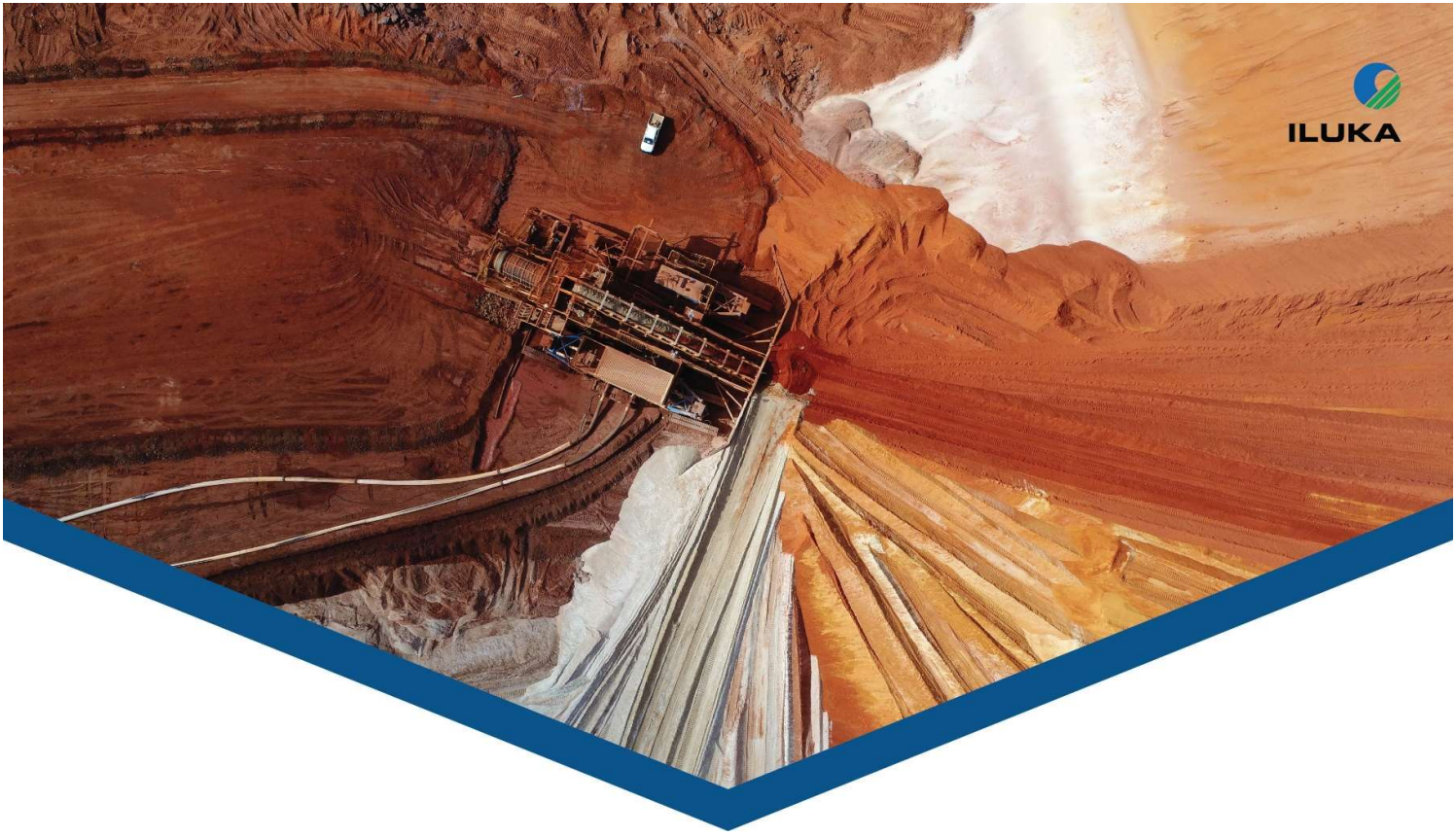

BALRANALD MINERAL SANDS MINE

Quarterly Noise Monitoring Report

Document Number: Noise Q4 - 2025

Revision	Details Of Review Or Changes	Date Created	Document Reference
00	DRAFT REPORT	04 DEC 2025	
01	**Final Report**	**29.03.2026**	

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TERMINOLOGY AND ABBREVIATIONS

Some definitions of terms and abbreviations which may be used in this report are provided in Table 1.

Table 1 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.
LA90	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.
LAmin	The minimum A-weighted noise level over a time period.
LCeq	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 when 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: 7:00 am to 6:00 pm, on Sundays and public holidays: 8:00 am to 6:00 pm.
Evening	Monday–Saturday: 6:00 pm to 10:00 pm, on Sundays and public holidays: 6:00 pm to 10:00 pm.
Night	Monday–Saturday: 10:00 pm to 7:00 am, on Sundays and public holidays: 10:00 pm to 8:00 am.

EXECUTIVE SUMMARY

This quarterly environmental noise monitoring report has been prepared in accordance with Development Consent SSD-5285 (Consolidated), NSW Environment Protection Licence (EPL) 20795, and relevant guidelines including *AS 1055:2018 Acoustics – Description and Measurement of Environmental Noise* Standard, and with the *NSW Noise Policy for Industry (EPA, 2017)* (NPfI).

Attended noise monitoring was carried out on 10 to 11 December 2025 across day, evening, and night periods at three EPL-designated monitoring locations. During the survey, activities at the Balranald Mineral Sands Mine included daytime construction and commissioning works, drilling operations at the mining panel, and vehicle movements along the mine access road and internal haul routes.

Site-only noise contributions were inaudible (IA) and no modifying factors (tonal, impulsive, low-frequency) were applicable. The monitoring confirmed that Balranald Mine activities did not contribute to measured environmental noise levels during the monitoring period. Compliance was maintained under all meteorological conditions encountered.

Quarterly monitoring will continue during day, evening and night periods as scheduled.

1. INTRODUCTION

1.1 Purpose and scope

On **10 and 11 December 2025** quarterly attended noise monitoring were completed at three monitoring locations at the nearest sensitive receivers located Balranald Mine. The purpose of the monitoring was to quantify the acoustic environment and compare site noise levels against specified limits in *Condition L3 Noise Limits* of the EPL 20795.

1.2 Attended noise monitoring locations

Site monitoring locations are detailed in Table 1 and shown on Figure 1. It should be noted that Figure 1 shows actual monitoring positions, not necessarily the location of residences.

Table 1 - Attended noise monitoring locations

Mine Location Descriptor	EPL Monitoring Point No. ID	Description	Coordinates (MGA 54)	
			Easting	Northing
BN1	14	Adjacent Balranald-Ivanhoe Road (R54 & R57)	737482	6172117
BN2	15	Burke and Wills Road (R2)	726679	6196614
BN3	16	Cringadale/Karra boundary (R362)	716208	6187677

1.3 Mine site activities

Construction activities were restricted during the day period. Mining development activities continued 24/7 hours of operation at the mining panels. Commissioning activities commenced during the toward the end of Quarter 4 - 2025.

The following are the activities at the time of the survey:

Table 2 – Mine site activities occurring during the noise monitoring survey on 10 & 11 December 2025

Site activity	Plant/Equipment	Period of Operation		
		Day	Eve	Night
Civil construction works at the remaining sections of the processing plant and HMC hardstand areas	generators, water trucks, excavators,	✓		
Vegetation clearing and disturbance earthworks for the mining pits, the future HMC storage area, T3 demobilisation, and the Solar Farm dust suppression polymer application	Bulldozers, excavators, scrapers, water trucks	✓		
Vehicle movements (external) for site deliveries (~ 18 to 20 trucks per day)	Delivery trucks, fuel tanker truck	✓		
Drilling works using both development and mining rigs at Mining Panels 1 and 2, drill mud processing at Mud Cities 1 & 2	Drill rig, mining rig, mud city processing plant, generators, water trucks	✓	✓	✓

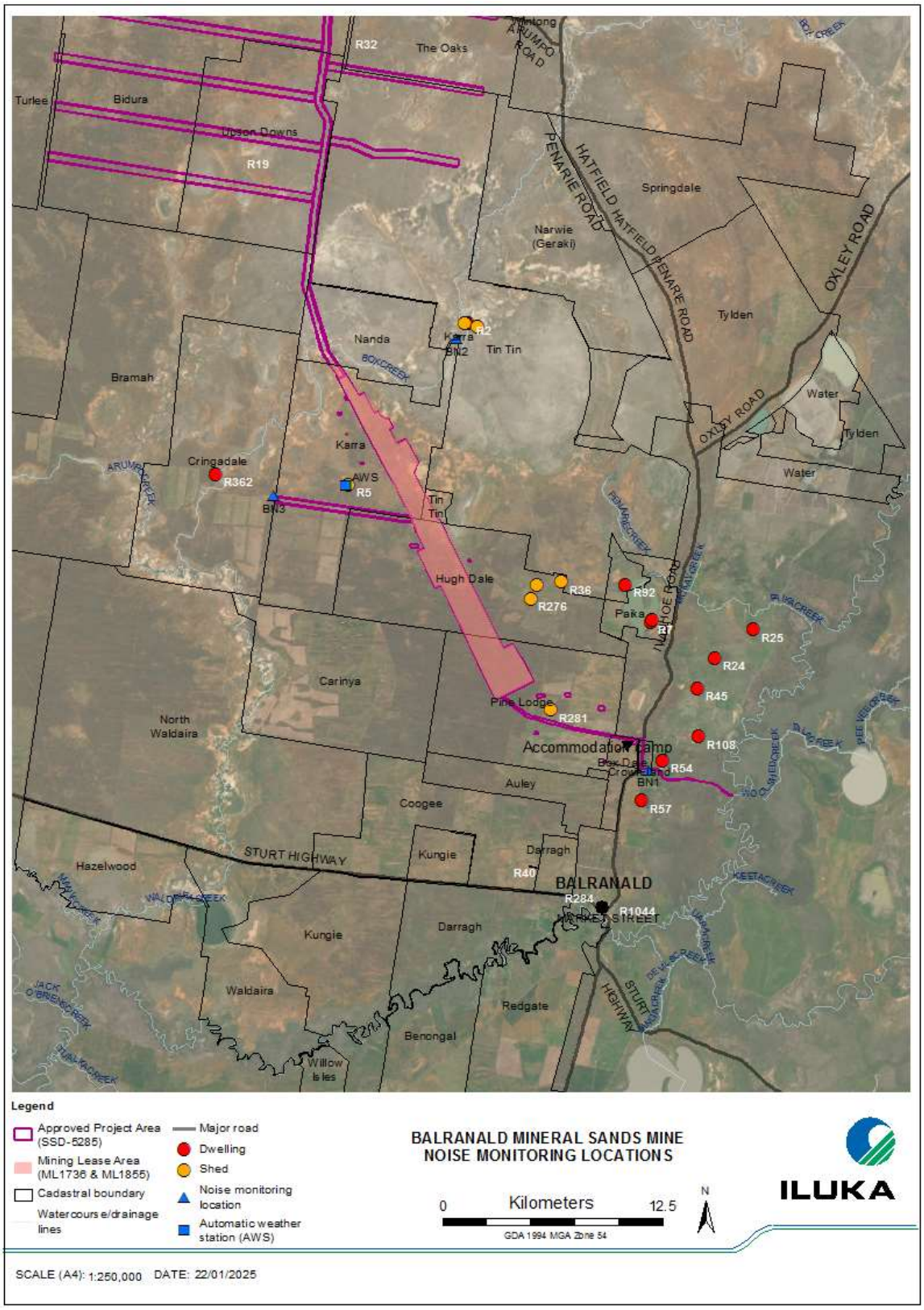

Figure 1 – Balranald Mineral Sands Mine noise monitoring locations

2. STATUTORY NOISE REQUIREMENTS

2.1 Development consent

The current development consent for Balranald Mine is the consolidated Development consent SSD-5285 (MOD 4, July 2025). A copy of the development consent is available on the Iluka Resources' **Balranald Mine Statutory Approvals** webpage.

2.2 Environment protection licence

Balranald Mine holds Environment Protection Licence (EPL) No. 20795 issued by the NSW Environment Protection Authority (EPA) on 5 July 2023. A copy of the current EPL is available on both the **NSW EPA POEO Licence Public Register** and Iluka Resources' **Balranald Mine Statutory Approvals** webpage.

2.3 Noise management plan (NMP)

Noise monitoring requirements are detailed in Balranald Mine Noise Management Plan (NMP). The most recent version of the NMP was prepared in February 2023 and is publicly available via the Iluka Resources' Balranald community webpage: **https://www.iluka.com/community-engagement/balranald/**.

2.4 Noise Assessment Criteria

Noise limit conditions on both Development Consent and EPL state that Iluka Resources must ensure that the noise generated at Balranald Mine does not exceed the noise criteria at the monitoring locations in the Table below.

Table 3 - Noise Criteria measured in decibels (dB(A)) over a 15-minute measurement period

Location / EPL ID	Day $L_{Aeq,15minute}$	Evening $L_{Aeq,15minute}$	Night $L_{Aeq,15minute}$	Night $L_{A1,\ 1\ minute}$
BN1 / EPL ID 14	35	35	35	45
BN2 / EPL ID 15	35	35	35	45
BN3 / EPL ID 16	35	35	35	45
Any residence on privately-owned land	35	35	35	45
Mungo National Park and Mungo State Conservation Area (when in use)	50	50	50	-

It should be noted that while these limits relate to operational noise from the mine,

- these have also been adopted for the mine's construction phase as a conservative measure; and
- may be exceeded if Iluka Resources has an agreement with the owner/s or leaseholders to permit generation of higher noise levels.

2.5 Monitoring and reporting requirements

Monitoring and reporting have been done in accordance with the NSW EPA '*Noise Policy for Industry*' (NPfI) (October 2017) and the *Approved methods for the measurement and analysis of environmental noise in NSW* (Approved Methods) (January 2022).

2.6 Meteorological conditions

Realtime meteorological monitoring is captured at Balranald Mine's Automatic Weather Station (AWS) which complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* (NSW EPA, 2022) guideline.

The EPL noise limit conditions apply under all meteorological conditions except:

- during rain and wind speeds (at 10m height) greater than 3m/s; and
- under "non-significant weather conditions".

Based on the initial noise impact assessment prepared for SSD-5285, it has been assumed as a conservative measure that noise limits apply under all meteorological conditions except during rainfall and/or wind speeds greater than 3 metres/second (m/s) at 10 metres above ground level (m AGL).

2.7 Very noise-enhancing meteorological conditions

In accordance with the Approved Methods, monthly noise monitoring for the site is scheduled to occur during forecasted meteorological conditions where noise limits in Table 2.1 will be applicable. However, in cases where actual meteorological conditions do not align with forecasts and noise limits are subsequently not directly applicable, it is the expectation of regulators that noise impact still be managed.

The NPfI states that:

> *"Noise limits derived for consents and licences will apply under the meteorological conditions used in the environmental assessment process, that is, standard or noise-enhancing meteorological conditions.*
>
> *For 'very noise-enhancing meteorological conditions' … a limit is set based on the limit derived under standard or noise-enhancing conditions (whichever is adopted in the assessment) plus 5 dB.*
>
> *In this way a development is subject to noise limits under all meteorological conditions."*

Therefore, if quarterly noise monitoring occurs during meteorological conditions outside of those specified in Section 2.6 above, then site limits shall be adjusted based on Table 2 in Section 2.4 **plus 5 dB**.

3. METHODOLOGY

3.1 Overview

Attended environmental noise monitoring was done in general accordance with Australian Standard AS 1055 *Acoustics, Description and Measurement of Environmental Noise*' and relevant NSW EPA requirements.

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

3.2 Attended Noise Monitoring

During this monitoring survey, attended noise monitoring was conducted during the day, evening and night periods 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, i.e.

- 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 (LA90), 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 site 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 Instrumentation and personnel

Attended noise monitoring was conducted by Balranald Mine Staff Chrissie Eckersley (Environmental Advisor) and Andrew Rogers (Environmental Technician).

Equipment used to measure environmental noise levels is detailed in the Table 4 below.

Table 4 – Equipment used for attended noise monitoring

Equipment / Model	Serial Number	Calibration due date	Relevant Standard
Rion NL-53EX sound level meter	440941	9/07/2026	IEC 61672-3:2013
Rion NC-75 noise meter sound calibrator	34645810	03/09/2026	IEC 60942:2017
Rion NX-43RT octave band filter	n/a	18/02/2026	IEC 61260-3:2016
Kestrel anemometer 5200 Professional	247196	n/a	n/a
WS-10 windscreen	n/a	n/a	n/a
Microphone extension cable	n/a	n/a	n/a
Sound level meter tripod	n/a	n/a	n/a

4. MONITORING RESULTS

4.1 Total measured noise levels and atmospheric conditions

Total noise levels measured during each 15-minute attended measurement are provided in Table 5 below. It should be noted that the total measured noise levels in Table 5 are not necessarily the result of activities at Balranald Mine.

Atmospheric condition data measured by the operators during each measurement using a hand-held weather meter (Kestrel) is also shown in Table 5. The wind speed, direction and temperature were measured at approximately 1.3 to 1.5 metres above ground.

Attended noise monitoring was not done during rain, hail, or wind speeds above 5 m/s at microphone height.

4.2 Site only noise levels and atmospheric data from the AWS

Table 6 provides site noise levels in the absence of other sources, where possible, and includes weather data from the site Automatic Weather Station (AWS) (see at the time of the survey:

Table 2 – Mine site activities occurring during the noise monitoring survey on 10 & 11 December 2025

Site activity	Plant/Equipment	Period of Operation		
		Day	Eve	Night
Civil construction works at the remaining sections of the processing plant and HMC hardstand areas	generators, water trucks, excavators,	✓		
Vegetation clearing and disturbance earthworks for the mining pits, the future HMC storage area, T3 demobilisation, and the Solar Farm dust suppression polymer application	Bulldozers, excavators, scrapers, water trucks	✓		
Vehicle movements (external) for site deliveries (~ 18 to 20 trucks per day)	Delivery trucks, fuel tanker truck	✓		
Drilling works using both development and mining rigs at Mining Panels 1 and 2, drill mud processing at Mud Cities 1 & 2	Drill rig, mining rig, mud city processing plant, generators, water trucks	✓	✓	✓

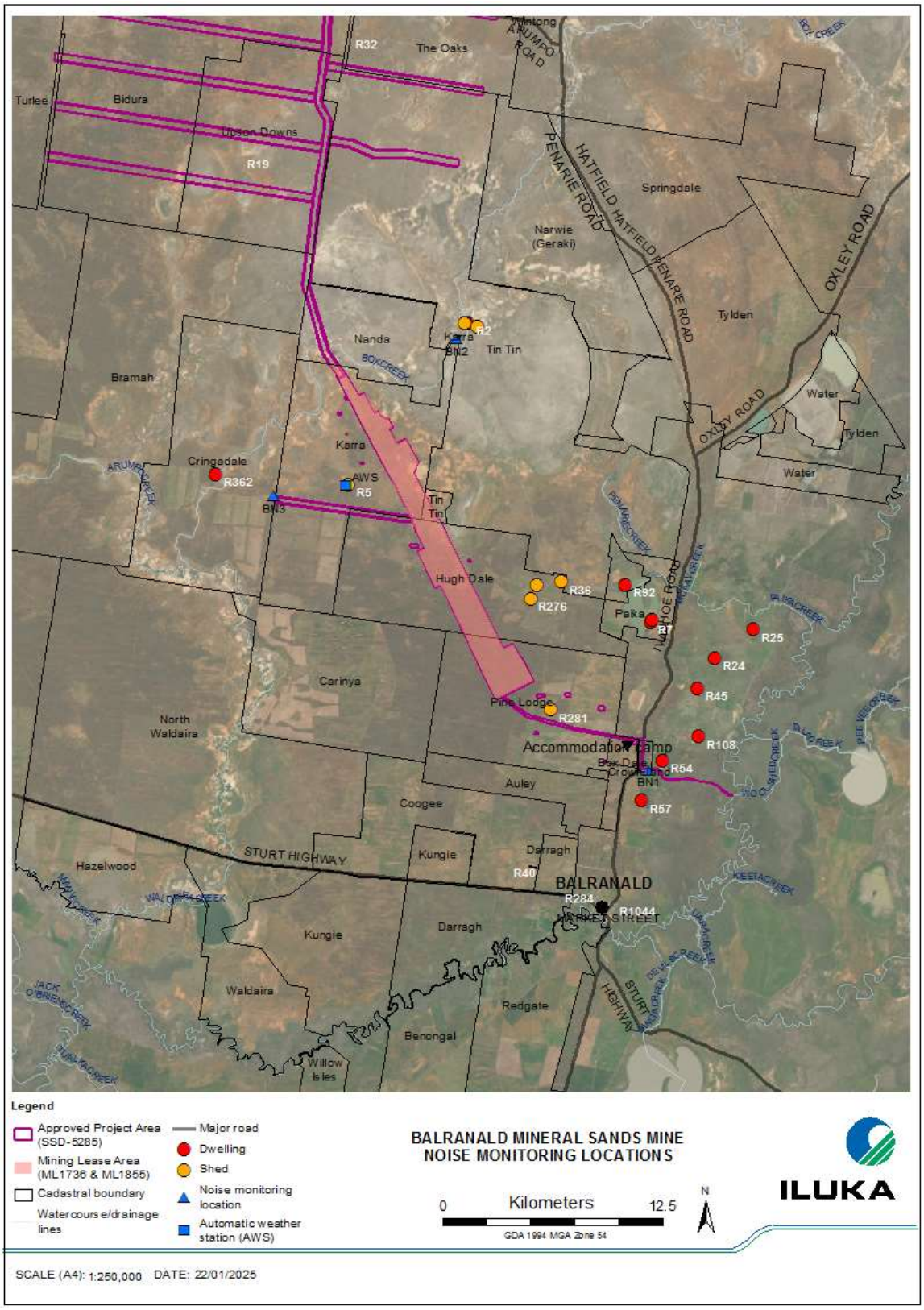

Figure 1 above) measured at an altitude of 10 meters above ground level (AGL).

Noise limits presented in

Table 6 are applicable under all weather conditions but are adjusted, where required, during very noise-enhancing weather conditions as defined by the NPfI.

Table 5 - Total measured noise levels in dB(A) and atmospheric conditions during the 15-min attended noise assessment on 10 and 11 December 2025 (Q4 – 2025)

EPL ID / Location	Date & Time	MONITORING LOCATION WEATHER CONDITIONS AT 1.5 m ABOVE GROUND LEVEL (mAGL)				TOTAL MEASURED NOISE LEVELS						
			Wind									
		Temp (°C)	Direction (°magnetic N)	Speed (m/s)	Cloud Cover	$L_{Aeq15min}$	L_{Amax}	L_{A1}	L_{A10}	L_{A50}	L_{A90}	L_{Amin}
PERIOD	**DAY**											
14 / BN1	10/12/2025 9:27	25.3	108	2	3/8	46.1	76.6	57.3	43.8	37.3	34.7	31.8
15 / BN2	10/12/2025 8:34	22.8	125	4.3	2/8	32.9	43.7	39.1	35.8	31.7	27.7	21.7
16 / BN3	10/12/2025 7:33	19.4	144	2.1	2/8	31.6	56.2	38.8	33.5	29.7	27.6	24.5
PERIOD	**EVENING**											
14 / BN1	11/12/2025 18:51	33.5	252	1.2	3/8	32.7	54.1	43.3	35.5	29.3	19.9	18.4
15 / BN2	11/12/2025 20:16	29.5	183	2.5	1/8	20.1	33.2	24	21.8	19.6	18.3	17.4
16 / BN3	11/12/2025 21:16	33.5	252	1.2	3/8	32.7	54.1	43.3	35.5	29.3	19.9	18.4
PERIOD	**NIGHT**											
14 / BN1	10/12/2025, 5:43	17.1	0	0.6	1/8	28.8	57.3	38.2	31.8	22.6	19.6	18.2
15 / BN2	10/12/2025 4:51	17.1	0	0.0	0/8	18.9	35.4	23.1	20.1	18.3	17.7	17.1
16 / BN3	10/12/2025, 3:55	20.4	150	0.6	0/8	28.4	57.4	34.8	25	23.3	22.3	20.6

NOTES: Cloud Cover

OKTA	Description	Approx % sky covered	OKTA	Description	Approx % sky covered	OKTA	Description	Approx % sky covered
0	Clear sky	0%	3	Partly cloudy	37.5%	6	Mostly cloudy	75%
1	Few clouds	12.5%	4	Partly cloudy	50%	7	Overcast	87.5%
2	Few clouds	25%	5	Mostly cloudy	62.5%	8	Completely overcast	100%

Table 6 – Balranald Mine 'site only' noise levels field results and monitoring data from the site weather station (Q4 – 2025)

EPL ID / Location	Date & Time	METEOROLOGICAL DATA (from Site Weather Station) AT 10 m ABOVE GROUND LEVEL (mAGL)					NOISE LIMITS (dB)[1]		SITE ONLY NOISE LEVELS (dB)			
		10 mAGL	Wind 10 mAGL									
		Temp (°C)	Direction (°magnetic N)[3]	Speed (m/s)	Stability Class	Very Enhancing?	L_{Aeq}	L_{Amax}	L_{Aeq}[2]	L_{Amax}	Background L_{A90}	RESULTS
PERIOD	**DAY**											
14 / BN1	10/12/2025 9:27	24.68	119.28	1.38	A	No	35	n/a	35.3	n/a	34.7	Compliant
15 / BN2	10/12/2025 8:34	21.07	113.77	3.08	C	No	35	n/a	32.4	n/a	27.7	Compliant
16 / BN3	10/12/2025 7:33	18.31	146.46	3.19	D	No	35	n/a	29.3	n/a	27.6	Compliant
PERIOD	**EVENING**											
14 / BN1	11/12/2025 18:51	31.39	206.7	3.28	D	No	35	n/a	30.6	n/a	19.9	Compliant
15 / BN2	11/12/2025 20:16	30.07	174.19	1.99	D	No	35	n/a	14.7	n/a	18.3	Compliant
16 / BN3	11/12/2025 21:16	28.33	192.53	1.78	D	No	35	n/a	23.0	n/a	19.9	Compliant
PERIOD	**NIGHT**											
14 / BN1	10/12/2025 5:43	17.32	154.85	2.45	D	No	35	45	22.4	56.2	19.6	Compliant
15 / BN2	10/12/2025 4:51	18.15	144.33	2.07	D	No	35	45	13.8	25.4	17.7	Compliant
16 / BN3	10/12/2025 3:55	19.11	159.45	1.58	D	No	n/a	45	27.2	55.1	22.3	Compliant

Notes:

1. Noise limits are adjusted by +5 dB during 'very noise-enhancing meteorological conditions' in accordance with the NPfI.
2. Site-only LAeq,15minute, includes modifying factor penalties, if applicable.
3. Degrees magnetic north, "-" indicates calm weather conditions.

5. DATA ANALYSIS AND DISCUSSION

Dominant noise sources at the three monitoring locations (EPL Points 14, 15, and 16) included animal sounds (such as birds, cows, frogs, and crickets), rustling branches and foliage due to wind gusts, and nearby road traffic noise. These sources were typical of the rural acoustic environment and did not exhibit intrusive characteristics.

Unavoidable noise sources not previously observed at Glen Avon (EPL Point 14) included farming machinery operating during the day and evening periods. An air-gun bird-scarer was also triggered at periodic intervals throughout the day, evening, and night periods. Although these sources were clearly identifiable, they represented normal agricultural activity within the region and did not dominate the acoustic environment for extended periods.

Mine site noise was not audible during attended monitoring and the 1/3-octave and percentile data showed no consistent tonal, low-frequency, intermittent or impulsive characteristics attributable to the mine. Accordingly, site noise is not identifiable under the NPfI.

6. CONCLUSION

Based on the Q4 – 2025 noise monitoring assessment:

- All attended monitoring results for Q4 2025 were **compliant with statutory noise limits** under SSD-5285 and EPL 20795.
- No audible or measurable noise was attributable to Balranald Mine during the monitoring period. There were no identifiable characteristics (such as tonality, low-frequency components, impulsive features, or correlation with operational activities) in the 1/3-octave band data.
- Compliance was maintained under all meteorological conditions, including adjustments for very noise-enhancing conditions.

The site remains in **general compliance with NPfI and Approved Methods requirements**, and no corrective actions are required.

Attended noise monitoring will continue next quarter during day, evening and night as scheduled.