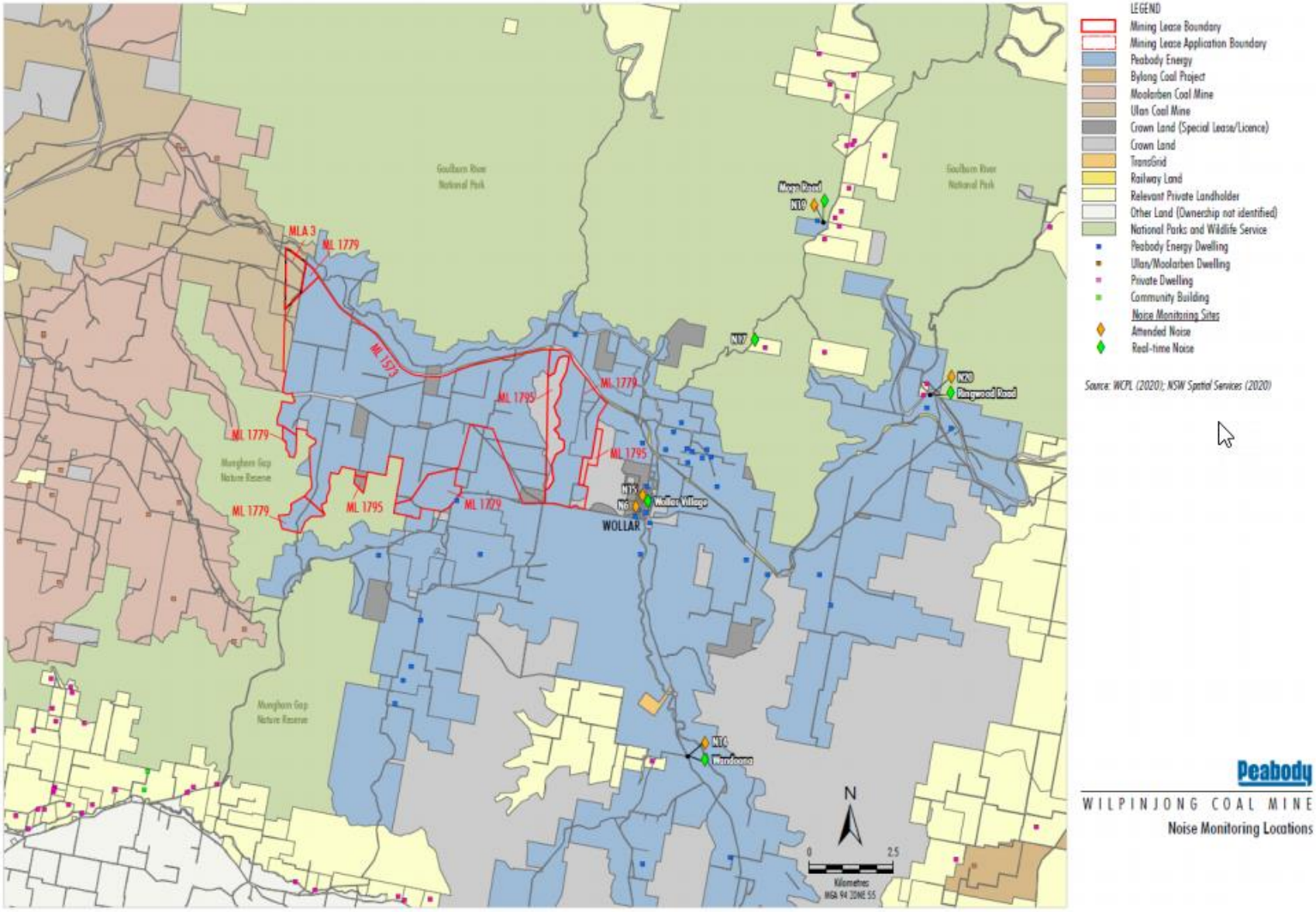

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in June 2021. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	30131882	25/01/2025	IEC 61672-1:2002
SVAN SV-36 acoustic calibrator	140737	06/09/2025	IEC 60942:2003

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – March 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	19/03/2024 22:48	48	47	44	42	41	40	39
N14	19/03/2024 23:45	43	41	40	39	39	38	37
N15	19/03/2024 23:15	53	50	44	43	42	40	38
N17	19/03/2024 22:22	39	31	28	26	25	24	23
N19	19/03/2024 22:00	49	36	28	27	25	24	23
N20	20/03/2024 00:15	54	34	33	32	31	30	27

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - March 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	19/03/2024 22:48	-	-	44	36	33	33	34	32	30	29	24	21
N14	19/03/2024 23:45	55	52	45	46	42	39	42	39	41	40	35	30
N15	19/03/2024 23:15	-	48	50	50	47	47	47	46	42	38	39	41
N17	19/03/2024 22:22	-	-	41	40	35	32	32	31	30	29	25	21
N19	19/03/2024 22:00	-	-	41	43	36	35	32	30	28	26	21	16
N20	20/03/2024 00:15	-	-	-	36	32	29	26	23	26	27	21	17

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – March 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	19/03/2024 22:48	23	<0.5	-	1
N14	19/03/2024 23:45	21	0.6	160	1
N15	19/03/2024 23:15	24	<0.5	-	1
N17	19/03/2024 22:22	26	<0.5	-	4
N19	19/03/2024 22:00	26	<0.5	-	4
N20	20/03/2024 00:15	21	<0.5	-	2

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – March 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	19/03/2024 22:48	1.3	96	E	Yes	37	45	IA	IA	Nil	Nil
N14	19/03/2024 23:45	0.8	118	D	Yes	35	45	IA	IA	Nil	Nil
N15	19/03/2024 23:15	1.4	138	D	Yes	37	45	IA	IA	Nil	Nil
N17	19/03/2024 22:22	2.0	80	E	Yes	38	45	IA	IA	Nil	Nil
N19	19/03/2024 22:00	2.5	79	E	Yes	35	45	IA	IA	Nil	Nil
N20	20/03/2024 00:15	0.0	-	A	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 metres per second (at a height of 10 metres).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

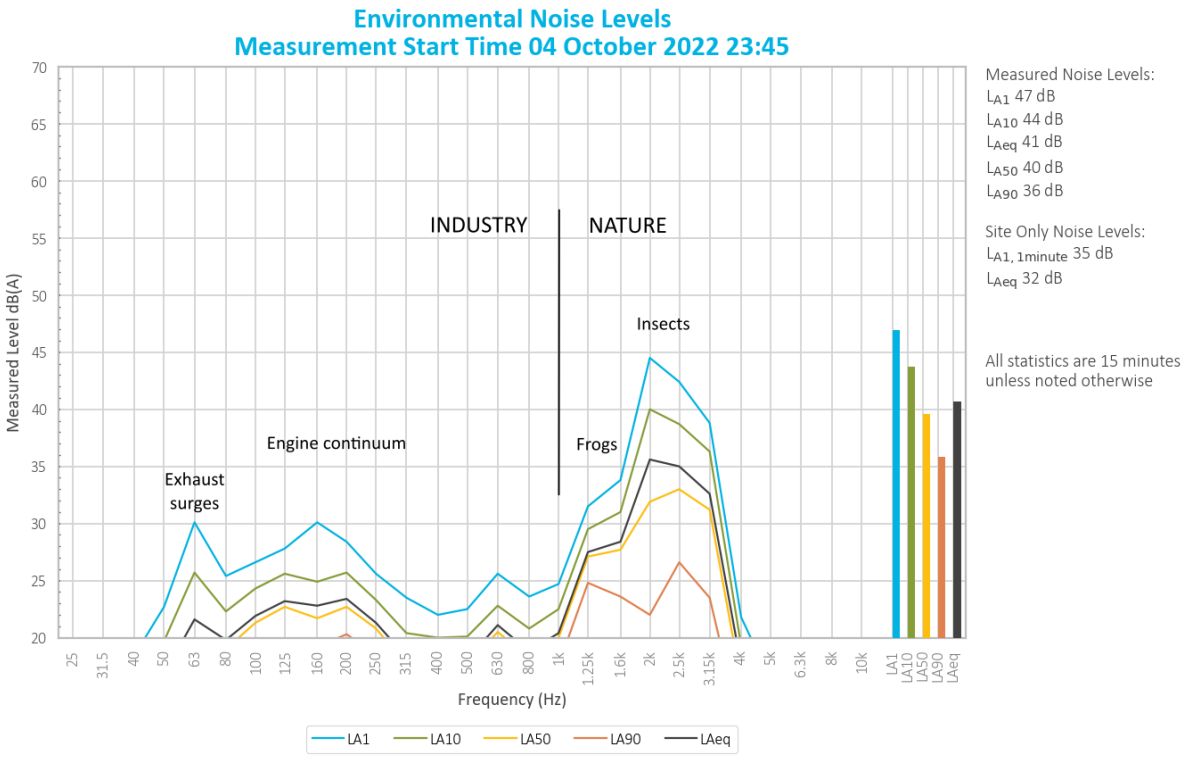

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

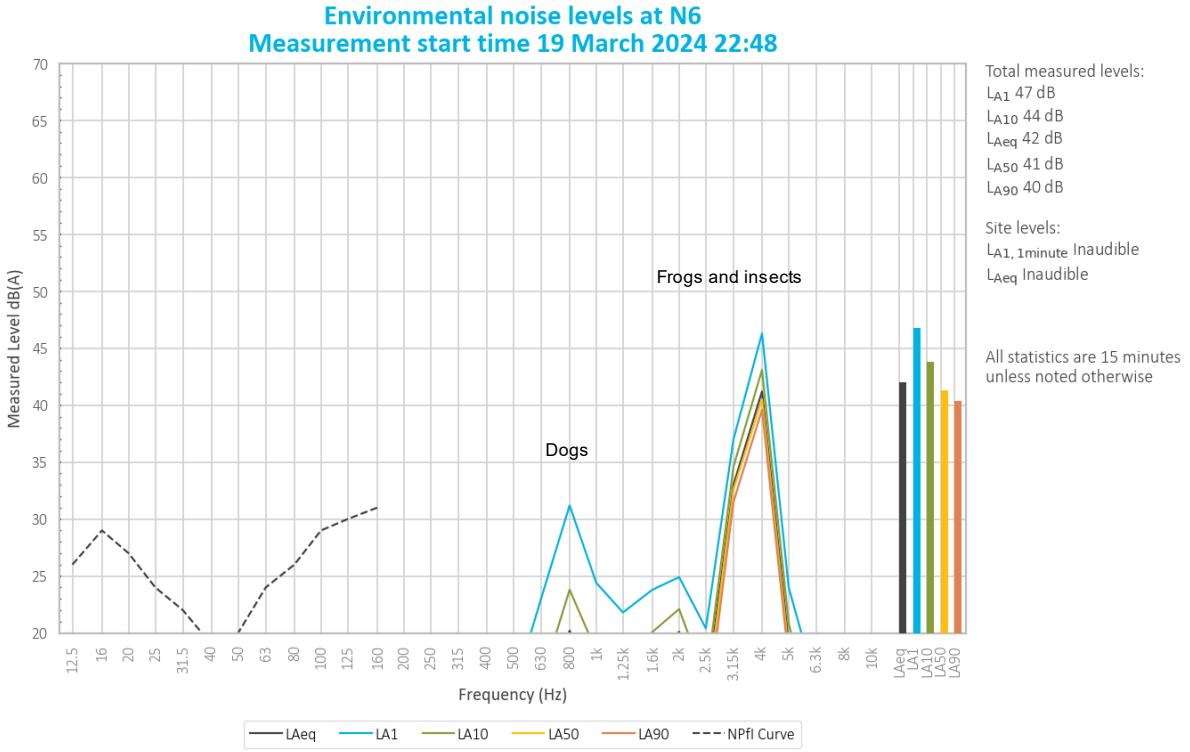

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels.

Noise from bats, cattle and dogs was also noted.

5.3 N14

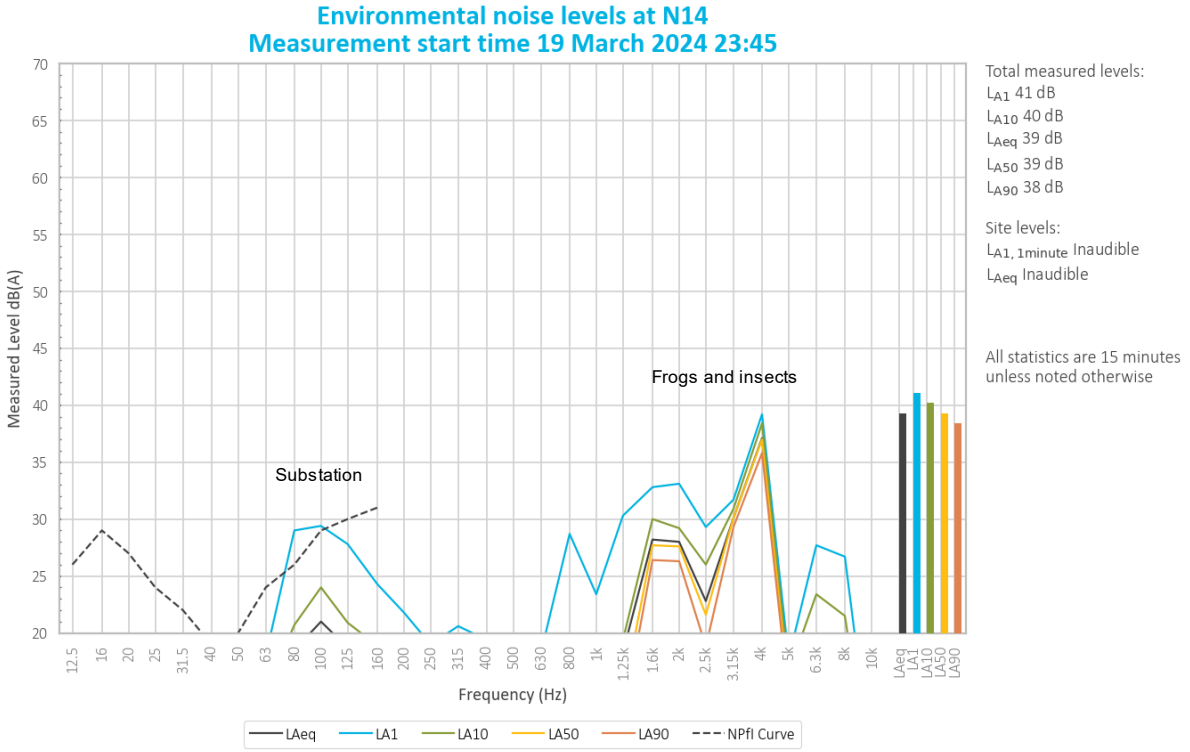

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels.

Local substation continuum and noise from bats, and birds was also noted.

5.4 N15

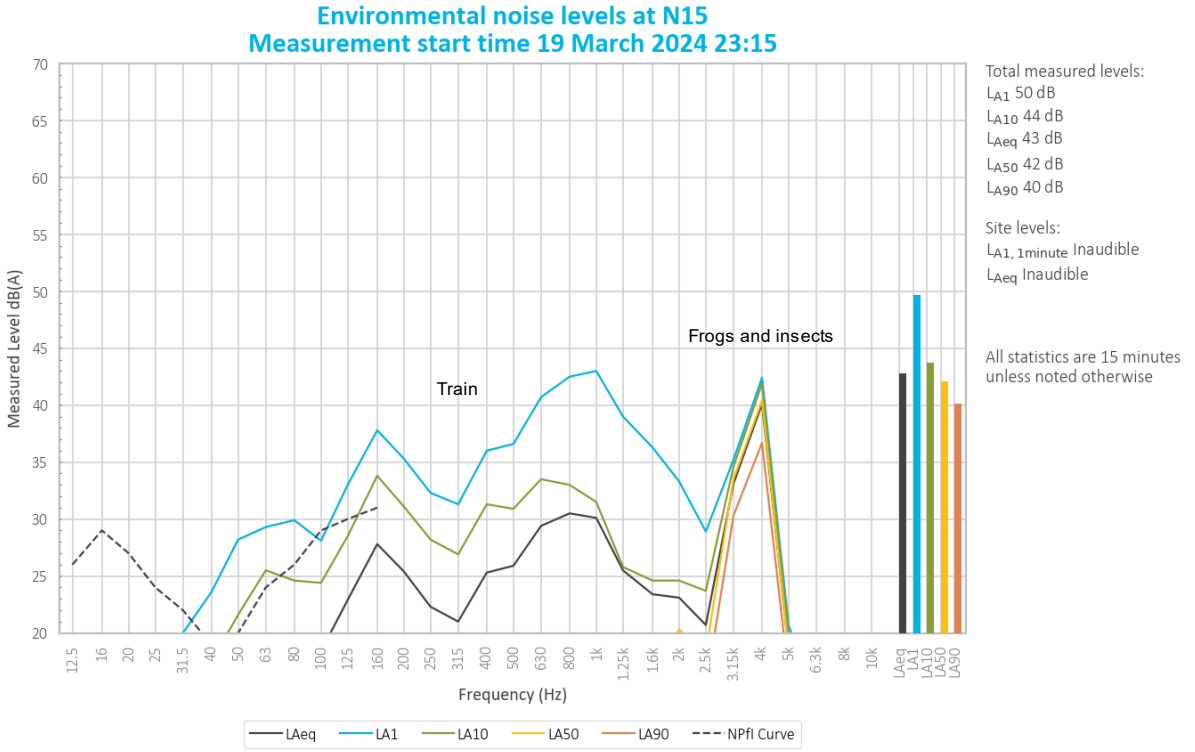

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels. A train contributed to the measured L_{A1}.

Noise from bats and cattle was also noted.

5.5 N17

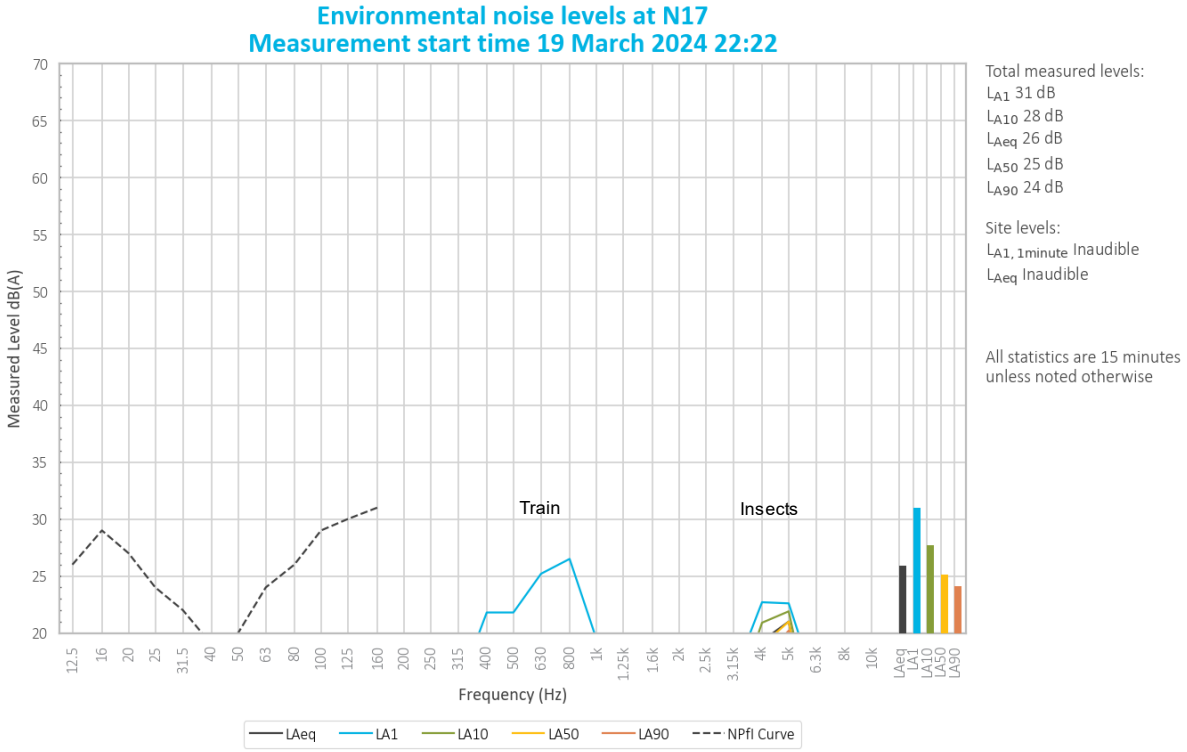

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

WCP was inaudible during the measurement.

Insects primarily generated total measured levels. A train generated the measured L_{A1}.

Noise from bats was also noted at low levels.

5.6 N19

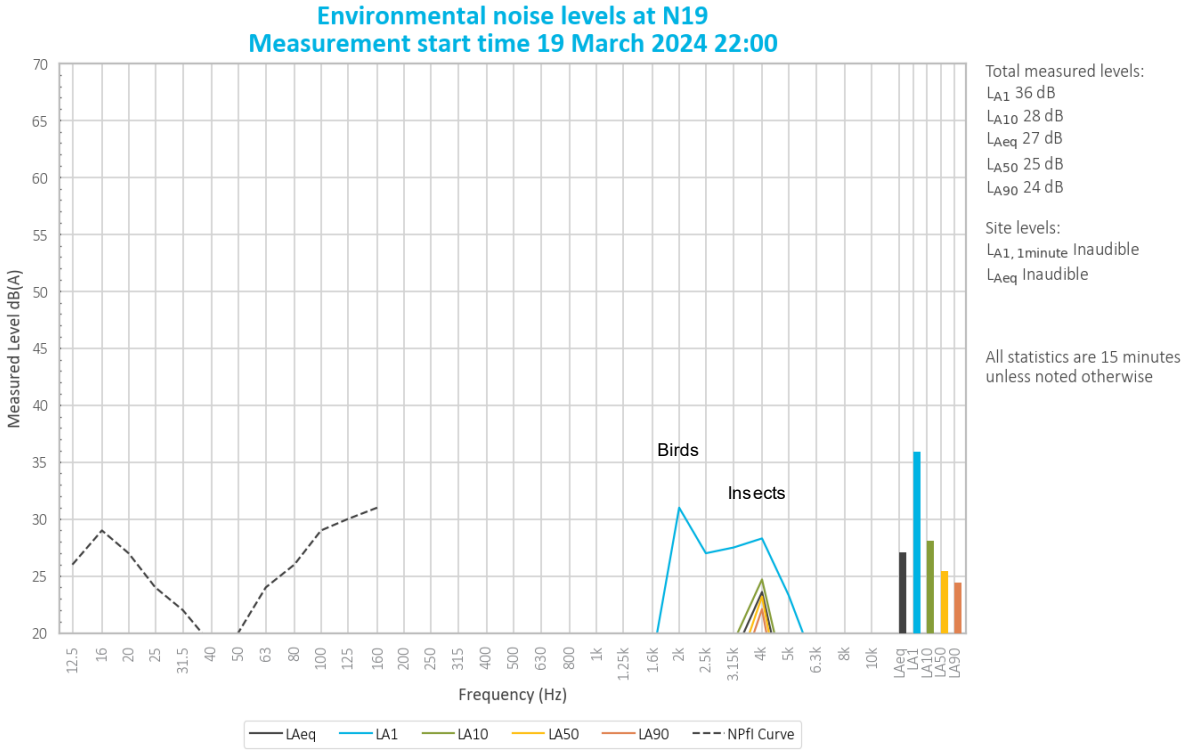

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

Insects primarily generated total measured levels. Birds generated the measured L_{A1}.

Noise from bats was also noted at low levels.

5.7 N20

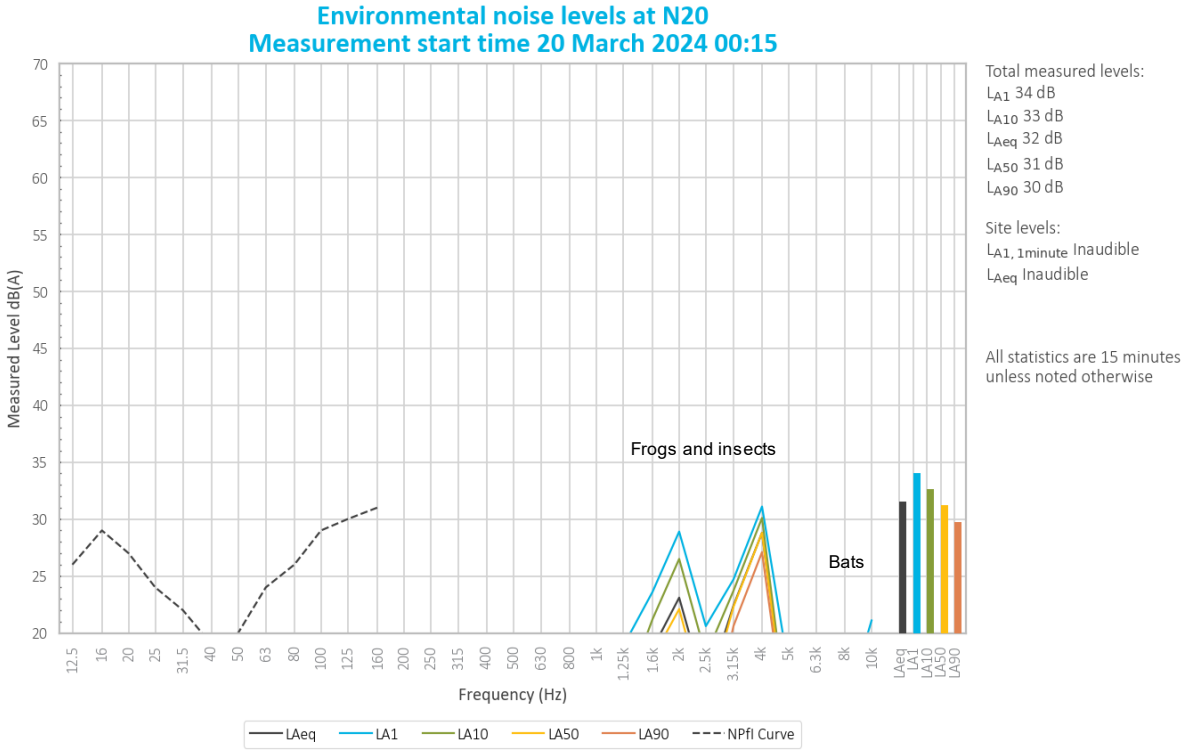

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels.

Noise from bats was also noted at low levels.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 19 March 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the March 2024 survey.

Noise limits may not applicable due to meteorological conditions at the time of monitoring.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

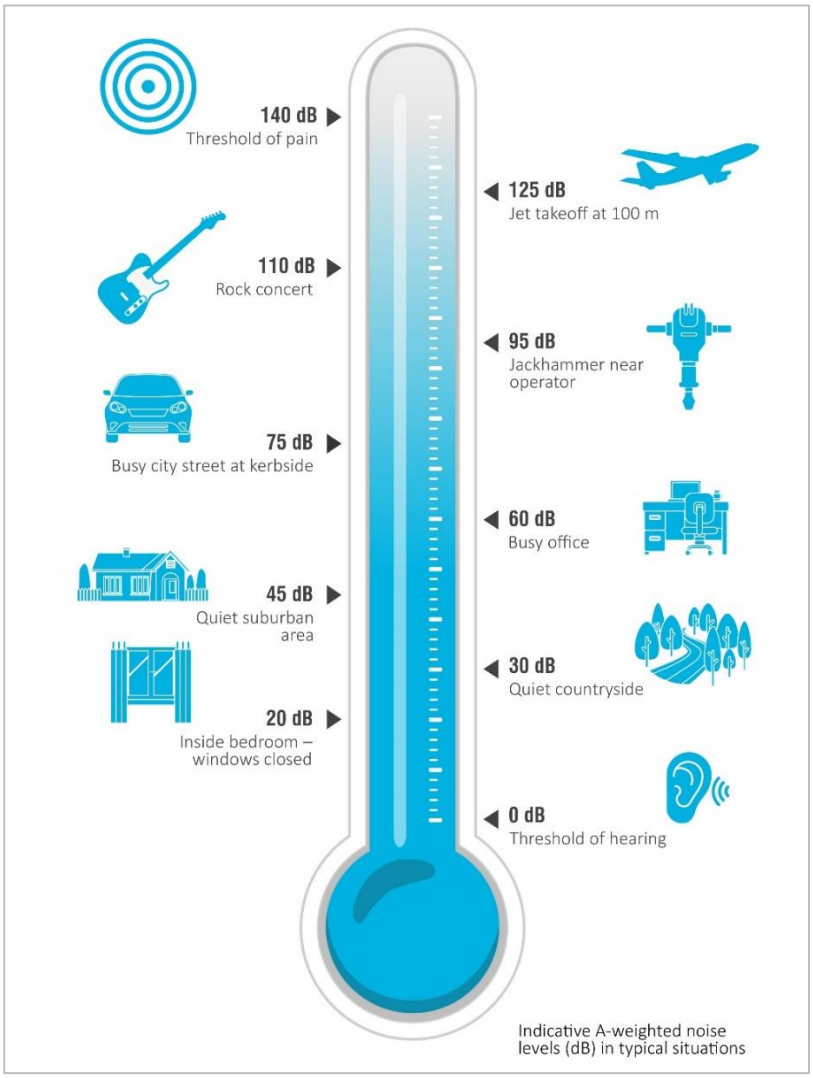

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

B.3 Noise management plan

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPIE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[4]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[4]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPIE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Wandoona may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians.

The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7**, **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5**, WCPL will report both results to DPIE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

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C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23032

Client Details	EMM Consulting Level 3/175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	24°C	**Ambient Temperature :**	23.5°C
Relative Humidity :	47.3%	**Relative Humidity :**	46.1%
Barometric Pressure :	100.14kPa	**Barometric Pressure :**	100.16kPa

Calibration Technician :	Shaheen Boaz	**Secondary Check:**	Dylan Selge
Calibration Date :	23 Jan 2023	**Report Issue Date :**	25 Jan 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C37305

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer:	Svantek
Type No:	SV36 **Serial No:** 140737
Class:	1
Owner:	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Tests Performed:	Measured Output Pressure level, Frequency & Distortion
Comments:	See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1005	hPa ±1 hPa	**Date of Receipt :**	06/09/2023
Temperature	24	°C ±1° C	**Date of Calibration :**	06/09/2023
Relative Humidity	35	% ±5%	**Date of Issue :**	06/09/2023

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: .....

AUTHORISED SIGNATURE: .....

Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

April 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP04

April 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	06/05/2024	Will Moore	Amanda Buckeridge	Final

Approved by

Robert Kirwan
Associate Acoustic Consultant
6 May 2024

Level 3 175 Scott Street
Newcastle NSW 2300

TABLE OF CONTENTS

Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 16 April 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

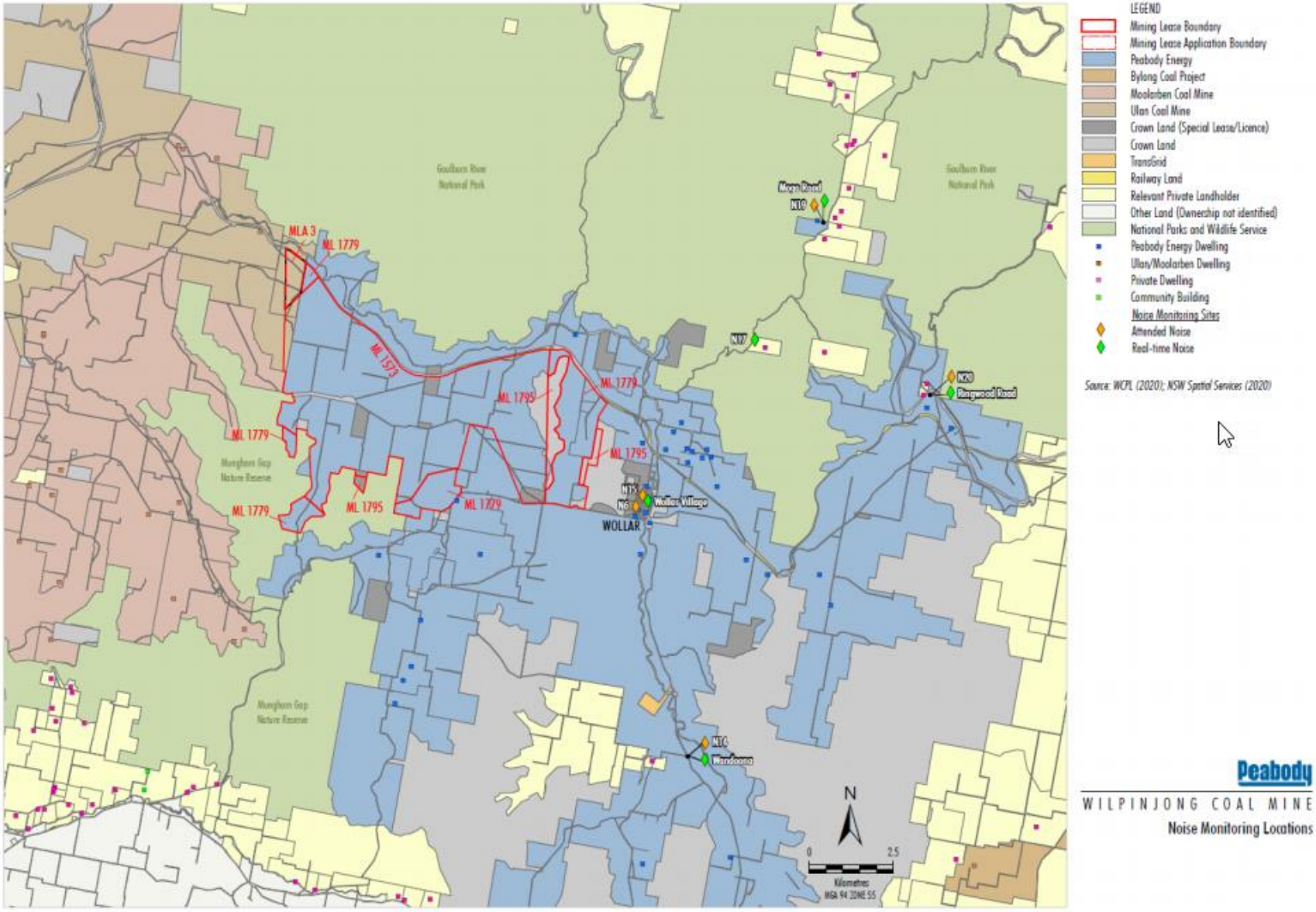

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in June 2021. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	30131882	25/01/2025	IEC 61672-1:2002
SVAN SV-36 acoustic calibrator	140737	06/09/2024	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – April 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	16/04/2024 22:49	39	28	24	23	22	21	20
N14	16/04/2024 23:45	52	48	46	42	37	32	28
N15	16/04/2024 23:15	56	50	45	40	27	20	19
N17	16/04/2024 22:22	38	31	26	24	23	21	19
N19	16/04/2024 22:00	40	32	29	25	23	21	19
N20	17/04/2024 00:15	48	40	35	32	28	26	23

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - April 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	16/04/2024 22:49	-	-	-	35	30	31	29	24	26	26	21	16
N14	16/04/2024 23:45	-	-	41	41	35	34	37	34	33	32	28	24
N15	16/04/2024 23:15	-	48	48	57	46	48	42	39	39	42	40	37
N17	16/04/2024 22:22	-	-	-	35	30	27	26	25	24	20	19	21
N19	16/04/2024 22:00	-	-	41	38	33	33	30	31	31	26	23	20
N20	17/04/2024 00:15	-	-	42	44	40	37	35	34	33	31	28	24

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – April 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	16/04/2024 22:49	13	<0.5	-	0
N14	16/04/2024 23:45	15	<0.5	-	0
N15	16/04/2024 23:15	13	<0.5	-	0
N17	16/04/2024 22:22	16	<0.5	-	0
N19	16/04/2024 22:00	19	<0.5	-	0
N20	17/04/2024 00:15	15	<0.5	-	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – April 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	16/04/2024 22:49	0.0	-	G	No	37	45	IA	IA	Nil	Nil
N14	16/04/2024 23:45	0.0	-	G	No	35	45	IA	IA	Nil	Nil
N15	16/04/2024 23:15	0.0	-	G	No	37	45	IA	IA	Nil	Nil
N17	16/04/2024 22:22	0.0	-	G	No	38	45	IA	IA	Nil	Nil
N19	16/04/2024 22:00	0.0	-	G	No	35	45	IA	IA	Nil	Nil
N20	17/04/2024 00:15	0.0	-	G	No	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits do not apply during periods of rainfall or winds greater than 3 metres per second (at a height of 10 metres).
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

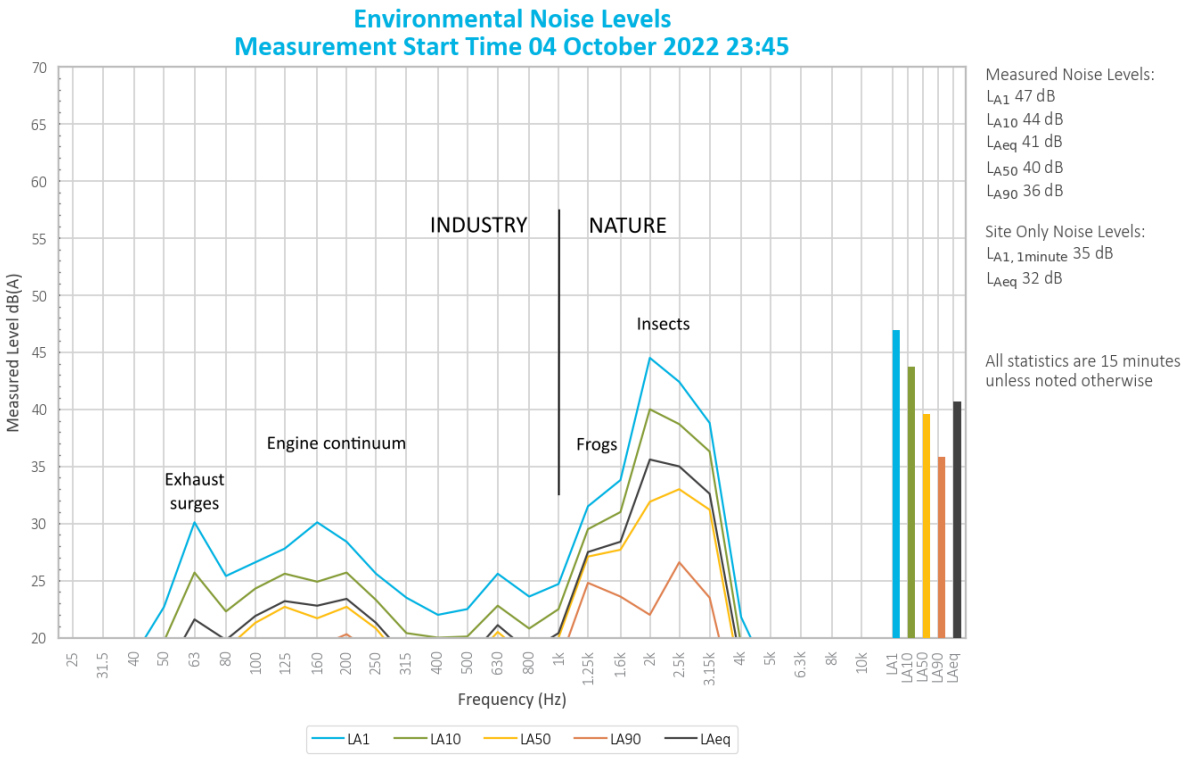

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

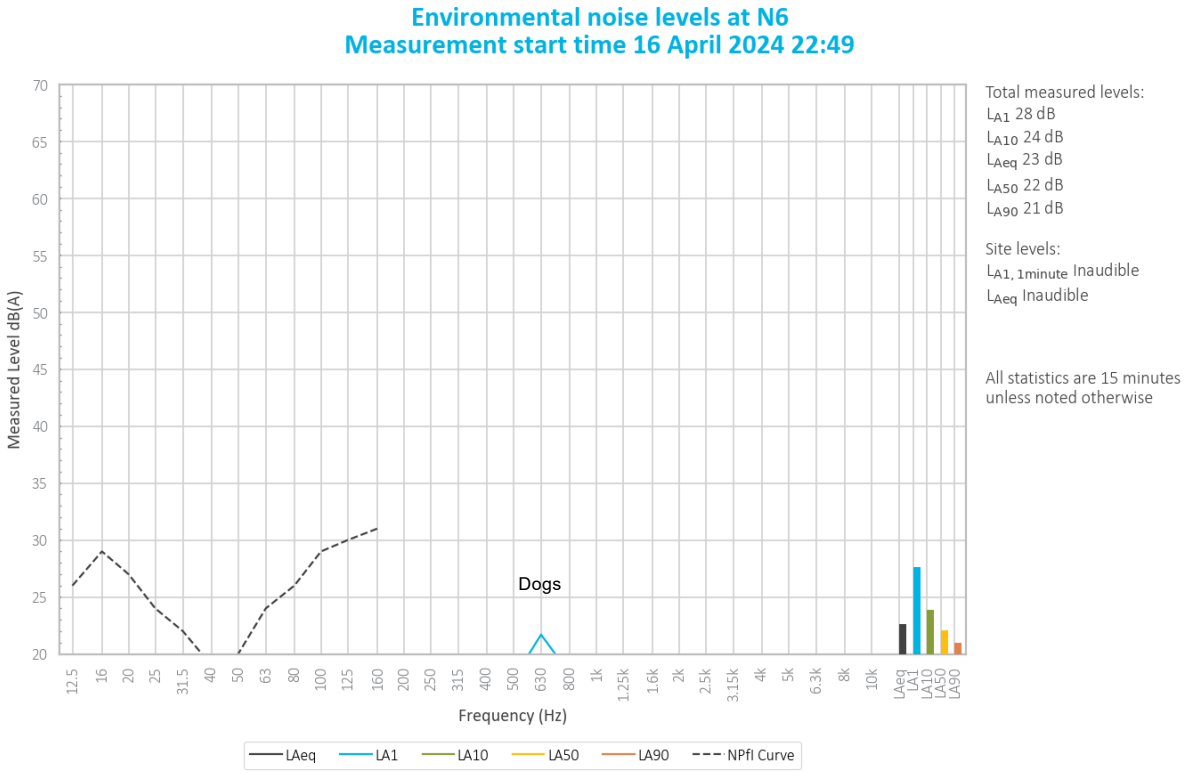

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

WCP was inaudible during the measurement.

Frogs and insects primarily generated total measured levels. Dogs generated the measured L_{A1}.

Noise from bats and cattle was also noted at low levels.

5.3 N14

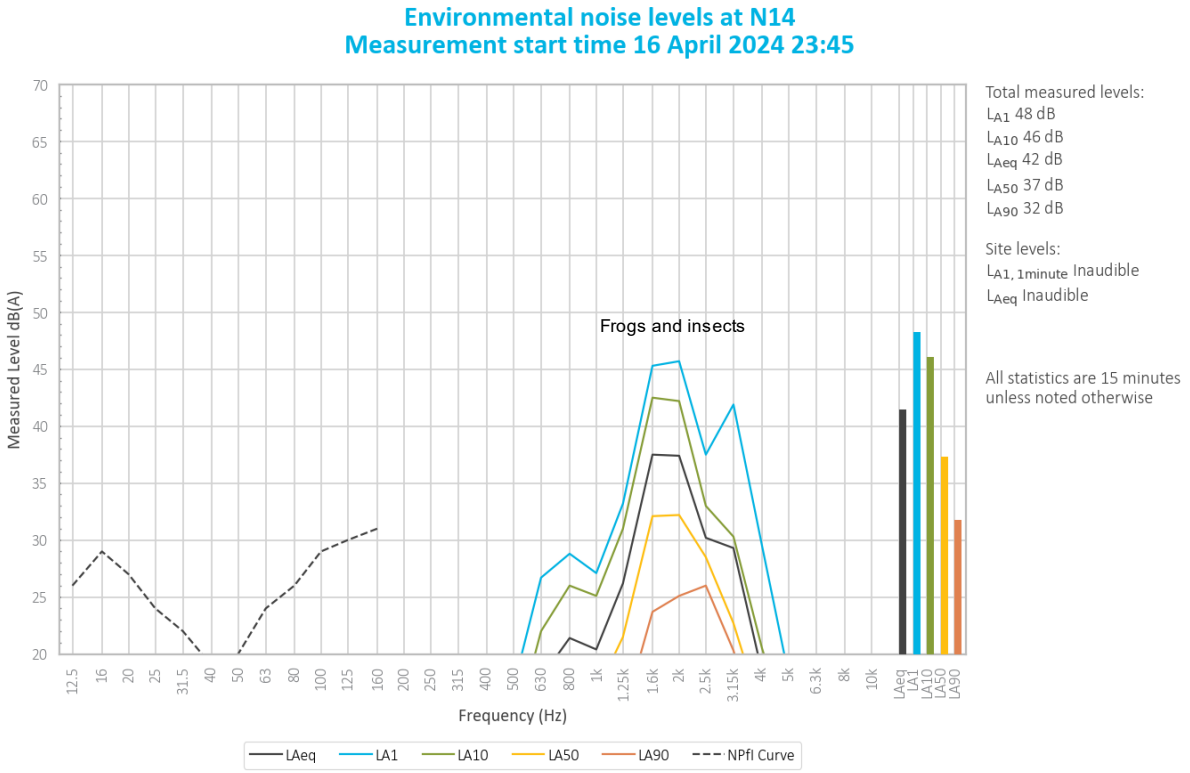

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels.

Local substation continuum was also noted.

5.4 N15

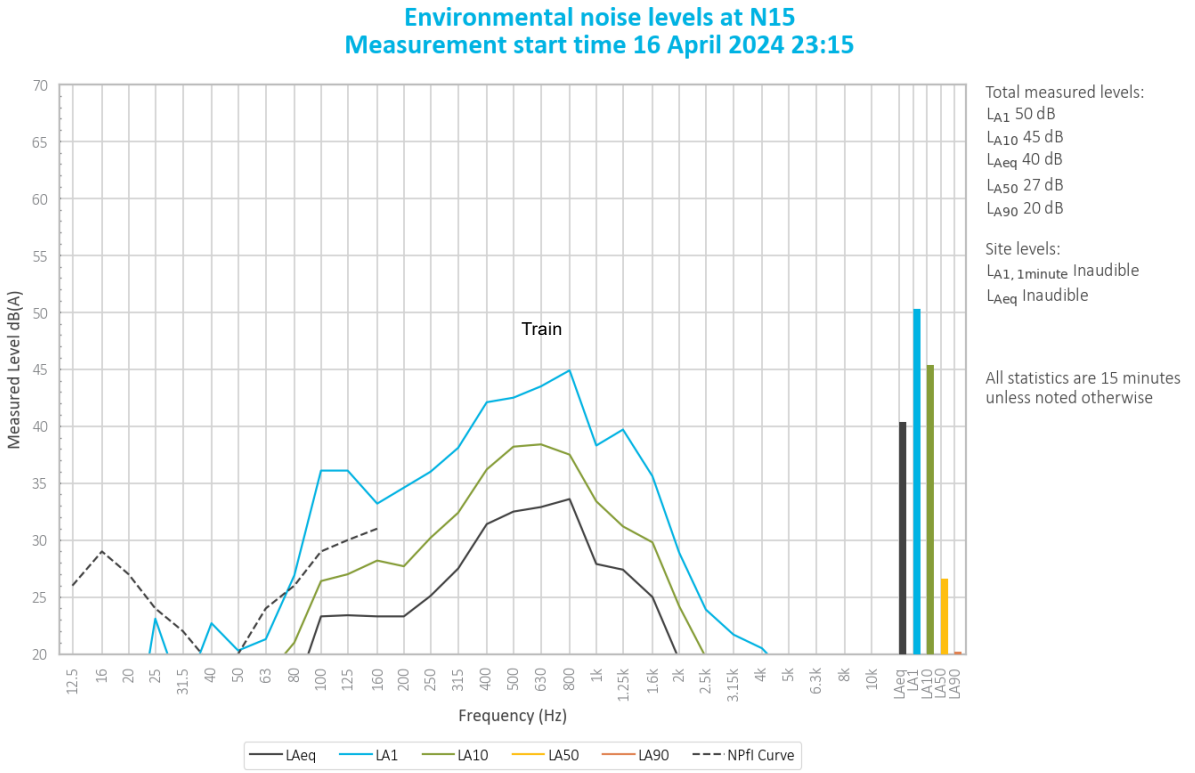

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

WCP was inaudible during the measurement.

A train generated the measured L_{A1}, L_{A10} and L_{Aeq}. Insects generated the measured L_{A50} and L_{A90}.

Noise from dogs was also noted at low levels.

5.5 N17

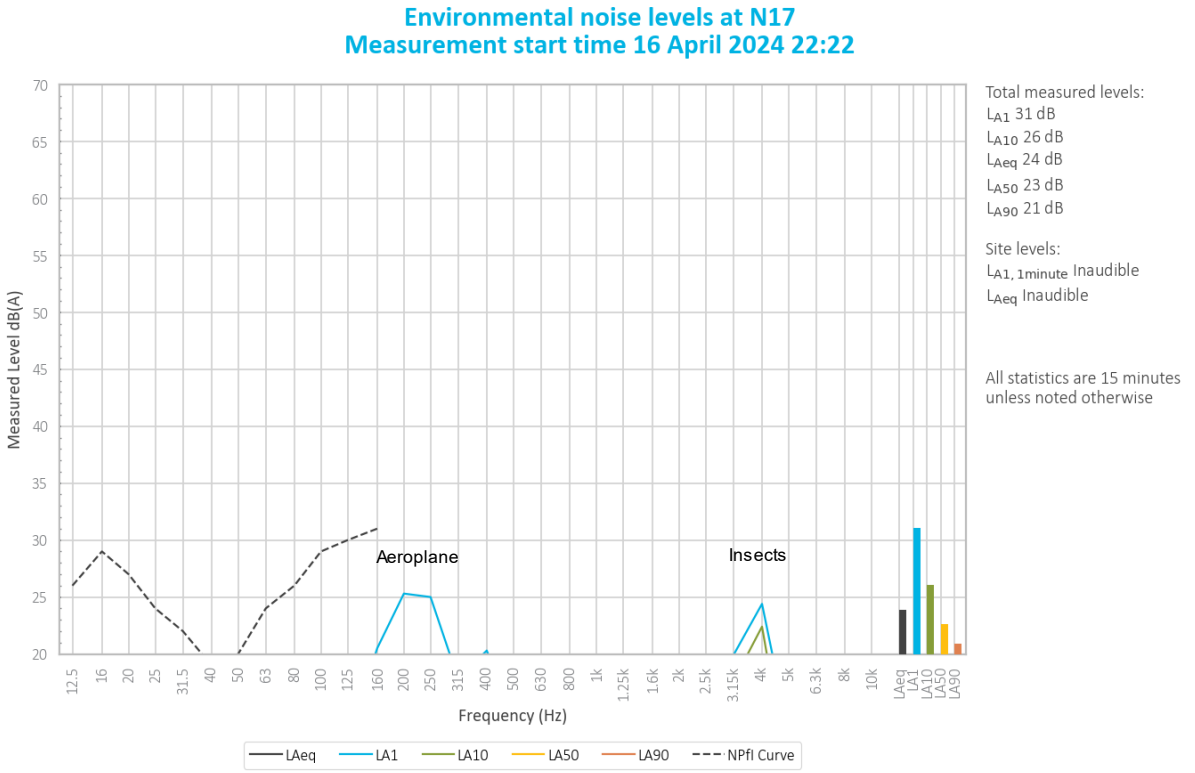

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

WCP was inaudible during the measurement.

Insects primarily generated total measured levels. An aeroplane was the major contributor to the measured L_{A1}.

Noise from bats was also noted at low levels.

5.6 N19

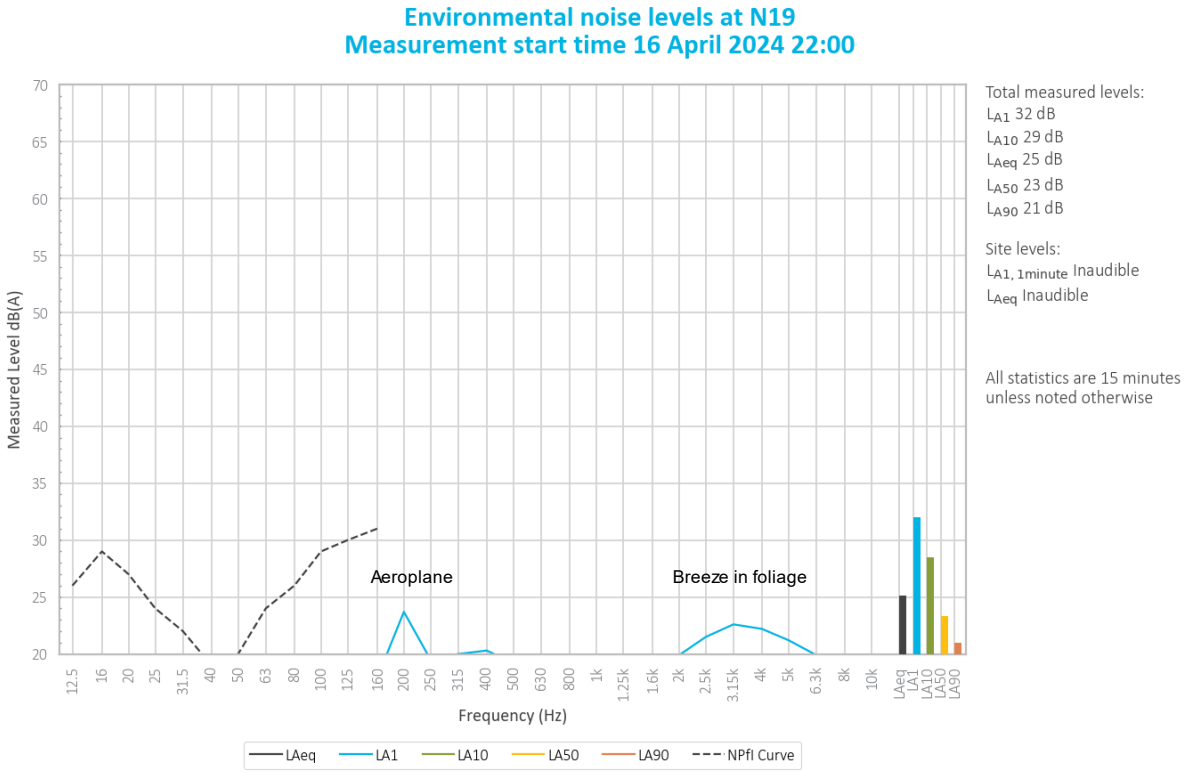

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

A breeze in nearby foliage primarily generated total measured levels. An aeroplane contributed to the measured L_{A1}.

Noise from bats and a train was also noted at low levels.

5.7 N20

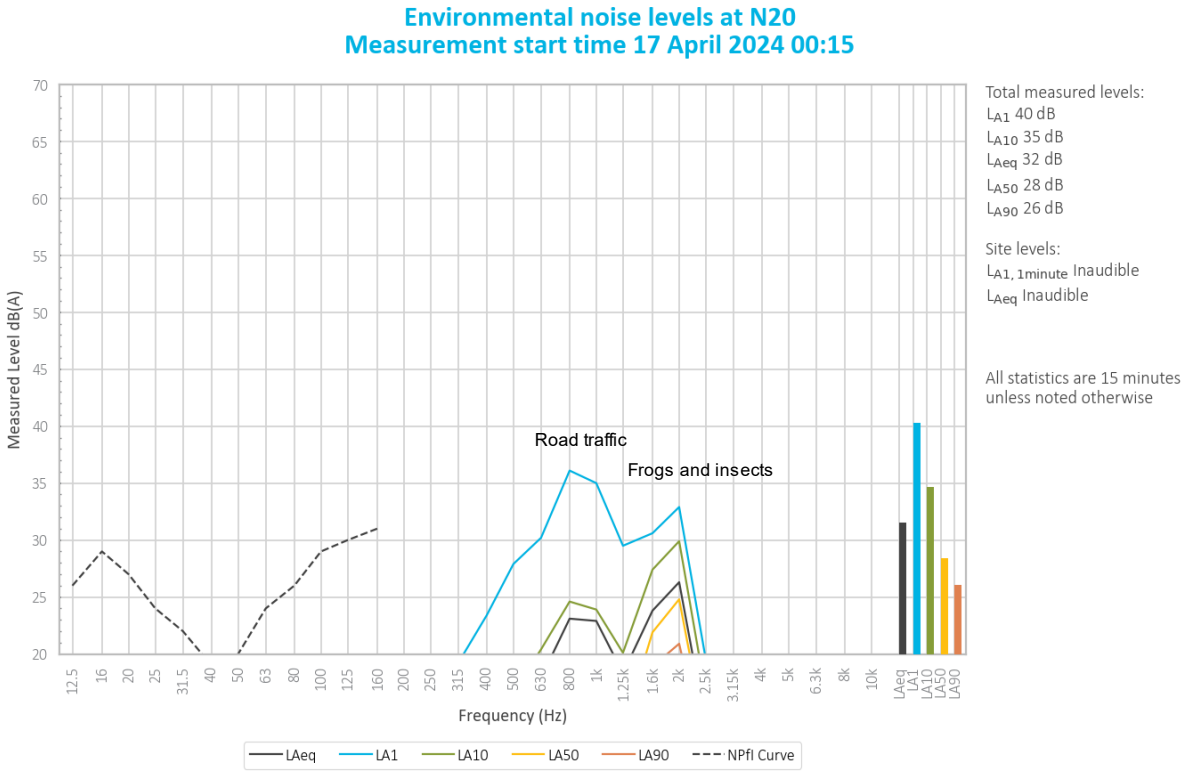

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Frogs and insects primarily generated total measured levels. Road traffic was the major contributor to the measured L_{A1}.

Noise from a train was also noted at low levels.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 16 April 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the April 2024 survey.

Noise limits may not applicable due to meteorological conditions at the time of monitoring.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

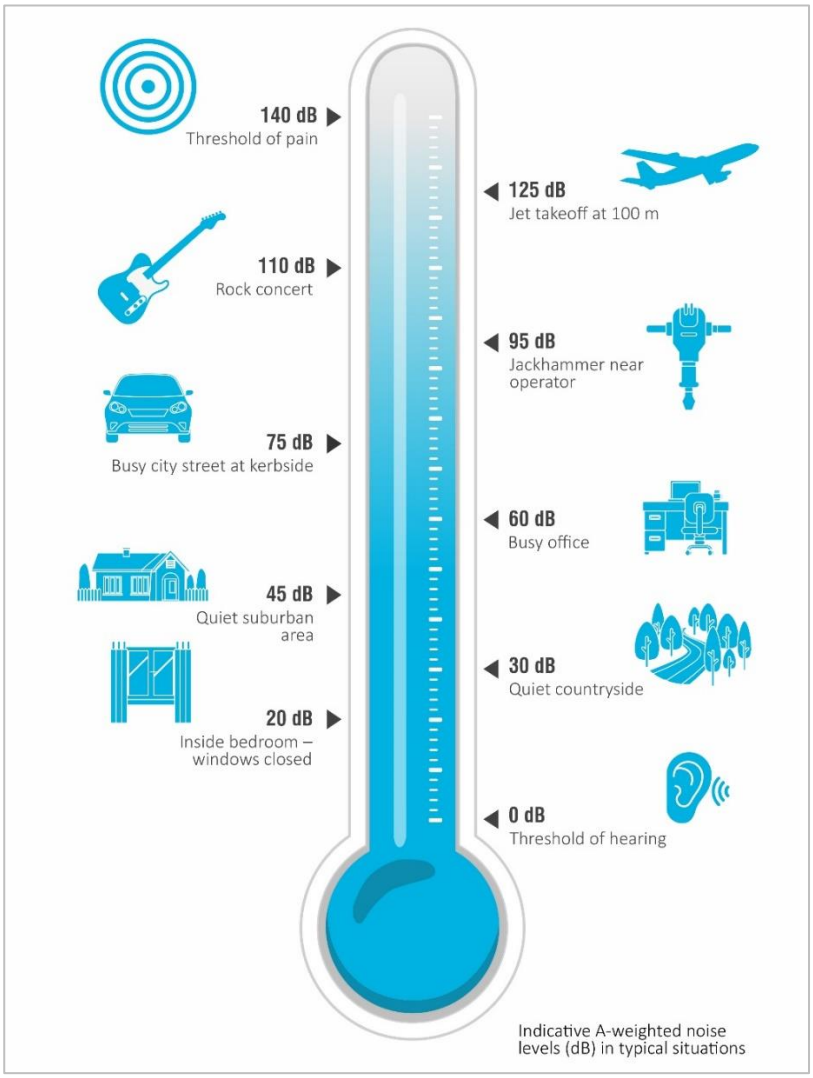

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

B.3 Noise management plan

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPIE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[4]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[4]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPIE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Wandoona may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians.

The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7**, **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5**, WCPL will report both results to DPIE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23032

Client Details	EMM Consulting Level 3/175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	24°C	**Ambient Temperature :**	23.5°C
Relative Humidity :	47.3%	**Relative Humidity :**	46.1%
Barometric Pressure :	100.14kPa	**Barometric Pressure :**	100.16kPa

Calibration Technician :	Shaheen Boaz	**Secondary Check:**	Dylan Selge
Calibration Date :	23 Jan 2023	**Report Issue Date :**	25 Jan 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C37305

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer: Svantek
Type No: SV36 **Serial No:** 140737
Class: 1
Owner: EMM Consulting
Level 3, 175 Scott Street
Newcastle NSW 2300
Tests Performed: Measured Output Pressure level, Frequency & Distortion
Comments: See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1005	hPa ±1 hPa	**Date of Receipt :**	06/09/2023
Temperature	24	°C ±1° C	**Date of Calibration :**	06/09/2023
Relative Humidity	35	% ±5%	**Date of Issue :**	06/09/2023

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: .....

AUTHORISED SIGNATURE: .....
Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration
Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

May 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP05

May 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	13/05/2024	Will Moore	Ryan Bruniges	Final

Approved by

Ryan Bruniges
Associate Acoustic Consultant
24 May 2024

Level 3 175 Scott Street
Newcastle NSW 2300

TABLE OF CONTENTS

Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 8 May 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

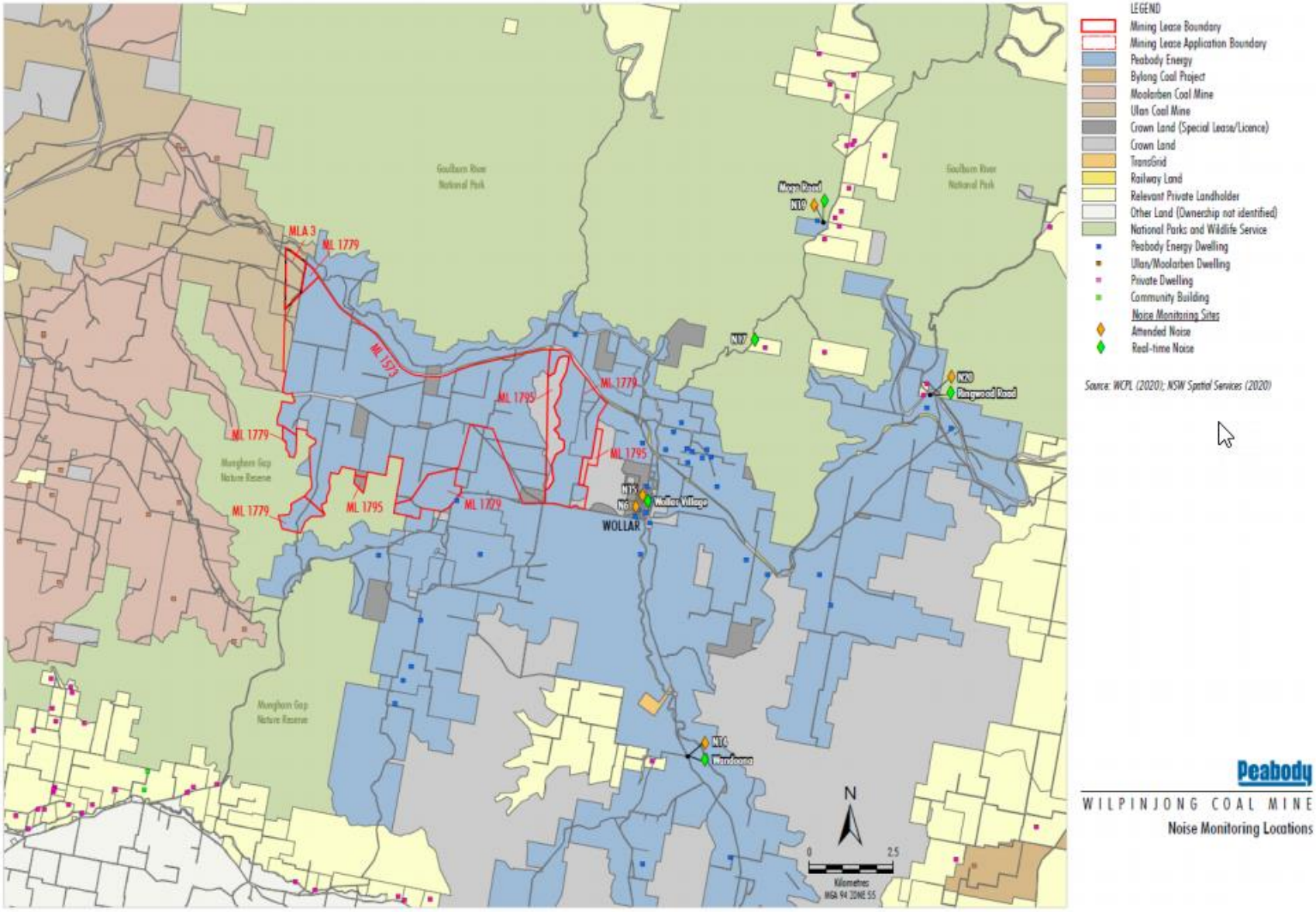

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in June 2021. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater then 3m/s at 10m above ground level;

- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or

- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	00701424	01/06/2025	IEC 61672-1:2002
Pulsar 105 acoustic calibrator	78226	26/02/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – May 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	8/05/2024 22:47	49	36	31	28	26	23	21
N14	8/05/2024 23:45	51	49	46	43	43	37	25
N15	8/05/2024 23:15	50	44	31	31	25	21	19
N17	8/05/2024 22:22	39	31	28	25	23	20	18
N19	8/05/2024 22:00	48	36	32	29	27	24	22
N20	9/05/2024 00:15	50	46	32	32	27	23	20

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - May 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	8/05/2024 22:47	54	48	42	39	33	31	31	32	31	31	27	24
N14	8/05/2024 23:45	-	-	41	43	32	28	27	25	24	22	19	16
N15	8/05/2024 23:15	-	-	-	37	32	33	33	33	32	31	27	25
N17	8/05/2024 22:22	-	-	41	37	33	32	31	31	31	30	28	28
N19	8/05/2024 22:00	-	-	-	-	30	26	23	22	21	19	17	16
N20	9/05/2024 00:15	-	-	-	-	30	26	25	24	25	20	19	24

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – May 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	8/05/2024 22:47	16	1.2	115	2
N14	8/05/2024 23:45	15	0.6	190	7
N15	8/05/2024 23:15	17	<0.5	-	2
N17	8/05/2024 22:22	16	<0.5	-	0
N19	8/05/2024 22:00	16	<0.5	-	0
N20	9/05/2024 00:15	14	<0.5	-	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – May 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	8/05/2024 22:47	1.7	76	E	Yes	37	45	IA	IA	Nil	Nil
N14	8/05/2024 23:45	2.2	93	E	Yes	35	45	IA	IA	Nil	Nil
N15	8/05/2024 23:15	2.1	65	E	Yes	37	45	IA	IA	Nil	Nil
N17	8/05/2024 22:22	1.9	67	E	Yes	38	45	IA	IA	Nil	Nil
N19	8/05/2024 22:00	1.8	76	D	Yes	35	45	IA	IA	Nil	Nil
N20	9/05/2024 00:15	1.9	91	E	Yes	35	45	IA	IA	Nil	Nil

Notes: 1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 2.5.

2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.

3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.

4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

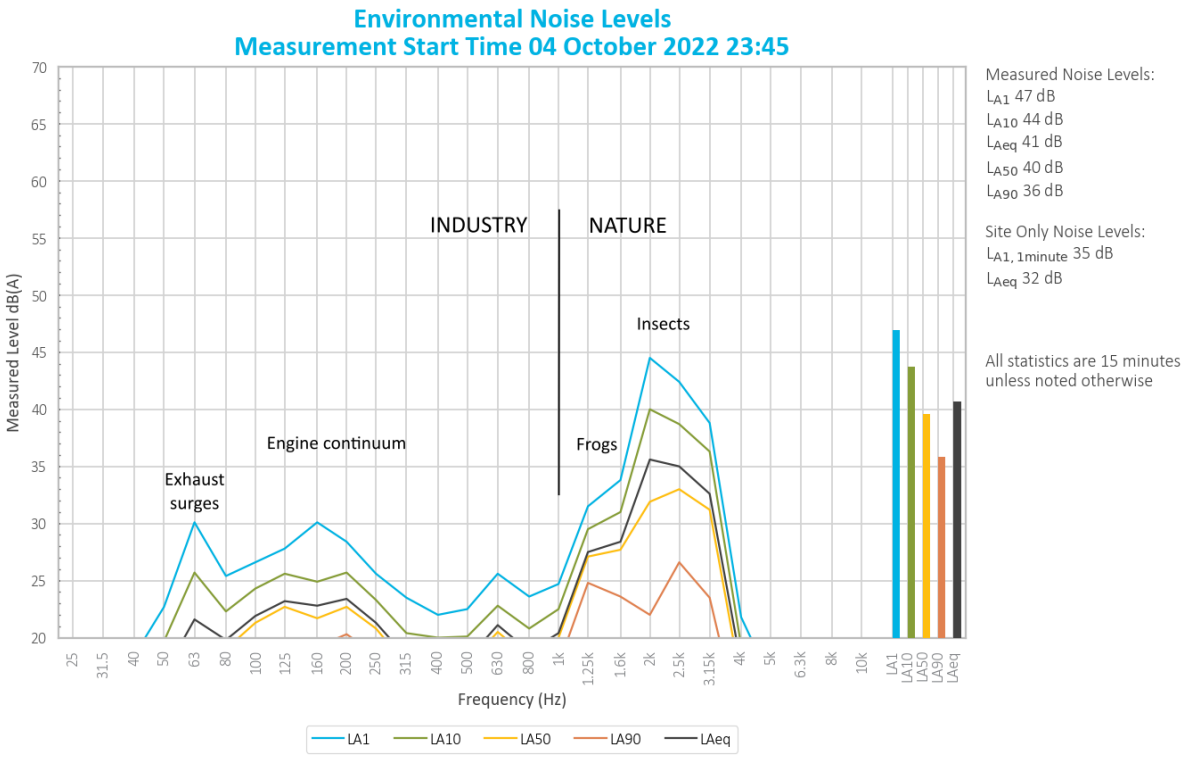

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

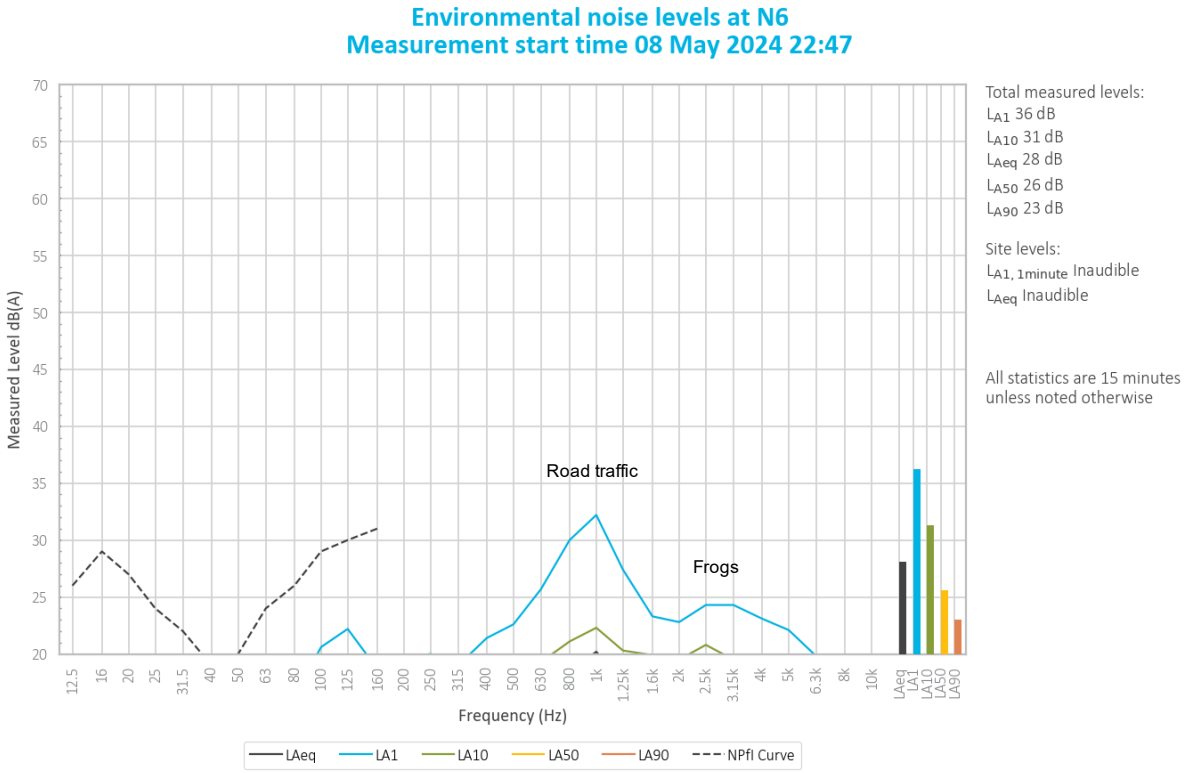

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

WCP was inaudible during the measurement.

Road traffic was responsible for generating the measured L_{A1} and L_{A10}. Frogs generated the measured L_{Aeq}, L_{A50} and L_{A90}.

Noise from a breeze in nearby foliage and cattle was also noted at low levels.

5.3 N14

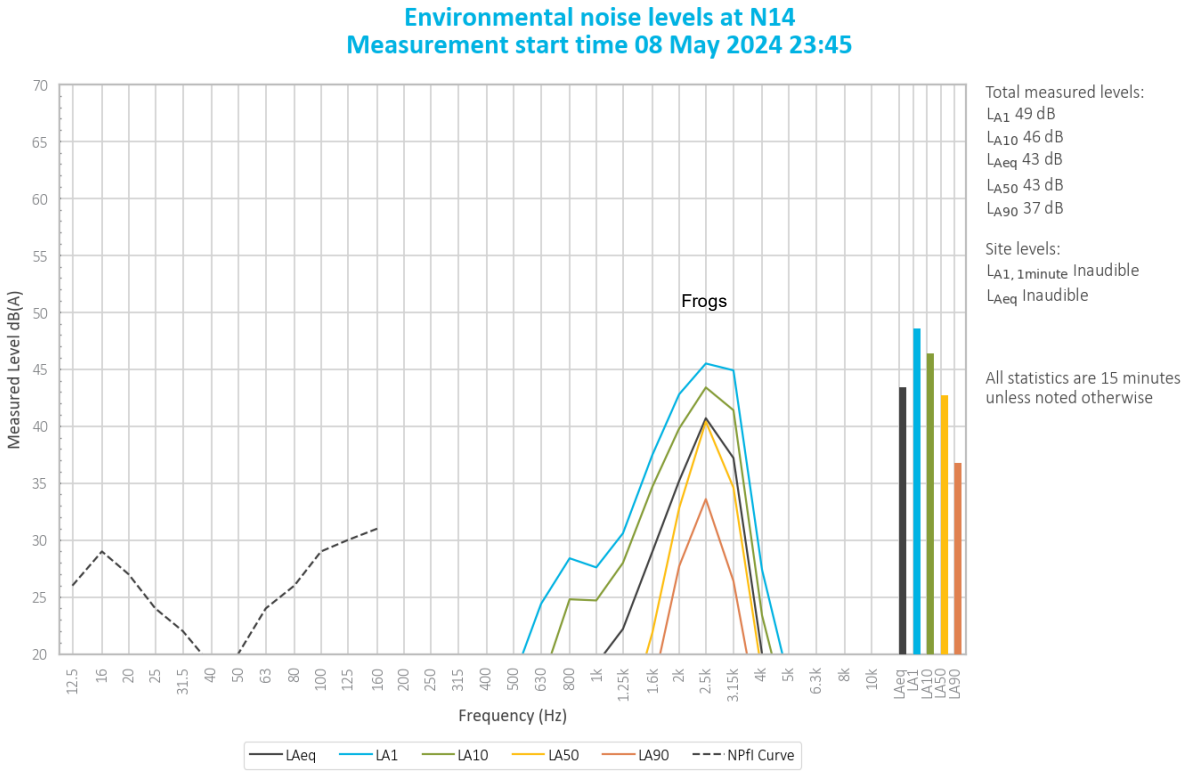

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

WCP was inaudible during the measurement.

Frogs generated total measured levels.

5.4 N15

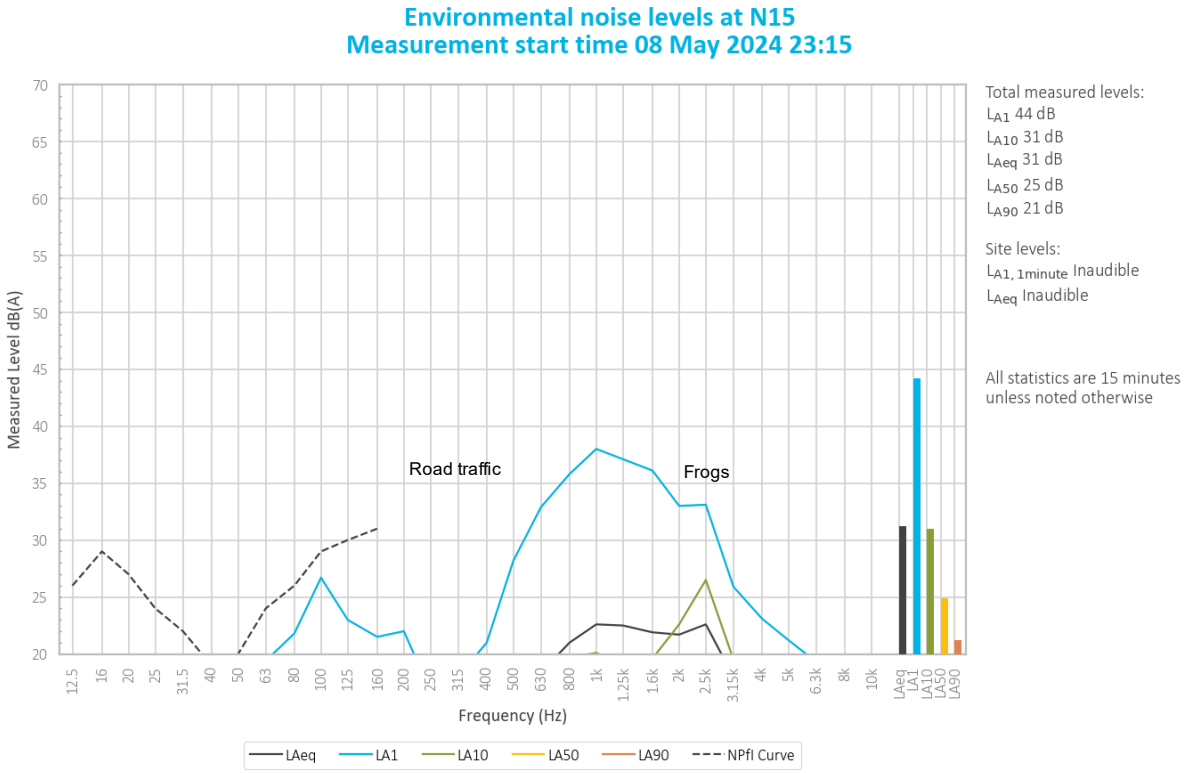

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

WCP was inaudible during the measurement.

Road traffic generated the measured L_{A1} and contributed to the measured L_{A10} and L_{Aeq}. Frogs contributed to the measured L_{A10} and L_{Aeq}, and generated the measured L_{A50} and L_{A90}.

Noise from cattle was also noted at low levels.

5.5 N17

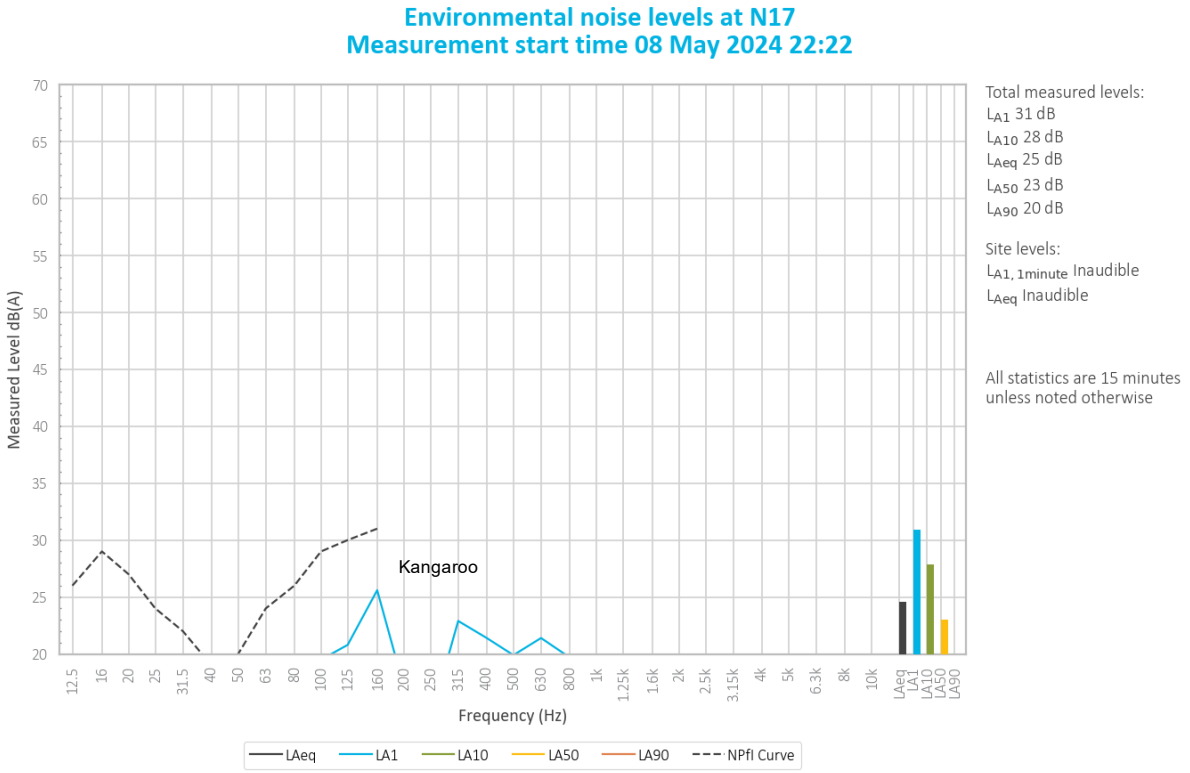

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

WCP was inaudible during the measurement.

Frogs and insects primarily generated total measured levels. A kangaroo generated the measured L_{A1}. A train contributed to the measured L_{A10}.

5.6 N19

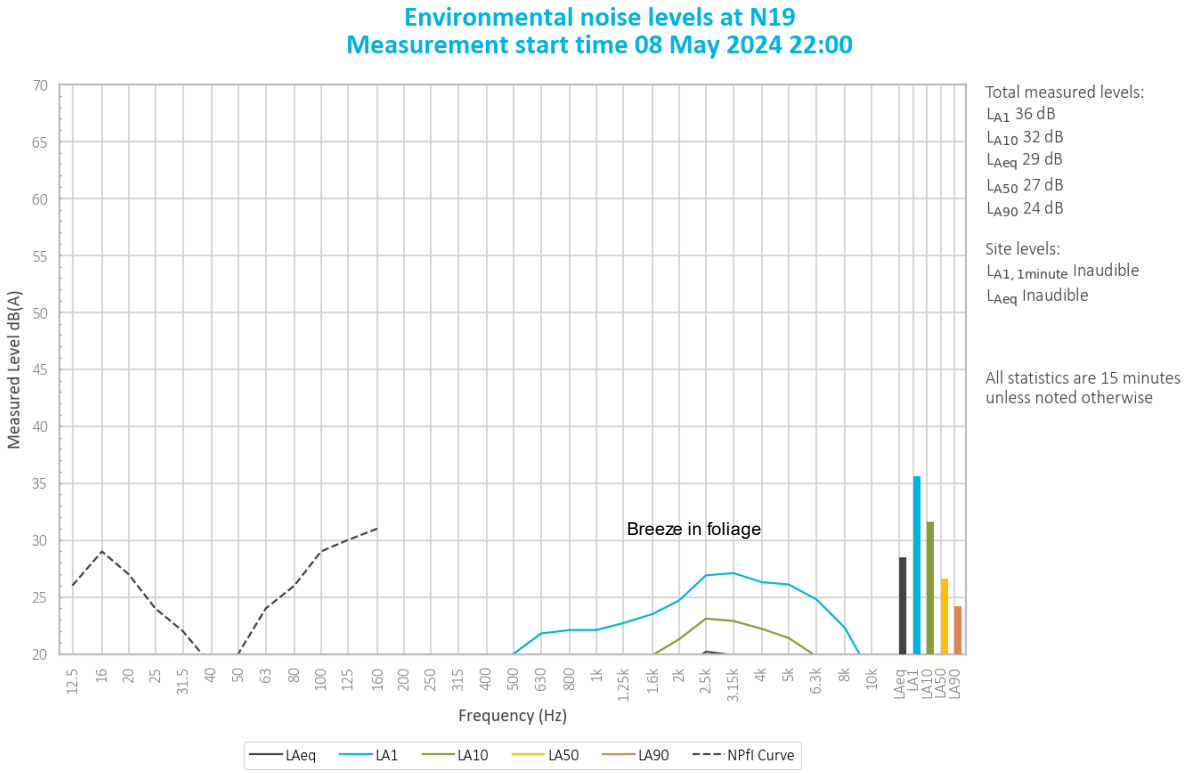

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

A breeze in nearby foliage was primarily responsible for total measured levels. Frogs contributed to the measured L_{A50} and L_{A90}.

Noise from bats was also noted.

5.7 N20

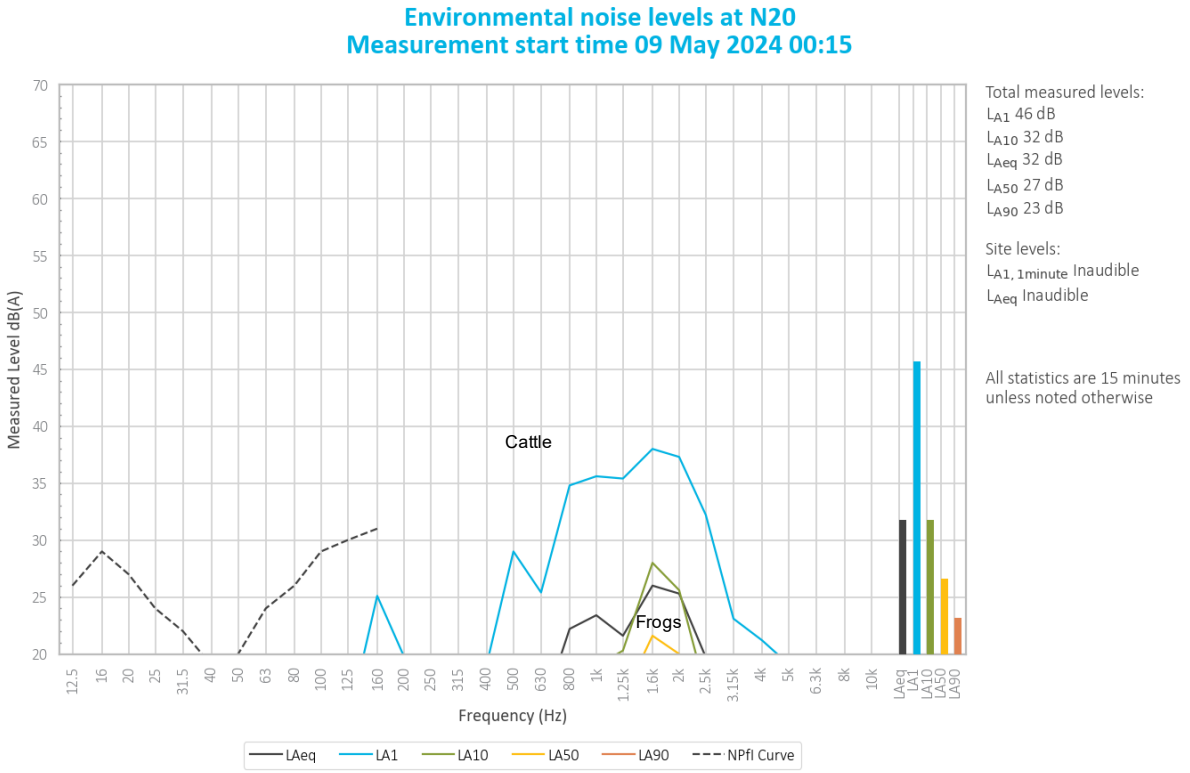

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Cattle were responsible for the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs generated the measured L_{A50} and L_{A90}.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 8 May 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the May 2024 survey.

Appendix A
Noise perception and examples

EMM
creating opportunities

A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

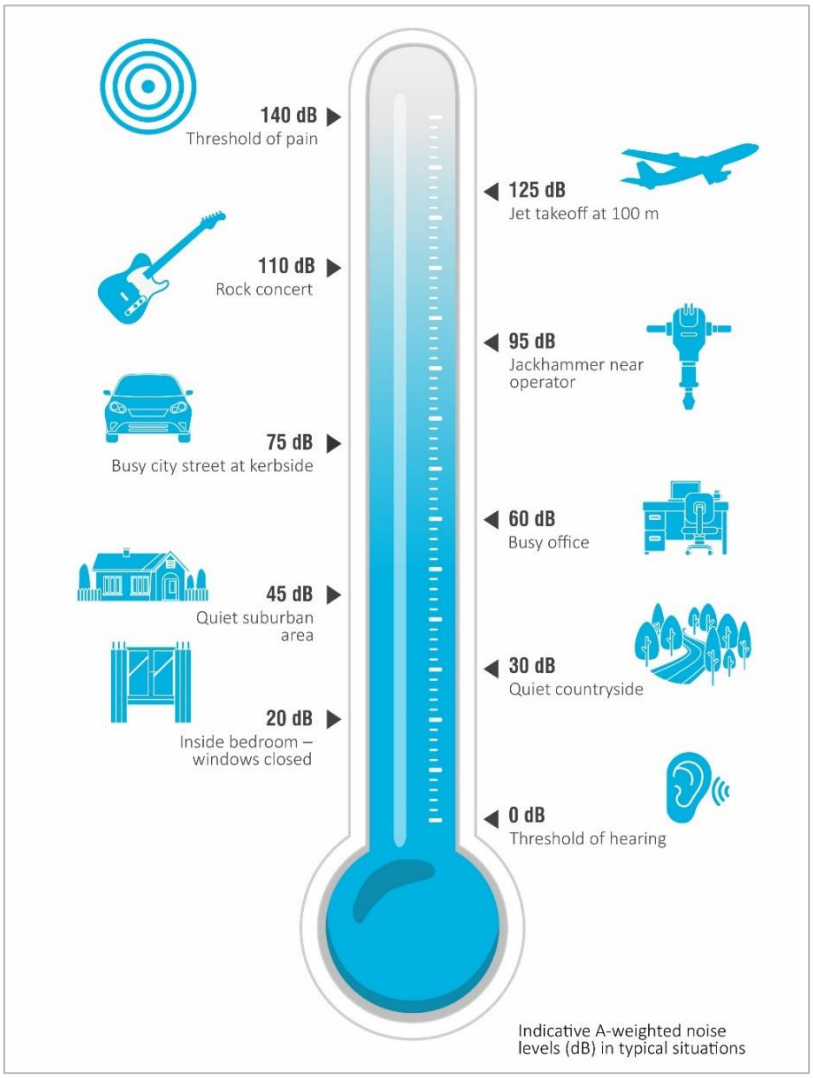

Figure A.1 Common noise levels

Appendix B
Regulator documents

EMM
creating opportunities

B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

B.3 Noise management plan

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPIE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[4]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[4]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPIE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Wandoona may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians.

The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7**, **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5**, WCPL will report both results to DPIE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23317

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	NA-28
Instrument Serial Number :	00701424
Microphone Serial Number :	01916
Pre-amplifier Serial Number :	01463
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	24°C	**Ambient Temperature :**	22.6°C
Relative Humidity :	46%	**Relative Humidity :**	46.6%
Barometric Pressure :	100.6kPa	**Barometric Pressure :**	100.6kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dylan Selge
Calibration Date :	1 Jun 2023	**Report Issue Date :**	2 Jun 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

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Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C24155

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Model 105
Instrument Serial Number :	78226

Atmospheric Conditions

Ambient Temperature :	25.3 °C
Relative Humidity :	53.6 %
Barometric Pressure :	100.41 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	26 Feb 2024	**Report Issue Date :**	26 Feb 2024

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.03	1000.30

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.11 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

June 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP06

June 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	01/07/2024	Will Moore	Amanda Buckeridge	Final

Approved by

Amanda Buckeridge
Associate Acoustic Consultant
1 July 2024

Level 3 175 Scott Street
Newcastle NSW 2300

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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 18 June 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

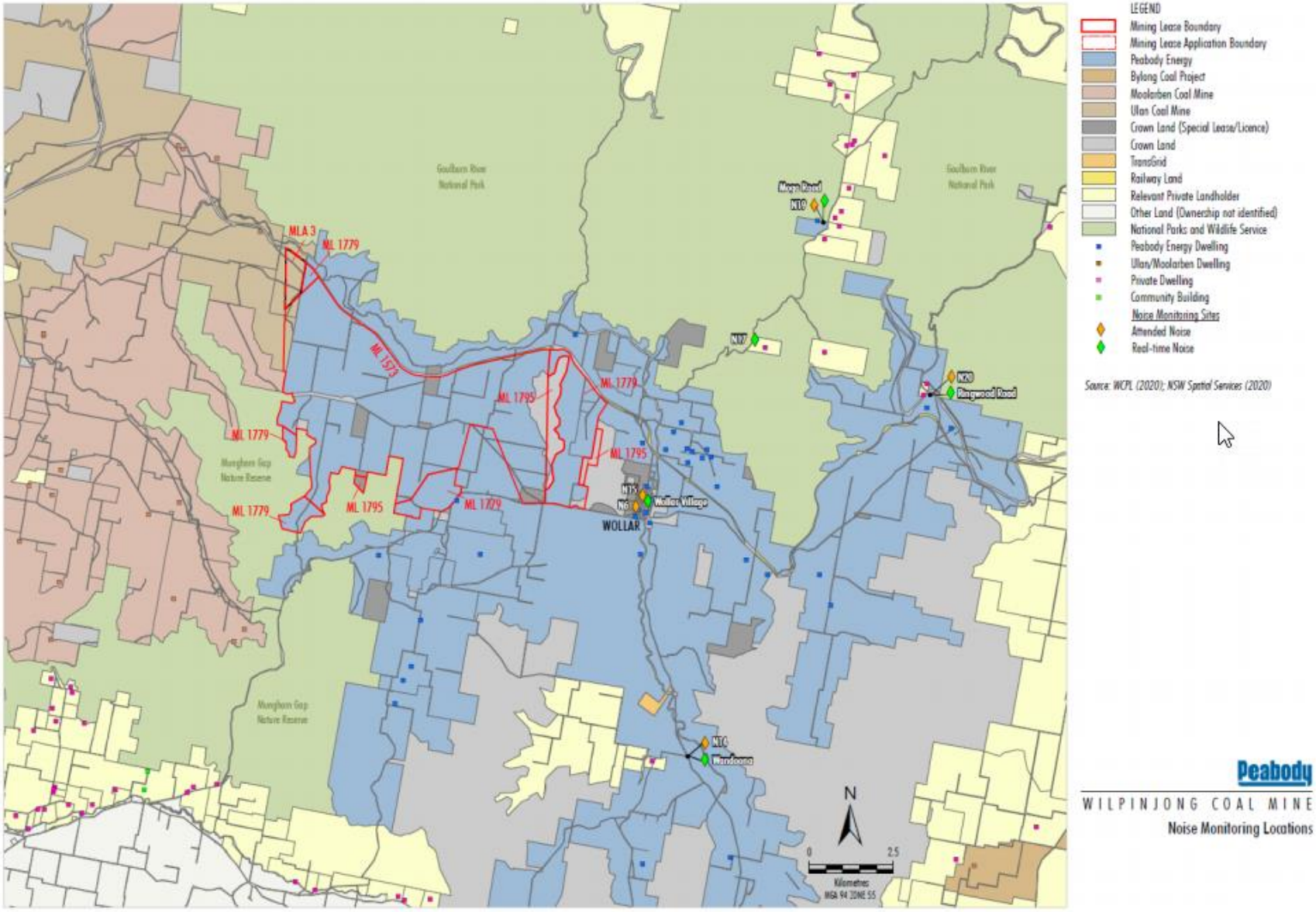

Figure 1.1 **Attended noise monitoring locations**

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in June 2021. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	00701424	01/06/2025	IEC 61672-1:2002
Pulsar 106 acoustic calibrator	81334	21/06/2025	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – June 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	18/06/2024 22:47	45	33	30	27	27	24	22
N14	18/06/2024 23:45	46	38	31	29	27	25	22
N15	18/06/2024 23:15	37	33	31	28	28	26	23
N17	18/06/2024 22:22	44	38	35	32	31	29	25
N19	18/06/2024 22:00	43	28	24	23	22	20	18
N20	19/06/2024 00:15	43	34	29	26	23	21	20

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - June 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	18/06/2024 22:47	-	-	41	38	36	37	40	34	34	36	33	30
N14	18/06/2024 23:45	-	-	41	39	40	38	40	36	36	38	34	28
N15	18/06/2024 23:15	-	47	41	40	40	38	39	34	36	38	34	31
N17	18/06/2024 22:22	-	-	41	39	44	42	42	38	41	40	38	35
N19	18/06/2024 22:00	-	-	-	36	33	30	28	27	28	28	23	20
N20	19/06/2024 00:15	-	47	41	37	38	36	36	33	33	34	33	26

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – June 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	18/06/2024 22:47	3	<0.5	-	0
N14	18/06/2024 23:45	3	<0.5	-	0
N15	18/06/2024 23:15	2	<0.5	-	0
N17	18/06/2024 22:22	5	<0.5	-	0
N19	18/06/2024 22:00	8	0.8	280	0
N20	19/06/2024 00:15	1	0.9	270	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – June 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	18/06/2024 22:47	1.5	222	E	Yes	37	45	27	35	Nil	Nil
N14	18/06/2024 23:45	0.8	250	E	Yes	35	45	<20	<20	Nil	Nil
N15	18/06/2024 23:15	0.9	296	E	Yes	37	45	28	37	Nil	Nil
N17	18/06/2024 22:22	1.9	229	F	Yes	38	45	32	44	Nil	Nil
N19	18/06/2024 22:00	1.9	224	F	Yes	35	45	<20	<20	Nil	Nil
N20	19/06/2024 00:15	0.0	-	F	Yes	35	45	<25	35	Nil	Nil

Notes:
1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 0.
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

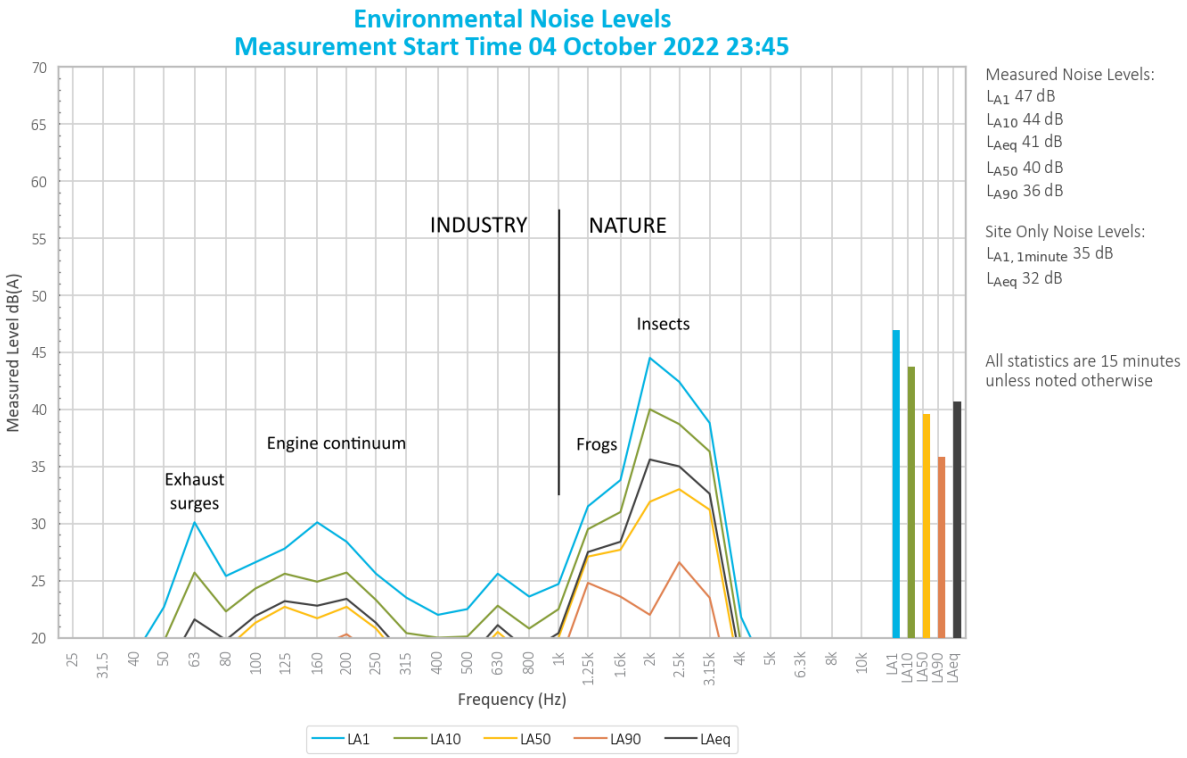

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

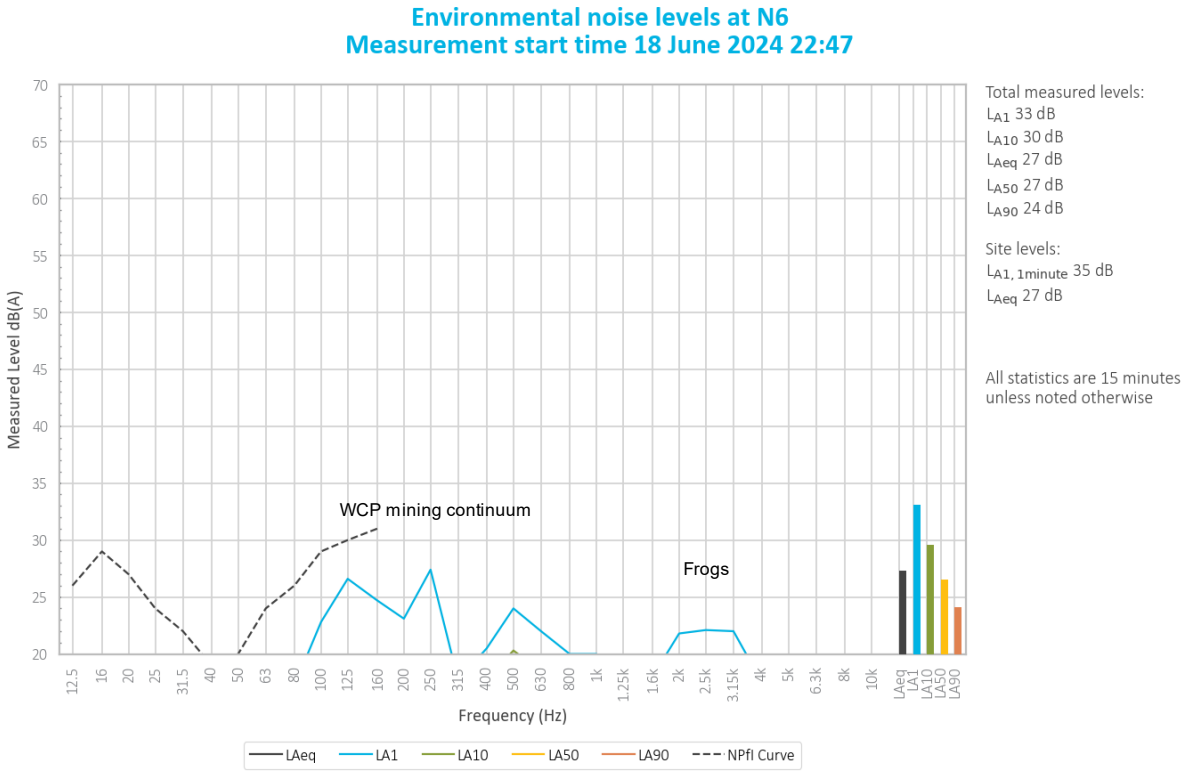

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 27 dB. Engine surges generated a site only $L_{A1,1minute}$ of 35 dB. Track noise was also noted.

Continuum from WCP generated total measured levels.

Noise from dogs and frogs was also noted.

5.3 N14

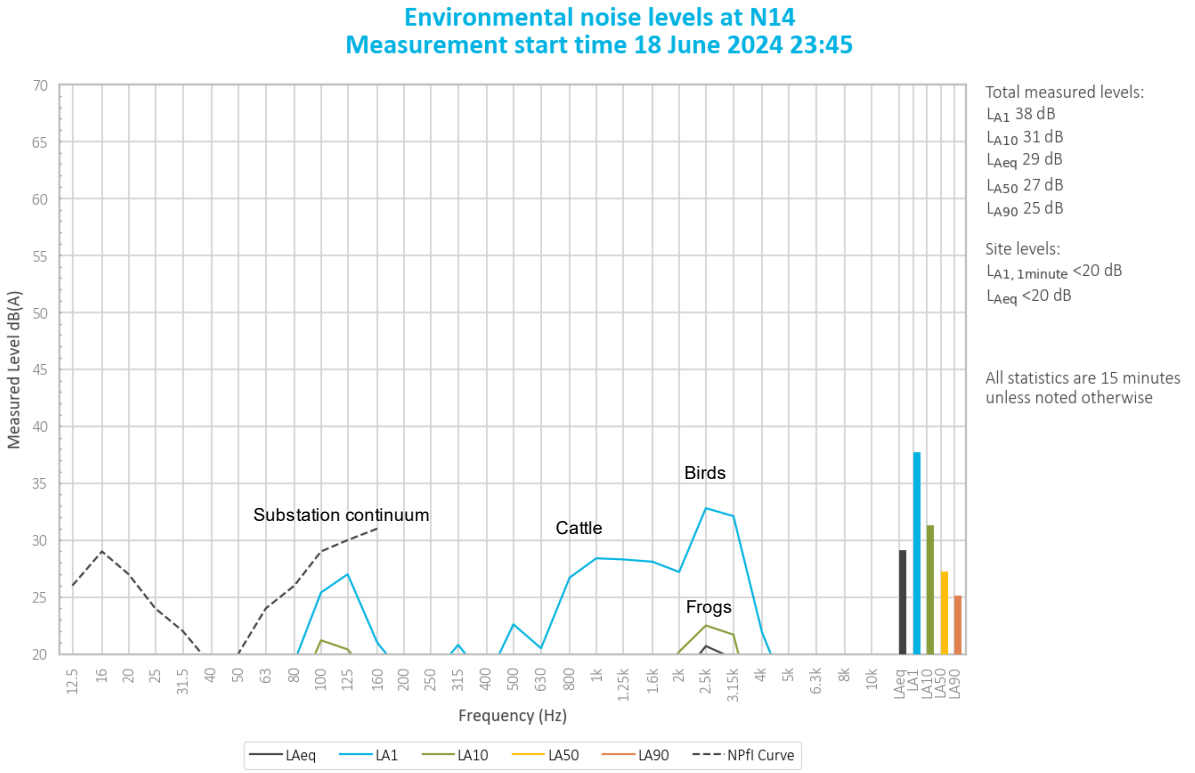

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Frogs and continuum from a nearby substation primarily generated total measured levels. Birds generated the measured L_{A1}.

Noise from cattle was also noted.

5.4 N15

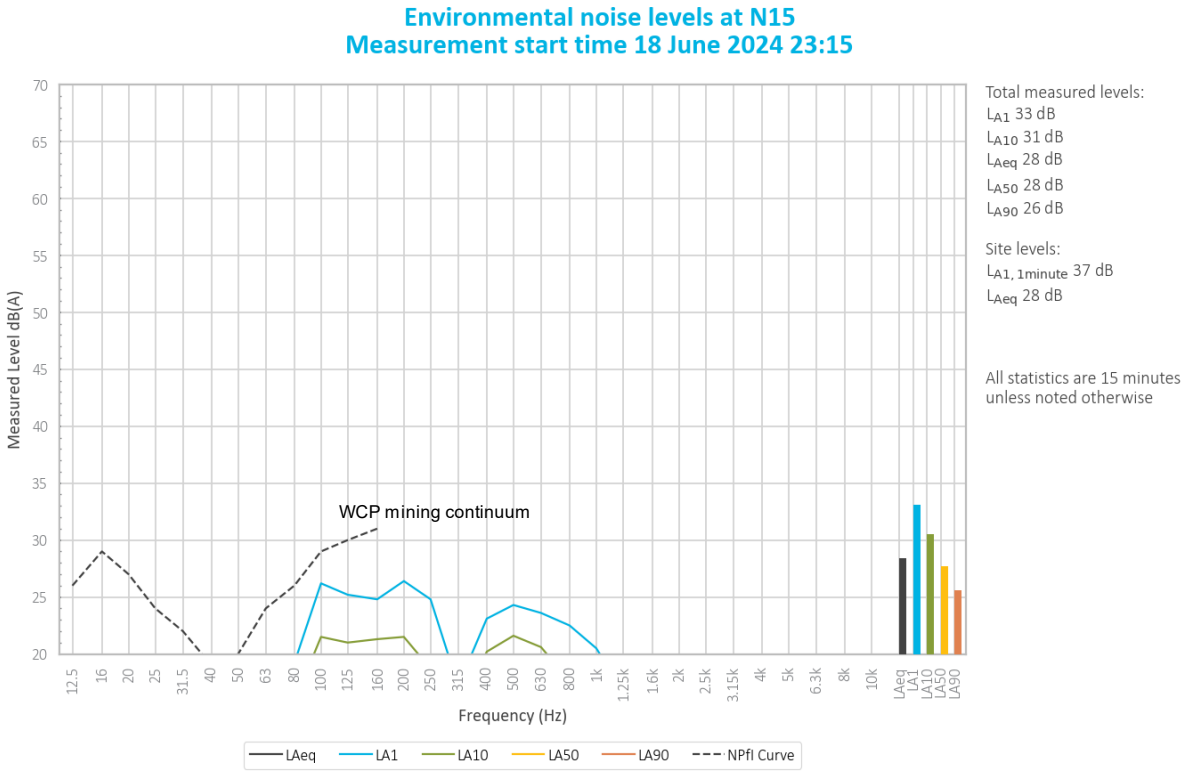

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 28 dB. Surges in this continuum generated a site only $L_{A1,1minute}$ of 37 dB.

Continuum from WCP generated total measured levels.

Noise from cattle was also noted at low levels.

5.5 N17

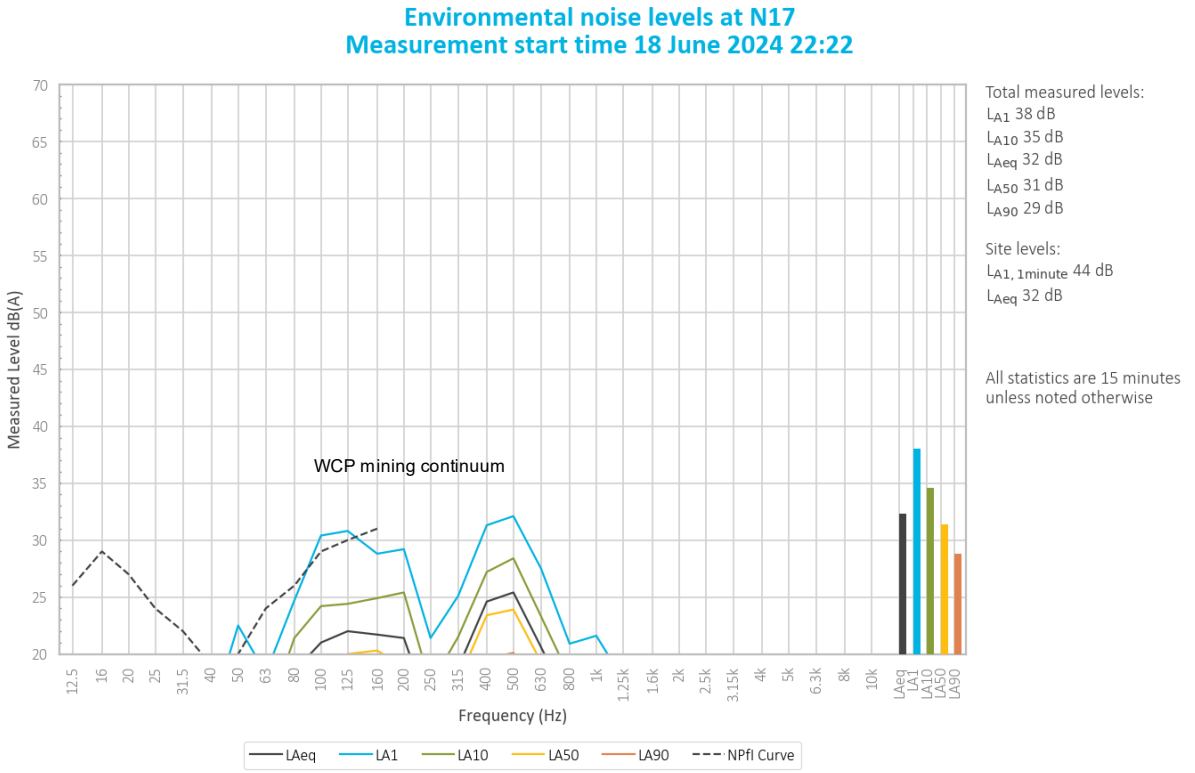

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 32 dB. Engine surges generated a site only $L_{A1,1minute}$ of 44 dB. Horn and track noise was also noted.

Continuum from WCP generated total measured levels.

Noise from frogs was also noted at low levels.

5.6 N19

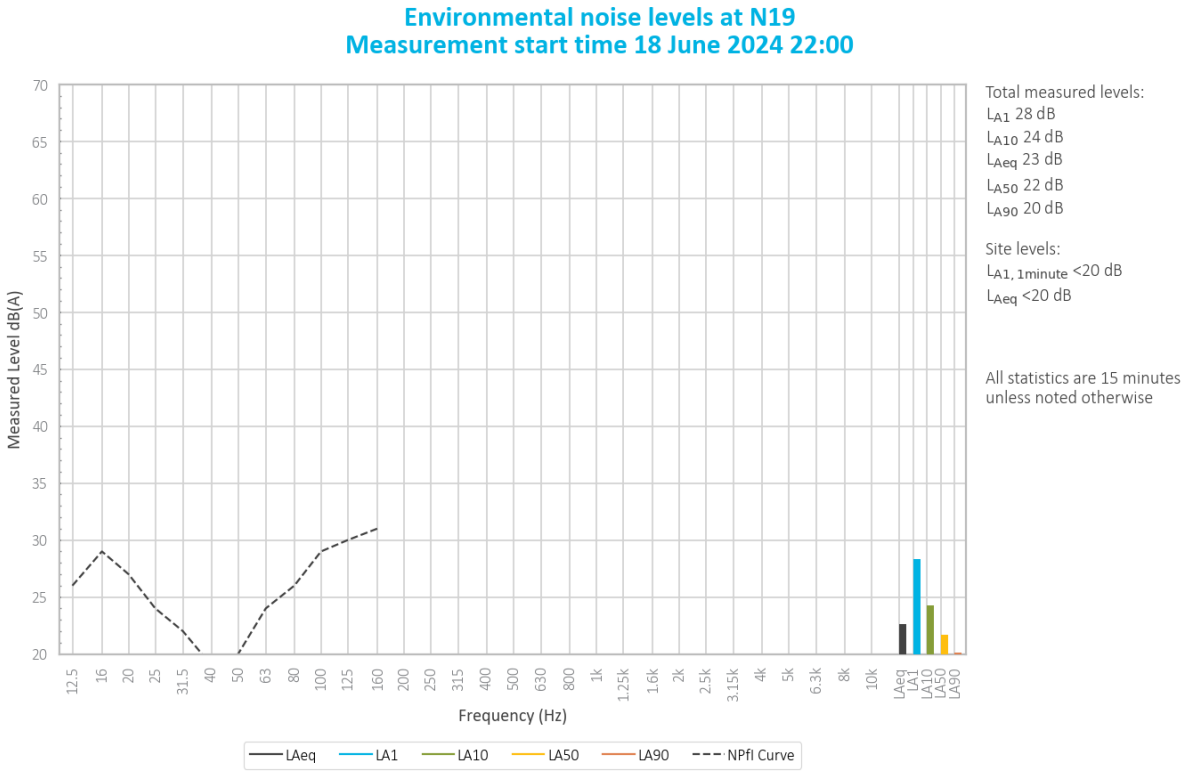

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Frogs were primarily responsible for total measured levels. A breeze in nearby foliage contributed to the measured L_{A50} and L_{A90}.

5.7 N20

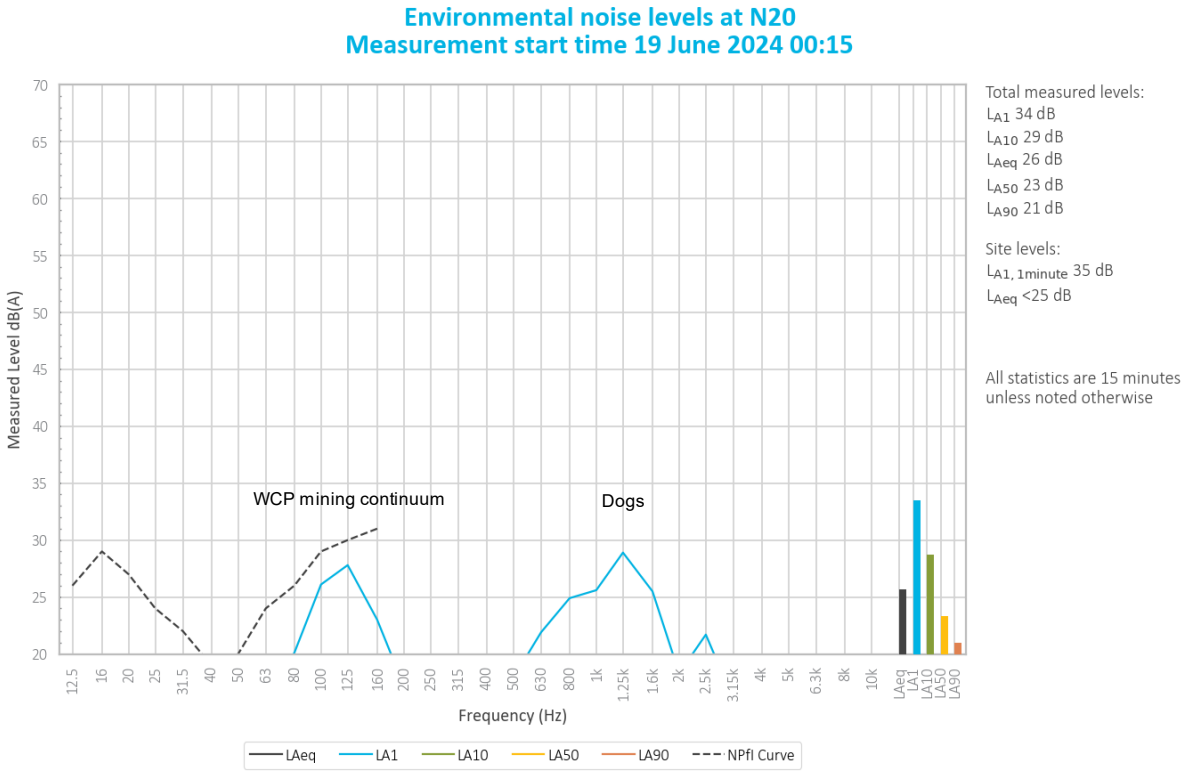

Figure 5.7 Environmental noise levels N20, Ringwood Road

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of less than 25 dB. Engine surges generated a site only $L_{A1,1minute}$ of 35 dB.

WCP surges and dogs generated the measured L_{A1} and L_{A10}. Continuum from WCP and frogs contributed to the measured L_{Aeq}, L_{A50} and L_{A90}.

Noise from a nearby pump was noted.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 18 June 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the June 2024 survey.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

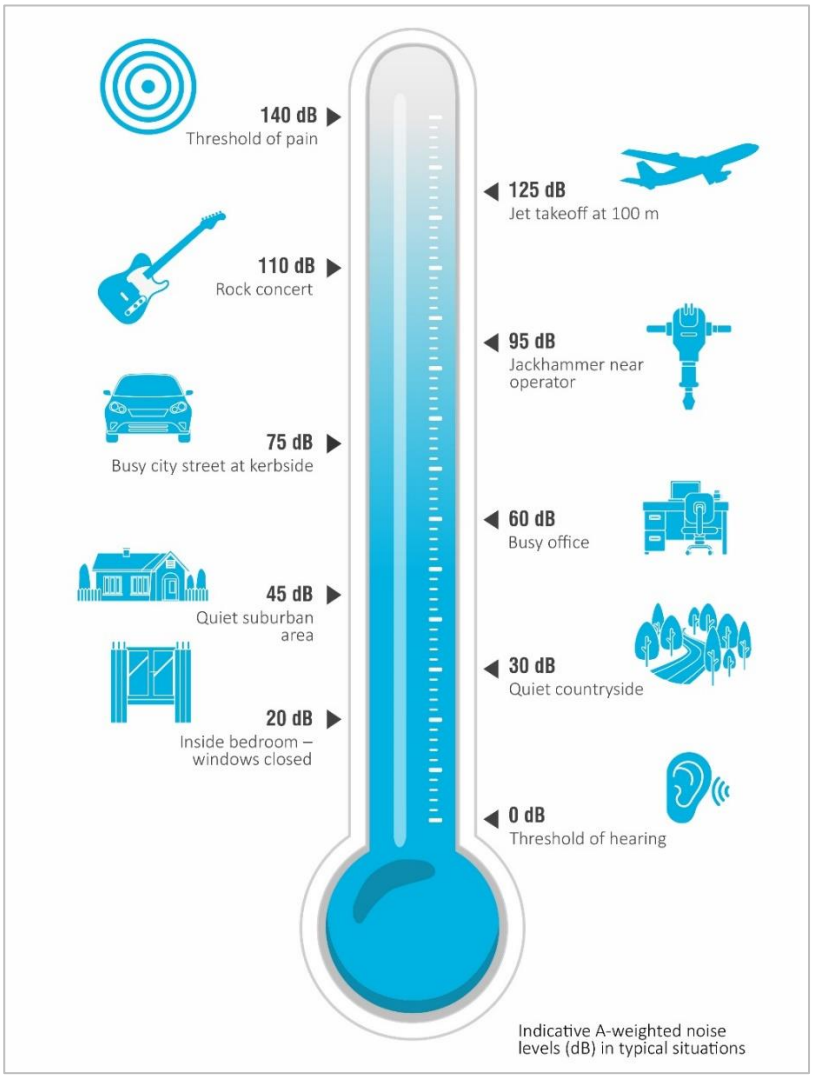

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

B.3 Noise management plan

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPIE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[4]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[4]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPIE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Wandoona may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians.

The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7**, **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5**, WCPL will report both results to DPIE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

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C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23317

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	NA-28
Instrument Serial Number :	00701424
Microphone Serial Number :	01916
Pre-amplifier Serial Number :	01463
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	24°C	**Ambient Temperature :**	22.6°C
Relative Humidity :	46%	**Relative Humidity :**	46.6%
Barometric Pressure :	100.6kPa	**Barometric Pressure :**	100.6kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dylan Selge
Calibration Date :	1 Jun 2023	**Report Issue Date :**	2 Jun 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C23389

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Pulsar Model 106
Instrument Serial Number :	81334

Atmospheric Conditions

Ambient Temperature :	22.6°C
Relative Humidity :	35.5%
Barometric Pressure :	101.43kPa

Calibration Technician :	Shaheen Boaz	**Secondary Check:**	Dhanush Bonu
Calibration Date :	21 Jun 2023	**Report Issue Date :**	21 Jun 2023

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.18	1000.30

The sound calibrator has been shown to conform to the class 2 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10dB*	*Temperature*	*±0.1°C*
Frequency	*±0.07%*	*Relative Humidity*	*±1.9%*
Distortion	*±0.20%*	*Barometric Pressure*	*±0.014kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

July 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP7

July 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	01/08/2024	Will Moore	Amanda Buckeridge	Final

Approved by

Amanda Buckeridge
Associate Acoustic Consultant
1 August 2024

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TABLE OF CONTENTS

Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 23 July 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

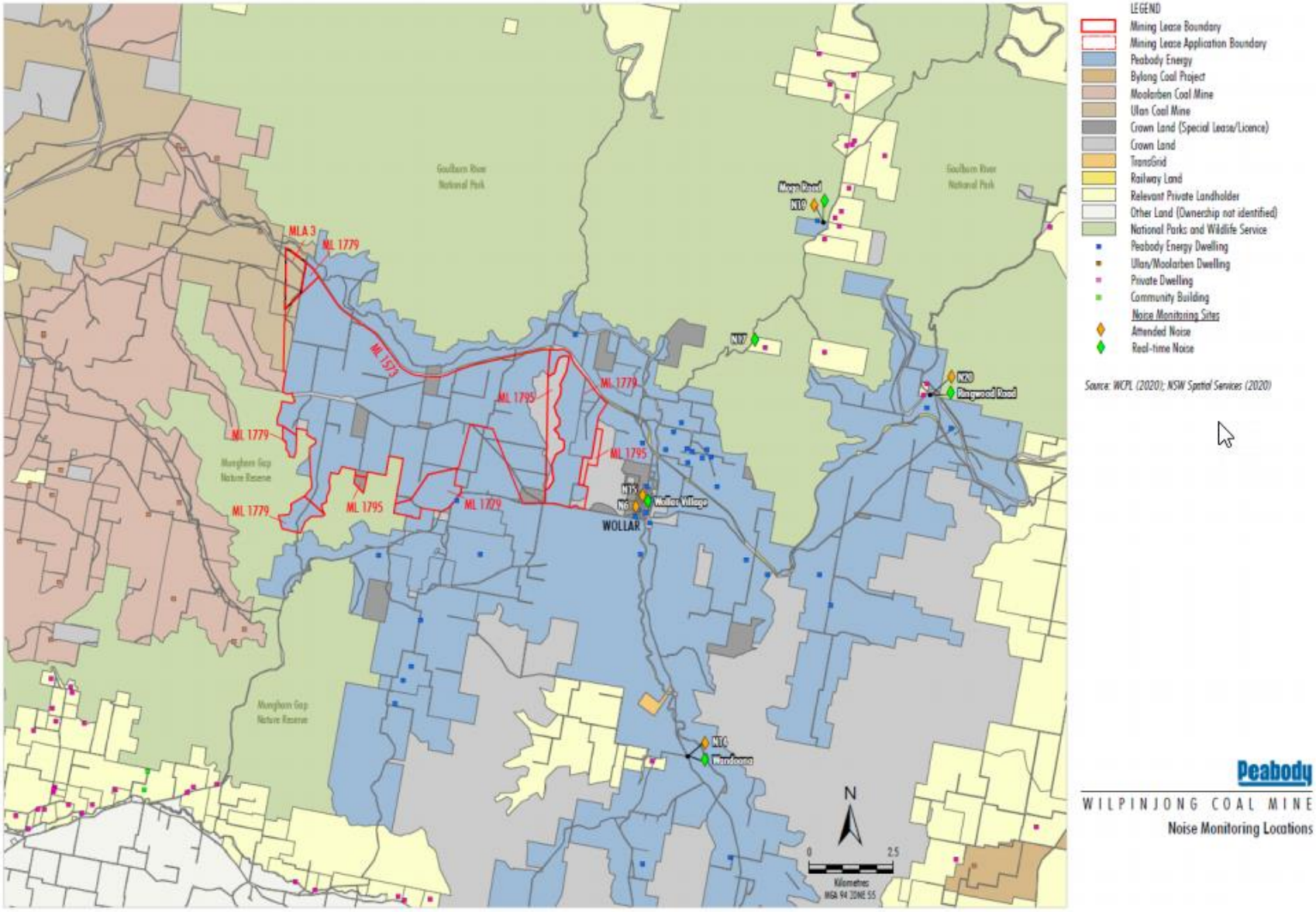

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version of the NMP was approved in June 2021. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	00701424	01/06/2025	IEC 61672-1:2002
Pulsar 105 acoustic calibrator	78226	26/02/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – July 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	23/07/2024 22:47	49	35	30	29	28	27	25
N14	23/07/2024 23:45	48	41	38	34	33	25	22
N15	23/07/2024 23:15	40	34	31	29	29	27	25
N17	23/07/2024 22:22	39	33	28	26	25	23	21
N19	23/07/2024 22:00	43	30	21	22	18	16	15
N20	24/07/2024 00:15	57	36	34	30	27	22	20

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - July 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	23/07/2024 22:47	-	-	-	36	33	39	37	38	37	33	31	28
N14	23/07/2024 23:45	-	47	41	37	35	33	42	31	31	31	26	24
N15	23/07/2024 23:15	-	-	-	37	35	37	43	37	38	35	31	29
N17	23/07/2024 22:22	-	-	-	36	37	35	37	31	32	32	28	26
N19	23/07/2024 22:00	-	-	-	-	30	27	27	25	23	21	15	13
N20	24/07/2024 00:15	-	-	42	37	34	36	37	36	37	40	37	33

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – July 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	23/07/2024 22:47	2	<0.5	-	0
N14	23/07/2024 23:45	4	0.7	350	0
N15	23/07/2024 23:15	2	<0.5	-	0
N17	23/07/2024 22:22	5	<0.5	-	0
N19	23/07/2024 22:00	6	<0.5	-	0
N20	24/07/2024 00:15	1	0.9	270	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – July 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	23/07/2024 22:47	0.0	-	F	Yes	37	45	26	41	Nil	Nil
N14	23/07/2024 23:45	0.0	-	F	Yes	35	45	<25	<25	Nil	Nil
N15	23/07/2024 23:15	0.0	-	F	Yes	37	45	29	40	Nil	Nil
N17	23/07/2024 22:22	0.0	-	F	Yes	38	45	26	34	Nil	Nil
N19	23/07/2024 22:00	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil
N20	24/07/2024 00:15	0.0	-	F	Yes	35	45	IA	IA	Nil	Nil

Notes: 1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 0.

2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.

3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.

4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

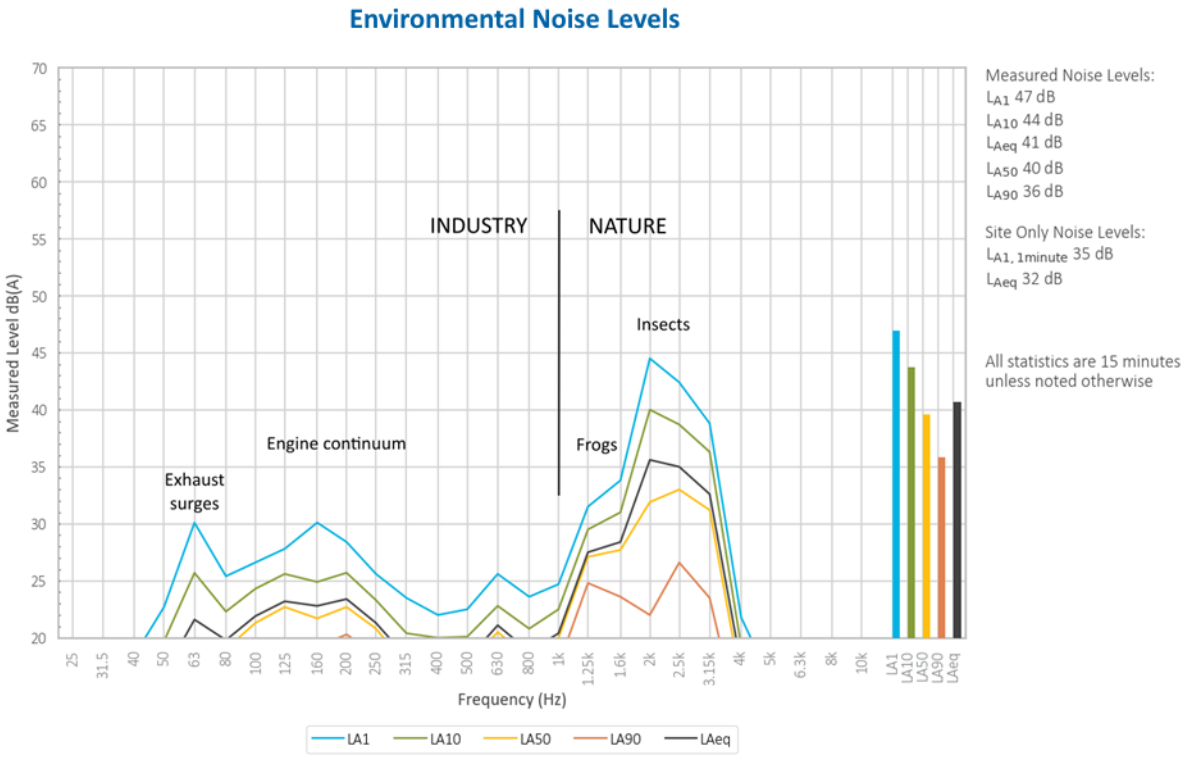

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

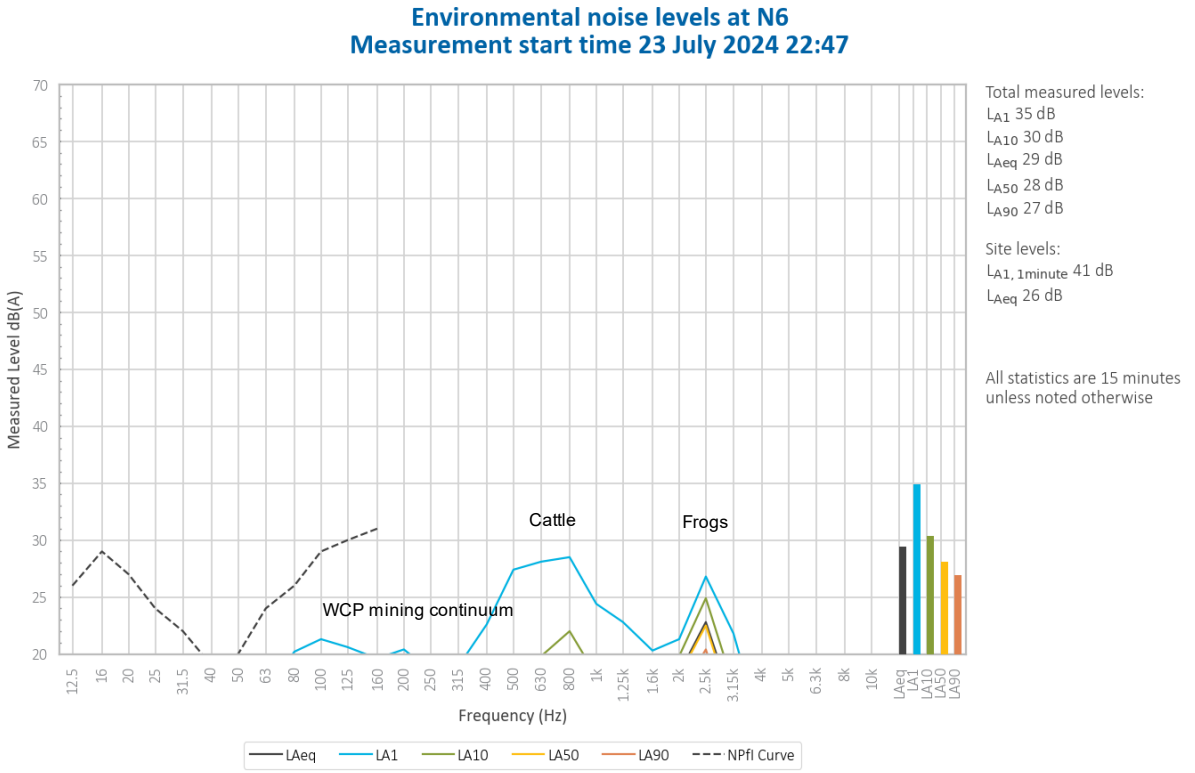

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 26 dB. Impact noise generated a site only $L_{A1,1minute}$ of 41 dB. Horn noise was also noted.

Frogs primarily generated total measured levels. Cattle generated the measured L_{A1}.

5.3 N14

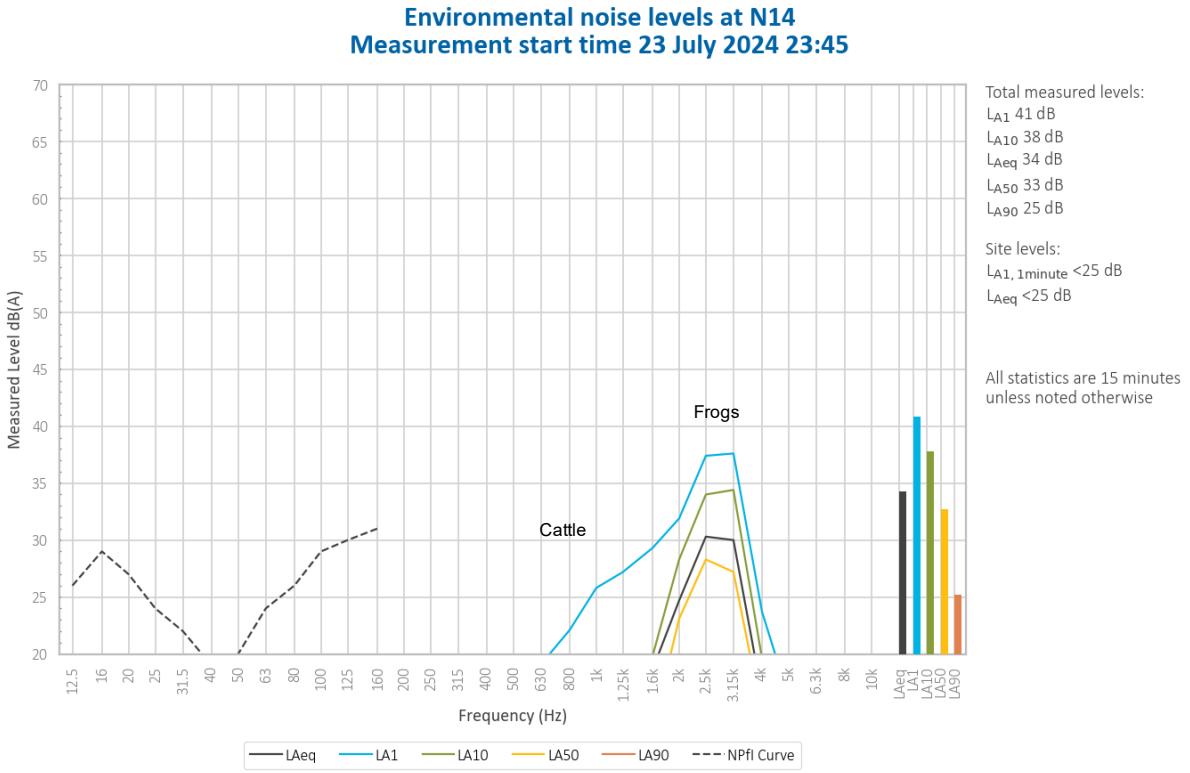

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 25 dB.

Frogs generated total measured levels.

Continuum from a nearby substation and noise from cattle was also noted.

5.4 N15

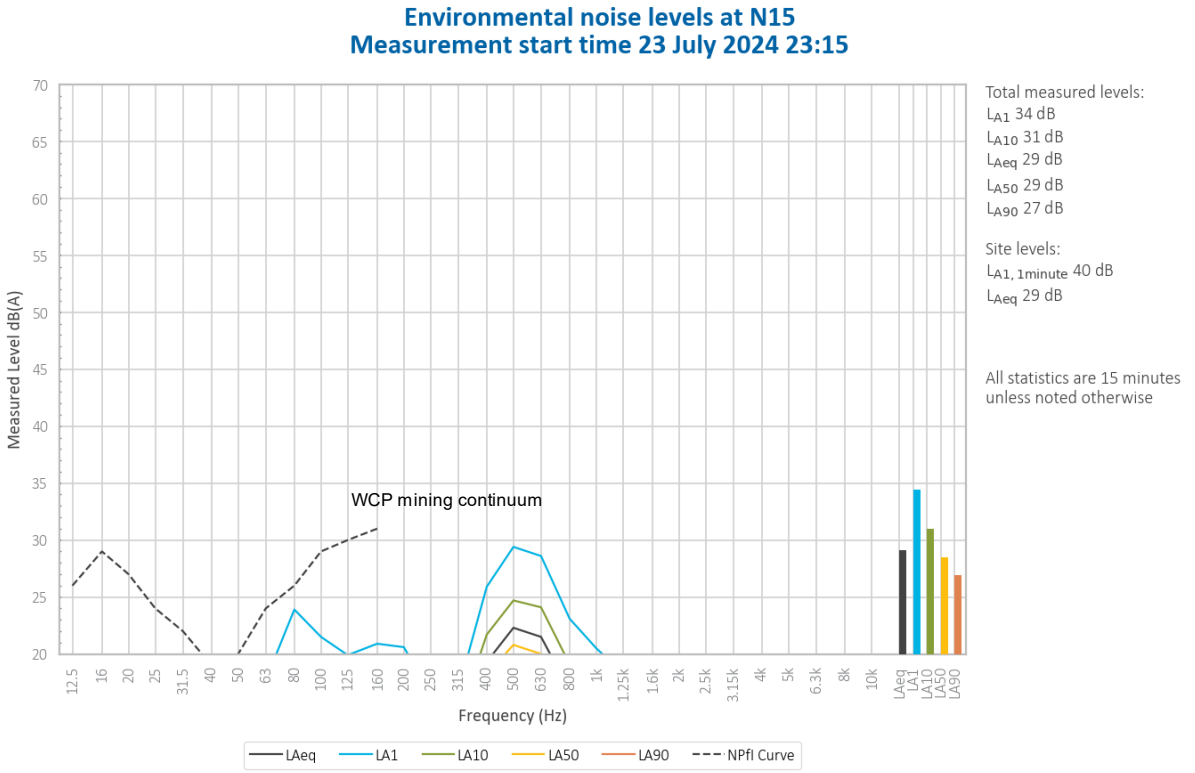

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 29 dB. Impact noise generated a site only $L_{A1,1minute}$ of 40 dB. Horn noise was also noted.

Continuum from WCP generated total measured levels.

Noise from cattle and frogs was also noted at low levels.

5.5 N17

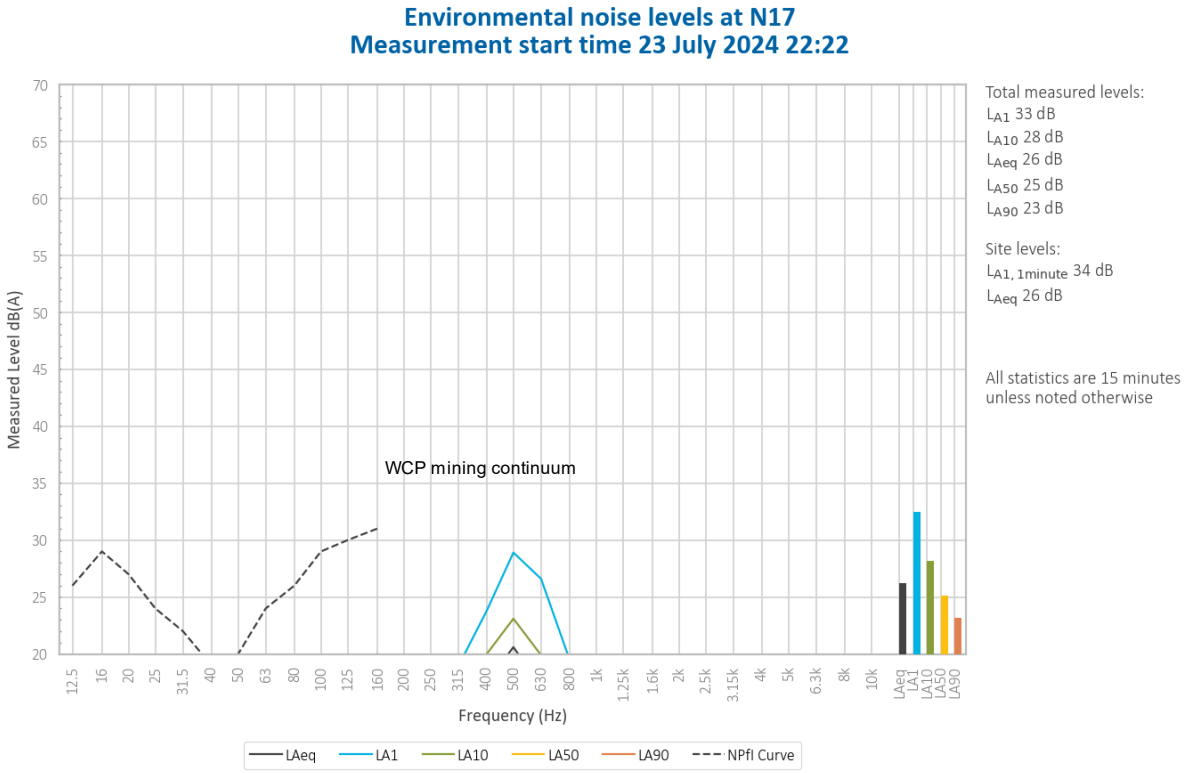

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 26 dB. Engine surges generated a site only $L_{A1,1minute}$ of 34 dB. Track noise was also noted.

Continuum from WCP generated total measured levels.

5.6 N19

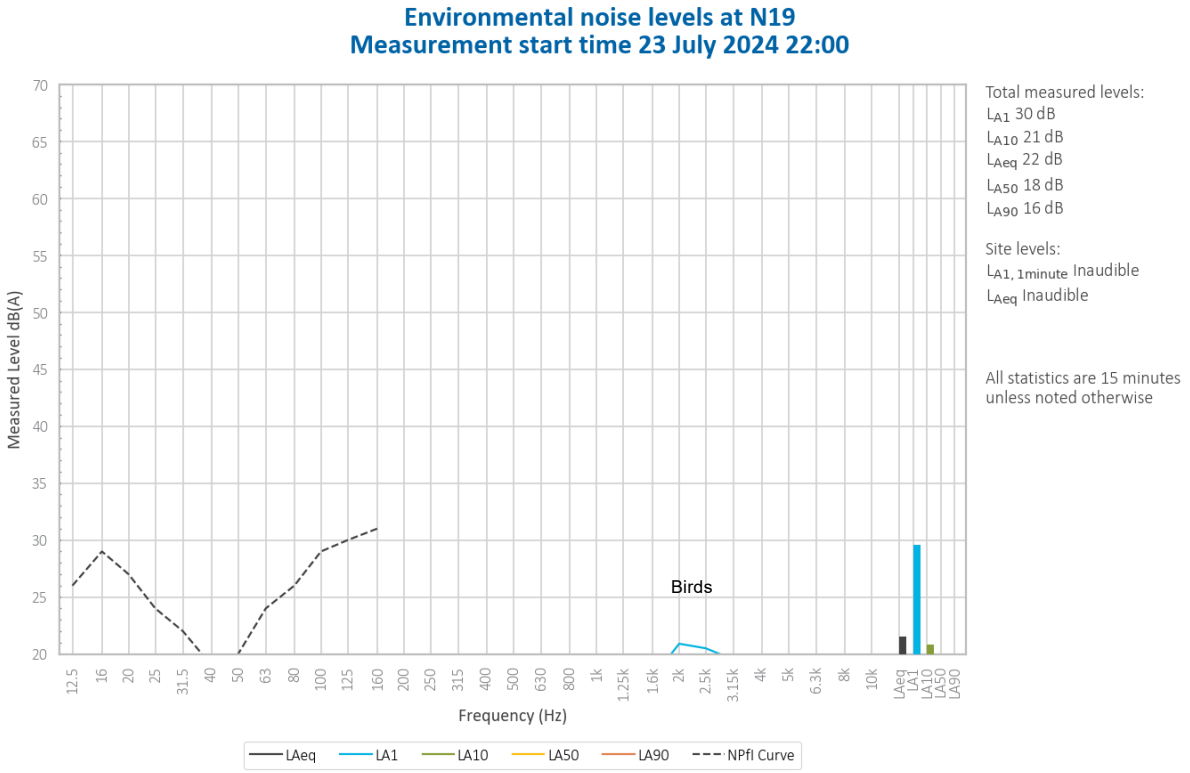

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

Frogs were primarily responsible for total measured levels. Birds generated the measured L_{A1}.

Noise from an aeroplane and a train was also noted at low levels.

5.7 N20

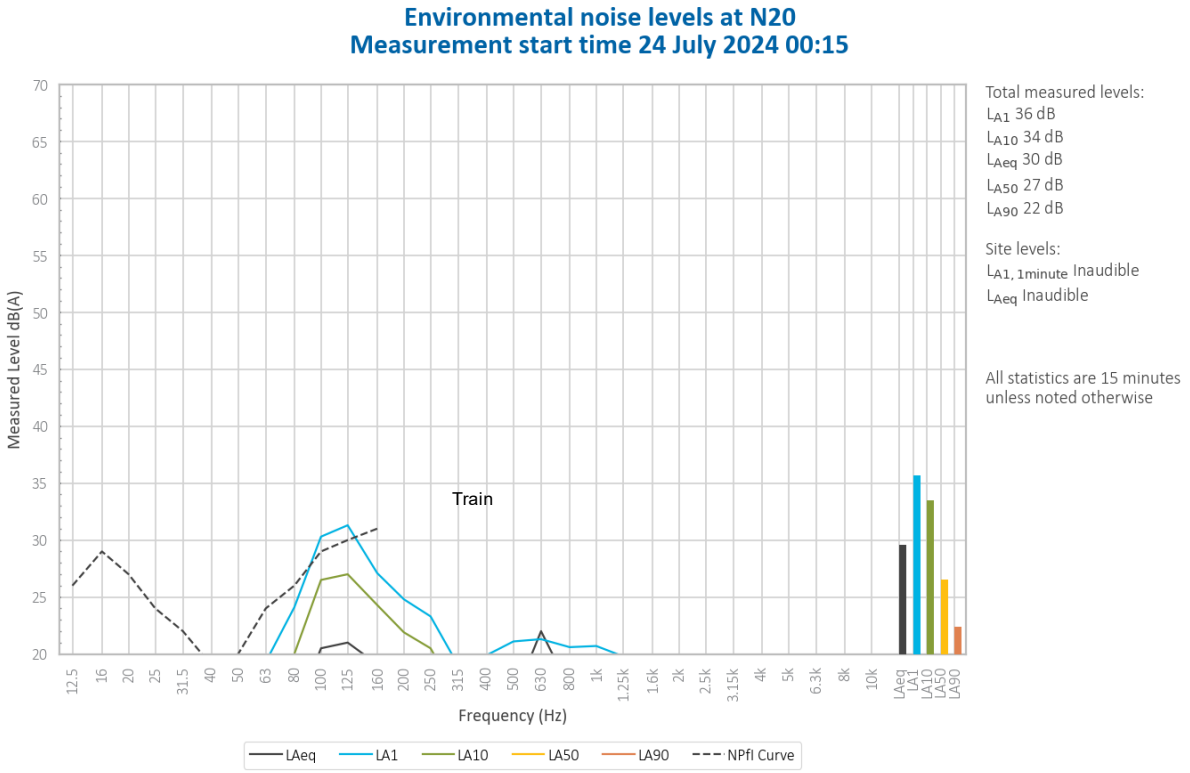

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

A train was audible throughout the measurement and generated total measured levels.

Noise from cattle, frogs and the nearby river was also noted at low levels.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 23 July 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the July 2024 survey.

Appendix A
Noise perception and examples

EMM
creating opportunities

A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

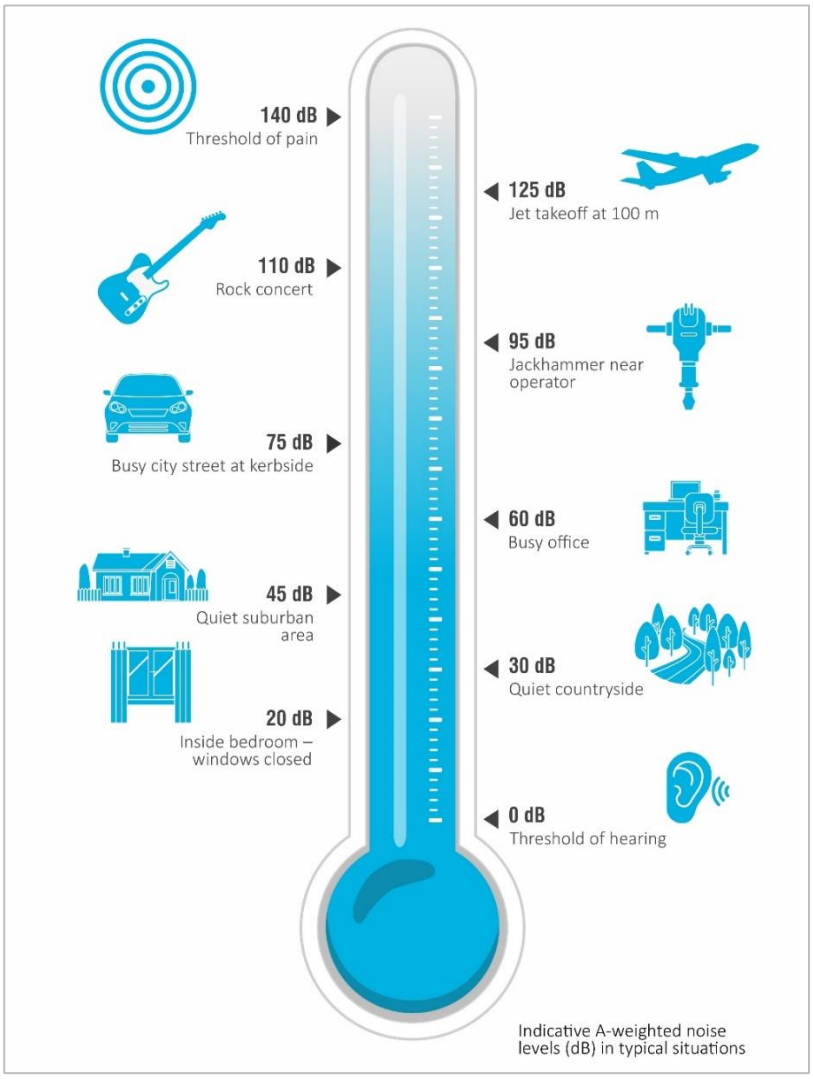

Figure A.1 Common noise levels

Appendix B
Regulator documents

EMM
creating opportunities

B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

B.3 Noise management plan

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPIE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[4]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[4]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPIE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPIE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Wandoona may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians.

The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7**, **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5**, WCPL will report both results to DPIE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23317

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	NA-28
Instrument Serial Number :	00701424
Microphone Serial Number :	01916
Pre-amplifier Serial Number :	01463
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	24°C	**Ambient Temperature :**	22.6°C
Relative Humidity :	46%	**Relative Humidity :**	46.6%
Barometric Pressure :	100.6kPa	**Barometric Pressure :**	100.6kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dylan Selge
Calibration Date :	1 Jun 2023	**Report Issue Date :**	2 Jun 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Sound Calibrator
IEC 60942:2017
Calibration Certificate

Calibration Number C24155

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Model 105
Instrument Serial Number :	78226

Atmospheric Conditions

Ambient Temperature :	25.3 °C
Relative Humidity :	53.6 %
Barometric Pressure :	100.41 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	26 Feb 2024	**Report Issue Date :**	26 Feb 2024

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.03	1000.30

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.11 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

August 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP8

August 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	28/08/2024	Will Moore	Amanda Buckeridge	Final

Approved by

Amanda Buckeridge
Associate Acoustic Consultant
28 August 2024

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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 19 August 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

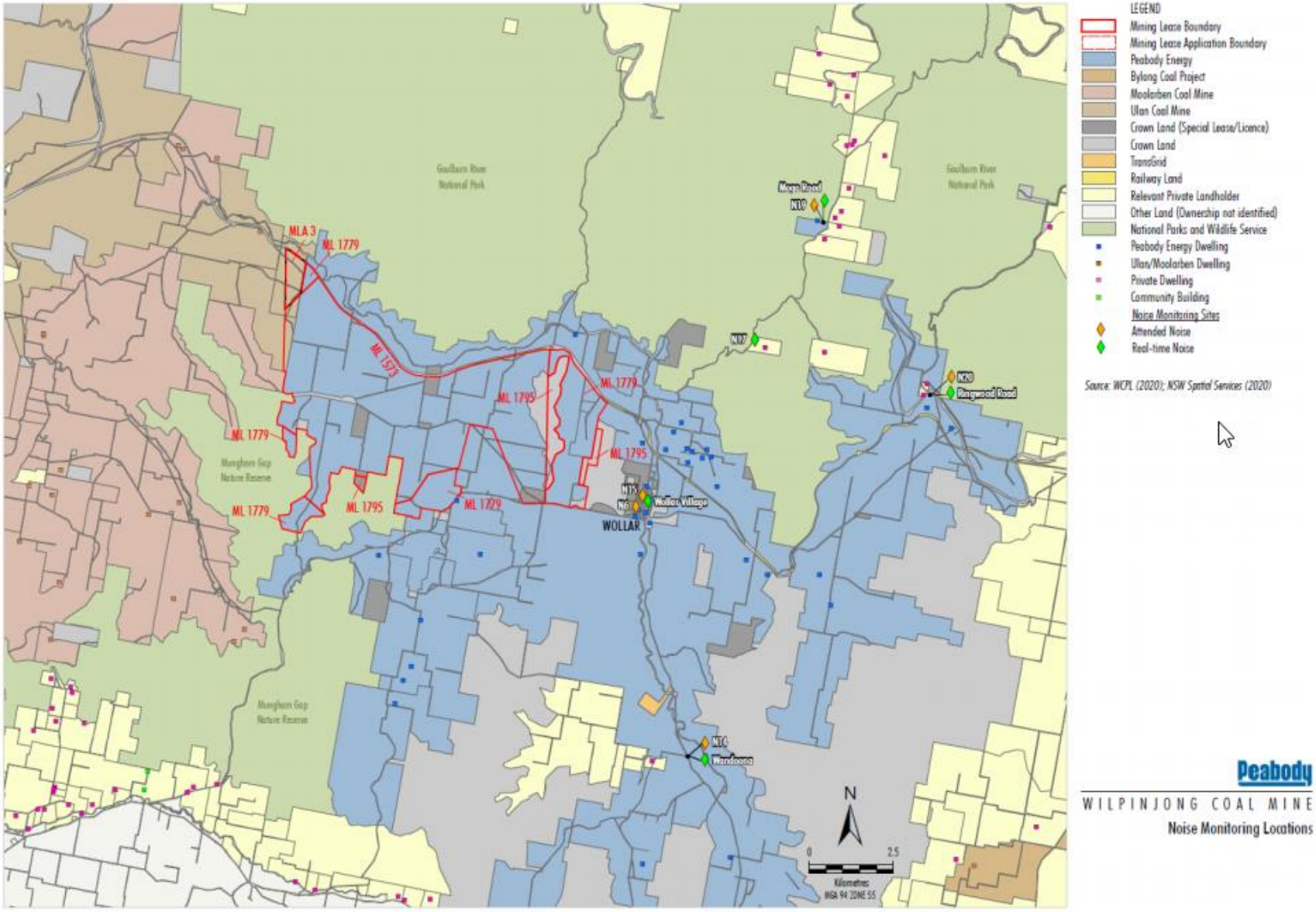

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version (Version 8) of the NMP was approved in January 2023. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	00701424	01/06/2025	IEC 61672-1:2002
Pulsar 105 acoustic calibrator	78226	26/02/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – August 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	19/08/2024 22:47	48	41	39	37	36	34	32
N14	19/08/2024 23:45	56	53	52	50	49	47	42
N15	19/08/2024 23:15	55	53	48	42	33	31	29
N17	19/08/2024 22:22	51	29	24	23	21	20	18
N19	19/08/2024 22:00	45	29	26	24	24	22	20
N20	20/08/2024 00:15	51	48	46	43	41	39	34

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - August 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	19/08/2024 22:47	-	47	42	43	35	36	35	36	37	35	33	29
N14	19/08/2024 23:45	-	47	43	43	42	41	45	39	39	39	34	30
N15	19/08/2024 23:15	54	50	57	55	57	51	49	48	44	42	42	43
N17	19/08/2024 22:22	-	-	-	38	33	30	27	24	24	23	21	17
N19	19/08/2024 22:00	-	-	-	37	32	30	28	27	25	20	17	15
N20	20/08/2024 00:15	-	-	41	41	34	34	33	31	31	30	27	22

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – August 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	19/08/2024 22:47	7	0.8	270	1
N14	19/08/2024 23:45	9	<0.5	-	0
N15	19/08/2024 23:15	10	<0.5	-	1
N17	19/08/2024 22:22	12	<0.5	-	1
N19	19/08/2024 22:00	12	<0.5	-	0
N20	20/08/2024 00:15	6	1.0	260	2

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – August 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	19/08/2024 22:47	0.9	89	E	Yes	37	45	IA	IA	Nil	Nil
N14	19/08/2024 23:45	0.0	-	F	Yes	35	45	<30	<30	Nil	Nil
N15	19/08/2024 23:15	0.0	-	E	Yes	37	45	IA	IA	Nil	Nil
N17	19/08/2024 22:22	1.1	42	E	Yes	38	45	<20	<20	Nil	Nil
N19	19/08/2024 22:00	0.9	37	E	Yes	35	45	IA	IA	Nil	Nil
N20	20/08/2024 00:15	0.7	43	F	Yes	35	45	IA	IA	Nil	Nil

Notes:
1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 0.
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

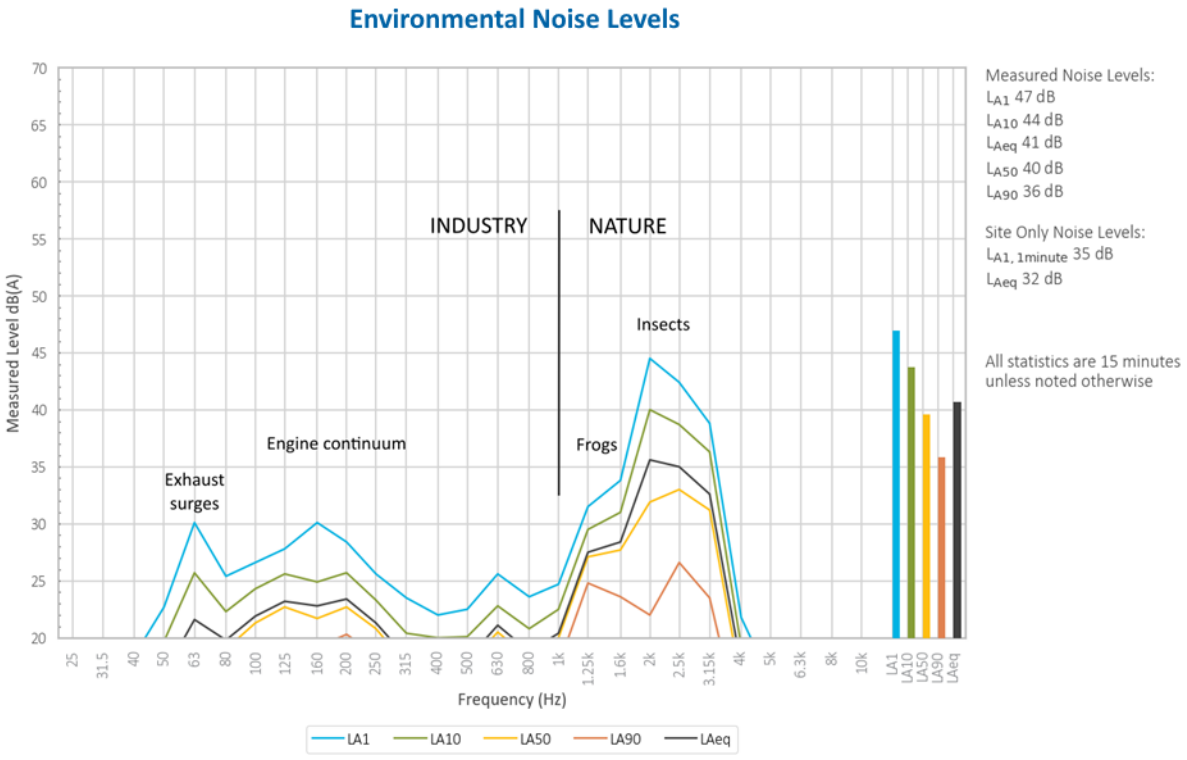

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

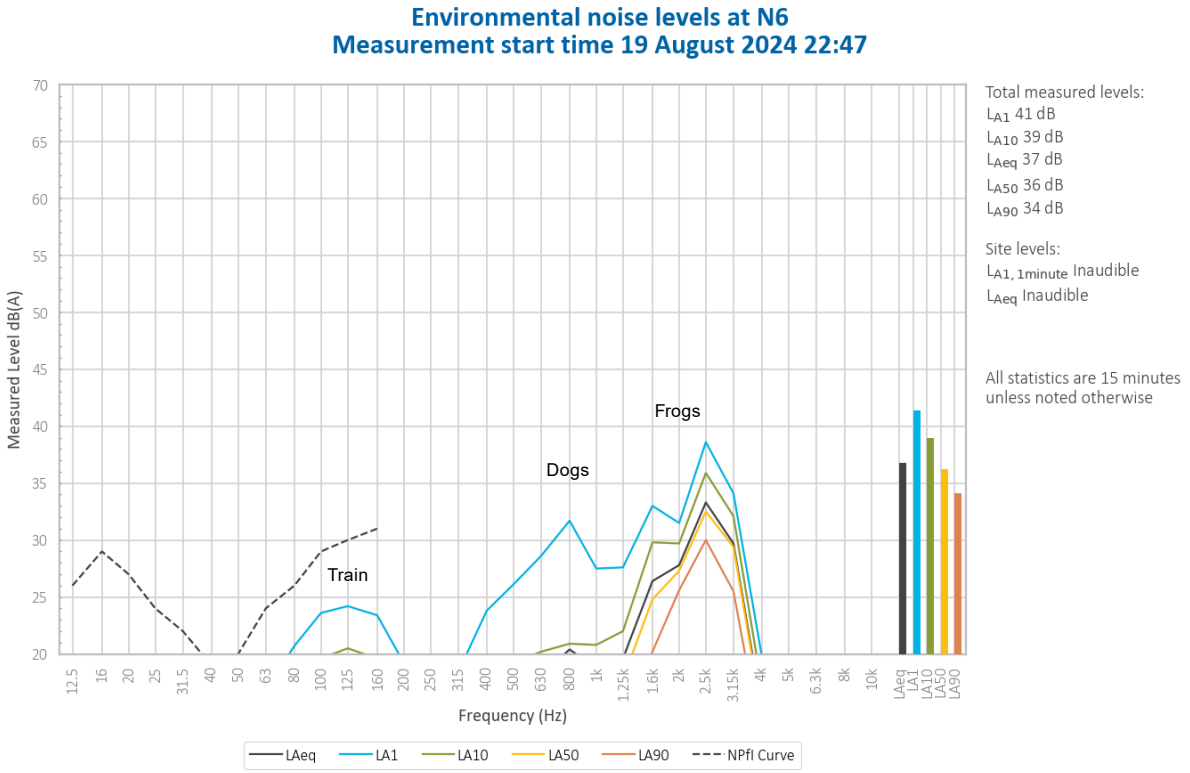

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

WCP was inaudible during the measurement.

Frogs generated total measured levels.

Noise from dogs, livestock and a train were also noted.

5.3 N14

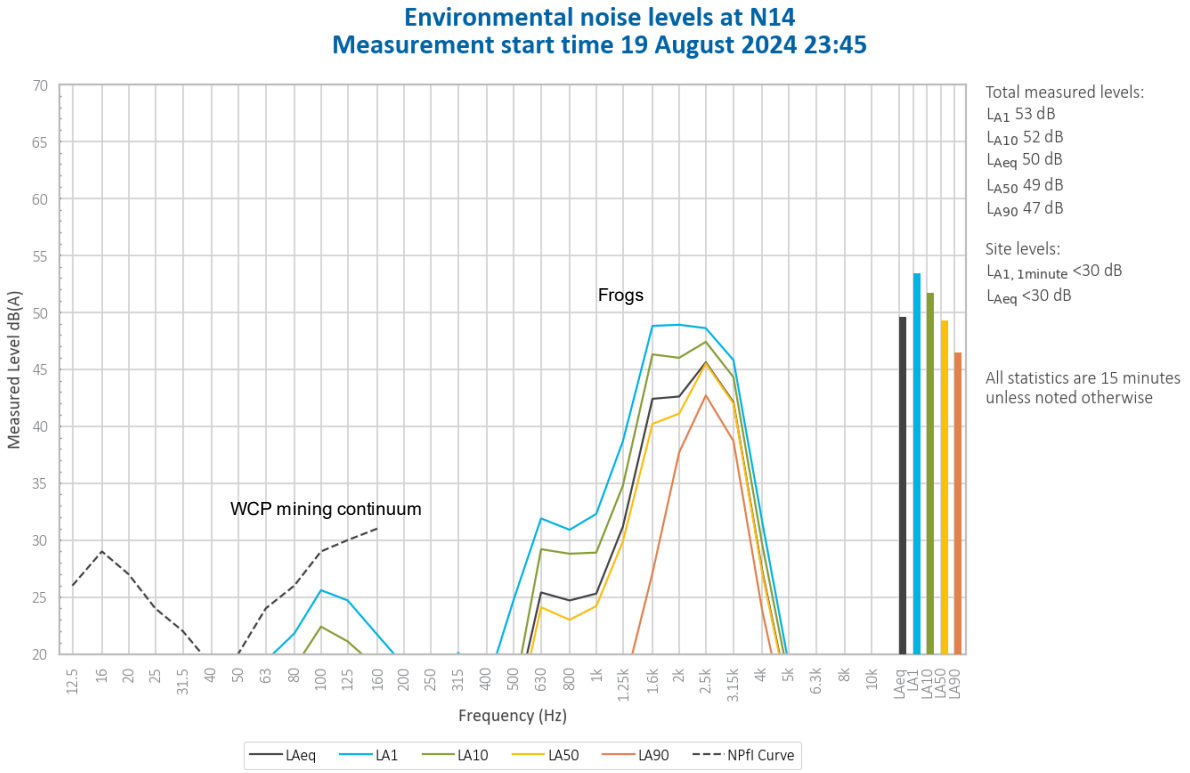

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 30 dB.

Frogs generated total measured levels.

5.4 N15

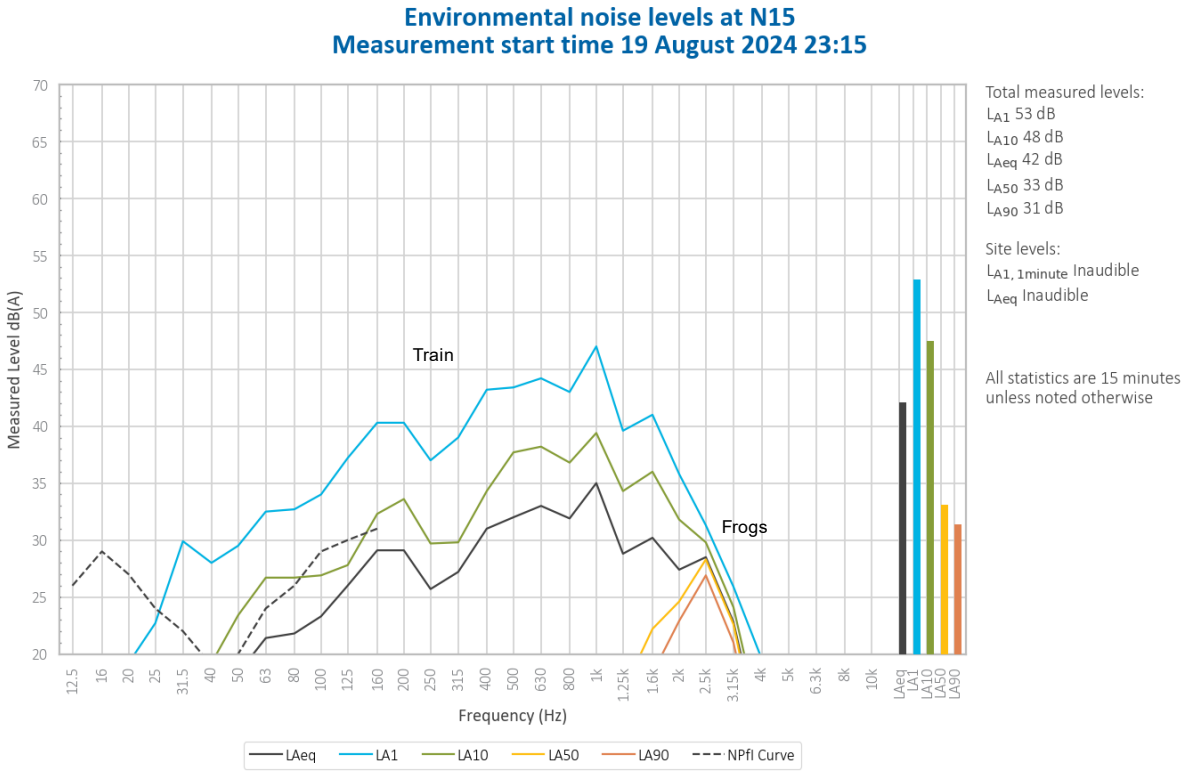

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

WCP was inaudible during the measurement.

A train generated the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs generated the measured L_{A50} and L_{A90}.

Noise from road traffic was also noted.

5.5 N17

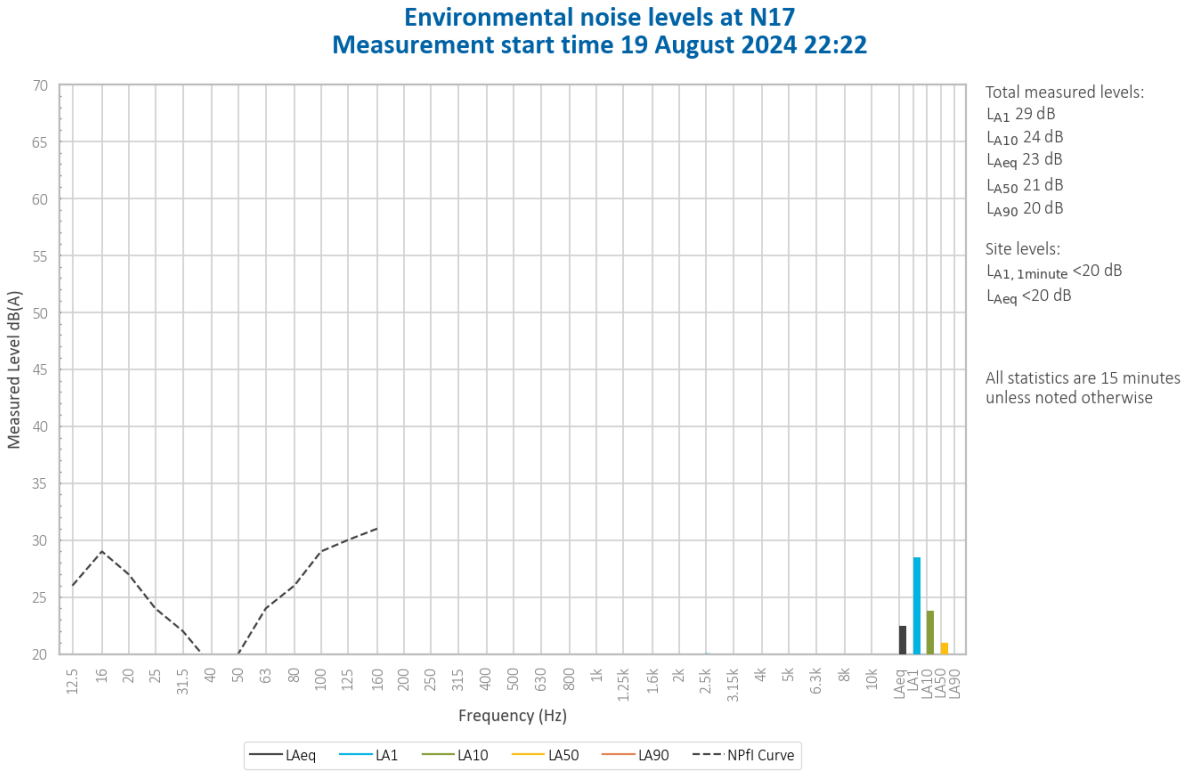

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Frogs generated total measured levels. Continuum from WCP contributed to the measured L_{A50} and L_{A90}.

5.6 N19

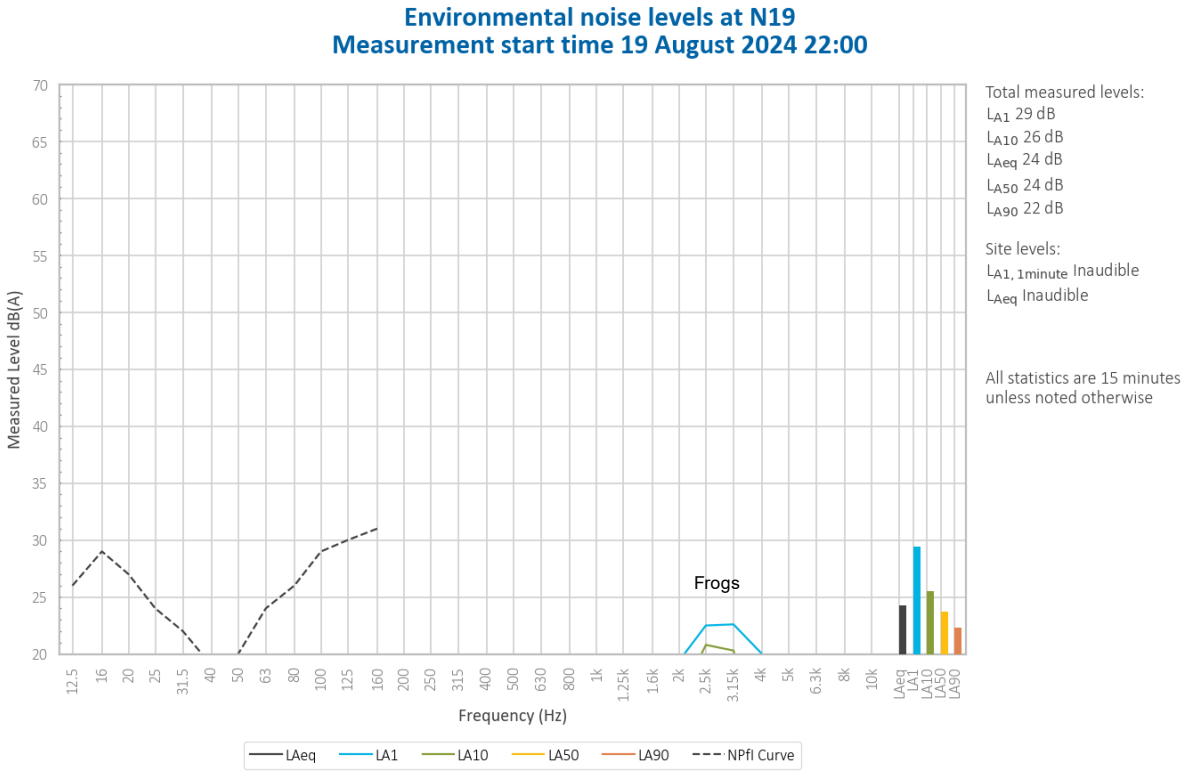

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

Frogs generated total measured levels.

Noise from an aeroplane was also noted at low levels.

5.7 N20

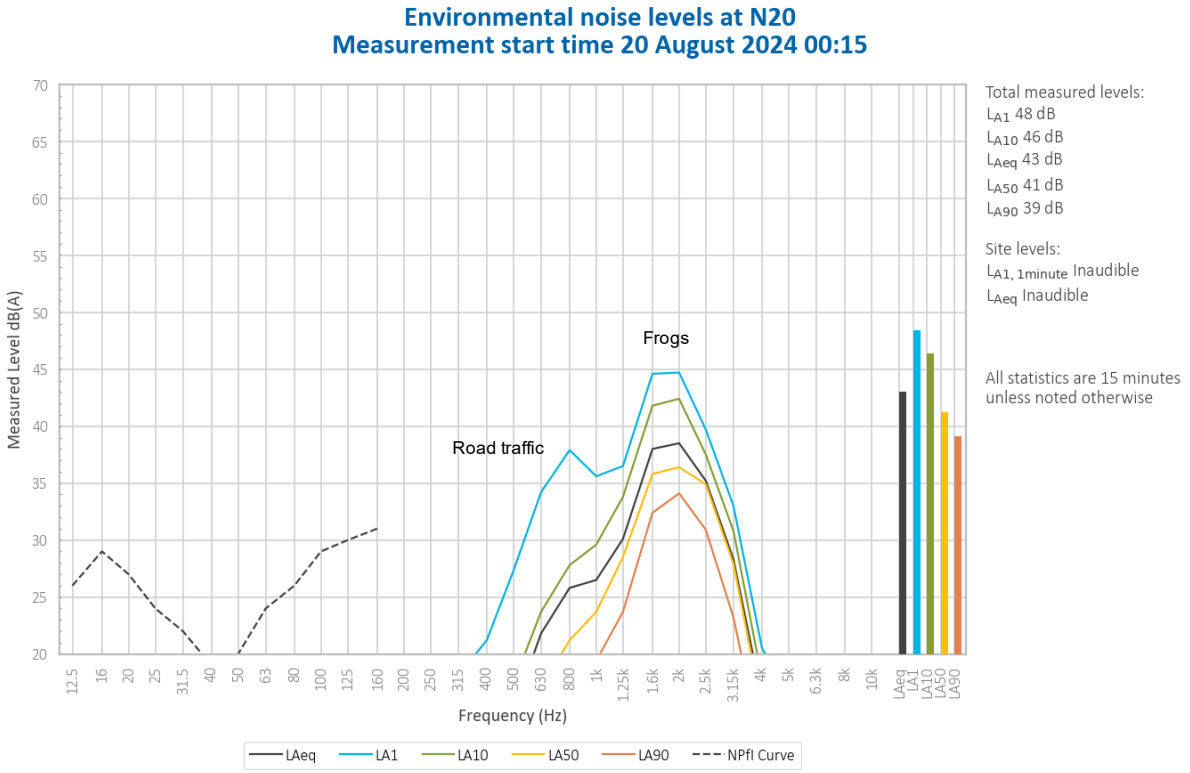

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Frogs generated total measured levels.

Noise from road traffic was also noted.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 19 August 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the August 2024 survey.

Appendix A
Noise perception and examples

EMM
creating opportunities

Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

September 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP9

September 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	16/09/2024	Will Moore	Amanda Buckeridge	Final

Approved by

Amanda Buckeridge
Associate Acoustic Consultant
16 September 2024

Level 3 175 Scott Street
Newcastle NSW 2300
ABN: 28 141 736 558

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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 9 September 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

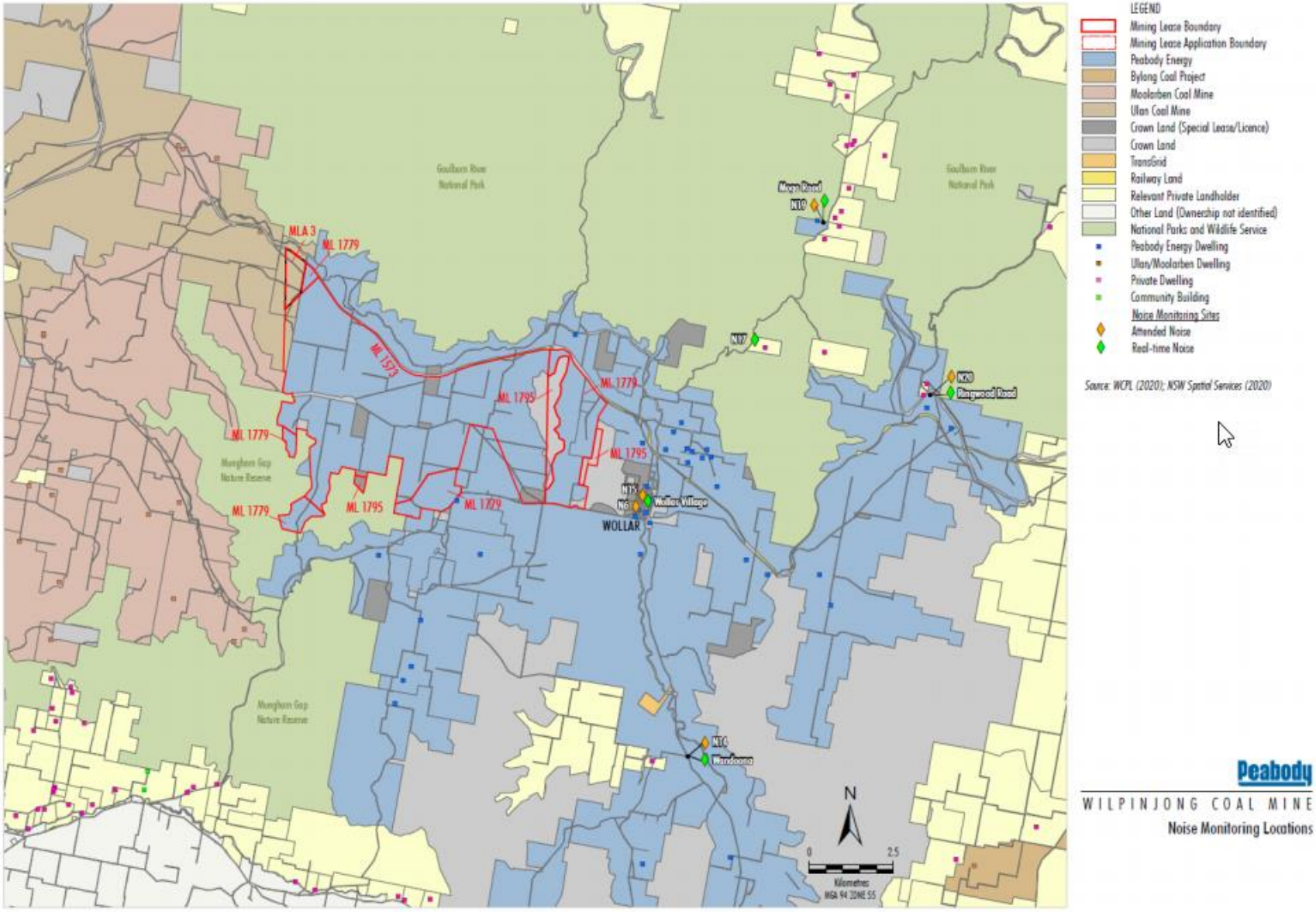

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version (Version 8) of the NMP was approved in January 2023. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Isaac Hepworth. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	01070590	27/05/2026	IEC 61672-1:2002
Pulsar 105 acoustic calibrator	96080	26/02/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – September 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	10/09/2024 01:03	51	41	38	33	29	27	25
N14	9/09/2024 23:30	41	35	31	29	28	27	25
N15	9/09/2024 23:00	58	42	35	33	29	26	24
N17	9/09/2024 22:28	42	36	34	32	32	30	28
N19	9/09/2024 22:00	46	32	27	26	25	23	21
N20	10/09/2024 00:15	48	44	30	31	22	20	18

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - September 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	10/09/2024 01:03	-	49	45	49	41	39	37	35	34	32	33	34
N14	9/09/2024 23:30	-	-	-	35	35	33	37	32	30	29	25	25
N15	9/09/2024 23:00	-	51	56	47	43	45	43	39	37	34	33	32
N17	9/09/2024 22:28	55	48	43	46	45	41	41	40	42	42	38	34
N19	9/09/2024 22:00	-	-	41	41	37	38	38	34	37	33	30	23
N20	10/09/2024 00:15	-	-	-	38	33	33	33	31	29	30	29	19

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – September 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	10/09/2024 01:03	7	<0.5	-	0
N14	9/09/2024 23:30	15	<0.5	-	0
N15	9/09/2024 23:00	9	<0.5	-	0
N17	9/09/2024 22:28	13	<0.5	-	0
N19	9/09/2024 22:00	13	<0.5	-	0
N20	10/09/2024 00:15	11	1.0	250	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – September 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	10/09/2024 01:03	0.0	-	G	No	37	45	<20	<20	Nil	Nil
N14	9/09/2024 23:30	0.0	-	F	Yes	35	45	<20	<20	Nil	Nil
N15	9/09/2024 23:00	0.5	179	F	Yes	37	45	<25	<25	Nil	Nil
N17	9/09/2024 22:28	0.4	215	F	Yes	38	45	32	38	Nil	Nil
N19	9/09/2024 22:00	0.6	190	F	Yes	35	45	<25	<25	Nil	Nil
N20	10/09/2024 00:15	0.0	-	F	Yes	35	45	<20	<20	Nil	Nil

Notes:
1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 0.
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

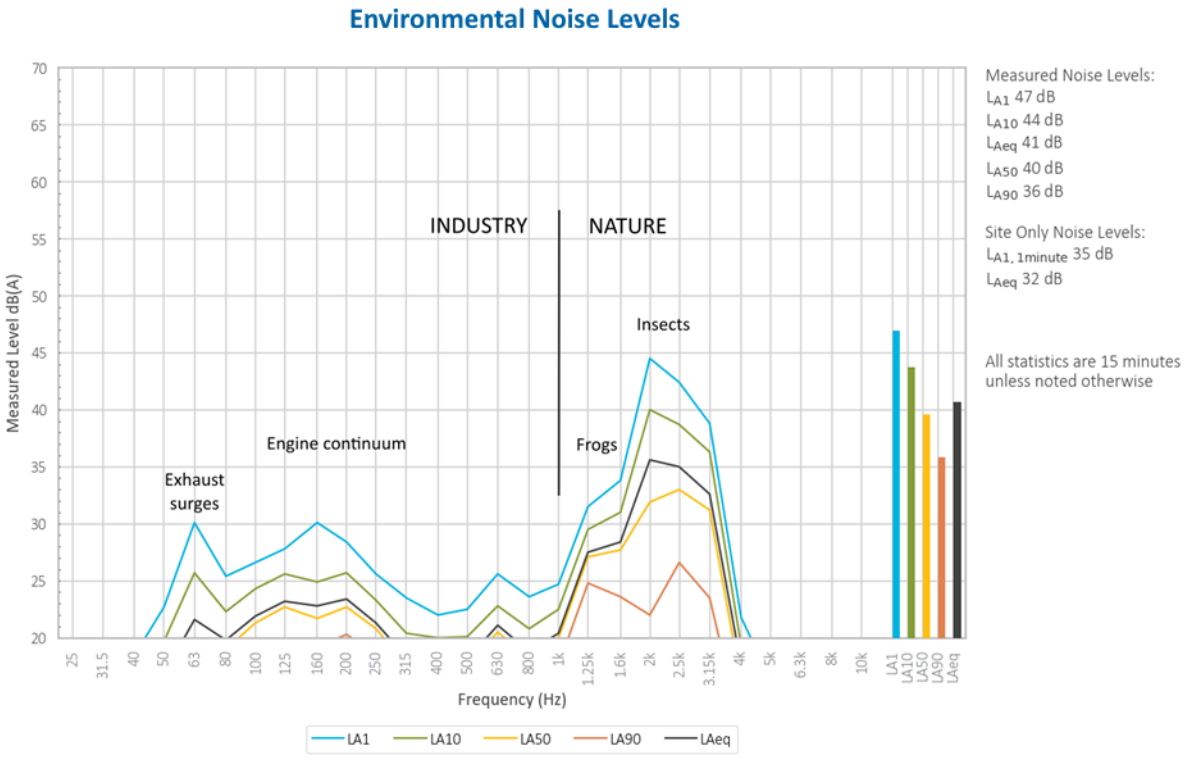

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

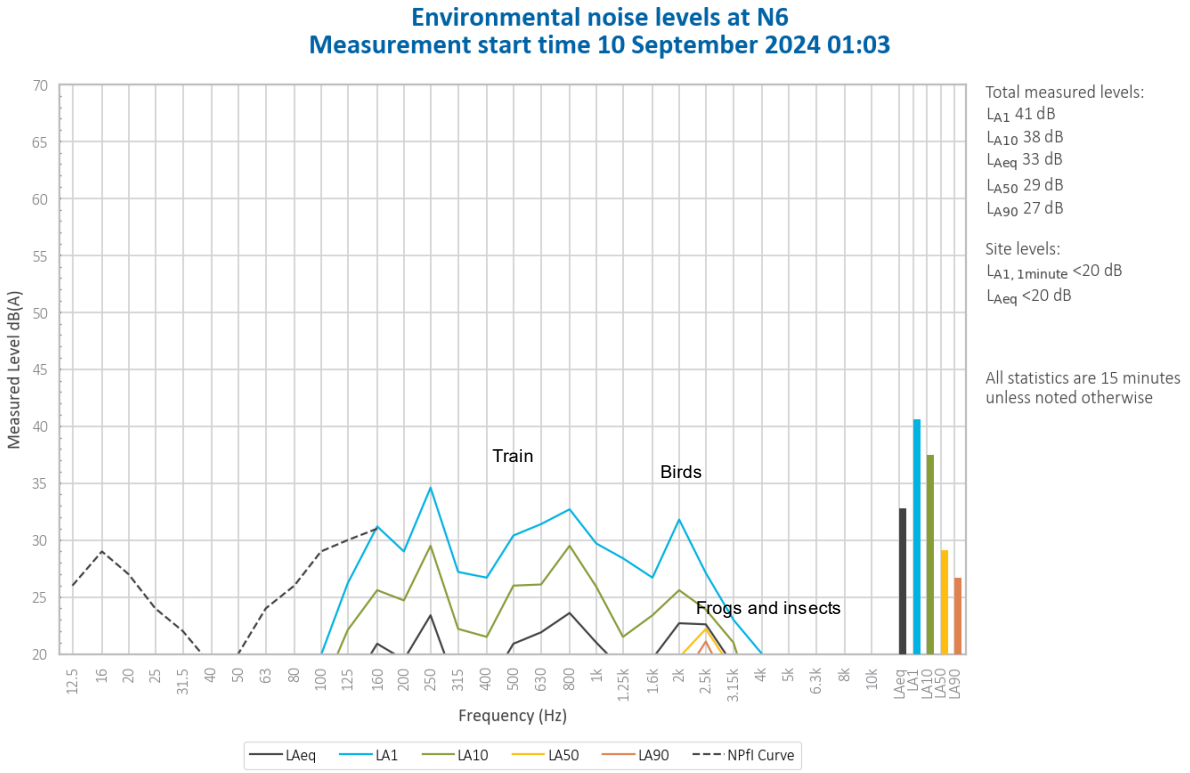

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

A train generated the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs and insects generated the measured L_{A50} and L_{A90}.

Noise from cattle and birds was also noted.

5.3 N14

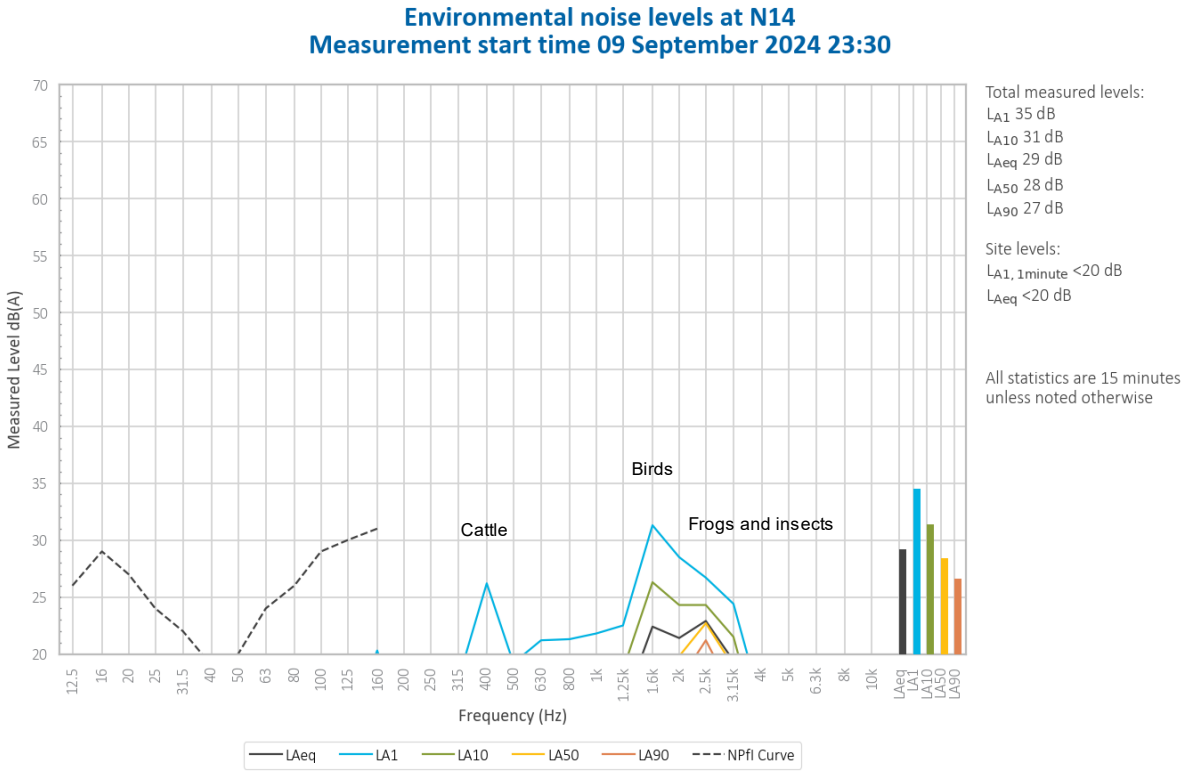

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Birds generated the measured L_{A1} and L_{A10} and contributed to the L_{Aeq}. Frogs and insects contributed to the measured L_{Aeq} and generated the L_{A50} and L_{A90}.

Continuum from a nearby substation and noise from cattle, other livestock and road traffic was also noted.

5.4 N15

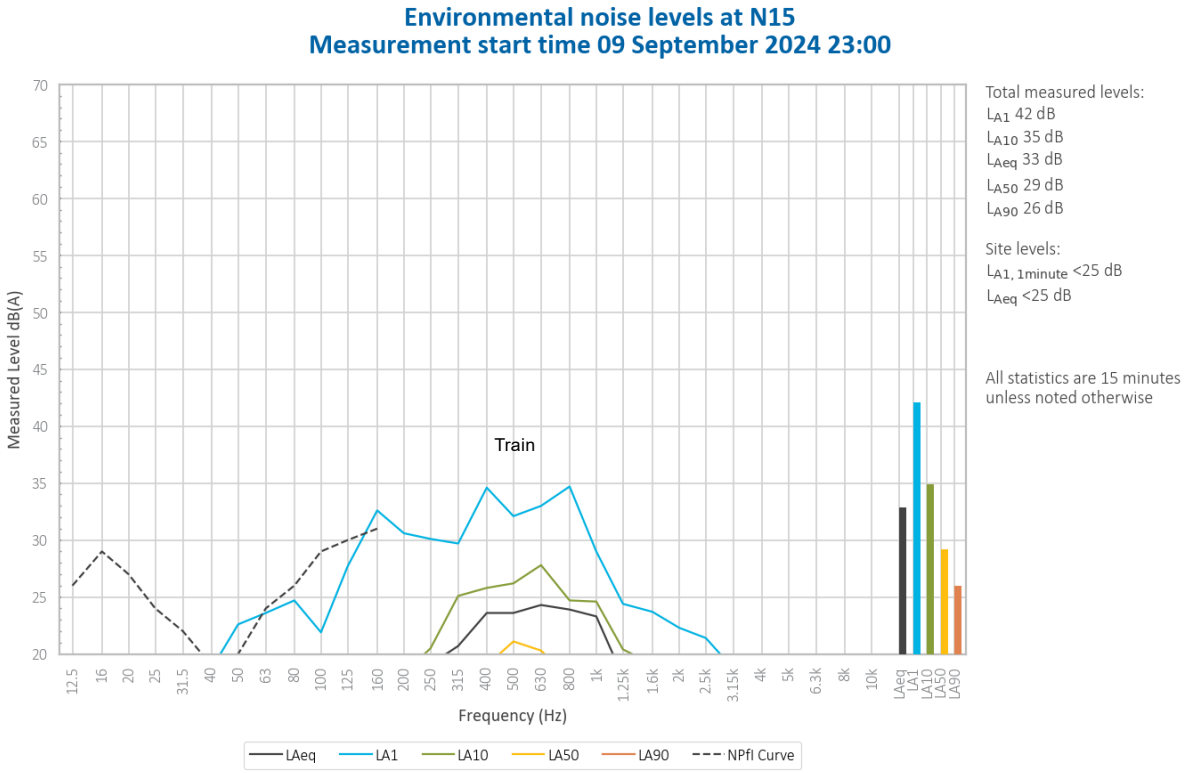

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 25 dB.

A train primarily generated total measured levels. Frogs and insects contributed to the measured L_{A50} and generated the L_{A90}.

Noise from birds and dogs was also noted.

5.5 N17

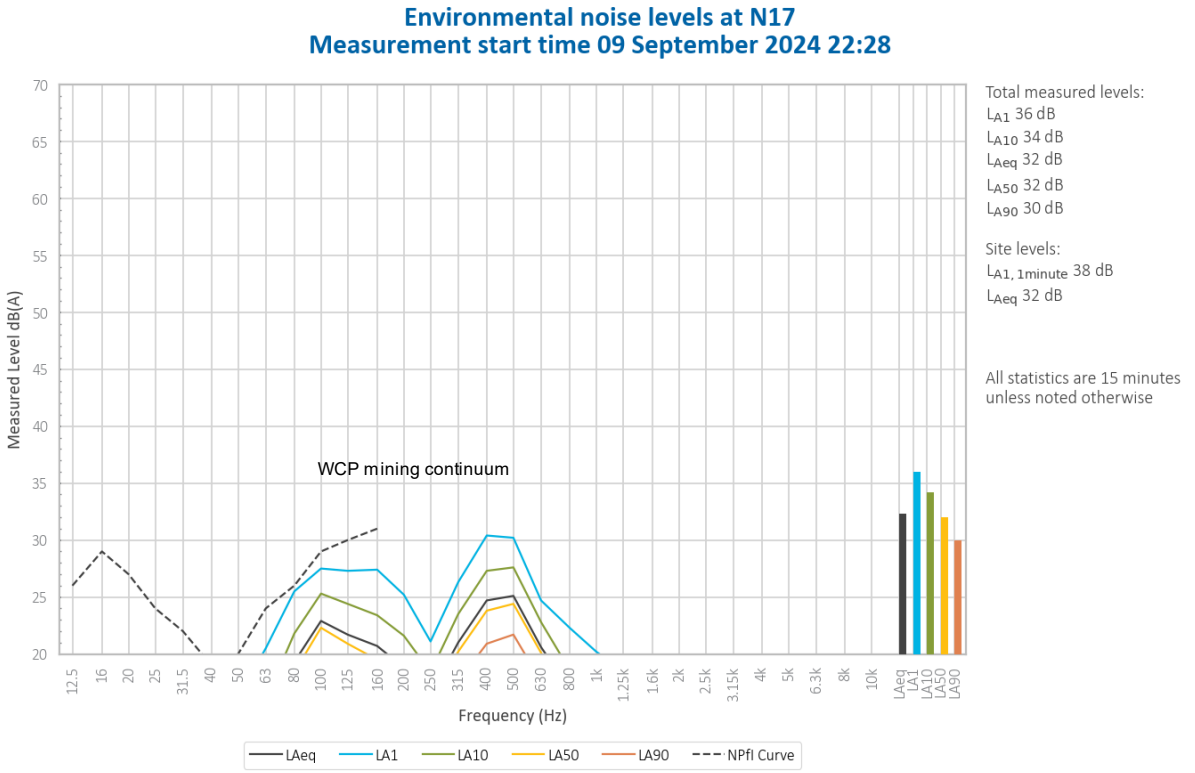

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 32 dB. Track noise generated the site only $L_{A1,1minute}$ of 38 dB. Horn noise was also noted.

Continuum from WCP generated total measured levels.

5.6 N19

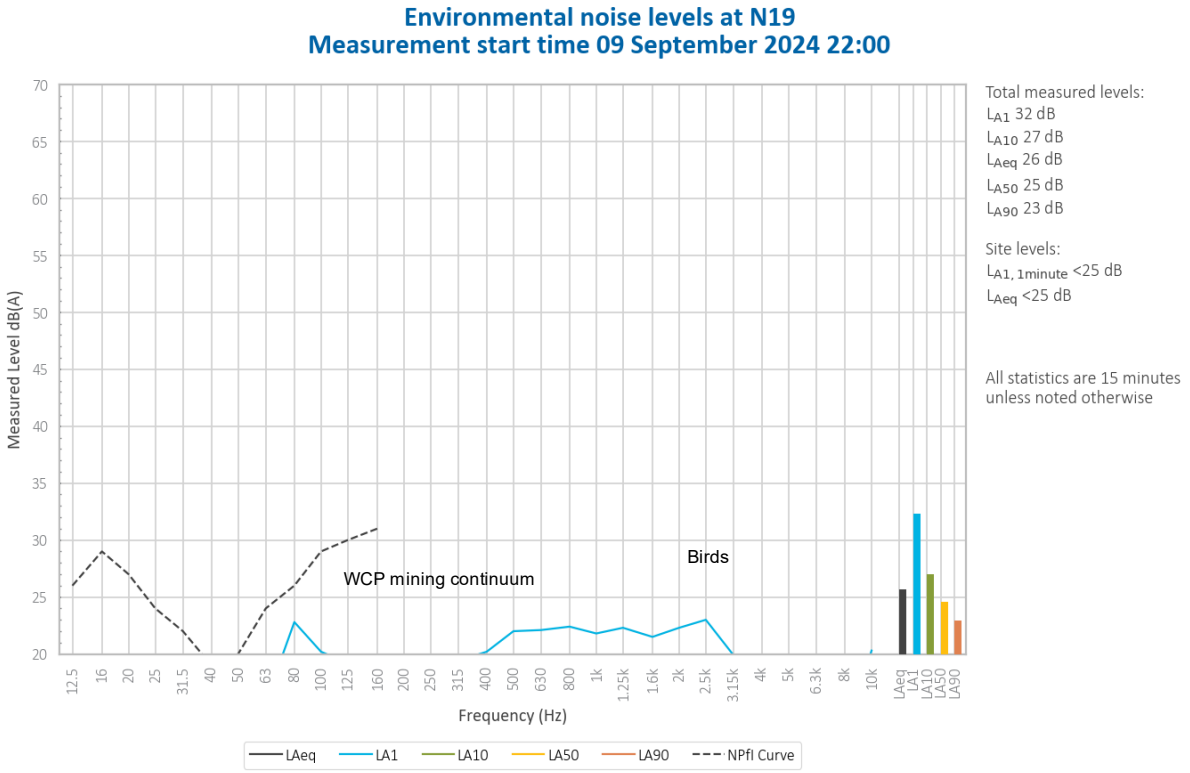

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 25 dB.

Continuum from WCP and noise from frogs and insects generated total measured levels. Birds and animals in foliage contributed to the measured L_{A1}.

5.7 N20

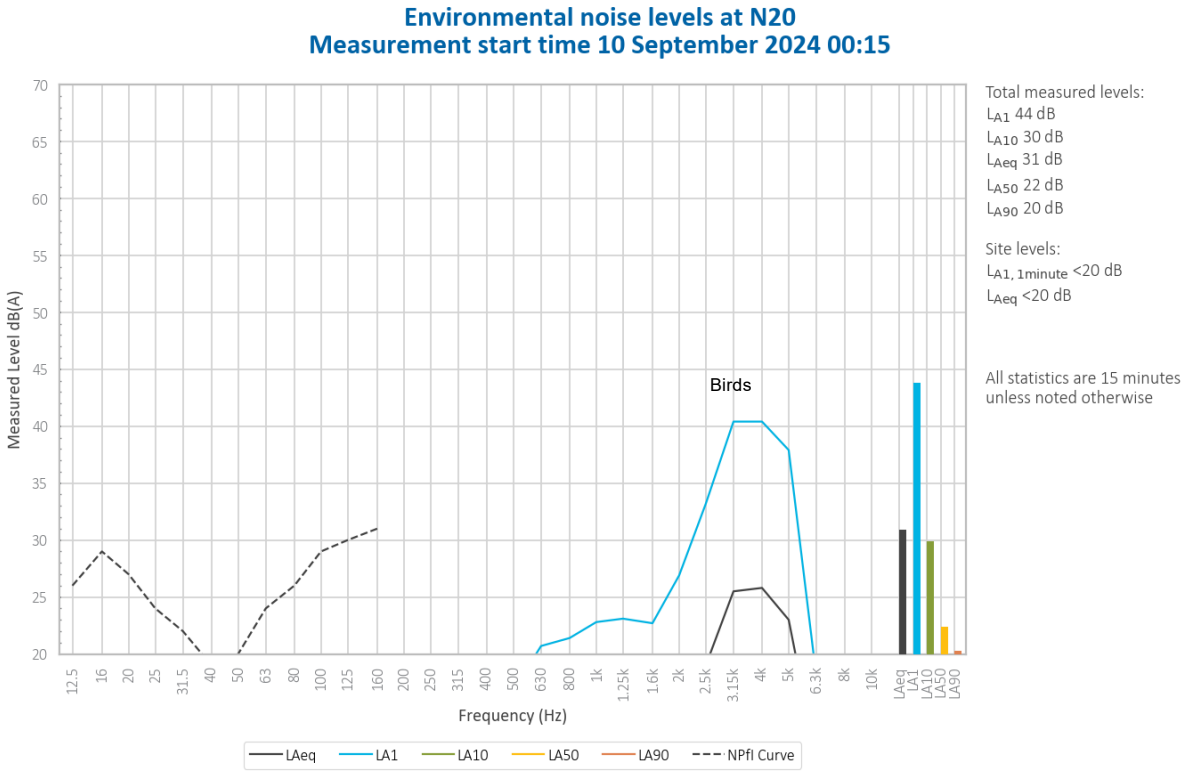

Figure 5.7 Environmental noise levels N20, Ringwood Road

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Birds generated the measured L_{A1}, L_{A10} and L_{Aeq}. Continuum from WCP and noise from frogs and insects generated the measured L_{A50} and L_{A90}.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 9 September 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the September 2024 survey.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

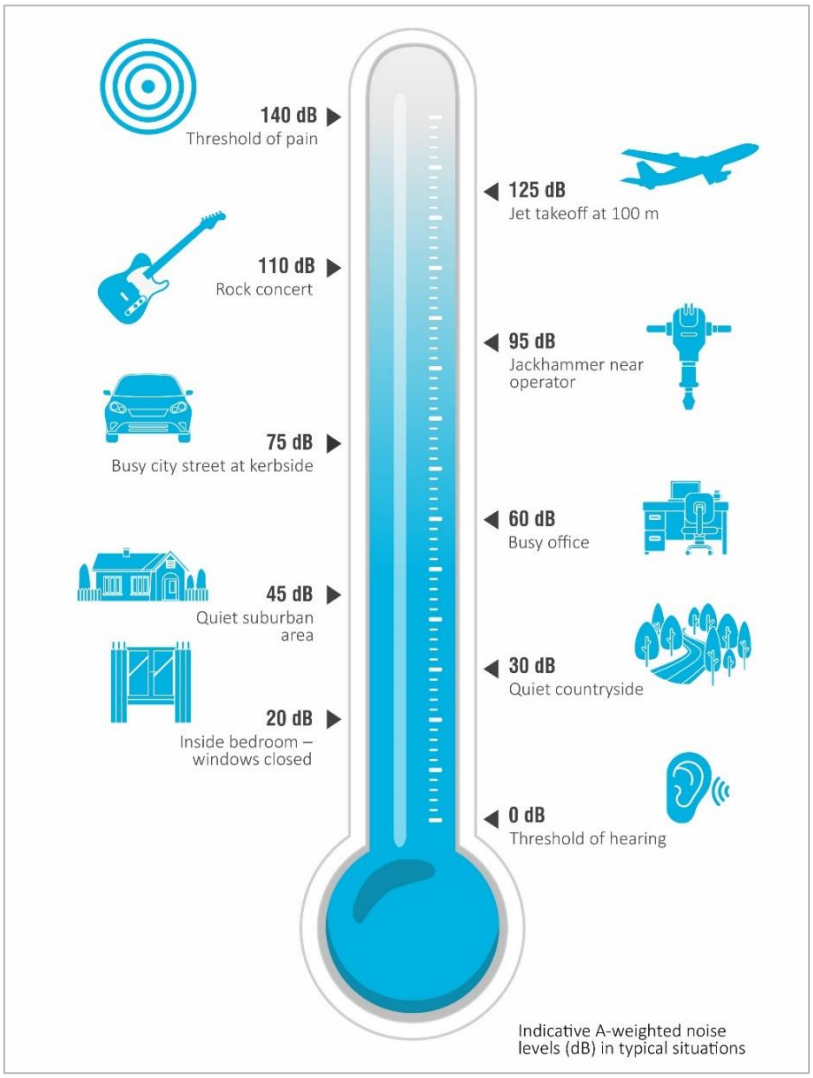

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[3]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[3]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Tichular may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians. The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

As required by EPL12425, when the meteorological station is unavailable for a period of time greater than 48 hours, WCPL must notify the EPA and state what alternative weather monitoring arrangements will be put in place until the return to service of the meteorological station.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7,** • **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5,** WCPL will report both results to DPE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

The assessment of excessive levels of low frequency noise generated by the mine shall be as follows: Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:

- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 9 One-third Octave Low Frequency Noise Thresholds

Hz/dB(Z)	One-third octave LZeq,15minute threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

6.3.4 Data Collection

Data and observations are collected in 15 minute periods and the Leq dBA results recorded. The Leq dBC noise levels will also be recorded to assess low frequency noise. All acoustic instrumentation will comply with *AS 1259.2-1990 'Acoustics – Sound level meters – Integrating – Averaging'*. Comprehensive field notes will be taken to indicate both mine related and non-mine related noise sources and when they occurred. Notes about maximum mine noise levels (source and times) will also be taken. All percentiles (LAmax, LA1, LA10, LA50, LA90, LAmin, LAeq) are measured in A weighting.

Where practicable, the LA1 measurement will be undertaken at 1 m from the dwelling façade and the LAeq measurement within 30 m of the dwelling. Where impracticable, measurements will be undertaken at a suitable and representative location as close to the dwelling as practicable.

6.3.5 Evaluation of Compliance

Tables 10 and **11** summarises the definition used by WCPL in this NMP for the evaluation of compliance with Development Consent (SSD-6764). The reporting requirements and actions that WCPL will take in the event of an exceedance or non-compliance are detailed in **Figure 5** and **Section 6.3.7**.

Table 10 Definition of an Exceedance

Term	Definition
Exceedance	An exceedance is deemed to have occurred when an operator-attended noise monitoring result, measured in accordance with the INP and Development Consent (SSD-6764), exceeds the Noise Criteria in **Table 6**. The noise must be solely attributable to the Mine and under the applicable meteorological conditions (**Section 6.3.6**).

Table 11 Definition of a Non-Compliance

Term	Definition
Non-compliance	A non-compliance is deemed to have occurred when a second operator-attended noise monitoring result [measured in accordance with the INP and Development Consent (SSD-6764)], taken within 75 minutes of an exceedance, also exceeds the Noise Criteria in **Table 6** and either the first and or the second measured noise result is more than 2dBA above the Noise Criteria. Reporting requirements for a non-compliance are detailed in **Section 6.3.7**.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

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C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter

IEC 61672-3:2013

Calibration Certificate

Calibration Number C24405

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	NA-28
Instrument Serial Number :	01070590
Microphone Serial Number :	08184
Pre-amplifier Serial Number :	52329
Firmware Version :	v2.0

Pre-Test Atmospheric Conditions		Post-Test Atmospheric Conditions	
Ambient Temperature :	24.4 °C	**Ambient Temperature :**	23.8 °C
Relative Humidity :	45.2 %	**Relative Humidity :**	46.7 %
Barometric Pressure :	101.3 kPa	**Barometric Pressure :**	101.26 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	27 May 2024	**Report Issue Date :**	3 Jun 2024

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

As public evidence was available, from an independent testing organisation responsible for approving the results of pattern evaluation test performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13 dB*	*Temperature*	*±0.1 °C*
1kHz	*±0.13 dB*	*Relative Humidity*	*±1.9 %*
8kHz	*±0.14 dB*	*Barometric Pressure*	*±0.11 kPa*
Electrical Tests	*±0.13 dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C24154

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Model 105
Instrument Serial Number :	96080

Atmospheric Conditions

Ambient Temperature :	25.5 °C
Relative Humidity :	52.1 %
Barometric Pressure :	100.4 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	26 Feb 2024	**Report Issue Date :**	26 Feb 2024

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	93.80	1000.30

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.11 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

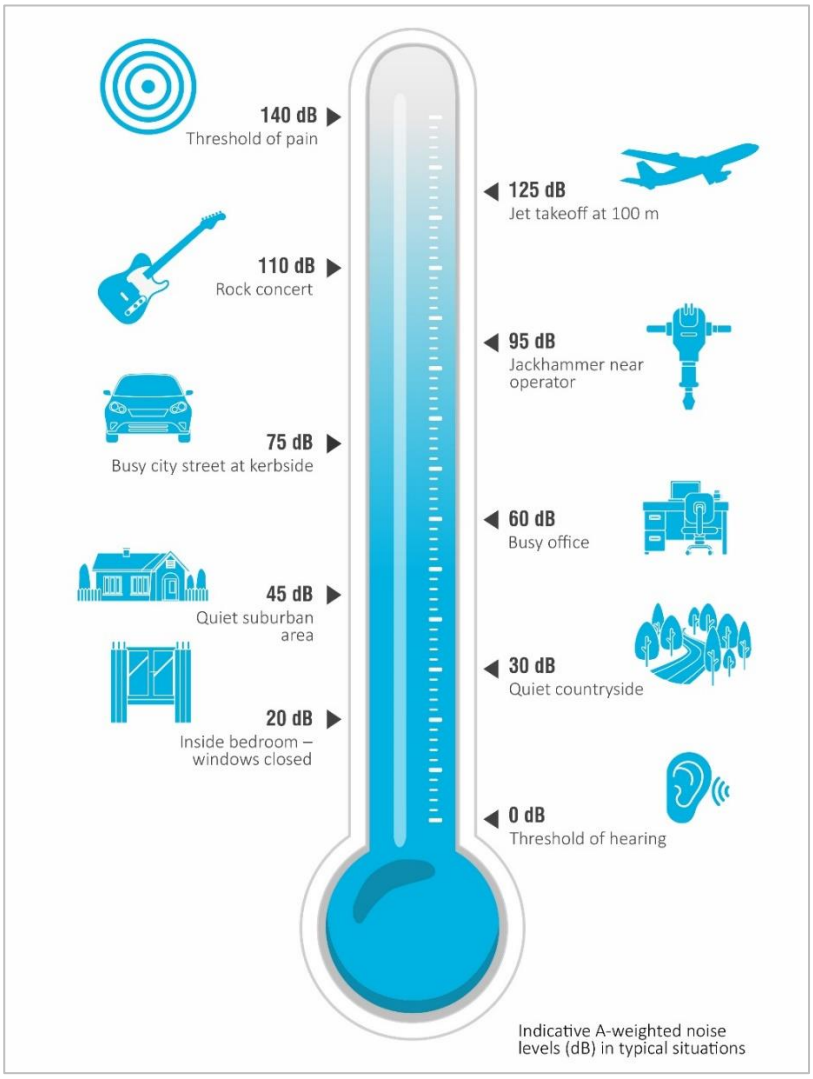

Figure A.1 Common noise levels

Appendix B
Regulator documents

EMM
creating opportunities

B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[3]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[3]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Tichular may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians. The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

As required by EPL12425, when the meteorological station is unavailable for a period of time greater than 48 hours, WCPL must notify the EPA and state what alternative weather monitoring arrangements will be put in place until the return to service of the meteorological station.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7,** • **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5,** WCPL will report both results to DPE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

The assessment of excessive levels of low frequency noise generated by the mine shall be as follows: Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:

- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 9 One-third Octave Low Frequency Noise Thresholds

Hz/dB(Z)	One-third octave LZeq,15minute threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

6.3.4 Data Collection

Data and observations are collected in 15 minute periods and the Leq dBA results recorded. The Leq dBC noise levels will also be recorded to assess low frequency noise. All acoustic instrumentation will comply with *AS 1259.2-1990 'Acoustics – Sound level meters – Integrating – Averaging'*. Comprehensive field notes will be taken to indicate both mine related and non-mine related noise sources and when they occurred. Notes about maximum mine noise levels (source and times) will also be taken. All percentiles (LAmax, LA1, LA10, LA50, LA90, LAmin, LAeq) are measured in A weighting.

Where practicable, the LA1 measurement will be undertaken at 1 m from the dwelling façade and the LAeq measurement within 30 m of the dwelling. Where impracticable, measurements will be undertaken at a suitable and representative location as close to the dwelling as practicable.

6.3.5 Evaluation of Compliance

Tables 10 and **11** summarises the definition used by WCPL in this NMP for the evaluation of compliance with Development Consent (SSD-6764). The reporting requirements and actions that WCPL will take in the event of an exceedance or non-compliance are detailed in **Figure 5** and **Section 6.3.7**.

Table 10 Definition of an Exceedance

Term	Definition
Exceedance	An exceedance is deemed to have occurred when an operator-attended noise monitoring result, measured in accordance with the INP and Development Consent (SSD-6764), exceeds the Noise Criteria in **Table 6**. The noise must be solely attributable to the Mine and under the applicable meteorological conditions (**Section 6.3.6**).

Table 11 Definition of a Non-Compliance

Term	Definition
Non-compliance	A non-compliance is deemed to have occurred when a second operator-attended noise monitoring result [measured in accordance with the INP and Development Consent (SSD-6764)], taken within 75 minutes of an exceedance, also exceeds the Noise Criteria in **Table 6** and either the first and or the second measured noise result is more than 2dBA above the Noise Criteria. Reporting requirements for a non-compliance are detailed in **Section 6.3.7**.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

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Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23317

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	NA-28
Instrument Serial Number :	00701424
Microphone Serial Number :	01916
Pre-amplifier Serial Number :	01463
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	24°C	**Ambient Temperature :**	22.6°C
Relative Humidity :	46%	**Relative Humidity :**	46.6%
Barometric Pressure :	100.6kPa	**Barometric Pressure :**	100.6kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dylan Selge
Calibration Date :	1 Jun 2023	**Report Issue Date :**	2 Jun 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

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Sound Calibrator
IEC 60942:2017
Calibration Certificate

Calibration Number C24155

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Model 105
Instrument Serial Number :	78226

Atmospheric Conditions

Ambient Temperature :	25.3 °C
Relative Humidity :	53.6 %
Barometric Pressure :	100.41 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	26 Feb 2024	**Report Issue Date :**	26 Feb 2024

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.03	1000.30

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.11 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

October 2024

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Wilpinjong Coal Pty Ltd

E231296 RP10

October 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	14/10/2024	Will Moore	Robert Kirwan	Final

Approved by

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14 October 2024

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1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 10 October 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

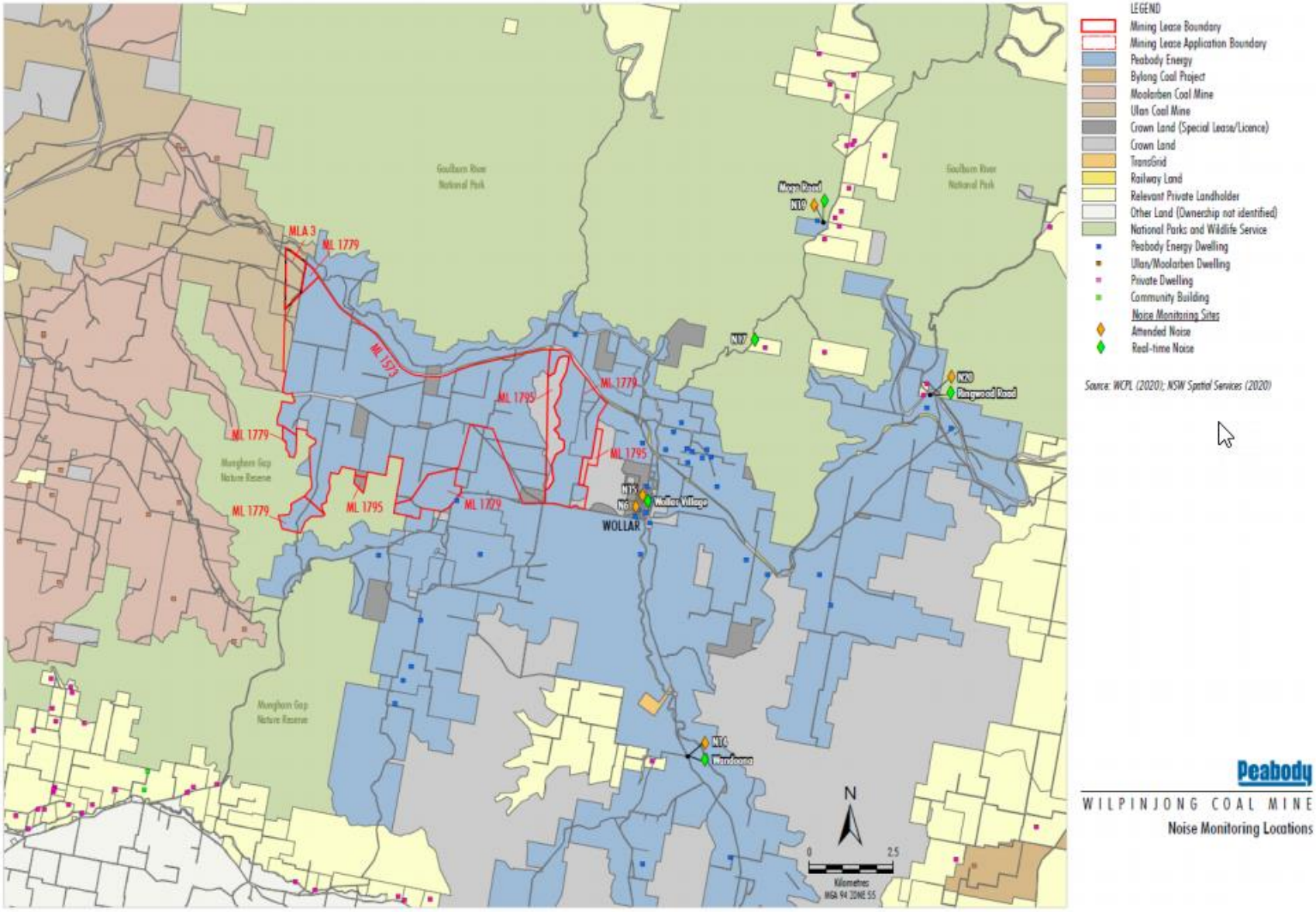

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version (Version 8) of the NMP was approved in January 2023. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	00701424	01/06/2025	IEC 61672-1:2002
Pulsar 105 acoustic calibrator	78226	26/02/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – October 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	10/10/2024 22:48	53	51	45	40	30	28	26
N14	10/10/2024 23:45	63	56	47	44	36	29	25
N15	10/10/2024 23:15	41	30	26	24	23	22	21
N17	10/10/2024 22:22	44	29	24	22	21	19	18
N19	10/10/2024 22:00	53	45	25	31	21	19	16
N20	11/10/2024 00:15	58	54	43	41	24	21	19

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - October 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	10/10/2024 22:48	-	49	46	51	43	47	41	42	42	44	42	39
N14	10/10/2024 23:45	54	48	43	38	35	33	37	31	31	31	28	27
N15	10/10/2024 23:15	-	-	-	37	32	28	31	25	25	24	20	18
N17	10/10/2024 22:22	-	-	-	35	30	29	27	27	26	27	20	19
N19	10/10/2024 22:00	-	-	-	-	-	25	21	18	15	14	12	10
N20	11/10/2024 00:15	-	-	-	-	30	27	26	25	26	24	20	19

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – October 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	10/10/2024 22:48	12	0.6	300	0
N14	10/10/2024 23:45	14	<0.5	-	0
N15	10/10/2024 23:15	12	<0.5	-	0
N17	10/10/2024 22:22	17	<0.5	-	0
N19	10/10/2024 22:00	15	<0.5	-	0
N20	11/10/2024 00:15	10	<0.5	-	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – October 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	10/10/2024 22:48	0.0	-	G	No	37	45	IA	IA	N/A	N/A
N14	10/10/2024 23:45	0.0	-	G	No	35	45	IA	IA	N/A	N/A
N15	10/10/2024 23:15	0.0	-	F	Yes	37	45	<20	<20	Nil	Nil
N17	10/10/2024 22:22	0.3	227	G	No	38	45	<20	<20	N/A	N/A
N19	10/10/2024 22:00	0.0	-	G	No	35	45	IA	IA	N/A	N/A
N20	11/10/2024 00:15	0.0	-	G	No	35	45	IA	IA	N/A	N/A

Notes:
1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 0.
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

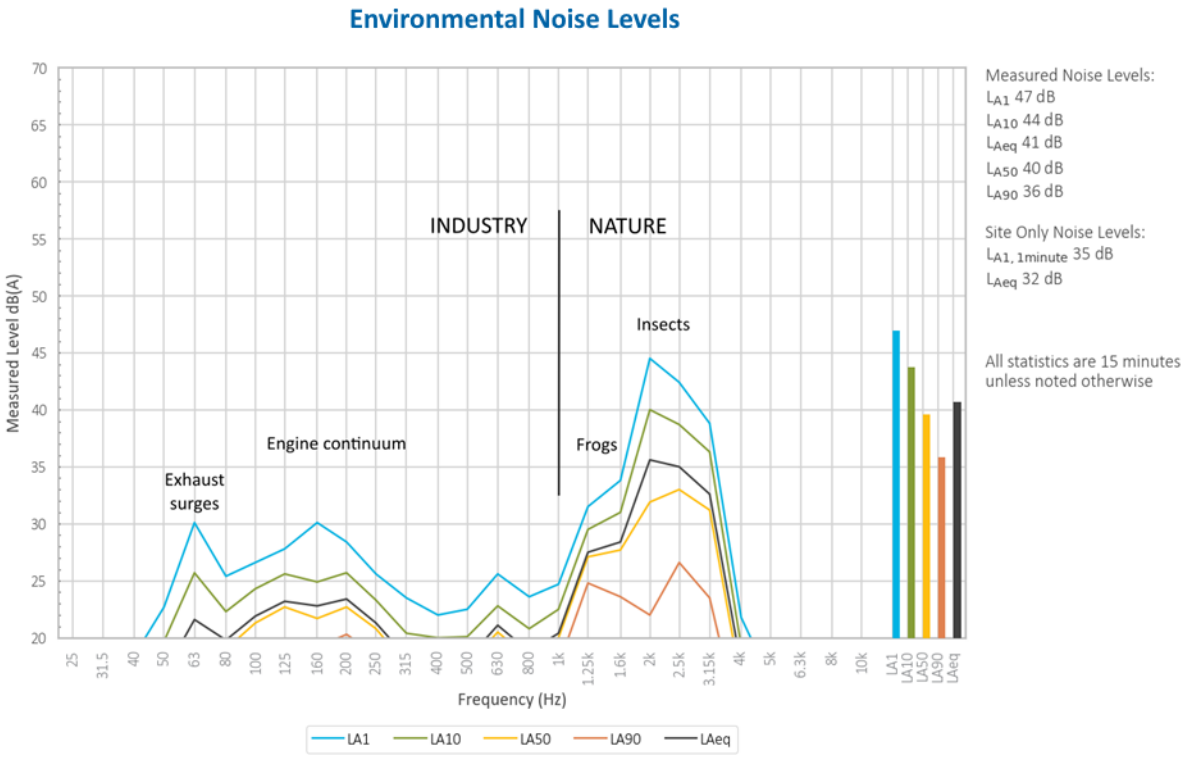

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

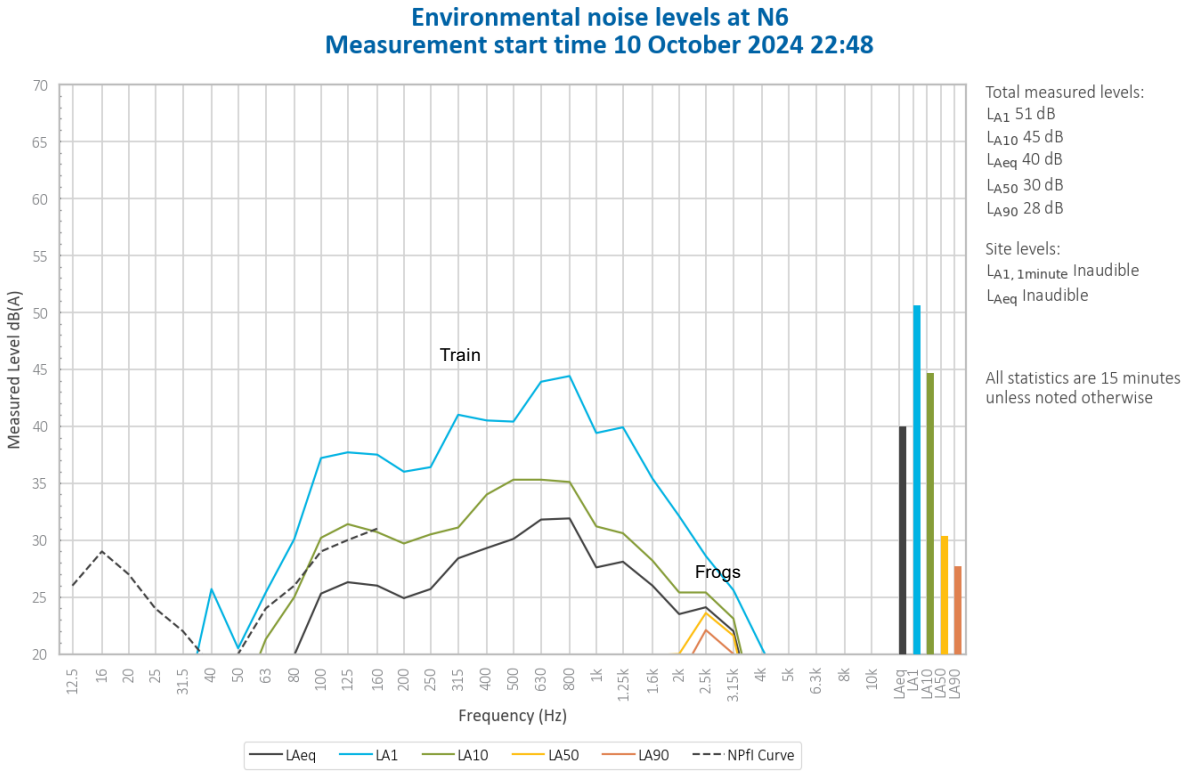

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

WCP was inaudible during the measurement.

A train generated the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs generated the measured L_{A50} and L_{A90}.

Noise from cattle and road traffic was also noted.

5.3 N14

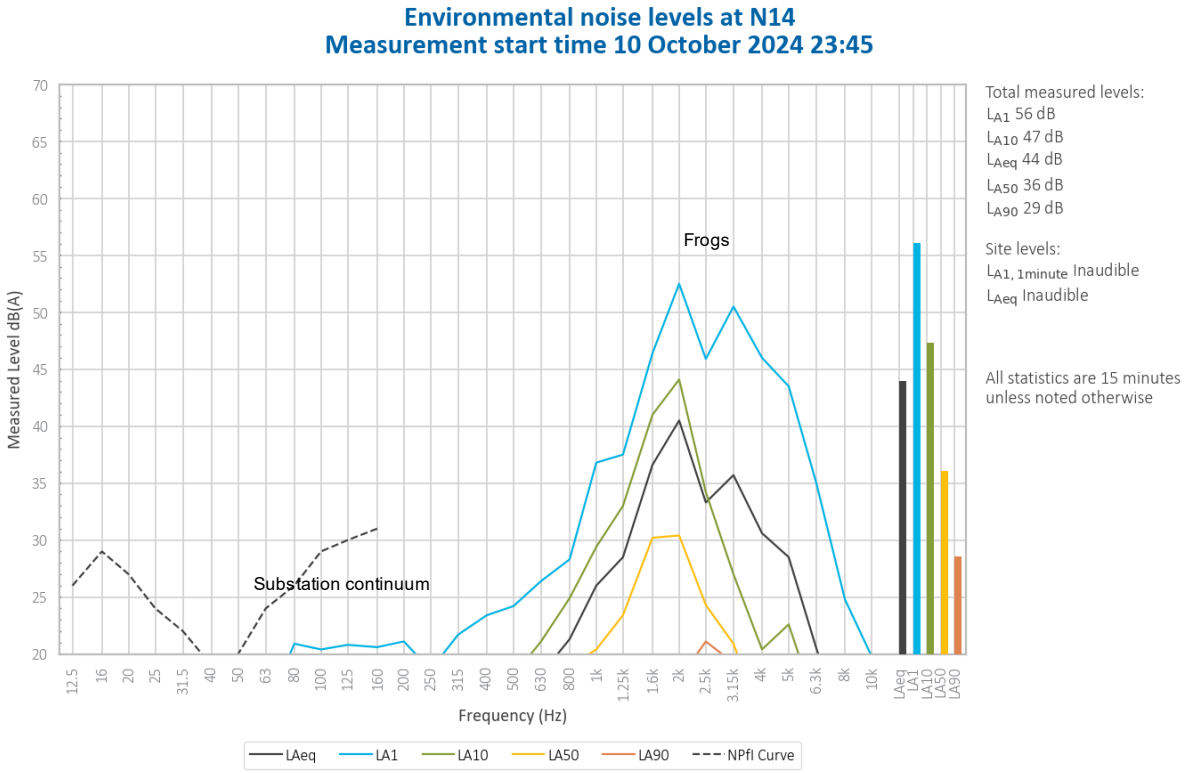

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

WCP was inaudible during the measurement.

Frogs generated total measured levels.

Continuum from a nearby substation and noise from birds, cattle and road traffic was also noted.

5.4 N15

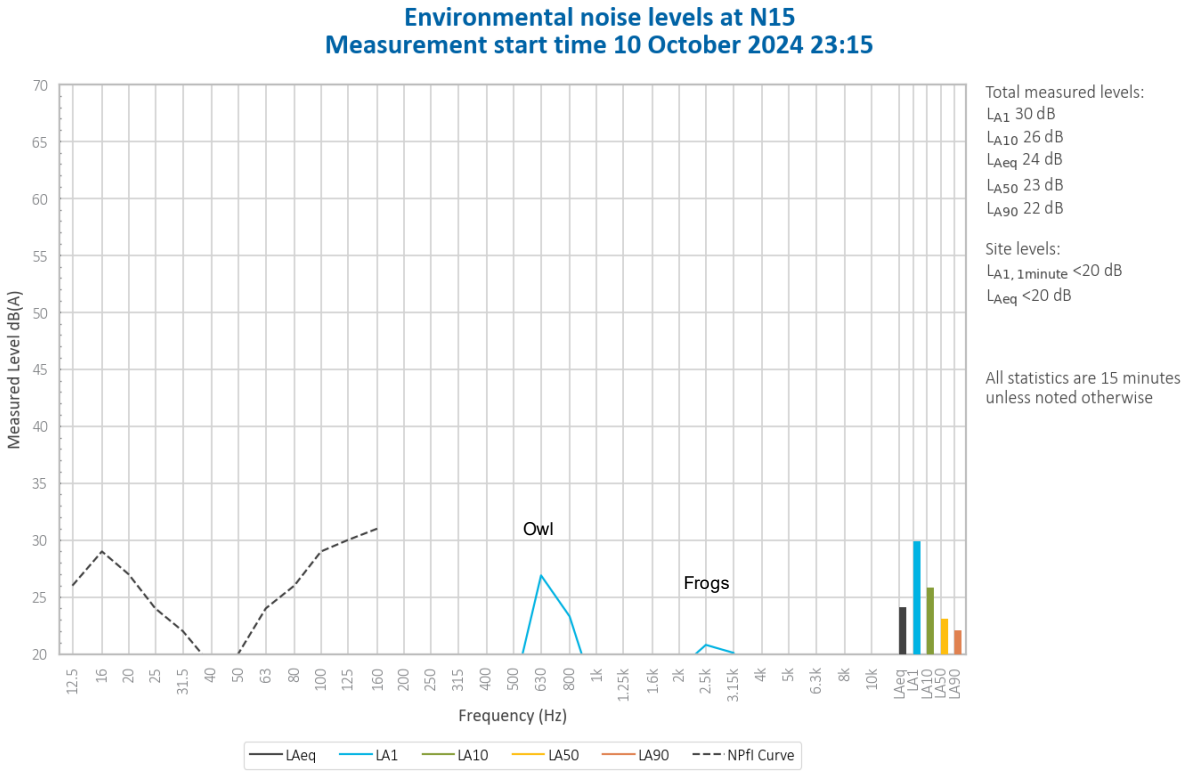

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

An owl generated the measured L_{A1} and L_{A10}. Frogs generated the measured L_{Aeq}, L_{A50} and L_{A90}.

Noise from cattle was also noted at low levels.

5.5 N17

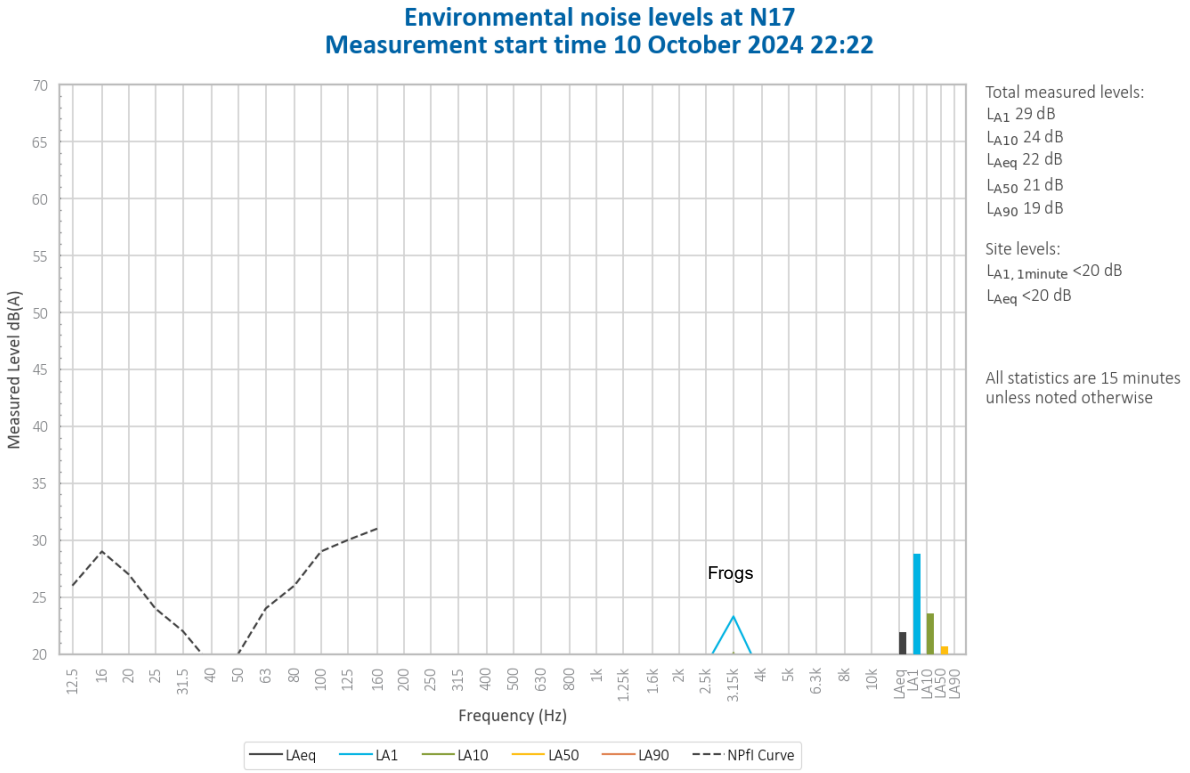

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Frogs generated total measured levels. Continuum from WCP contributed to the measured L_{A50} and L_{A90}.

Noise from bats was also noted at low levels.

5.6 N19

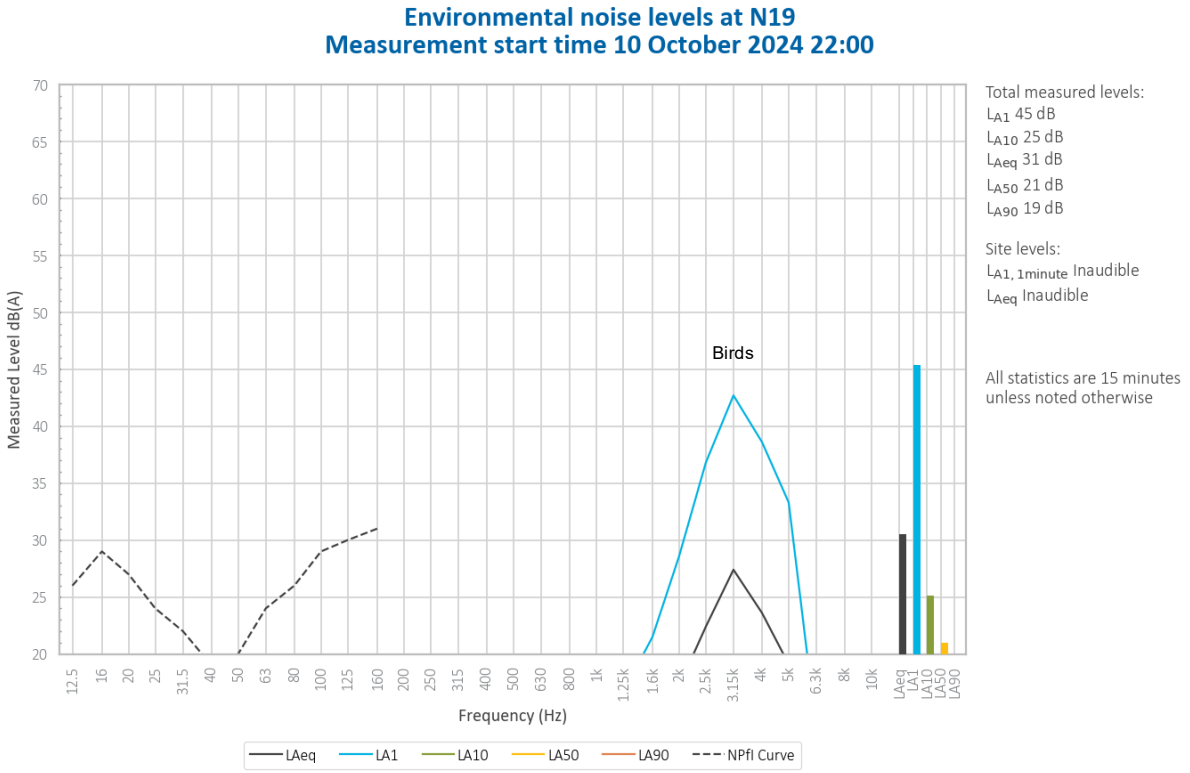

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

WCP was inaudible during the measurement.

Birds generated the measured L_{A1} and L_{Aeq}. Frogs generated the measured L_{A10}, L_{A50} and L_{A90}.

5.7 N20

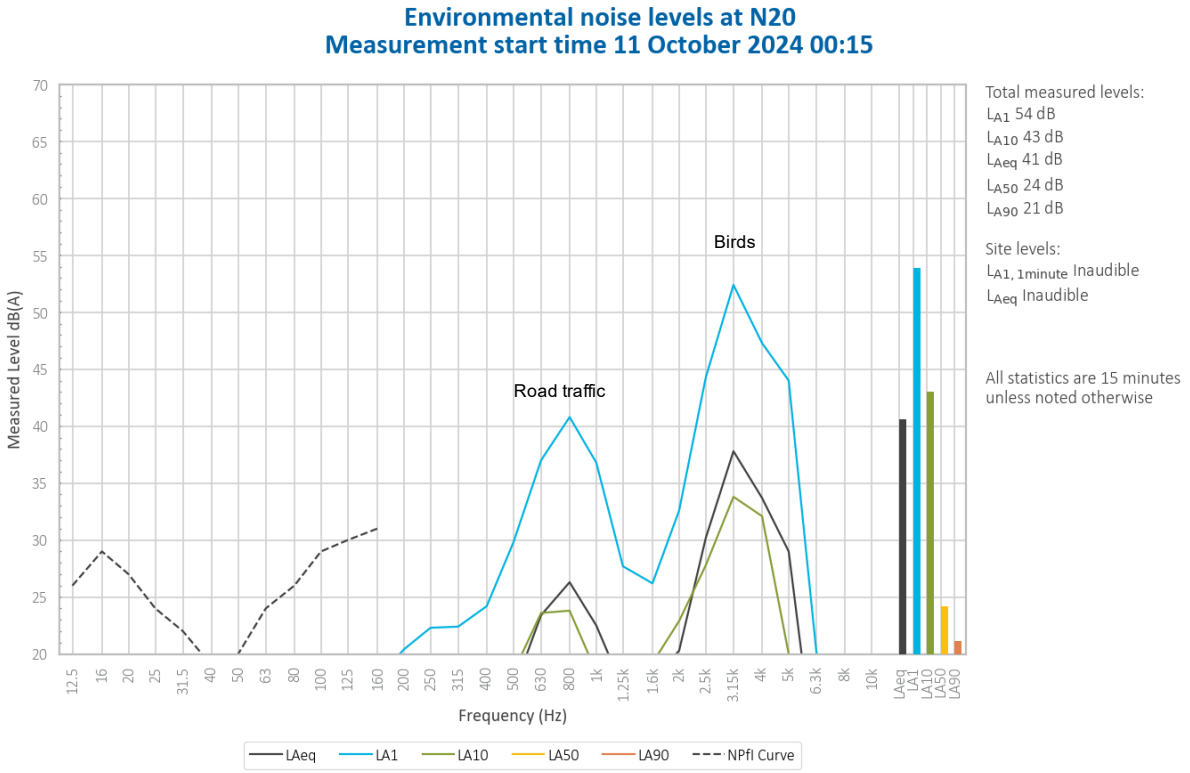

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Birds generated the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs generated the measured L_{A50} and L_{A90}.

Noise from road traffic and nearby running water was also noted.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 10 October 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the October 2024 survey.

Appendix A
Noise perception and examples

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A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

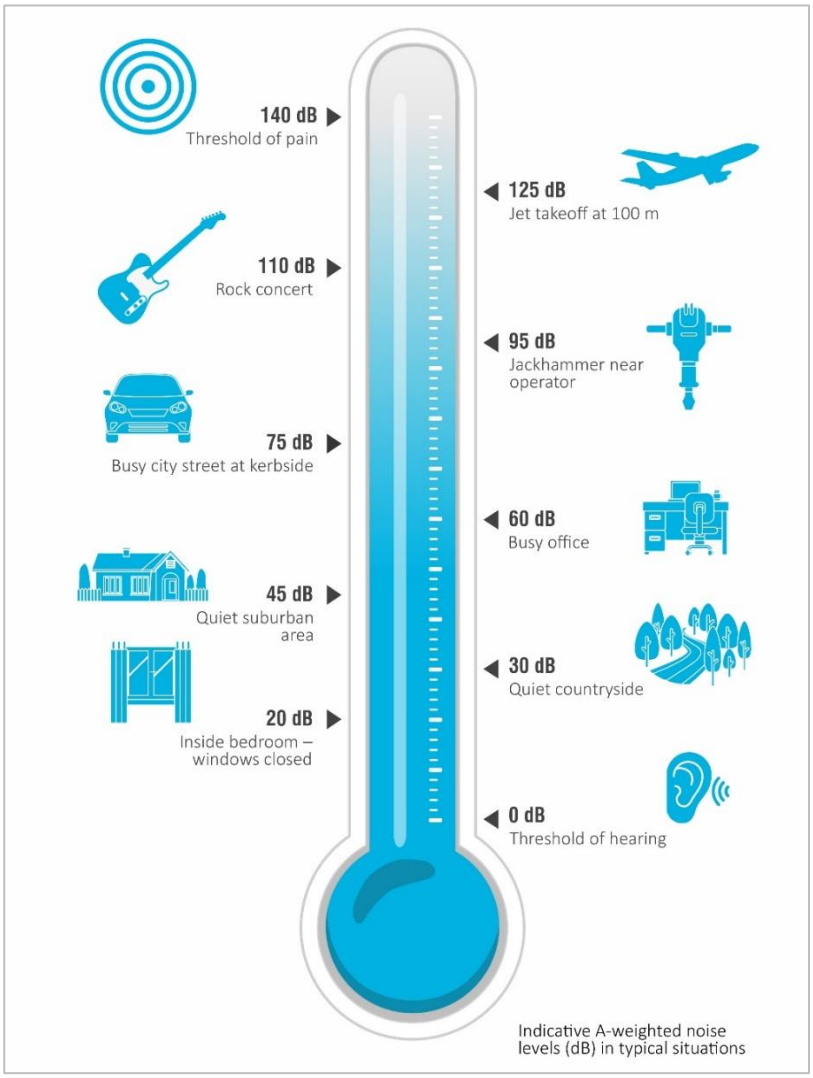

Figure A.1 Common noise levels

Appendix B
Regulator documents

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B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[3]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[3]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Tichular may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians. The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

As required by EPL12425, when the meteorological station is unavailable for a period of time greater than 48 hours, WCPL must notify the EPA and state what alternative weather monitoring arrangements will be put in place until the return to service of the meteorological station.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7,** • **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5,** WCPL will report both results to DPE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

The assessment of excessive levels of low frequency noise generated by the mine shall be as follows: Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:

- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 9 One-third Octave Low Frequency Noise Thresholds

Hz/dB(Z)	One-third octave LZeq,15minute threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

6.3.4 Data Collection

Data and observations are collected in 15 minute periods and the Leq dBA results recorded. The Leq dBC noise levels will also be recorded to assess low frequency noise. All acoustic instrumentation will comply with *AS 1259.2-1990 'Acoustics – Sound level meters – Integrating – Averaging'*. Comprehensive field notes will be taken to indicate both mine related and non-mine related noise sources and when they occurred. Notes about maximum mine noise levels (source and times) will also be taken. All percentiles (LAmax, LA1, LA10, LA50, LA90, LAmin, LAeq) are measured in A weighting.

Where practicable, the LA1 measurement will be undertaken at 1 m from the dwelling façade and the LAeq measurement within 30 m of the dwelling. Where impracticable, measurements will be undertaken at a suitable and representative location as close to the dwelling as practicable.

6.3.5 Evaluation of Compliance

Tables 10 and **11** summarises the definition used by WCPL in this NMP for the evaluation of compliance with Development Consent (SSD-6764). The reporting requirements and actions that WCPL will take in the event of an exceedance or non-compliance are detailed in **Figure 5** and **Section 6.3.7**.

Table 10 Definition of an Exceedance

Term	Definition
Exceedance	An exceedance is deemed to have occurred when an operator-attended noise monitoring result, measured in accordance with the INP and Development Consent (SSD-6764), exceeds the Noise Criteria in **Table 6**. The noise must be solely attributable to the Mine and under the applicable meteorological conditions (**Section 6.3.6**).

Table 11 Definition of a Non-Compliance

Term	Definition
Non-compliance	A non-compliance is deemed to have occurred when a second operator-attended noise monitoring result [measured in accordance with the INP and Development Consent (SSD-6764)], taken within 75 minutes of an exceedance, also exceeds the Noise Criteria in **Table 6** and either the first and or the second measured noise result is more than 2dBA above the Noise Criteria. Reporting requirements for a non-compliance are detailed in **Section 6.3.7**.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
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www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013
Calibration Certificate

Calibration Number C23317

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	NA-28
Instrument Serial Number :	00701424
Microphone Serial Number :	01916
Pre-amplifier Serial Number :	01463
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	24°C	**Ambient Temperature :**	22.6°C
Relative Humidity :	46%	**Relative Humidity :**	46.6%
Barometric Pressure :	100.6kPa	**Barometric Pressure :**	100.6kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dylan Selge
Calibration Date :	1 Jun 2023	**Report Issue Date :**	2 Jun 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Sound Calibrator

IEC 60942:2017

Calibration Certificate

Calibration Number C24155

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Model 105
Instrument Serial Number :	78226

Atmospheric Conditions

Ambient Temperature :	25.3 °C
Relative Humidity :	53.6 %
Barometric Pressure :	100.41 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	26 Feb 2024	**Report Issue Date :**	26 Feb 2024

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.03	1000.30

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.11 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

November 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP11

November 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	12/11/2024	Will Moore	Rob Kirwan	Final

Approved by

Robert Kirwan
Associate Acoustic Consultant
12 November 2024

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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 5 November 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

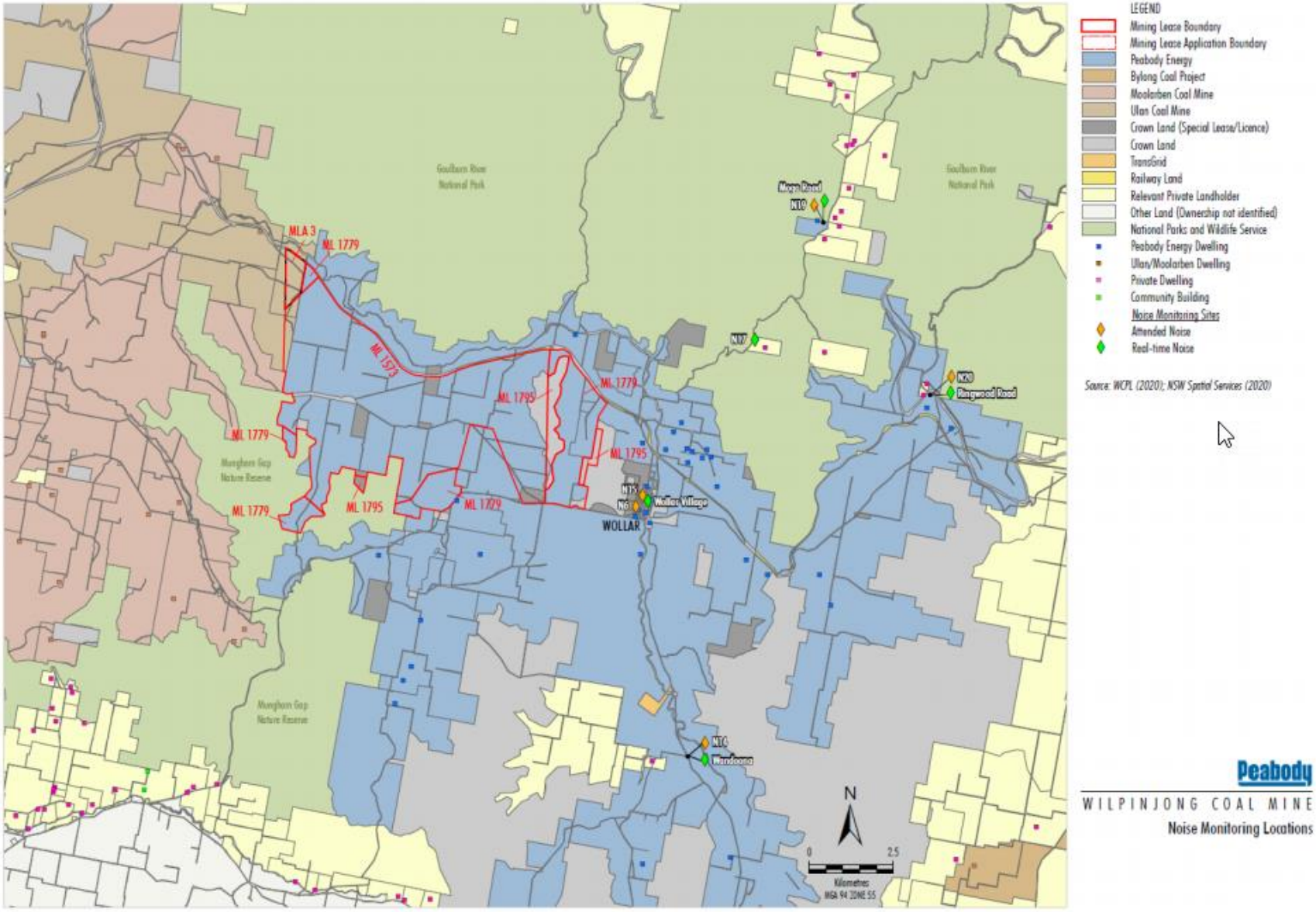

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The most current development consent associated with activities at WCP is the 'Wilpinjong Extension Project SSD-6764' (April 2017), which covers all current operations and has replaced the previous consent (05-0021). Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version (Version 8) of the NMP was approved in January 2023. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}.

Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Isaac Hepworth. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	30131882	23/01/2025	IEC 61672-1:2002
SVAN SV36 acoustic calibrator	138014	07/08/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – November 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	6/11/2024 00:48	49	44	32	33	28	27	27
N14	5/11/2024 23:30	48	46	41	38	37	34	29
N15	5/11/2024 23:00	35	29	27	25	24	22	19
N17	5/11/2024 22:26	40	34	33	32	32	31	30
N19	5/11/2024 22:00	41	35	33	31	31	29	26
N20	6/11/2024 00:15	46	41	38	34	31	24	21

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.2. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.2 Measured low-frequency L_{eq} noise levels, dB(Z) - November 2024 [1]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	6/11/2024 00:48	54	53	47	44	41	39	38	36	34	33	32	35
N14	5/11/2024 23:30	54	47	45	48	44	42	40	38	38	37	33	29
N15	5/11/2024 23:00	-	-	41	40	37	37	38	33	34	34	28	24
N17	5/11/2024 22:26	57	52	45	52	45	43	42	40	40	39	35	32
N19	5/11/2024 22:00	56	49	44	49	44	43	41	38	39	38	31	27
N20	6/11/2024 00:15	55	49	44	48	44	40	37	36	38	36	32	30

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.3. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.3 Measured atmospheric conditions – November 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction °Magnetic north[1]	Cloud cover 1/8s
N6	6/11/2024 00:48	17	<0.5	-	2
N14	5/11/2024 23:30	22	<0.5	-	1
N15	5/11/2024 23:00	21	<0.5	-	1
N17	5/11/2024 22:26	24	<0.5	-	0
N19	5/11/2024 22:00	21	0.9	20	0
N20	6/11/2024 00:15	18	<0.5	-	0

Notes: 1. "-" indicates calm conditions at monitoring location.

4.2 Site only noise levels

4.2.1 Modifying factors

Measured site-only levels were assessed for the application of modifying factors in accordance with the NPfI and methodology described in Section 3.3. There were no modifying factors applicable during the survey. Mining noise was analysed and did not satisfy requirements for tonal, intermittent, or low frequency modifying factors, as defined in the NPfI.

4.2.2 Monitoring results

Table 4.4 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.4 Site noise levels and limits – November 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	6/11/2024 00:48	1.3	97	E	Yes	37	45	<25	<25	Nil	Nil
N14	5/11/2024 23:30	1.9	63	D	Yes	35	45	24	28	Nil	Nil
N15	5/11/2024 23:00	2.0	58	D	Yes	37	45	<20	<20	Nil	Nil
N17	5/11/2024 22:26	2.6	48	D	Yes	38	45	26	32	Nil	Nil
N19	5/11/2024 22:00	2.2	50	D	Yes	35	45	25	30	Nil	Nil
N20	6/11/2024 00:15	1.4	83	D	Yes	35	45	<20	<20	Nil	Nil

Notes:
1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 0.
2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.
3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.
4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

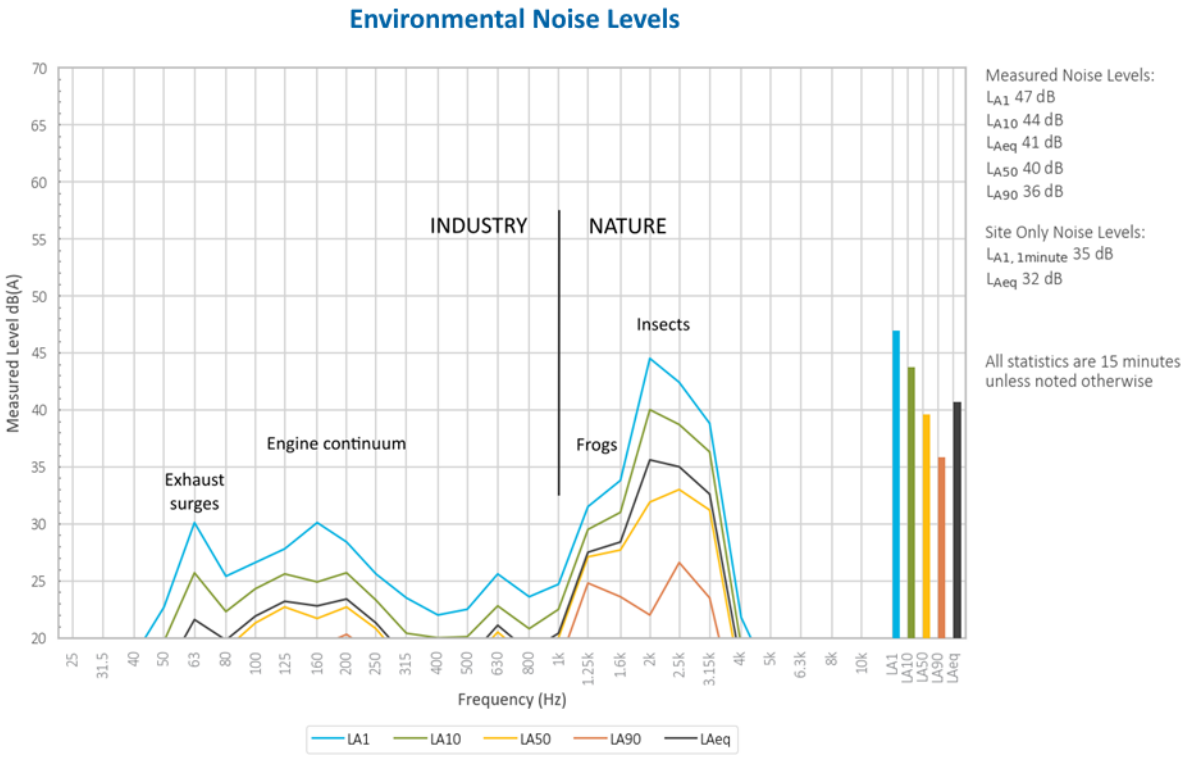

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

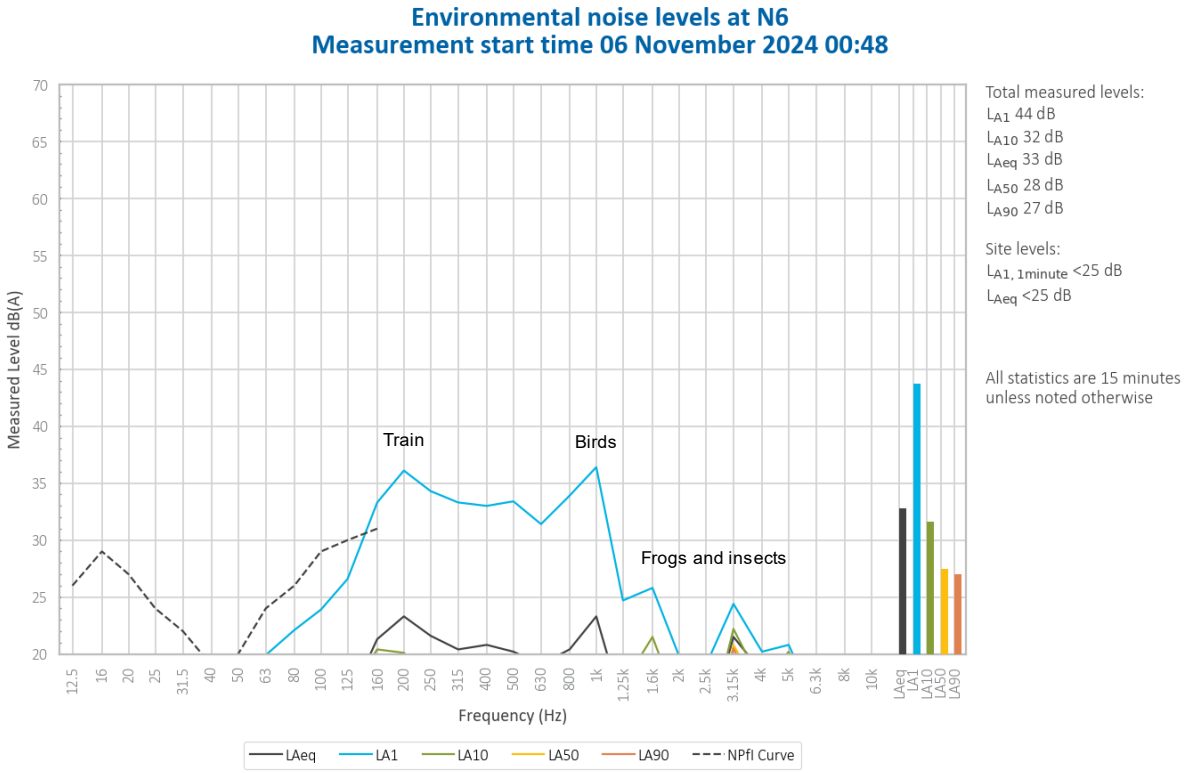

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 25 dB.

A train and birds both generated the measured L_{A1} and contributed to the L_{Aeq}. Frogs and insects contributed to the measured L_{Aeq} and generated the measured L_{A10}, L_{A50} and L_{A90}.

5.3 N14

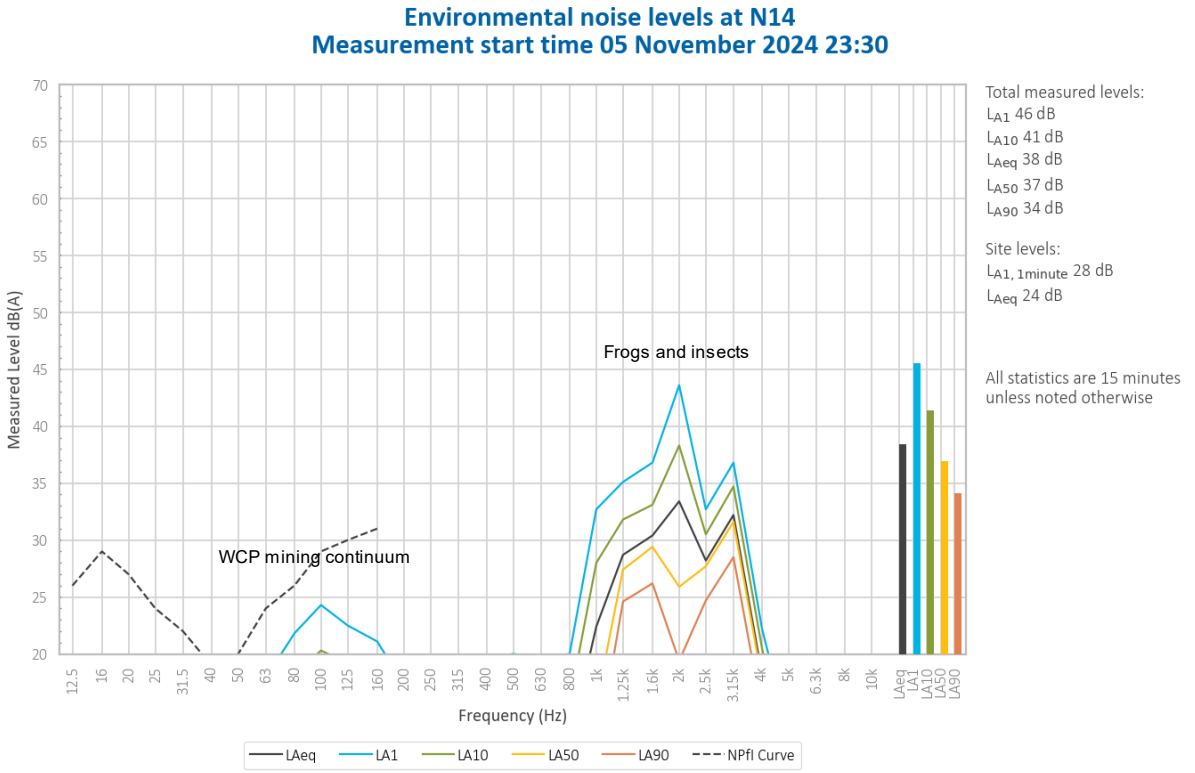

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 24 dB. Surges in this continuum generated the site-only $L_{A1,1minute}$ of 28 dB. Horn noise was also noted.

Frogs and insects generated total measured levels.

5.4 N15

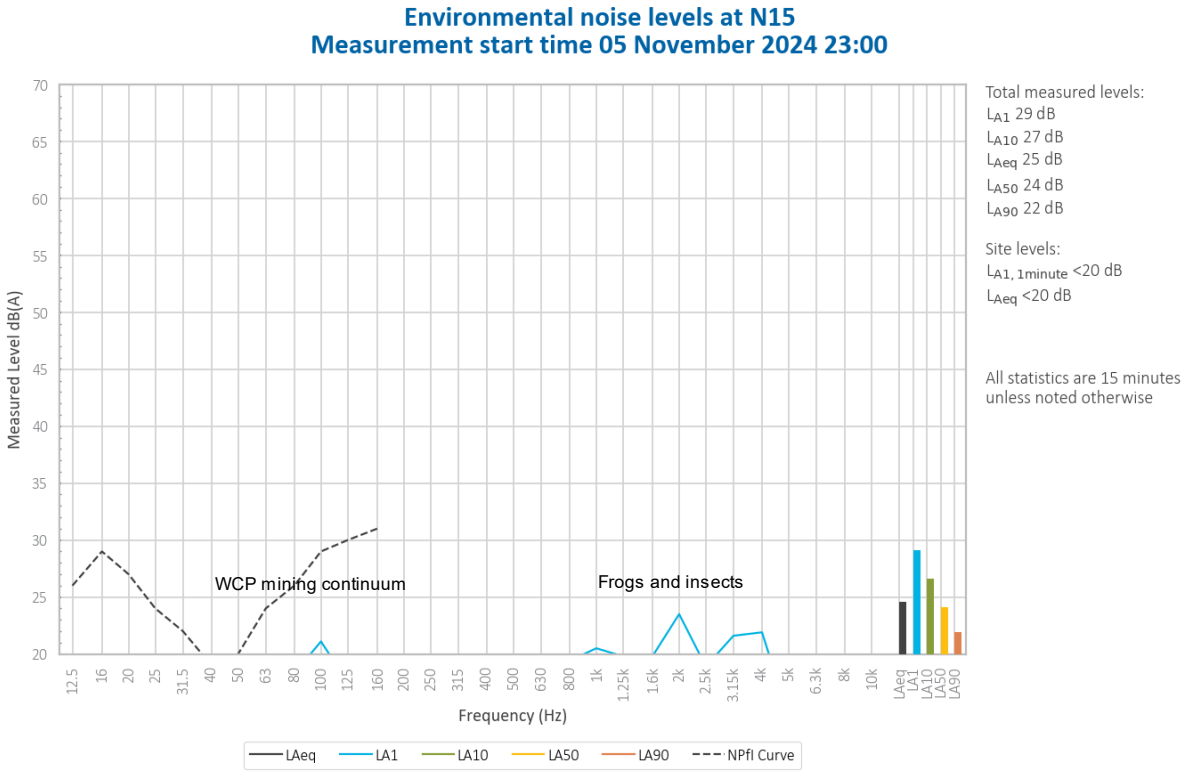

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Frogs and insects generated total measured levels.

Local continuum and noise from birds, dogs and road traffic was noted at low levels.

5.5 N17

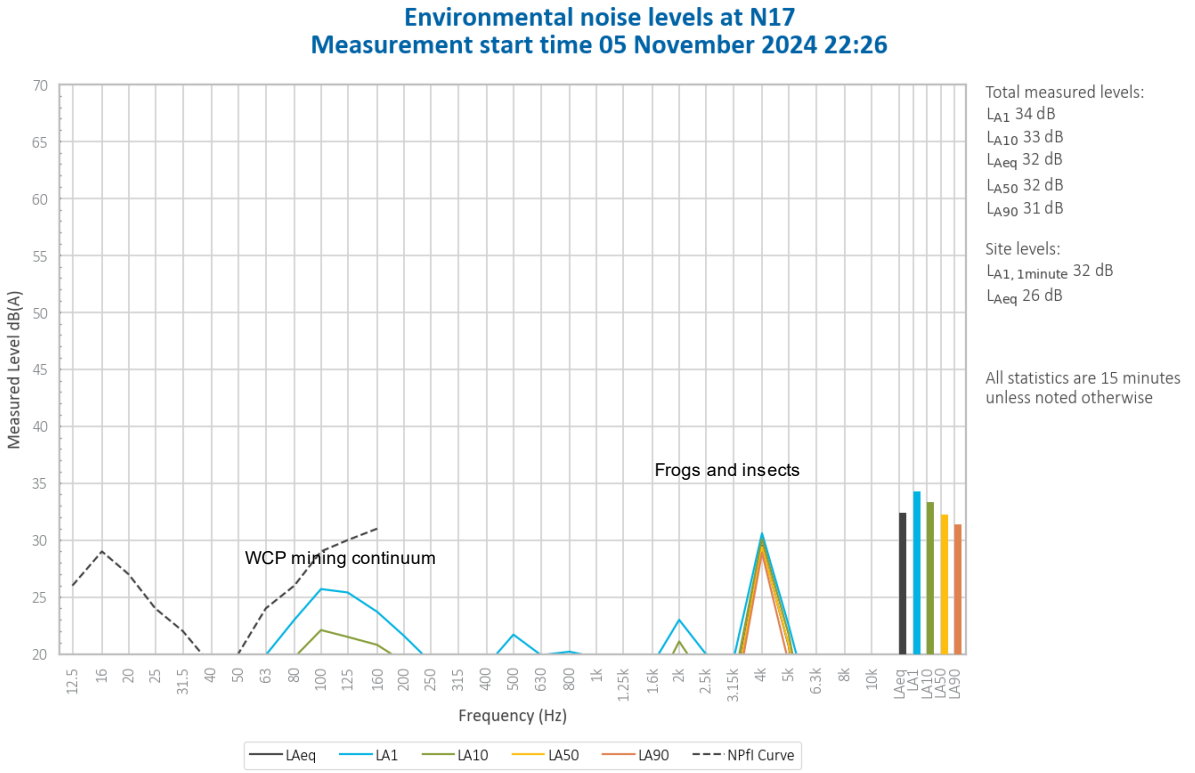

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 26 dB. Surges in this continuum generated the site-only $L_{A1,1minute}$ of 32 dB. Horn noise was also noted.

Frogs and insects generated total measured levels.

Noise from a train was also noted at low levels.

5.6 N19

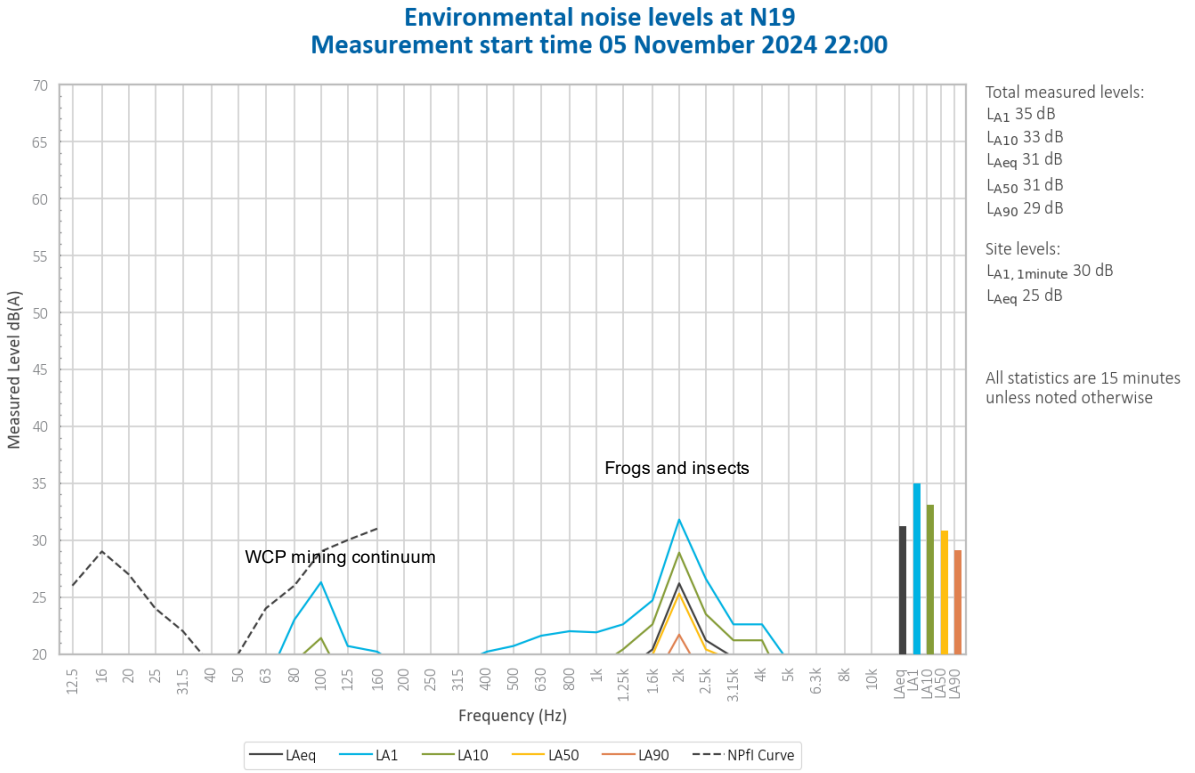

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of 25 dB. Engine surges generated the site-only $L_{A1,1minute}$ of 30 dB.

Frogs and insects generated total measured levels.

Noise from a breeze in foliage was also noted.

5.7 N20

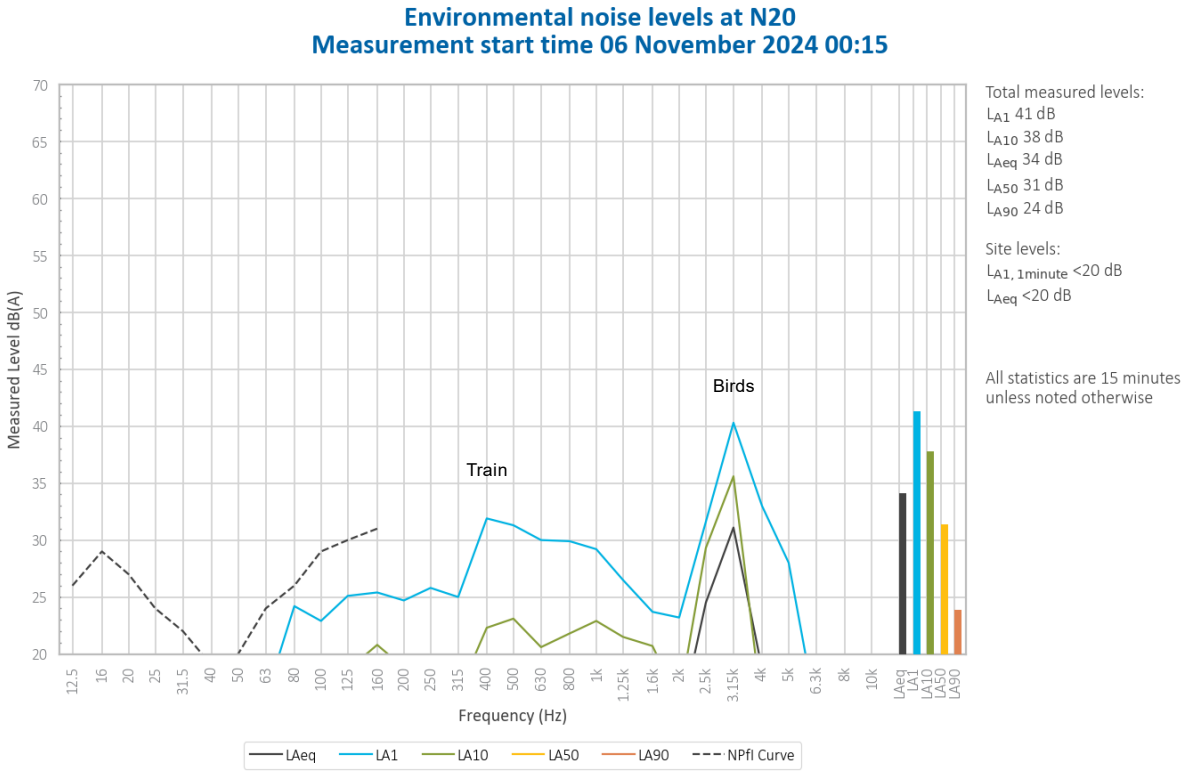

Figure 5.7 Environmental noise levels N20, Ringwood Road

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} and $L_{A1,1minute}$ of less than 20 dB.

Birds generated the measured L_{A1}, L_{A10} and L_{Aeq}. Frogs generated the measured L_{A50} and L_{A90}.

Noise from dogs, cattle and a train were also noted.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 5 November 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the November 2024 survey.

Appendix A
Noise perception and examples

EMM
creating opportunities

A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

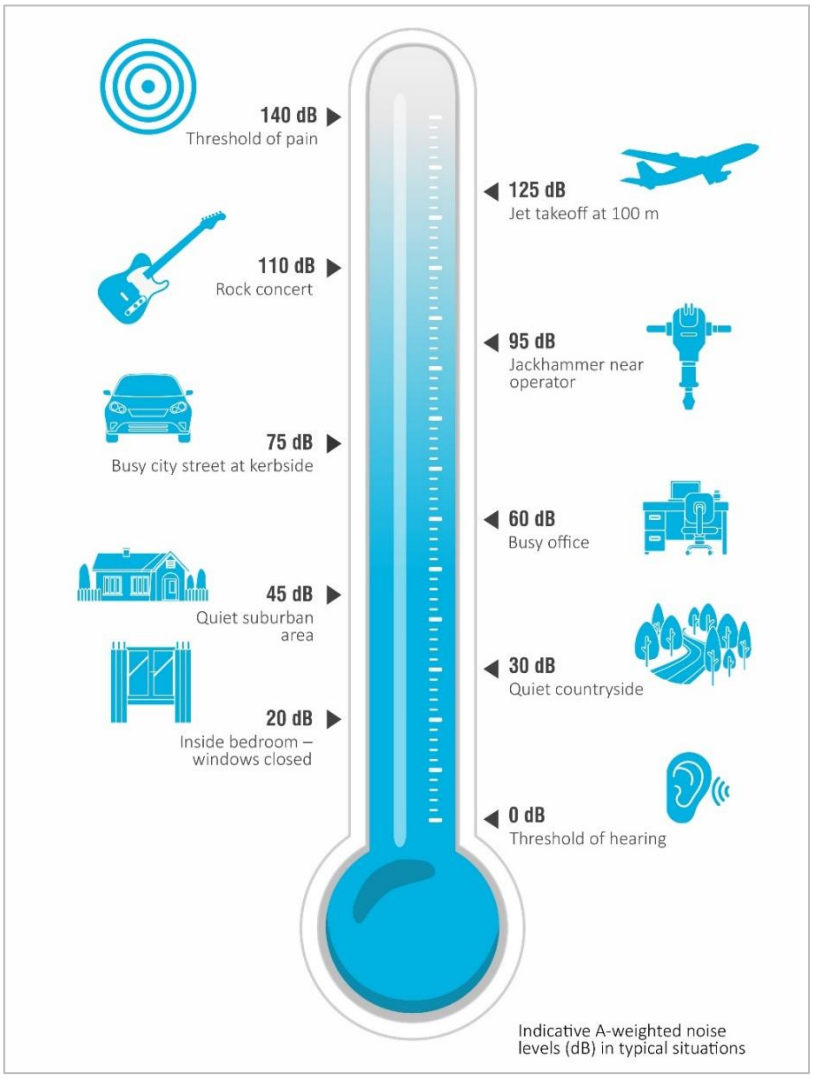

Figure A.1 Common noise levels

Appendix B
Regulator documents

EMM
creating opportunities

B.1 Development consent

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102, 903, 908, 933, and 959

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	*102, 903, 908 and 933*

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	*36*	*36*	*38*	*45*
Wollar Village – Residential	*36*	*37*	*37*	*45*
All other privately owned land	*35*	*35*	*35*	*45*
901 – Wollar School	*35 (internal) 45 (external) When in use*			-
150A – St Luke's Anglican Church 900 – St Laurence O'Toole Catholic Church	*40 (internal) When in use*			-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[3]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[3]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Tichular may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians. The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

As required by EPL12425, when the meteorological station is unavailable for a period of time greater than 48 hours, WCPL must notify the EPA and state what alternative weather monitoring arrangements will be put in place until the return to service of the meteorological station.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7,** • **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5,** WCPL will report both results to DPE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

The assessment of excessive levels of low frequency noise generated by the mine shall be as follows: Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:

- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 9 One-third Octave Low Frequency Noise Thresholds

Hz/dB(Z)	One-third octave LZeq,15minute threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

6.3.4 Data Collection

Data and observations are collected in 15 minute periods and the Leq dBA results recorded. The Leq dBC noise levels will also be recorded to assess low frequency noise. All acoustic instrumentation will comply with *AS 1259.2-1990 'Acoustics – Sound level meters – Integrating – Averaging'*. Comprehensive field notes will be taken to indicate both mine related and non-mine related noise sources and when they occurred. Notes about maximum mine noise levels (source and times) will also be taken. All percentiles (LAmax, LA1, LA10, LA50, LA90, LAmin, LAeq) are measured in A weighting.

Where practicable, the LA1 measurement will be undertaken at 1 m from the dwelling façade and the LAeq measurement within 30 m of the dwelling. Where impracticable, measurements will be undertaken at a suitable and representative location as close to the dwelling as practicable.

6.3.5 Evaluation of Compliance

Tables 10 and **11** summarises the definition used by WCPL in this NMP for the evaluation of compliance with Development Consent (SSD-6764). The reporting requirements and actions that WCPL will take in the event of an exceedance or non-compliance are detailed in **Figure 5** and **Section 6.3.7**.

Table 10 Definition of an Exceedance

Term	Definition
Exceedance	An exceedance is deemed to have occurred when an operator-attended noise monitoring result, measured in accordance with the INP and Development Consent (SSD-6764), exceeds the Noise Criteria in **Table 6**. The noise must be solely attributable to the Mine and under the applicable meteorological conditions (**Section 6.3.6**).

Table 11 Definition of a Non-Compliance

Term	Definition
Non-compliance	A non-compliance is deemed to have occurred when a second operator-attended noise monitoring result [measured in accordance with the INP and Development Consent (SSD-6764)], taken within 75 minutes of an exceedance, also exceeds the Noise Criteria in **Table 6** and either the first and or the second measured noise result is more than 2dBA above the Noise Criteria. Reporting requirements for a non-compliance are detailed in **Section 6.3.7**.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
Unit 36/14 Loyalty Rd
North Rocks NSW AUSTRALIA 2151
Ph: +61 2 9484 0800 A.B.N. 65 160 399 119
www.acousticresearch.com.au

Sound Level Meter
IEC 61672-3:2013

Calibration Certificate

Calibration Number C23032

Client Details	EMM Consulting Level 3/175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Rion NA-28
Instrument Serial Number :	30131882
Microphone Serial Number :	04739
Pre-amplifier Serial Number :	11942
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	24°C	**Ambient Temperature :**	23.5°C
Relative Humidity :	47.3%	**Relative Humidity :**	46.1%
Barometric Pressure :	100.14kPa	**Barometric Pressure :**	100.16kPa

Calibration Technician :	Shaheen Boaz	**Secondary Check:**	Dylan Selge
Calibration Date :	23 Jan 2023	**Report Issue Date :**	25 Jan 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

PAGE 1 OF 1

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C50817

EQUIPMENT TESTED : Acoustic Calibrator

Manufacturer:	Svantek
Type No:	SV 36 **Serial No:** 138014
Class:	1
Owner:	EMM Consulting Suite 01, 20 Chandos St St Leonards NSW 2065
Tests Performed:	Measured Output Pressure level, Frequency & Distortion
Comments:	See Details and Class Tolerance overleaf.

CONDITION OF TEST:

Ambient Pressure	1013	hPa ±1 hPa	**Date of Receipt :**	05/08/2024
Temperature	22	°C ±1° C	**Date of Calibration :**	07/08/2024
Relative Humidity	41	% ±5%	**Date of Issue :**	07/08/2024

Acu-Vib Test Procedure: AVP02 (Calibrators)
Test Method: AS IEC 60942 - 2017

CHECKED BY: KB **AUTHORISED SIGNATURE:** Hein Soe

Accredited for compliance with ISO/IEC 17025 - Calibration

Results of the tests, calibration and/or measurements included in this document are traceable to SI units through reference equipment that has been calibrated by the Australian National Measurement Institute or other NATA accredited laboratories demonstrating traceability.

This report applies only to the item identified in the report and may not be reproduced in part.

The uncertainties quoted are calculated in accordance with the methods of the ISO Guide to the Uncertainty of Measurement and quoted at a coverage factor of 2 with a confidence interval of approximately 95%.

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Wilpinjong Coal Mine

Environmental noise monitoring

Prepared for Wilpinjong Coal Pty Ltd

December 2024

Wilpinjong Coal Mine

Environmental noise monitoring

Wilpinjong Coal Pty Ltd

E231296 RP12

December 2024

Version	Date	Prepared by	Reviewed by	Comments
V1	15/12/2024	Will Moore	Jesse Tribby	Draft
V2	20/12/2024	Will Moore	Jesse Tribby	Final

Approved by

Jesse Tribby
Associate, Acoustics
20 December 2024

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Appendices

Tables

Figures

1 Introduction

1.1 Background

EMM Consulting Pty Ltd (EMM) was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at Wilpinjong Coal Project (WCP, the site), an open cut coal mine near Wollar NSW. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits.

Attended environmental noise monitoring described in this report was done during the night period of 9/10 December 2024 at six monitoring locations.

1.2 Attended monitoring locations

Site monitoring locations are detailed in Table 1.1 and shown on Figure 1.1. It should be noted that Figure 1.1 shows actual monitoring positions, not necessarily the location of residences.

Table 1.1 Attended noise monitoring locations

Location ID	Description	Coordinates (MGA 55)	
		Easting	Northing
N6	St Laurence O'Toole Catholic Church representative of Wollar Village south	777300	6415717
N14	'Tichular' intersection of Tichular and Barigan Roads, Tichular	778792	6408625
N15	Track off Barigan Street near Wollar Public School, Wollar Village	777452	6416159
N17	Mogo Road, off Araluen Road, Wollar	780771	6420641
N19	North Mogo Road, Mogo	782645	6424151
N20	Ringwood Road, off Wollar Road, Wollar	785964	6419051

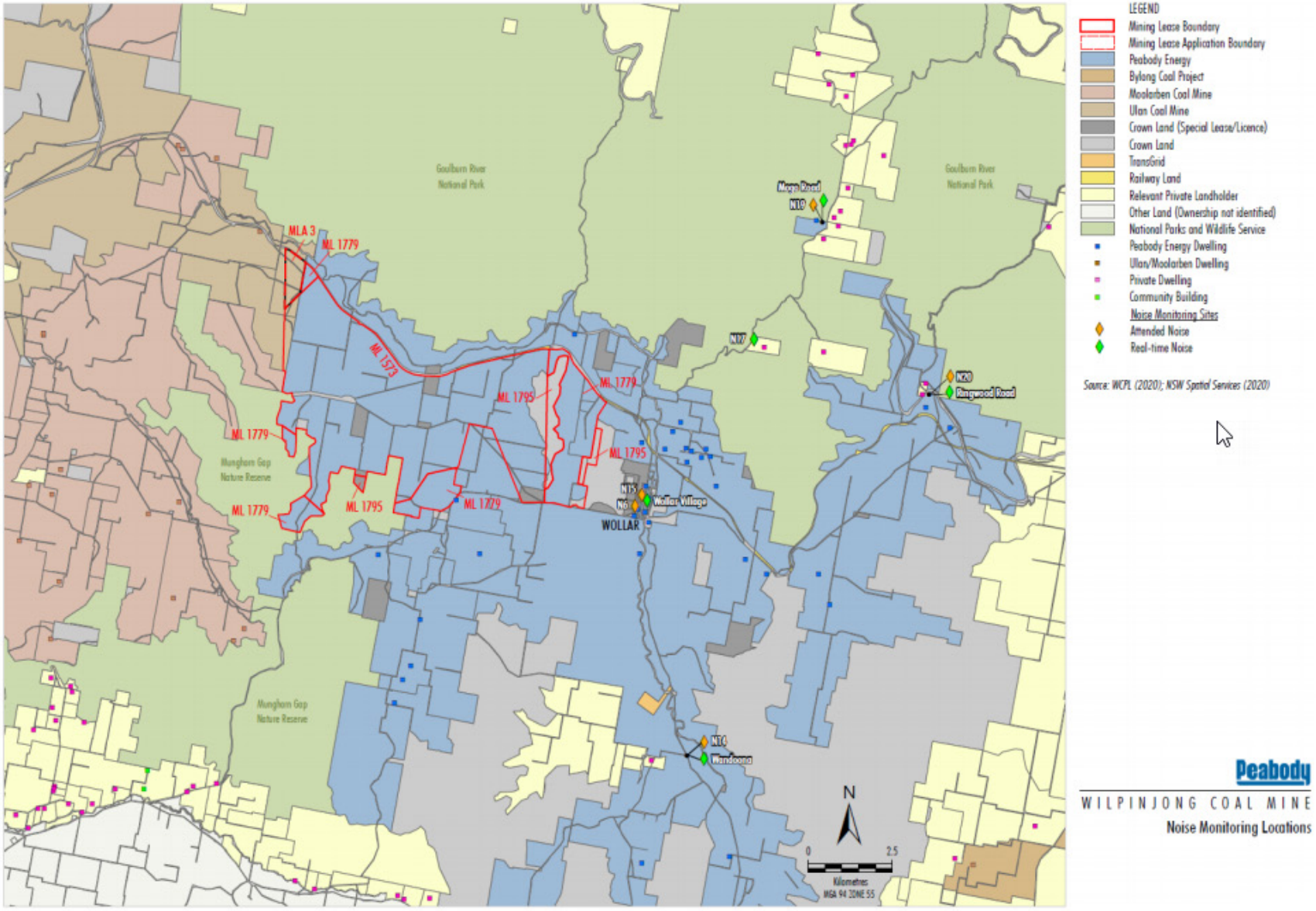

Figure 1.1 Attended noise monitoring locations

1.3 Terminology and abbreviations

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.2.

Table 1.2 Terminology and abbreviations

Term/descriptor	Definition
dB(A)	Noise level measurement units are decibels (dB). The "A" weighting scale is used to approximate how humans hear noise.
L_{Amax}	The maximum root mean squared A-weighted noise level over a time period.
L_{A1}	The A-weighted noise level which is exceeded for 1% of the time.
$L_{A1,1minute}$	The A-weighted noise level which is exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The A-weighted noise level which is exceeded for 10% of the time.
L_{Aeq}	The energy average A-weighted noise level.
L_{A50}	The A-weighted noise level which is exceeded for 50% of the time, also the median noise level during a measurement period.
L_{A90}	The A-weighted noise level exceeded for 90% of the time, also referred to as the "background" noise level and commonly used to derive noise limits.
L_{Amin}	The minimum A-weighted noise level over a time period.
L_{Ceq}	The energy average C-weighted noise energy during a measurement period. The "C" weighting scale is used to take into account low-frequency components of noise within the audibility range of humans.
SPL	Sound pressure level. Fluctuations in pressure measured as 10 times a logarithmic scale, with the reference pressure being 20 micropascals.
Hertz (Hz)	The frequency of fluctuations in pressure, measured in cycles per second. Most sounds are a combination of many frequencies together.
AWS	Automatic weather station used to collect meteorological data, typically at an altitude of 10 metres
VTG	Vertical temperature gradient in degrees Celsius per 100 metres altitude.
Sigma-theta	The standard deviation of the horizontal wind direction over a period of time.
IA	Inaudible. When site noise is noted as IA then there was no site noise at the monitoring location.
NM	Not Measurable. If site noise is noted as NM, this means some noise was audible but could not be quantified.
Day	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.

Appendix A provides further information that gives an indication as to how an average person perceives changes in noise level, and examples of common noise levels.

2 Noise limits

2.1 Development consent

The current development consent for WCP is the 'Wilpinjong Extension Project SSD-6764' (MOD 4, September 2024). Schedule 3 and Appendix 6 of the consent details specific conditions relating to noise generated by WCP. Relevant sections of the consent are reproduced in Appendix B.1.

2.2 Environment protection licence

WCP currently holds Environment Protection Licence (EPL) No. 12425 issued by the Environment Protection Authority (EPA), most recently in March 2023. Relevant sections of the EPL are reproduced in Appendix B.2.

2.3 Noise management plan

Noise monitoring requirements are detailed in the WCP Noise Management Plan (NMP). The most recent version (Version 8) of the NMP was approved in January 2023. Relevant sections of the NMP are reproduced in Appendix B.3.

2.4 Noise limits

Noise impact limits based on both the consent and EPL are as shown in Table 2.1.

Table 2.1 Noise impact limits, dB

Location	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,1minute}$
N6 [1]	36	37	37	45
N14	35	35	35	45
N15	36	37	37	45
N17 [2]	36	36	38	45
N19	35	35	35	45
N20	35	35	35	45

Notes: 1. N6 noise limits have been assumed to be as detailed for 'Wollar Village – Residential' in the consent, as the church is no longer a place of worship.

2. N17 noise limits have been determined based on the assumption that N17 is property 102 in accordance with Appendix 5 Figure 1 of Development Consent SSD-6764.

2.5 Meteorological conditions

Meteorological data was obtained from the WCP automatic weather station (AWS), which allowed correlation of atmospheric parameters and measured noise levels.

As detailed in the WCP consent and NMP, noise criteria apply under all meteorological conditions except the following:

- wind speeds greater than 3m/s at 10m above ground level;
- stability category F temperature inversion conditions and wind speeds greater than 2m/s at 10m above ground level; or
- stability category G temperature inversion conditions.

2.6 Additional requirements

Monitoring and reporting have been done in accordance with the NSW EPA 'Noise Policy for Industry' (NPfI) issued in October 2017 and the 'Approved methods for the measurement and analysis of environmental noise in NSW' (Approved Methods) issued in January 2022. For assessment of modifying factors, the NPfI immediately superseded the 'Industrial Noise Policy' (INP 2000), as outlined in the EPA document 'Implementation and transitional arrangements for the Noise Policy for Industry' (2017). Assessment and reporting of modifying factors have been undertaken in accordance with Fact Sheet C of the NPfI.

Condition 6 in Appendix 6 of the development consent details specific methodology for assessment of low-frequency noise, which is consistent with methodology in Fact Sheet C of the NPfI. Low frequency modifying factors have been assessed in accordance with both the development consent and NPfI.

3 Methodology

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS1055 'Acoustics, Description and Measurement of Environmental Noise' and relevant NSW EPA requirements. Meteorological data was obtained from the WCP automatic weather station (AWS) which allowed correlation of atmospheric parameters with measured site noise levels.

3.2 Attended noise monitoring

During this survey, attended noise monitoring was conducted during the night period at each location. The duration of each measurement was 15 minutes. Atmospheric conditions were measured at each monitoring location.

Measured sound levels from various sources were noted during each measurement, and particular attention was paid to the extent of site's contribution (if any) to measured levels. At each monitoring location, the site-only $L_{Aeq,15minute}$ and L_{Amax} were measured directly or determined by other methods detailed in Section 7.1 of the NPfI.

The terms 'Inaudible' (IA) or 'Not Measurable' (NM) may be used in this report. When site noise is noted as IA, it was inaudible at the monitoring location. When site noise is noted as NM, this means it was audible but could not be quantified. All results noted as IA or NM in this report were due to one or more of the following:

- Site noise levels were very low, typically more than 10 dB below the measured background (L_{A90}), and unlikely to be noticed.
- Site noise levels were masked by more dominant sources that are characteristic of the environment (such as breeze in foliage or continuous road traffic noise) that cannot be eliminated by monitoring at an alternate or intermediate location.
- It was not feasible or reasonable to employ methods such as to move closer and back calculate. Cases may include rough terrain preventing closer measurement, addition/removal of significant source to receiver shielding caused by moving closer, and meteorological conditions where back calculation may not be accurate.

If exact noise levels from site could not be established due to masking by other noise sources in a similar frequency range but were determined to be at least 5 dB lower than relevant limits, then a maximum estimate of may be provided. This is expressed as a 'less than' quantity, such as <20 dB or <30 dB.

For this assessment, the measured L_{Amax} has been used as a conservative estimate of $L_{A1,1minute}$. The EPA accepts sleep disturbance analysis based on either the $L_{A1,1minute}$ or L_{Amax} metrics, with the L_{Amax} representing a more conservative assessment of site noise emissions.

3.3 Modifying factors

All measurements were evaluated for potential modifying factors in accordance with the NPfI. Assessment of modifying factors is undertaken at the time of measurement if the site was audible and directly quantifiable. If applicable, modifying factor penalties have been reported and added to measured site-only L_{Aeq}. Specific methodology for assessment of each modifying factor is outlined in Fact Sheet C of the NPfI.

Methodology for assessment of low-frequency modifying factors is consistent between Fact Sheet C of the NPfI and Appendix 6 of the consent. Low-frequency modifying factor penalties have only been applied to site-only L_{Aeq} if the site was the only contributing low-frequency noise source.

The NPfI reference curve has been added to the graphs in Section 5 to provide site noise level context. The reference curve has been converted from dB(Z) to dB(A), as shown in Table 3.1, so that it can be compared to the A-weighted graphs in Section 5.

Table 3.1 NPfI reference curve adjusted for A-weighting, dB

Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
NPfI Reference (Z)	92	89	86	77	69	61	54	50	50	48	48	46	44
NPfI Reference (A)	22	26	29	27	24	22	19	20	24	26	29	30	31

3.4 Instrumentation and personnel

Attended noise monitoring was conducted by Will Moore. Qualifications, experience, and/or demonstration of competence in accordance with the Approved Methods is available upon request.

Equipment used to measure environmental noise levels is detailed in Table 3.2. Calibration certificates are provided in Appendix C.

Table 3.2 Attended noise monitoring equipment

Item	Serial number	Calibration due date	Relevant standard
Rion NA-28 sound level meter	00701424	01/06/2025	IEC 61672-1:2002
SVAN SV36 acoustic calibrator	78226	26/02/2026	IEC 60942:2017

4 Results

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each attended 15-minute measurement are provided in Table 4.1. Discussion as to the noise sources responsible for these measured levels is provided in Section 5 of this report.

Table 4.1 Total measured noise levels, dB – December 2024 [1]

Location	Start date and time	L_{Amax}	L_{A1}	L_{A10}	L_{Aeq}	L_{A50}	L_{A90}	L_{Amin}
N6	9/12/2024 22:47	46	44	42	41	41	38	33
N14	9/12/2024 23:45	68	66	64	61	60	57	51
N15	9/12/2024 23:15	54	48	41	38	34	31	28
N17	9/12/2024 22:22	59	58	58	56	54	53	49
N19	9/12/2024 22:00	56	50	49	48	48	46	43
N20	10/12/2024 00:15	38	35	32	30	29	27	26

Notes: 1. Levels in this table are not necessarily the result of activity at site.

Atmospheric condition data measured by the operator during each measurement using a hand-held weather meter is shown in Table 4.2. The wind speed, direction, and temperature were measured at approximately 1.5 metres above ground. Attended noise monitoring is not done during rain, hail, or wind speeds above 5 m/s at microphone height.

Table 4.2 Measured atmospheric conditions – December 2024

Location	Start date and time	Temperature °C	Wind speed m/s	Wind direction ° Magnetic north [1]	Cloud cover 1/8s
N6	9/12/2024 22:47	23	<0.5	-	6
N14	9/12/2024 23:45	23	<0.5	-	6
N15	9/12/2024 23:15	24	<0.5	-	3
N17	9/12/2024 22:22	24	<0.5	-	8
N19	9/12/2024 22:00	22	1.2	60	8
N20	10/12/2024 00:15	22	<0.5	-	4

Notes: 1. "-" indicates calm conditions at monitoring location.

Low-frequency linear spectra measured from all sources during each attended 15-minute measurement are shown in Table 4.3. If low-frequency noise levels from site triggered a modifying factor, additional analysis is provided in Section 4.2 of this report.

Table 4.3 Measured low-frequency L_{eq} noise levels, dB(Z) - December 2024 [1,2]

Location	Start date and time	Frequency (Hz)											
		12.5	16	20	25	31.5	40	50	63	80	100	125	160
N6	9/12/2024 22:47	-	-	-	35	31	31	31	27	28	28	25	25
N14	9/12/2024 23:45	-	-	-	37	34	32	33	32	33	35	28	24
N15	9/12/2024 23:15	54	49	53	52	53	49	45	42	37	34	32	32
N17	9/12/2024 22:22	-	-	41	40	42	39	38	35	34	35	32	30
N19	9/12/2024 22:00	54	48	42	45	41	39	39	35	35	36	30	27
N20	10/12/2024 00:15	-	47	41	44	38	33	31	30	30	26	25	25

Notes: 1. Levels in this table are not necessarily the result of activity at site.

2. "-" indicates noise levels were too low to be measured by the sound level meter.

4.2 Site only noise levels

4.2.1 Modifying factors

Modifying factors were assessed during the survey and are detailed in Table 4.4.

Table 4.4 WCP modifying factor assessment – December 2024

Location	Start date and time	Measured WCP L_{Aeq} dB	Limits apply? [1]	Tonality modifying factor? [2]	Frequency of tonality [2]	Measured WCP $L_{Ceq} - L_{Aeq}$ [3]	Exceedance of reference spectrum [2,4,5]	Low-frequency modifying factor? [2]	Total penalty dB [2,4]
N6	9/12/2024 22:47	IA	Yes	No	N/A	N/A	N/A	No	Nil
N14	9/12/2024 23:45	IA	Yes	No	N/A	N/A	N/A	No	Nil
N15	9/12/2024 23:15	IA	Yes	No	N/A	N/A	N/A	No	Nil
N17	9/12/2024 22:22	<25	Yes	No	N/A	N/A	N/A	No	Nil
N19	9/12/2024 22:00	<25	Yes	No	N/A	N/A	N/A	No	Nil
N20	10/12/2024 00:15	IA	Yes	No	N/A	N/A	N/A	No	Nil

Notes: 1. Modifying factors are considered not applicable when noise limits are not applicable.

2. Yes/No denote modifying factor was or was not applied. N/A denotes assessment was 'not applicable' due to meteorological conditions or further assessment was not required.

3. N/A denotes assessment was 'not applicable' due to meteorological conditions or site L_{Ceq} and/or L_{Aeq} could not be directly quantified.

4. Bold results indicate that application of NPfI modifying factor(s) is required.

5. The reference spectrum is provided in Fact Sheet C of the NPfI and Table 6-1 of Appendix 6 of the development consent SSD-6764.

4.2.2 Monitoring results

Table 4.5 provides site noise level levels in the absence of other sources, where possible, and includes weather data from the site AWS. Limits are applicable if weather conditions were within specified parameters during each measurement.

Table 4.5 Site noise levels and limits – December 2024

Location	Start date and time	Wind		Stability class	Limits apply? [1]	Site limits, dB		Site levels, dB		Exceedances, dB	
		Speed m/s	Direction [4]			$L_{Aeq,15minute}$	$L_{A1,1minute}$	$L_{Aeq,15minute}$ [2]	$L_{A1,1minute}$	$L_{Aeq,15minute}$	$L_{A1,1minute}$
N6	9/12/2024 22:47	2.0	45	D	Yes	37	45	IA	IA	Nil	Nil
N14	9/12/2024 23:45	2.1	103	C	Yes	35	45	IA	IA	Nil	Nil
N15	9/12/2024 23:15	1.1	55	D	Yes	37	45	IA	IA	Nil	Nil
N17	9/12/2024 22:22	1.3	24	D	Yes	38	45	<25	30	Nil	Nil
N19	9/12/2024 22:00	1.1	28	D	Yes	35	45	<25	27	Nil	Nil
N20	10/12/2024 00:15	1.2	86	D	Yes	35	45	IA	IA	Nil	Nil

Notes: 1. Noise emission limits are applicable if weather conditions were within parameters specified in Section 2.5.

2. Site-only $L_{Aeq,15minute}$, includes modifying factor penalties if applicable.

3. N/A in exceedance column means criterion was not applicable due to atmospheric conditions outside those specified in consent.

4. Degrees magnetic north, "-" indicates calm conditions.

5 Discussion

5.1 Noted noise sources

During attended monitoring, the time variations (temporal characteristics) of noise sources are considered in each measurement via statistical descriptors. From these observations, summaries have been derived for the location and provided in this section. Statistical 1/3 octave-band analysis of environmental noise was done and the following figures display frequency ranges of various noise sources at each location for L_{A1}, L_{A10}, L_{Aeq}, L_{A50}, and L_{A90} descriptors. These figures also provide, graphically, statistical information for these noise levels.

An example is provided as Figure 5.1, where frogs and insects are seen to be generating noise at frequencies above 1,000 Hz, while industrial noise is observed at frequencies less than 1,000 Hz.

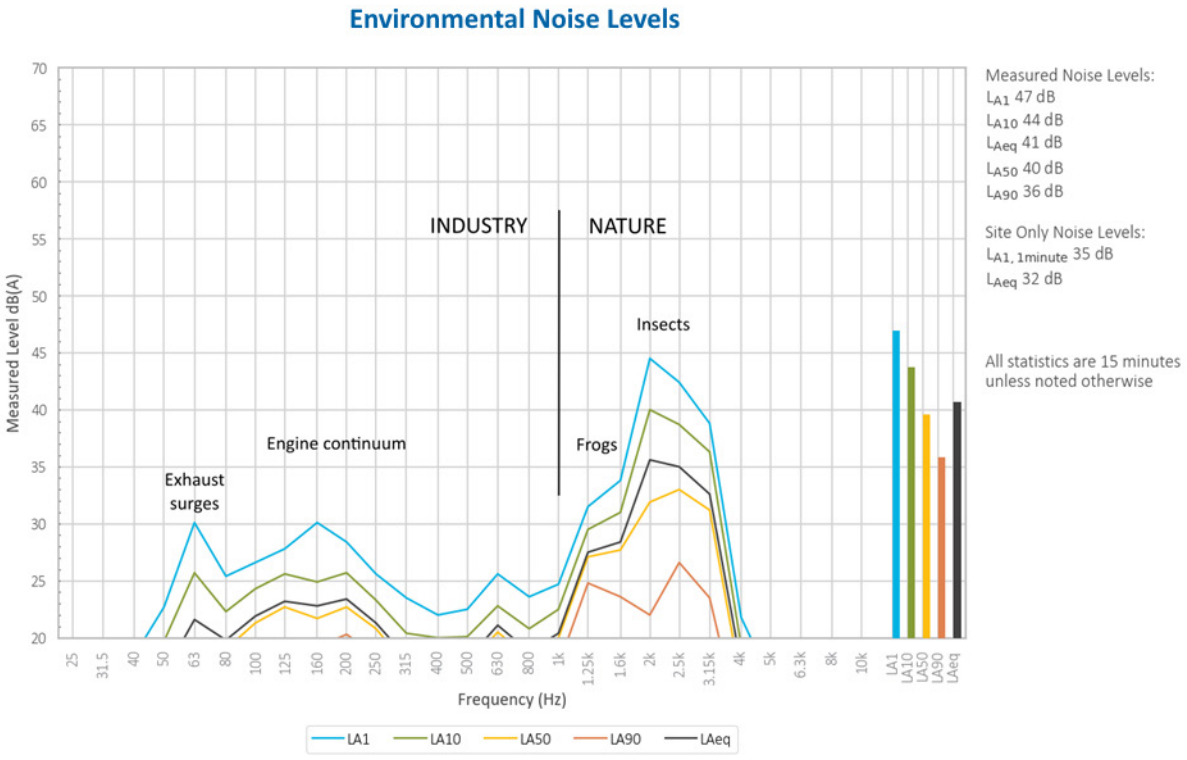

Figure 5.1 Example graph (refer to Section 5.1 for explanatory note)

5.2 N6

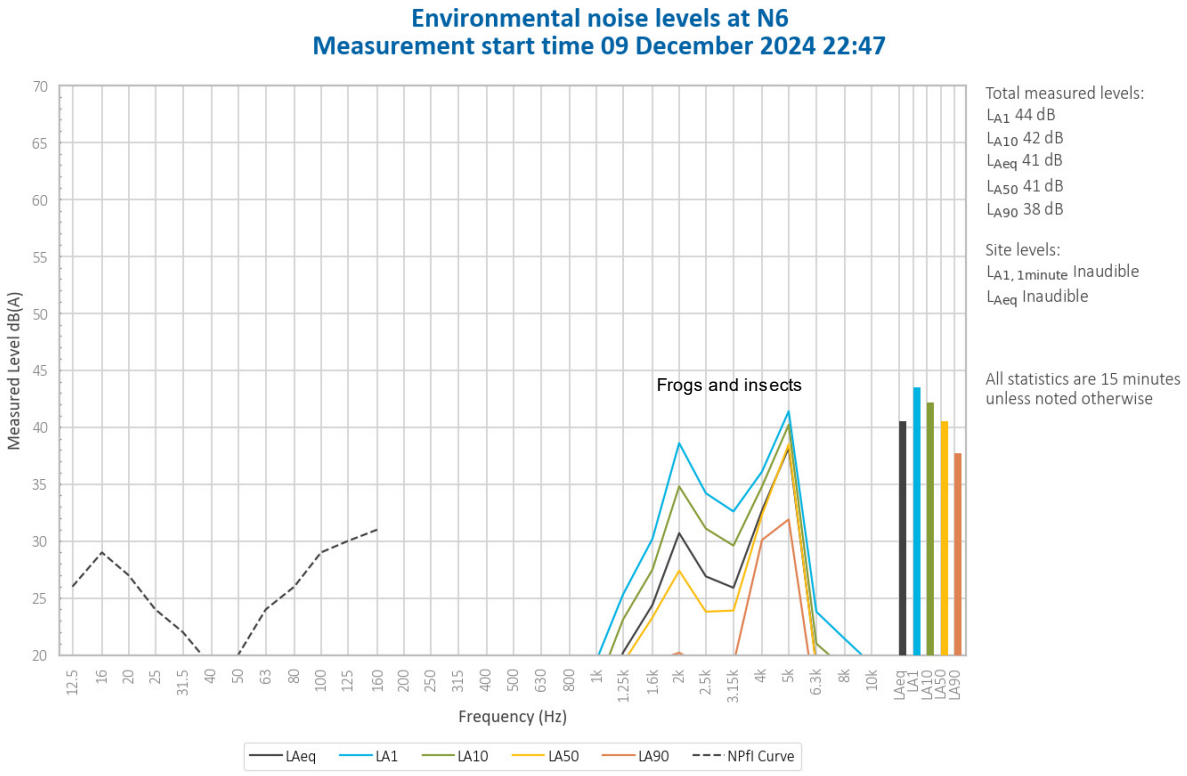

Figure 5.2 Environmental noise levels N6, St Laurence O'Toole Catholic Church, Wollar Village

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels.

Noise from bats and a train was also noted at low levels.

5.3 N14

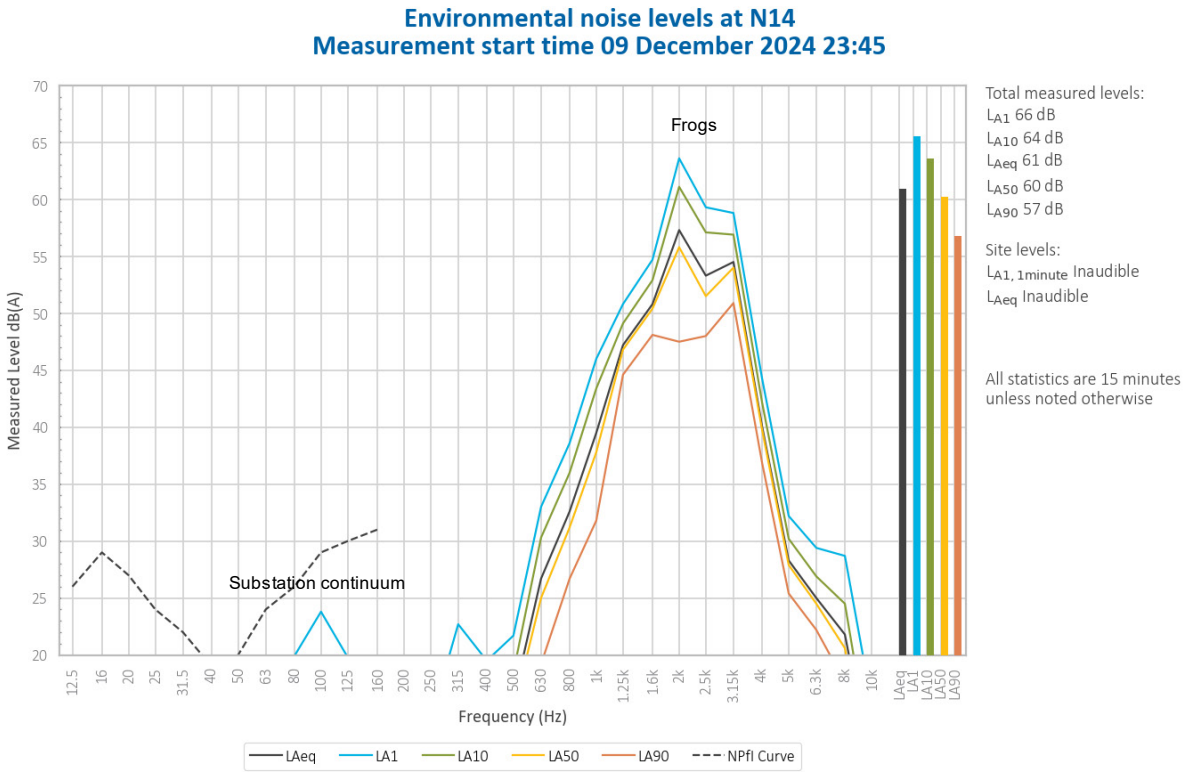

Figure 5.3 Environmental noise levels N14, 'Tichular', intersection of Tichular and Barigan Roads

WCP was inaudible during the measurement.

Frogs generated total measured levels.

Continuum from a nearby substation and noise from bats and birds were also noted.

5.4 N15

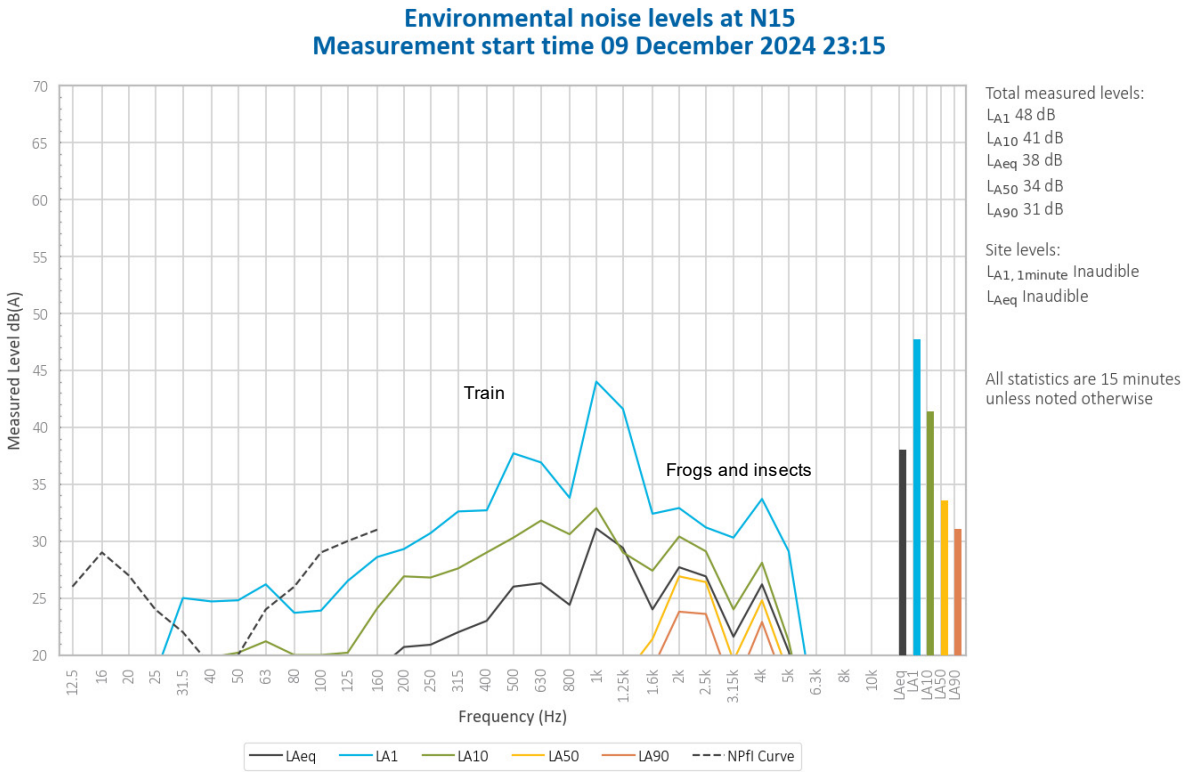

Figure 5.4 Environmental noise levels N15, track off Barigan Street near Wollar School, Wollar Village

WCP was inaudible during the measurement.

A train generated the measured L_{A1} and L_{A10} and contributed to the L_{Aeq}. Frogs and insects contributed to the L_{Aeq} and generated the measured L_{A50} and L_{A90}.

5.5 N17

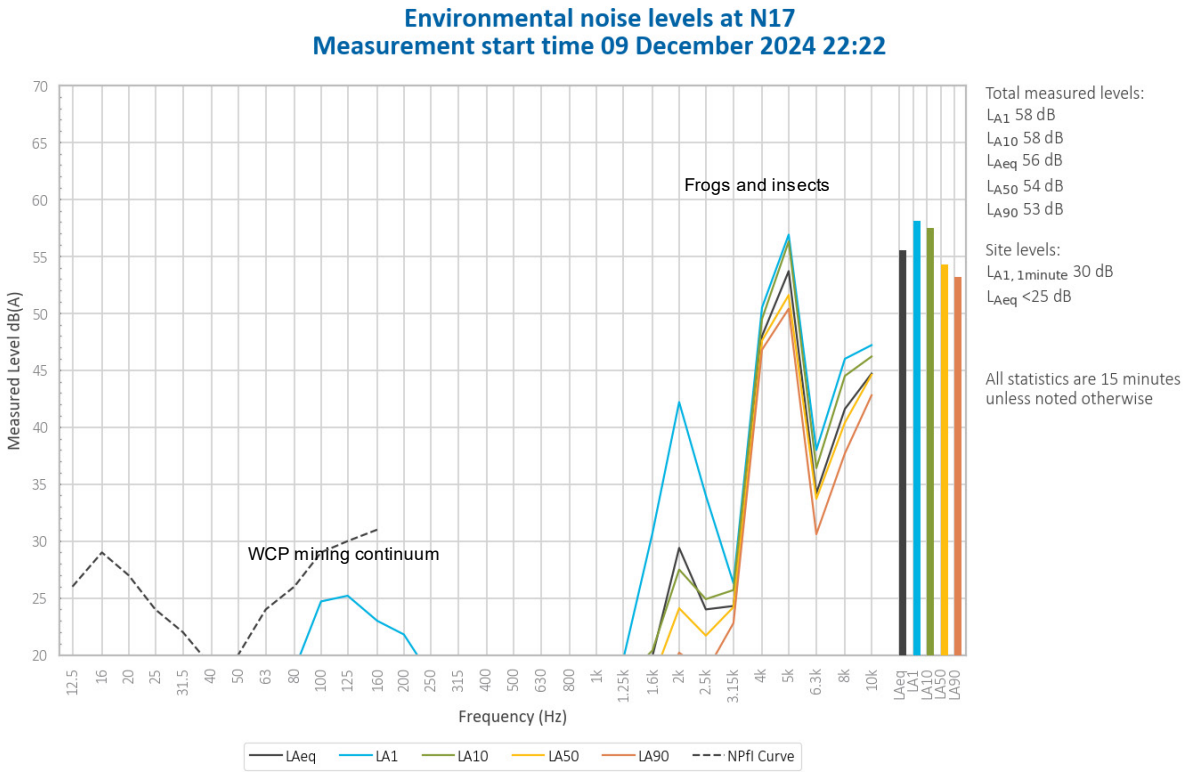

Figure 5.5 Environmental noise levels N17, Mogo Road (1)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of less than 25 dB. Surges in this continuum generated the site-only $L_{A1,1minute}$ of 30 dB.

Frogs and insects generated total measured levels.

5.6 N19

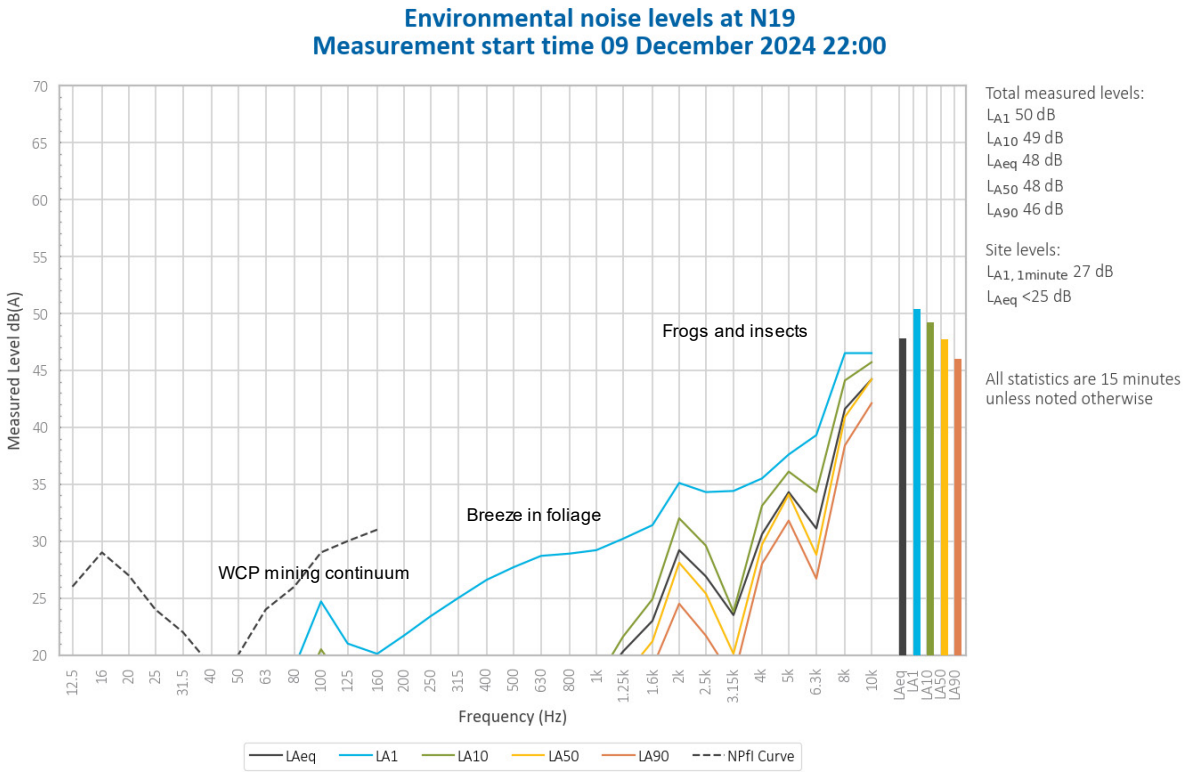

Figure 5.6 Environmental noise levels N19, Mogo Road (2)

A mining continuum from WCP was audible throughout the measurement, generating a site only L_{Aeq} of less than 25 dB. Surges in this continuum generated the site-only $L_{A1,1minute}$ of 27 dB.

Frogs and insects generated total measured levels.

Noise from breeze in foliage was also noted.

5.7 N20

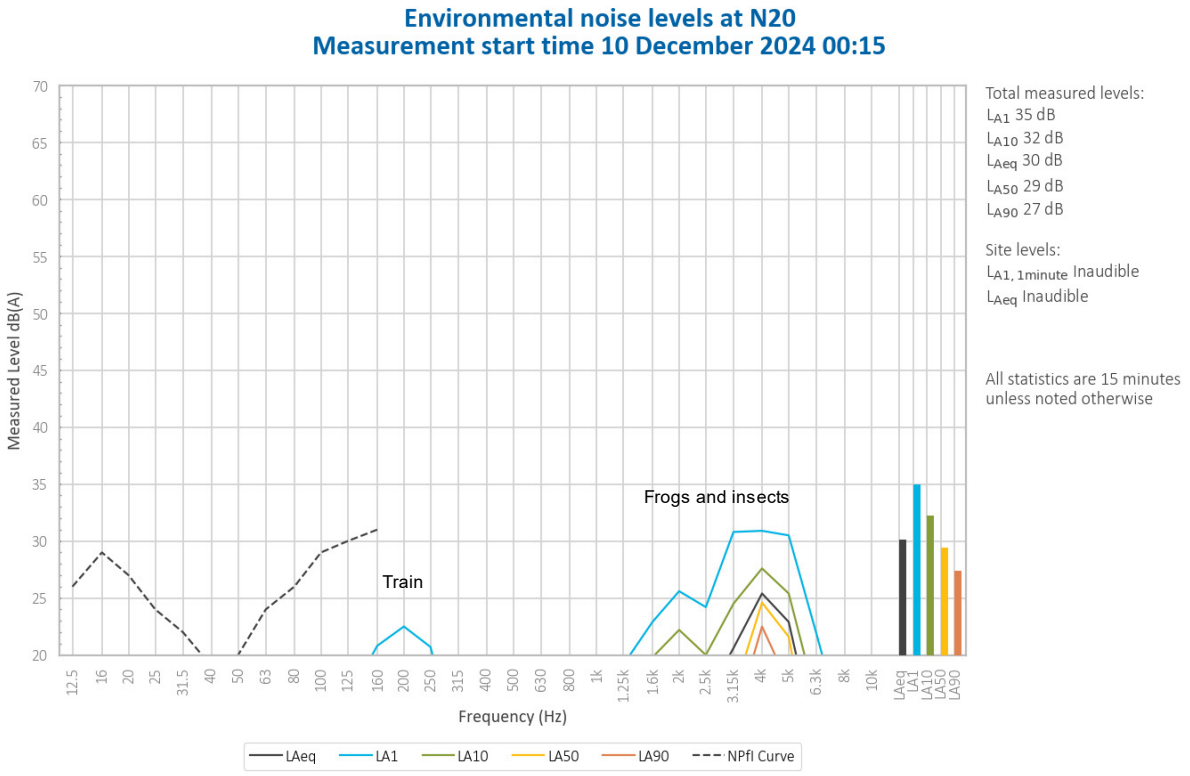

Figure 5.7 Environmental noise levels N20, Ringwood Road

WCP was inaudible during the measurement.

Frogs and insects generated total measured levels.

Noise from a train was also noted.

6 Summary

EMM was engaged by Wilpinjong Coal Pty Ltd to conduct a monthly noise survey of operations at WCP. The survey purpose was to quantify the acoustic environment and compare site noise levels against specified limits from the relevant EPL and consent.

Attended environmental noise monitoring described in this report was done during the night period of 9/10 December 2024 at six monitoring locations.

Noise levels from site complied with relevant limits at all monitoring locations during the December 2024 survey.

Appendix A
Noise perception and examples

EMM
creating opportunities

A.1 Noise levels

Table A.1 gives an indication as to how an average person perceives changes in noise level. Examples of common noise levels are provided in Figure A.1.

Table A.1 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise
Up to 2	Not perceptible
3	Just perceptible
5	Noticeable difference
10	Twice (or half) as loud
15	Large change
20	Four times (or quarter) as loud

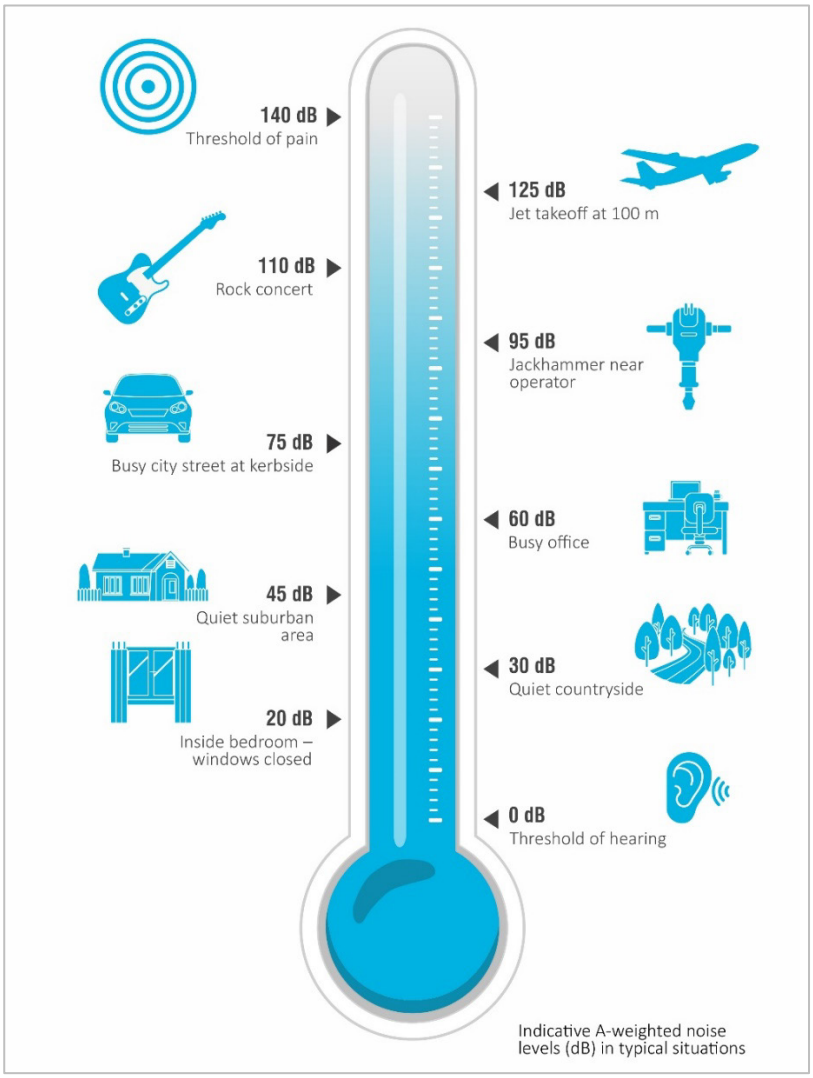

Figure A.1 Common noise levels

Appendix B
Regulator documents

EMM
creating opportunities

B.1 Development consent

CONSOLIDATED CONSENT

SCHEDULE 3
SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION UPON REQUEST

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Applicant must acquire the land in accordance with the procedures in conditions 5 and 6 of schedule 4.

Table 1: Land subject to acquisition upon request

Residence
102 and 933

Note: To interpret the land referred to in Table 1, see the applicable figures in Appendix 5.

MITIGATION UPON REQUEST

2. Upon receiving a written request from the owner of any residence on the land listed in Table 2, the Applicant must implement additional noise mitigation measures at or in the immediate vicinity of the residence in consultation with the landowner. These measures must be consistent with the measures outlined in the *Voluntary Land Acquisition and Mitigation Policy*. They must also be reasonable and feasible and proportionate with the level of predicted impact.

   If within 3 months of receiving this request from the owner, the Applicant and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Land subject to additional mitigation upon request

Mitigation Basis	Residence
Noise	102 and 933

Note: To interpret the land referred to in Table 2, see the applicable figures in Appendix 5.

NOISE

Noise Criteria

3. The Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 3 at any residence on privately-owned land or at the other specified locations.

Table 3: Noise criteria dB(A)

Location	Day	Evening	Night	
	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
102	36	36	38	45
Wollar Village – Residential	36	37	37	45
All other privately owned land	35	35	35	45
901 – Wollar School		35 (internal) 45 (external) When in use		-

Note: To interpret the locations referred to in Table 3, see the applicable figures in Appendix 5.

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time to time). Appendix 6 sets out the meteorological conditions under which these criteria apply along with any modifications to the *NSW Industrial Noise Policy* and the requirements for evaluating compliance with these criteria.

However, these criteria do not apply if the Applicant has an agreement with the owner/s of the relevant residence of land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

4. The Applicant must:
   (a) implement all reasonable and feasible measures to minimise the construction, operational, low frequency, road and rail noise of the development;
   (b) operate a comprehensive noise management system that uses a combination of predictive meteorological forecasting and real-time noise monitoring data to guide the day to day planning of mining operations, and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this consent;

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(c) minimise the noise impacts of the development during meteorological conditions when the noise limits in this consent do not apply (see Appendix 6);
(d) only use locomotives and rolling stock that are approved to operate on the NSW rail network in accordance with the noise limits in ARTC's EPL;
(e) co-ordinate noise management at the site with the noise management at Moolarben and Ulan mines to minimise cumulative noise impacts; and
(f) carry out regular monitoring to determine whether the development is complying with the relevant conditions of this consent.

Noise Management Plan

5. Prior to carrying out any development under this consent, unless the Secretary agrees otherwise, the Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Secretary. This plan must:
   (a) be prepared in consultation with the EPA;
   (b) describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;
   (c) describe the proposed noise management system in detail; and
   (d) include a monitoring program that:
   - evaluates and reports on:
     - the effectiveness of the noise management system;
     - compliance against the noise criteria in this consent; and
     - compliance against the noise operating conditions;
   - includes a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results over time (so the real-time noise monitoring program can be used as a better indicator of compliance with the noise criteria in this consent and trigger for further attended monitoring); and
   - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

6. The Applicant must implement the approved Noise Management Plan for the development.

APPENDIX 6
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 3 of schedule 3 are to apply under all meteorological conditions except the following:
   (a) wind speeds greater than 3 m/s at 10 m above ground level; or
   (b) stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
   (c) stability category G temperature inversion conditions.

Determination of Meteorological Conditions

2. Except for wind speed at microphone height, the data to be used for determining meteorological conditions must be that recorded by the meteorological station located on the site.

Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this consent.

4. This monitoring must be carried out at least 12 times a year, unless the Secretary directs otherwise.

5. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements for reviewing performance set out in the *NSW Industrial Noise Policy* (as amended from time to time), in particular the requirements relating to:
   (a) monitoring locations for the collection of representative noise data;
   (b) meteorological conditions during which collection of noise data is not appropriate;
   (c) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
   (d) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.

6. The assessment of excessive levels of low frequency noise generated by the mine shall be as follows:

   Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
   - where any of the 1/3 octave noise levels in Table 6-1 are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 6-1: One-third octave low frequency noise thresholds

Hz/dB(Z)	***One-third octave $L_{Zeq,15minute}$ threshold level***												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

B.2 Environmental protection licence

L5 Noise limits

L5.1 Noise generated at the premises must not exceed the noise limits presented in the table below. The

locations referred to in the table below are indicated in Appendix 5 - Figures 1 and 2 of Development Consent number SSD-6764 dated 24 April 2017.

Location	Day	Evening	Night	Night
	LAeq(15 minute)	LAeq(15 minute)	LAeq(15 minute)	LA1(1 minute)
Wollar village - residential	36	37	37	45
All other privately owned land	35	35	35	45
102	36	36	38	45
Wollar school	35 (internal), 45 (external) when in use			
St Luke's Anglican Church & St Laurence O'Toole Catholic Church	40 (internal) when in use			

Note: The above noise limits do not apply at properties where the licensee has a written agreement with the landowner to exceed the noise limits.

L5.2 For the purpose of condition L5.1;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- Evening is defined as the period 6pm to 10pm.
- Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and Public Holidays.

L5.3 The noise limits set out in condition L5.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
b) Stability category F temperature inversions and wind speeds greater than 2m/s at 10m above ground level; or
c) Stability category G temperature inversion conditions.

L5.4 For the purpose of condition L5.3:
a) The meteorological data to be used for determining meteorological conditions is the data recorded by the meteorological weather station identified as EPA identification Point 21 in condition P1.1; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L5.5 To determine compliance:
a) With the Leq(15 minute) noise limits in condition L5.1, the noise measurement equipment must be located:

i) approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
ii) within 30 metres of a dwelling façade, but not closer than 3 metres where any dwelling

on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
iii) within approximately 50 metres of the boundary of a National Park or Nature Reserve

b) With the LA1(1 minute) noise limits in condition L5.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) With the noise limits in condition L5.1, the noise measurement equipment must be located:
i) at the most affected point at a location where there is no dwelling at the location; or
ii) at the most affected point within an area at a location prescribed by conditions L5.5(a) or L5.5(b).

L5.6 A non-compliance of condition L5.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

a) at a location other than an area prescribed by conditions L5.5(a) and L5.5(b); and/or
b) at a point other than the most affected point at a location.

L5.7 For the purpose of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

6 Noise Monitoring Program

WCPL utilise a combination of operator-attended and unattended noise monitoring to assess the performance of the Mine against the Noise Criteria from Development Consent (SSD-6467). Operator-attended noise monitoring will be used for determining compliance against the Noise Criteria in **Table 6**. Unattended real-time noise monitoring is primarily utilised as a proactive noise control system; providing noise alerts when predetermined noise levels are triggered so mining operations can be modified where noise levels are influenced by noise from the Project.

6.1 Monitoring Locations

Operator-attended noise monitoring locations have been chosen considering the following criteria:

- In any given direction, the site is as close as reasonably practical to the nearest Private Receiver;
- There is no closer Private Receiver that is not monitored;
- The site is unlikely to cause concern to any person residing on nearby private property; and
- The site can be safely accessed by the persons carrying out the noise monitoring.

WCPL will undertake operator-attended noise monitoring as identified in **Table 7** (**Figure 3** and **Figure 4**). Real-time noise monitoring units are relocated from time to time, to assist with additional targeted noise monitoring and in response to community complaints. Real-time noise monitoring locations will be reviewed and modified as necessary in response to monitoring results, changes to the operation, or as a result of community consultation.

Should circumstances change, WCPL may amend the noise monitoring locations shown in **Table 7** with consideration to the above criteria. WCPL will update this NMP, in consultation with DPE and the EPA.

Table 7 Noise Monitoring Locations

Location	Site	Type	Easting[1]	Northing[1]	Justification
St Laurence O'Toole Church	N6	Operator-attended Noise	777299.9	6415716.9	Location based on the nearest community structure to the East of the Mine
Tichular	N14	Operator-attended Noise	778791.9	6408624.7	Location based on the nearest community structure to the South of the Mine
Wollar Village	N15	Operator-attended Noise	777452.0	6416158.9	Location based on the nearest community structure to the South-East of the Mine
Mogo Rd	N17	Operator-attended Noise	780771.0	6420641.0	Location based on the nearest community structure to the North-East of the Mine
Mogo Rd	N19	Operator-attended Noise	782644.5	6424151.1	Location based on the nearest and residential community structure to the North-East of the Mine
Ringwood Road	N20	Operator-attended Noise	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine.
WCPL Rail Loop	-	Meteorology & Inversion	770630.9	6418085.1	Location based on consideration of prevailing meteorological conditions

Location	Site	Type	Easting[1]	Northing[1]	Justification
Wollar Village[3]	-	Real-Time Noise - Fixed	777608.9	6415996.8	Location based on the nearest non-mine owned residence to the South-East of the Mine N15 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Mogo Rd[3]	-	Real-Time Noise - Fixed	782644.5	6424151.1	Location based on the nearest non-mine owned residence to the East of the Mine N19 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Ringwood Road	-	Real-Time Noise - Fixed	785964.2	6419050.6	Location based near to community residence in discussions with DPE and EPA on the 23 May 2017 to the East of the Mine. N20 operator-attended Noise Monitoring (validation of real-time noise monitoring)
Tichular[3]	-	Real-Time Noise - Mobile	778791.9	6408624.7	Location based on recommendations from noise specialist (Global Acoustics) review of this NMP (Version 4). N14 operator-attended Noise Monitoring (validation of real-time noise monitoring)

Notes:

1. MGA94, Zone 55
2. Monitoring will be undertaken at this location until it can be demonstrated that the noise contribution from the Mine is negligible. At this point, WCPL will notify DPE and EPA of the results of this monitoring and advise if and when the monitoring at this location will be scaled back or discontinued. The real-time noise monitor at Tichular may be relocated in response to a complaint or identified noise issue at another location.
3. Where continuous monitors are located at compliance locations (e.g. privately-owned receivers), WCPL will conduct a review of the identification/characterisation of mine-related noise by the real-time monitoring system at that location by comparing against observed mine-related noise identified during operator-attended monitoring (i.e. validate the identification of mine related noise and filtering of extraneous noise sources by the real-time system). Refer to **Section 6.5**.

6.2 Meteorological Monitoring

WCPL maintains a continuous on-site meteorological monitoring station that complies with the requirements of the *Approved Methods for the Sampling and Analysis of Air Pollutants in New South Wales* (DEC, 2007). The location of this meteorological monitoring station is shown on **Figure 3**.

WCPL's meteorological monitoring station is capable of continuous real-time measurement of temperature lapse rate in accordance with the INP (EPA, 2000).

The meteorological station is routinely calibrated by appropriately accredited technicians. The following parameters are monitored:

a) Rainfall;
b) Relative humidity;
c) Temperature – measured at 2, 10 and 60 m above ground level;
d) Wind speed – horizontal and vertical;
e) Wind direction – measured at 10 m above ground level;
f) Sigma theta;
g) Pasquil stability classification;
h) Solar radiation; and
i) Temperature lapse rate.

Meteorological forecasting will be undertaken as specified in **Section 5.4**.

As required by EPL12425, when the meteorological station is unavailable for a period of time greater than 48 hours, WCPL must notify the EPA and state what alternative weather monitoring arrangements will be put in place until the return to service of the meteorological station.

6.3 Operator-attended Noise Monitoring

6.3.1 Purpose

Operator-attended noise monitoring will be used to evaluate compliance against the Noise Criteria detailed in **Table 6**.

6.3.2 Summary

Operator-attended noise will be undertaken in accordance with **Table 8**.

Table 8 Operator-attended Noise Monitoring Summary

Element	Description
Locations	• As per **Table 7,** • **Figure 3** and **Figure 4**
Period	• Night-time period (10 pm to 7 am) being the most sensitive time period for noise.
Frequency	• 12 times per year[1] (i.e. one night per month); plus • 12 times per year[1] (i.e. one night per month) at locations as identified in Table 7 to validate real-time noise monitoring data (Section 6.5).

Notes: [1] Monitoring frequency at Mogo Road (N19) and Ringwood Road (N20) will remain at the frequency identified in Table 8 during the commencement of operations in Pit 8. A review of the monitoring frequency at N19 and N20 will be undertaken during subsequent reviews of this NMP in consultation with WCPL's noise specialist and relevant government agencies.

6.3.3 Methodology

Operator-attended noise monitoring will be undertaken as outlined in **Table 8** by an independent acoustic consultant and guided by the requirements of the INP (EPA, 2000) and *AS 1055.1-1997 'Acoustics – Description and measurement of environmental noise – General procedures'*. Routine operator-attended noise monitoring will be undertaken during night-time periods (10 pm - 7 am).

If any of the Noise Criteria are exceeded, a second measurement will be taken at the same location within 75 minutes of the first measurement. If the second measurement does not exceed the Noise Criteria, as defined in **Table 6**, then the result will be recorded and the regular monitoring program resumed.

If the second measurement does exceed the applicable Noise Criteria, then:

a) The noise consultant will immediately report both results to the WCPL Environment and Community Manager or delegate immediately;
b) Upon confirming the exceedances are deemed a non-compliance in accordance with the **Figure 5,** WCPL will report both results to DPE and EPA immediately, upon confirming the exceedance (**Section 9.0**).

WCPL will:

a) Take immediate action in accordance with the NMS;
b) Arrange for additional operator-attended noise monitoring to occur at that site within 1 week; and
c) Deploy the mobile real-time noise monitor to measure and record the noise at that site for at least a 1 week period.

WCPL will also investigate any changes to the mine operations, and may revisit the noise model on the basis of the noise measurements recorded at the site.

The acoustic noise consultant will consider the modification factors in Section 4 of the INP (EPA, 2000) during the evaluation of attending monitoring results.

The assessment of excessive levels of low frequency noise generated by the mine shall be as follows: Measure/assess C- and A-weighted Leq,T levels over same time period. Where the C minus A level is 15dB or more and:

- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by up to 5dB and cannot be mitigated, a 2 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period.
- Where any of the 1/3 octave noise levels in **Table 9** are exceeded by more than 5dB and cannot be mitigated, a 5 dB(A) positive adjustment to measured/predicted A weighted levels applies for the evening/night period and a 2dB positive adjustment applies for the daytime period.

Table 9 One-third Octave Low Frequency Noise Thresholds

Hz/dB(Z)	One-third octave LZeq,15minute threshold level												
Frequency (Hz)	10	12.5	16	20	25	31.5	40	50	63	80	100	125	160
dB(Z)	92	89	86	77	69	61	54	50	50	48	48	46	44

6.3.4 Data Collection

Data and observations are collected in 15 minute periods and the Leq dBA results recorded. The Leq dBC noise levels will also be recorded to assess low frequency noise. All acoustic instrumentation will comply with *AS 1259.2-1990 'Acoustics – Sound level meters – Integrating – Averaging'*. Comprehensive field notes will be taken to indicate both mine related and non-mine related noise sources and when they occurred. Notes about maximum mine noise levels (source and times) will also be taken. All percentiles (LAmax, LA1, LA10, LA50, LA90, LAmin, LAeq) are measured in A weighting.

Where practicable, the LA1 measurement will be undertaken at 1 m from the dwelling façade and the LAeq measurement within 30 m of the dwelling. Where impracticable, measurements will be undertaken at a suitable and representative location as close to the dwelling as practicable.

6.3.5 Evaluation of Compliance

Tables 10 and **11** summarises the definition used by WCPL in this NMP for the evaluation of compliance with Development Consent (SSD-6764). The reporting requirements and actions that WCPL will take in the event of an exceedance or non-compliance are detailed in **Figure 5** and **Section 6.3.7**.

Table 10 Definition of an Exceedance

Term	Definition
Exceedance	An exceedance is deemed to have occurred when an operator-attended noise monitoring result, measured in accordance with the INP and Development Consent (SSD-6764), exceeds the Noise Criteria in **Table 6**. The noise must be solely attributable to the Mine and under the applicable meteorological conditions (**Section 6.3.6**).

Table 11 Definition of a Non-Compliance

Term	Definition
Non-compliance	A non-compliance is deemed to have occurred when a second operator-attended noise monitoring result [measured in accordance with the INP and Development Consent (SSD-6764)], taken within 75 minutes of an exceedance, also exceeds the Noise Criteria in **Table 6** and either the first and or the second measured noise result is more than 2dBA above the Noise Criteria. Reporting requirements for a non-compliance are detailed in **Section 6.3.7**.

6.3.6 Applicable Meteorological Conditions

The Noise Criteria in **Table 6** are to be applied under all meteorological conditions except for the following:

- Wind speeds greater than 3 m/s at 10 m above ground level; or
- Stability category F temperature inversions and wind speeds greater than 2 m/s at 10 m above ground level; or
- Stability category G temperature inversion conditions.

Except for wind speed at microphone height, the data used for determining meteorological conditions will be that recorded by the meteorological station located on the Mine site.

It should be noted that when assessing wind conditions to determine the potential for noise level alteration by the refraction of sound-waves through the atmosphere, meteorological measurements should be undertaken at a height of 10 m above the ground level, in accordance with Section 5 of the INP (EPA, 2000). Local meteorological conditions, including near-surface winds are measured at the inbuilt meteorological station (2 m); however, in accordance with the INP (EPA, 2000), the 2 m data cannot be used to determine impacts from sound-wave refraction. The 2 m meteorological data is used to assess local meteorological conditions that may increase ambient noise levels including surface winds and rainfall.

Appendix C
Calibration certificates

EMM
creating opportunities

C.1 Calibration certificates

Acoustic Research Labs Pty Ltd
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Sound Level Meter
IEC 61672-3:2013

Calibration Certificate

Calibration Number C23317

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	NA-28
Instrument Serial Number :	00701424
Microphone Serial Number :	01916
Pre-amplifier Serial Number :	01463
Firmware Version :	2.0

Pre-Test Atmospheric Conditions		**Post-Test Atmospheric Conditions**	
Ambient Temperature :	24°C	**Ambient Temperature :**	22.6°C
Relative Humidity :	46%	**Relative Humidity :**	46.6%
Barometric Pressure :	100.6kPa	**Barometric Pressure :**	100.6kPa

Calibration Technician :	Max Moore	**Secondary Check:**	Dylan Selge
Calibration Date :	1 Jun 2023	**Report Issue Date :**	2 Jun 2023

Approved Signatory : Ken Williams

Clause and Characteristic Tested	Result	Clause and Characteristic Tested	Result
12: Acoustical Sig. tests of a frequency weighting	*Pass*	17: Level linearity incl. the level range control	*Pass*
13: Electrical Sig. tests of frequency weightings	*Pass*	18: Toneburst response	*Pass*
14: Frequency and time weightings at 1 kHz	*Pass*	19: C Weighted Peak Sound Level	*Pass*
15: Long Term Stability	*Pass*	20: Overload Indication	*Pass*
16: Level linearity on the reference level range	*Pass*	21: High Level Stability	*Pass*

The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed.

However, no general statement or conclusion can be made about conformance of the sound level meter to the full requirements of IEC 61672-1:2013 because evidence was not publicly available, from an independent testing organisation responsible for pattern approvals, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013 and because the periodic tests of IEC 61672-3:2013 cover only a limited subset of the specifications in IEC 61672-1:2013.

Uncertainties of Measurement -

Acoustic Tests		Environmental Conditions	
125Hz	*±0.13dB*	*Temperature*	*±0.1°C*
1kHz	*±0.13dB*	*Relative Humidity*	*±1.9%*
8kHz	*±0.14dB*	*Barometric Pressure*	*±0.014kPa*
Electrical Tests	*±0.13dB*		

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

Acoustic Research Labs Pty Ltd is NATA Accredited Laboratory Number 14172.
Accredited for compliance with ISO/IEC 17025 - Calibration.

The results of the tests, calibrations and/or measurements included in this document are traceable to SI units.

NATA is a signatory to the ILAC Mutual Recognition Arrangement for the mutual recognition of the equivalence of testing, medical testing, calibration and inspection reports.

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Sound Calibrator
IEC 60942:2017
Calibration Certificate

Calibration Number C24155

Client Details	EMM Consulting Level 3, 175 Scott Street Newcastle NSW 2300
Equipment Tested/ Model Number :	Model 105
Instrument Serial Number :	78226

Atmospheric Conditions

Ambient Temperature :	25.3 °C
Relative Humidity :	53.6 %
Barometric Pressure :	100.41 kPa

Calibration Technician :	Peter Elters	**Secondary Check:**	Rhys Gravelle
Calibration Date :	26 Feb 2024	**Report Issue Date :**	26 Feb 2024

Approved Signatory : Ken Williams

Characteristic Tested	Result
Generated Sound Pressure Level	*Pass*
Frequency Generated	*Pass*
Total Distortion	*Pass*

Nominal Level	Nominal Frequency	Measured Level	Measured Frequency
94	1000	94.03	1000.30

The sound calibrator has been shown to conform to the class 1 requirements for periodic testing, described in Annex B of IEC 60942:2017 for the sound pressure level(s) and frequency(ies) stated, for the environmental conditions under which the tests were performed..

Uncertainties of Measurement -

Specific Tests		Environmental Conditions	
Generated SPL	*±0.10 dB*	*Temperature*	*±0.1 °C*
Frequency	*±0.07 %*	*Relative Humidity*	*±1.9 %*
Distortion	*±0.20 %*	*Barometric Pressure*	*±0.11 kPa*

All uncertainties are derived at the 95% confidence level with a coverage factor of 2.

This calibration certificate is to be read in conjunction with the calibration test report.

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