



# Narrabri Mine Noise Monitoring

## Quarter Ending December 2024 Summary Noise Report

### Narrabri Coal Operations Pty Ltd

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Baan Baa NSW 2390

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Revision	Date	Prepared By	Checked By	Authorised By
v1.0	24 December 2024	Adam Sirianni	Martin Davenport	Martin Davenport

## Basis of Report

This report has been prepared by SLR Consulting Australia (SLR) with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with Narrabri Coal Operations Pty Ltd (the Client). Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

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## 1.0 Introduction

Narrabri Coal Operations Pty Ltd has commissioned SLR Consulting Australia Pty Ltd (SLR) to conduct operational noise monitoring for the Narrabri Mine located near Narrabri, New South Wales (NSW) in accordance with the approved Noise Management Plan (NMP) dated August 2023, the Narrabri Mine Project Approval (PA) 08\_0144 and the Environment Protection Licence 12789 (EPL 12789).

The objectives of the noise monitoring programme for this operating period were as follows:

- Conduct operator attended noise surveys at 5 locations (as listed in **Section 3.3**) surrounding the mine during the day, evening and night-time periods.
- Quantify all sources of noise within each of the attended noise surveys, including their measured and/or estimated contribution and maximum level of individual noise sources.
- Assess the noise emissions of Narrabri Mine and determine compliance with respect to the limits contained in Section 2 of the NMP and the relevant approvals.

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

## 2.0 Performance Assessment And Discussion

The following provides a summary of the attended noise measurements undertaken at each monitoring location. Further details are provided for each location in **Section 5.0** of this report.



**Table 1 Performance Assessment - Operations**

EPL ID	Location	Date	Narrabri Mine Contribution, dBA				Noise Criteria <sup>1</sup>	Measurement Periods	Standard Weather			Compliant		
			LAeq(15 min) Day	LAeq(15 min) Evening	LAeq(15 min) Night	LA1(1 min) Night			Day	Evening	Night			
N5	Oakleigh <sup>2</sup>	02/12/2024 <sup>3</sup>	N/M	28	34	38	Day, Evening, Night – LAeq(15min) - 35 dBA  Night LA1(1min) – 45 dBA	Day - 1.5 hrs Evening - 0.5 hrs Night – 1hrs	N	Y	Y	Y		
		03/12/2024 <sup>3</sup>	N/M	34	35	40			Y	Y	Y	Y		
		04/12/2024 <sup>3</sup>	29	I/A	I/A	I/A			Y	Y	Y	Y		
N6	Newhaven	02/12/2024	I/A	I/A	I/A	I/A		Day, Evening, Night – LAeq(15min) - 35 dBA  Night LA1(1min) – 45 dBA	Day - 1.5 hrs Evening - 0.5 hrs Night – 1hrs	N	Y	Y	Y	
		03/12/2024	N/M	N/M	I/A	I/A				N	Y	Y	Y	
		04/12/2024	29	30	30	33				Y	Y	Y	Y	
N8	Haylin View <sup>2</sup>	02/12/2024 <sup>3</sup>	N/M	34	35	43			Day, Evening, Night – LAeq(15min) - 35 dBA  Night LA1(1min) – 45 dBA	Day - 1.5 hrs Evening - 0.5 hrs Night – 1hrs	N	Y	N	Y
		03/12/2024 <sup>3</sup>	N/M	31	34	40					Y	Y	Y	Y
		04/12/2024 <sup>3</sup>	N/M	39	38	44					Y	Y	Y	Y <sup>2</sup>
N9	High Range <sup>2</sup>	02/12/2024 <sup>3</sup>	I/A	I/A	I/A	I/A	Day, Evening, Night – LAeq(15min) - 35 dBA  Night LA1(1min) – 45 dBA			Day - 1.5 hrs Evening - 0.5 hrs Night – 1hrs	N	Y	Y	Y
		03/12/2024 <sup>3</sup>	I/A	I/A	I/A	I/A					Y	Y	Y	Y
		04/12/2024 <sup>3</sup>	I/A	I/A	I/A	I/A					Y	Y	Y	Y
-	Bow Hills <sup>1</sup>	02/12/2024	32	31	37	43		Day - 15 min Evening - 15 min Night - 15 min		Y	Y	Y	Y	

I/A = Inaudible, N/M = Not Measurable

Note 1: A private agreement between NCOPL and the residents of N1 Bow Hills of 50 dBA LAeq(15minute) is in place. This new level of 50 dBA LAeq(15minute) replaces the levels identified in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 12789.

Note 2: Property is owned by Narrabri Coal Operations. Noise limits contained in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 12789 are not applicable.

Note 3: Evening and Night monitoring conducted on this date, Day monitoring conducted during the following day period.



## 3.0 Noise Criteria

### 3.1 Project Approval, EPL and NMP

Noise monitoring at the Narrabri Mine was conducted in accordance with EPL 12789, the PA requirements and the NMP. The site specific EPL and PA noise limits are summarised in Section 2 of the NMP and are reproduced in **Table 2**. These criteria do not apply where the mine has an agreement with the relevant owner/s of the residence to generate higher noise levels, or where the property is mine owned.

**Table 2 Project Approval and EPL Noise Criteria**

Location	Day	Emergency Day	Night	
	LAeq(15minute)	LAeq(15minute)	LAeq(15minute)	LA1(1minute)
All Privately owned Residences	35	35	35	45

### 3.2 Non-compliances & Exemptions

In accordance with Section 11.1.3 of the NSW Industrial Noise Policy (INP) a development is deemed to be in non-compliance with a noise consent or licence condition if the monitored noise level is more than 2 dB above the statutory noise limit specified in the consent or licence. This may occur for two reasons:

- The noise from the Narrabri Mine is excessive, in which case Narrabri Mine will be not complying with its consent or licence condition.
- The noise was increased by extreme, non-standard weather effects—in which case the Narrabri Mine is not considered to be in noncompliance with its consent or licence condition.

In this latter case, further monitoring at a later date is required to determine compliance under “normal” meteorological conditions.

The INP states in Section 9.2 that *“it is not practicable to meet the noise limit under all inversion events; hence exceedances under extreme temperature inversions are not considered to be a non-compliance with consent or licence conditions.”*

Non-standard weather effects include:

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

As stated in EPL 12789 *“Data recorded by the meteorological station identified as EPA Identification Point(s) W1 must be used to determine meteorological conditions and temperature inversion conditions (stability category) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 of Appendix E of the “New South Wales Industrial Noise Policy” dated January 2000 ISBN 0 7313 2715 2.”*

Weather and Temperature inversion monitoring is undertaken continuously in accordance with EPL 12789 with monitoring locations displayed in **Figure 1**. Monitoring Location W1



records wind speed and direction at 10m above ground level. Temperature inversion monitoring is undertaken continuously by directly measuring temperature at two elevations 50 m apart (10 m & 60 m from ground level) at monitoring location W2. All weather data reported in **Table 5** to **Table 17** have been recorded at these monitoring locations.

### 3.3 Attended Monitoring

Attended Noise monitoring is to be undertaken on a quarterly basis at residential areas. The attended monitoring will take place at the following locations:

#### 3.3.1 EPL Monitoring Locations

- N5 Oakleigh – 16293 Kamilaroi Highway Baan Baa
- N6 Newhaven – 184 Greylands Road Turrawan
- N8 Haylin View – 791 Mayfield Road, Baan Baa
- N9 High Range – 92 Davis Road Turrawan

It is noted that the Narrabri Mine own the properties Oakleigh (N5), Haylin View (N8) and High Range (N9).

#### 3.3.2 NMP Monitoring Location

- N1 Bow Hills – 16652 Kamilaroi Highway Baan Baa

It is noted that the Narrabri Mine has a private agreement with the landholder of Bow Hills (N1) for increased noise limits of 50 dBA  $L_{Aeq}(15\text{minute})$ . This new level replaces the levels identified in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 12789.

#### 3.3.3 EPL Monitoring Requirements

- At each one of the monitoring locations N5, N6, N8 and N9;
- Occur quarterly in a reporting period;
- Occur during each day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum of:
  - i. 1.5 hours during the day;
  - ii. 30 minutes during the evening; and
  - iii. 1 hour during the night.
- Occur for three consecutive operating days.

#### 3.3.4 NMP Monitoring Requirements

- At monitoring location N1,
- Occur quarterly in a reporting period; and
- Occur during a day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum 15 minutes.





## 4.0 Operational Noise Monitoring Methodology

### 4.1 General Requirements

All acoustic instrumentation employed throughout the monitoring programme has been designed to comply with the requirements of AS IEC 61672.1 – 2019 *Electroacoustics— Sound level meters*, AS IEC 60942 2017 *Electroacoustics – Sound calibrators* and carried current NATA or manufacturer calibration certificates. Instrument calibration was checked before and after each measurement survey, with the variation in calibrated levels not exceeding  $\pm 0.5$  dBA. Calibration certificates for all instruments employed during the monitoring campaign are presented in **Appendix B**.

### 4.2 Methodology - Operator Attended Noise Monitoring

Operator attended noise measurements were conducted during the day, evening and night-time periods for a minimum of 1.5 hours during the day; 30 minutes during the evening and 1 hour during the night at the three EPL nominated noise monitoring locations and for 15 minutes during the day, evening and night at each of the NMP nominated noise monitoring location representing the most affected receiver locations, listed in **Table 3** and shown in **Figure 1**. During the operator attended noise measurements, the character and relative contribution of ambient noise sources and mine contributions were determined.

**Table 3 Noise Monitoring Locations**

Monitoring Location	Monitoring Requirements	Receiver Type	Address	Monitoring Location - MGA Zone 55	
				Easting (m)	Northing (m)
N5 <sup>1,2</sup>	EPL	Residence	Oakleigh – 16293 Kamilaroi Highway Baan Baa	779526	6617751
N6 <sup>1,2</sup>	EPL	Residence	Newhaven – 184 Greylands Road Turrawan	776564	6624643
N8 <sup>1</sup>	EPL	Residence	Haylin View – 791 Mayfield Road Baan Baa	777428	6617316
N9 <sup>1</sup>	EPL	Residence	High Range – 92 Davis Road Turrawan	775879	6625895
N1 <sup>2</sup>	NMP	Residence	Bow Hills – 16652 Kamilaroi Highway Baan Baa	780114	6620641

Note: 1. EPL monitoring locations  
 2. NMP monitoring locations

The objective of the operator attended noise monitoring was to measure the  $LA_{1(1\text{minute})}$  and the  $LA_{eq(15\text{minute})}$  noise level contribution from the Narrabri Mine at the nearest potentially affected receptors in order to determine the noise contribution of operational activities associated with Narrabri Mine over each 15 minute measurement period. In addition, the operator quantifies and characterises the overall levels of ambient noise in the area (i.e.  $LA_{max}$ ,  $LA_1$ ,  $LA_{10}$ ,  $LA_{90}$ , and  $LA_{eq}$ ) over the 15 minute measurement interval.

Operator attended noise measurements were conducted using one-third octave integrating Brüel & Kjær Type 2270 sound level meters (s/n 3029485 and s/n 3027586). Attended noise measurements were undertaken by SLR staff Alex Bian and Adam Sirianni.



**Figure 1 Attended Noise Monitoring Locations**



**Table 4** presents a summary of which days of the week the quarterly monitoring was conducted, in accordance with condition M7.4 of EPL 12789 and Section 5 of the NMP.

**Table 4 Days of the Week Quarterly EPL Monitoring was Conducted – Q4 2024**

Period	Day of the Week (Excluding Weekends and Public Holidays)				
	Monday	Tuesday	Wednesday	Thursday	Friday
<b>EPL Monitoring Locations</b>					
Day	2 December 2024	3 December 2024	4 December 2024	5 December 2024	
Evening	2 December 2024	3 December 2024	4 December 2024		
Night	2 December 2024	3 December 2024	4 December 2024		
<b>NMP Monitoring Location</b>					
Day	2 December 2024				
Evening	2 December 2024				
Night	2 December 2024				

## 5.0 Results and Discussion

### 5.1 Results of Operator Attended Monitoring

Results of the operator attended noise surveys at N5, N6, N8, N9 and N1 are provided **Table 5** to **Table 17**.

Ambient noise levels presented include all noise sources such as transport (roads, rail and aircraft), fauna (insects, frogs, birds and bats), the natural environment (wind in trees), domestic noises, other industrial operations as well as Narrabri Mine noise emissions.

Weather data during the monitoring period has been obtained from the weather station located on the Narrabri Mine site and observed conditions.

The tables also provide the following information:

- Date and start time, operator and equipment details.
- Monitoring location.
- Wind velocity (m/s) and temperature (°C) at weather station W1, as detailed in **Section 3.2**.
- Typical maximum ( $L_{Amax}$ ) and contributed  $L_{Aeq(15minute)}$  noise levels.



### 5.1.1 Operator Attended Noise Survey Results – EPL Monitoring Location N5

Results of the operator attended noise surveys at N5 are provided in **Table 5**, **Table 6** and **Table 7**. Monitoring location N5 represents residential receptors located to the southeast of the site in Oakleigh.

**Table 5 Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 1)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 1 03/12/2024 08:53 5.8 – 7.9 m/s NW 26-27°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	D	63	52	47	42	45	38	N/M	<b>Site Related Noise Events:</b> General surface activity faintly audible at times  <b>Other Noise Events:</b> Birds 60-67 Traffic 44-52 Wind 47-60 Aircraft 51
		2	D	61	56	52	44	49	41	I/A	
		3	D	60	56	52	44	49	42	N/M	
		4	D	67	60	57	48	54	44	I/A	
		5	D	63	58	53	46	51	43	I/A	
		6	D	67	60	56	47	53	43	I/A	
Evening 1 02/12/2024 19:52 1.1 – 1.3 m/s W 27-30°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	F	56	44	42	37	41	35	28 LAeq	<b>Site Related Noise Events:</b> General surface activity 26-31 Dozer operations 27-32  <b>Other Noise Events:</b> Traffic 43-48 Insects 38-42 Birds 50-56
		2	F	48	46	43	39	41	37	27 LAeq	



Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Night 1 02/12/2024 23:07 0 – 1.1 m/s NW 22-23°C 3029485	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	G	58	56	54	49	51	46	33 L <sub>Aeq</sub> 37 L <sub>A1</sub>	<b>Site Related Noise Events:</b> Dozer operations 31-38 General surface activity 30-32 <b>Other Noise Events:</b> Insects 48-52 Train 50-57 Traffic 44-51 Horn 56-58
		2	F	56	53	52	48	50	45	32 L <sub>Aeq</sub> 36 L <sub>A1</sub>	
		3	F	57	55	53	47	51	44	30 L <sub>Aeq</sub> 34 L <sub>A1</sub>	
		4	G	56	53	50	46	48	43	34 L <sub>Aeq</sub> 38 L <sub>A1</sub>	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.





**Table 6 Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 2)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 2 04/12/2024 09:06 0.8 – 3.5 m/s NW 28-30°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	D	58	50	43	34	40	28	I/A	<b>Site Related Noise Events:</b> General surface activity faintly audible at times  <b>Other Noise Events:</b> Birds 50-59 Traffic 40-50 Aircraft 46-50
		2	C	58	51	43	33	40	27	N/M	
		3	A	59	49	42	33	39	30	I/A	
		4	A	57	48	44	33	40	30	I/A	
		5	B	52	44	42	30	37	27	I/A	
		6	C	57	46	43	33	39	30	N/M	
Evening 2 03/12/2024 20:09 0.9 – 1.3 m/s NW 23-24°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	E	55	48	47	40	45	38	33 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 30-40  <b>Other Noise Events:</b> Insects 40-50 Traffic 46-53 Animals 55
		2	E	53	51	50	46	48	43	34 L <sub>Aeq</sub>	
Night 2 03/12/2024 22:00 Calm 22°C 3029485	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	E	60	57	52	48	50	46	35 L <sub>Aeq</sub> 40 L <sub>A1</sub>	<b>Site Related Noise Events:</b> Dozer operations 27-40  <b>Other Noise Events:</b> Traffic 47-56 Insects 48-58 Impact 60
		2	E	58	56	54	49	52	47	30 L <sub>Aeq</sub> 36 L <sub>A1</sub>	
		3	E	58	56	55	49	52	46	29 L <sub>Aeq</sub> 34 L <sub>A1</sub>	
		4	E	54	52	51	48	49	46	29 L <sub>Aeq</sub> 39 L <sub>A1</sub>	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 7 Operator Attended EPL Noise Survey Results – N5 – Oakleigh (Day 3)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 3 05/12/2024 07:19 1.8 – 3.4 m/s SE 24-27°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	C	52	46	43	35	39	31	28 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 25-32 <b>Other Noise Events:</b> Traffic 38-45 Birds 47-60 Train 45
		2	D	56	48	42	35	40	32	29 L <sub>Aeq</sub>	
		3	D	60	47	43	33	40	30	27 L <sub>Aeq</sub>	
		4	B	55	47	40	33	38	30	25 L <sub>Aeq</sub>	
		5	C	52	44	40	34	38	31	N/M	
		6	B	56	46	41	32	38	29	N/M	
Evening 3 04/12/2024 20:40 1.4 – 1.9 m/s SE 23°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	E	49	46	45	43	44	41	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Traffic 42-50 Insects 44-49
		2	E	50	48	45	43	44	42	I/A	
Night 3 04/12/2024 22:01 2.2 – 2.9 m/s SE 23-24°C 3029485	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	F	50	45	44	42	43	41	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Traffic 40-54 Insects 42-46
		2	E	54	50	48	43	45	41	I/A	
		3	E	51	49	46	44	45	42	I/A	
		4	E	51	49	46	44	45	43	I/A	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



### 5.1.2 Operator Attended Noise Survey Results – EPL Monitoring Location N6

Results of the operator attended noise surveys at N6 are provided in **Table 8**, **Table 9** and **Table 10**. Monitoring location N6 represents residential receptors located to the northwest of the site in Newhaven.

**Table 8 Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 1)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 1 02/12/2024 11:54 4.3 – 5.1 m/s NW 33-35°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	A	55	46	43	36	40	33	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Traffic 40-43 Birds 45-67 Wind 40-50 Aircraft 45-49
		2	A	58	50	45	37	42	33	I/A	
		3	A	55	49	43	36	41	33	I/A	
		4	A	67	52	44	36	43	32	I/A	
		5	A	58	50	42	35	40	32	I/A	
		6	A	53	48	42	35	40	32	I/A	
Evening 1 02/12/2024 18:39 1.5 – 2.0 m/s NW 33-34°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	D	54	45	39	33	37	30	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Birds 40-58 Traffic 35-43
		2	E	58	47	41	34	39	31	I/A	
Night 1 03/12/2024 00:31 0 – 1.1 m/s NE 22-23°C 3029485	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	G	58	56	55	52	53	49	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Insects 54-59 Traffic 45-52 Bat 60-65
		2	F	59	57	55	52	54	49	I/A	
		3	F	64	56	54	51	53	49	I/A	
		4	G	58	55	54	51	52	48	I/A	

Note: N/M = Not Measurable, I/A = Inaudible





**Table 9 Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 2)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 2 03/12/2024 07:01 5.0 – 6.9 m/s NW 25-27°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	D	65	56	51	43	48	40	N/M	<b>Site Related Noise Events:</b> Dozer operations faintly audible briefly <b>Other Noise Events:</b> Birds 51-70 Wind 45-60 Aircraft 50-53 Traffic 38-42 Train 38-42
		2	D	70	58	55	46	52	41	I/A	
		3	D	63	57	53	44	50	41	I/A	
		4	D	56	53	50	43	47	40	I/A	
		5	D	56	53	51	44	48	40	I/A	
		6	D	58	53	50	43	47	40	I/A	
Evening 2 03/12/2024 19:17 1.7 – 1.8 m/s W 24-25°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	E	71	61	53	42	51	35	N/M	<b>Site Related Noise Events:</b> Dozer operations faintly audible at times <b>Other Noise Events:</b> Birds 66-78 Traffic 44-49 Train 45-50
		2	E	78	63	54	44	53	38	I/A	
Night 2 03/12/2024 23:25 Calm 21°C 3029485	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	E	57	55	55	52	54	50	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Insects 52-57 Traffic 40-54 Train 50-60
		2	E	60	58	55	53	54	50	I/A	
		3	F	56	54	54	51	53	49	I/A	
		4	F	56	54	53	51	52	50	I/A	

Note: N/M = Not Measurable, I/A = Inaudible



**Table 10 Operator Attended EPL Noise Survey Results – N6 – Newhaven (Day 3)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 3 04/12/2024 07:07 1.4 – 2.5 m/s SE 23-25°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	E	69	53	45	38	44	35	29 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Main exhaust vent fan 27-29 Dozer operations 27-31 <b>Other Noise Events:</b> Traffic 40-49 Birds 52-70 Aircraft 43-46
		2	D	62	53	44	35	42	32	28 L <sub>Aeq</sub>	
		3	D	70	59	49	37	47	33	29 L <sub>Aeq</sub>	
		4	D	63	54	47	36	44	33	28 L <sub>Aeq</sub>	
		5	D	67	53	46	37	44	33	29 L <sub>Aeq</sub>	
		6	D	74	63	52	36	50	32	28 L <sub>Aeq</sub>	
Evening 3 04/12/2024 19:48 2.2 – 2.7 m/s SE 23-24°C 3029485	35 dBA L <sub>Aeq</sub> (15min)	1	E	57	50	45	39	43	37	30 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 29-36 <b>Other Noise Events:</b> Traffic 40-54 Birds 42-61 Insects 54-56
		2	E	61	54	50	43	48	40	30 L <sub>Aeq</sub>	
Night 3 04/12/2024 23:25 1.2 – 2.5 m/s SE 23°C 3029485	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	E	60	58	57	55	56	53	N/M	<b>Site Related Noise Events:</b> Dozer operations 28-33 <b>Other Noise Events:</b> Insects 56-60 Traffic 47-59
		2	E	59	58	57	55	56	52	N/M	
		3	E	57	56	55	52	53	50	29 L <sub>Aeq</sub> 32 L <sub>A1</sub>	
		4	E	57	55	54	51	53	49	30 L <sub>Aeq</sub> 33 L <sub>A1</sub>	

Note: N/M = Not Measurable, I/A = Inaudible



### 5.1.3 Operator Attended Noise Survey Results – EPL Monitoring Location N8

Results of the operator attended noise surveys at N8 are provided in **Table 11**, **Table 12** and **Table 13**. Monitoring location N8 represents residential receptors located to the southeast of the site in Haylin View.

**Table 11 Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 1)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 1 03/12/2024 09:14 5.0 – 6.9 m/s NNW 25-27°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	D	67	57	51	41	48	37	N/M	<b>Site Related Noise Events:</b> Dozer operations faintly audible at times  <b>Other Noise Events:</b> Birds 46-76 Wind 62-63
		2	D	76	58	53	43	50	40	N/M	
		3	D	66	58	50	41	48	36	N/M	
		4	D	69	59	54	43	50	39	N/M	
		5	D	69	55	50	40	47	36	N/M	
		6	D	62	56	50	42	47	38	N/M	
Evening 1 02/12/2024 20:24 0 – 1.1 m/s W 26-27°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	F	53	51	49	41	46	38	34 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 28-41  <b>Other Noise Events:</b> Frogs 42-50 Insects 49-58
		2	G	58	57	56	50	54	47	32 L <sub>Aeq</sub>	
Night 1 02/12/2024 22:02 0.9 – 1.6 m/s NW 22-23°C 3027586	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	G	60	58	57	54	55	52	I/A	<b>Site Related Noise Events:</b> Dozer operations 30-43  <b>Other Noise Events:</b> Insects 54-60
		2	G	59	58	57	53	55	51	35 L <sub>Aeq</sub> 43 L <sub>A1</sub>	
		3	G	58	57	56	50	54	48	32 L <sub>Aeq</sub> 40 L <sub>A1</sub>	
		4	G	59	57	55	52	54	49	31 L <sub>Aeq</sub> 39 L <sub>A1</sub>	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable



**Table 12 Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 2)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 2 04/12/2024 09:18 0.8 – 3.5 m/s SE 28-30°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	D	71	55	48	33	45	26	N/M	<b>Site Related Noise Events:</b> Dozer operations faintly audible at times <b>Other Noise Events:</b> Traffic 54-70 Bird 52-71 Aircraft 44-58
		2	C	58	51	45	32	41	28	I/A	
		3	A	67	54	46	32	43	27	N/M	
		4	A	64	52	43	32	41	28	N/M	
		5	B	63	51	43	31	40	28	I/A	
		6	C	60	50	42	31	40	27	N/M	
Evening 2 03/12/2024 20:23 0.9 – 1.3 m/s NW 23°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	E	54	48	46	41	44	38	30 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 28-35 <b>Other Noise Events:</b> Insects 48-49 Impacts 51-54
		2	E	53	52	51	47	49	45	31 L <sub>Aeq</sub>	
Night 2 03/12/2024 22:01 No wind 21-22°C 3027586	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	E	55	49	48	45	46	44	33 L <sub>Aeq</sub> 37 L <sub>A1</sub>	<b>Site Related Noise Events:</b> Dozer operations 32-40 <b>Other Noise Events:</b> Insects 42-49 Impacts 52-64
		2	E	64	47	46	43	45	42	34 L <sub>Aeq</sub> 37 L <sub>A1</sub>	
		3	F	47	45	45	43	44	42	33 L <sub>Aeq</sub> 40 L <sub>A1</sub>	
		4	F	50	49	48	44	46	43	34 L <sub>Aeq</sub> 37 L <sub>A1</sub>	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 13 Operator Attended EPL Noise Survey Results – N8 – Haylin View (Day 3)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 3 05/12/2024 09:16 0.7 – 3.2 m/s NNW 28-31°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	A	58	50	43	30	40	25	I/A	<b>Site Related Noise Events:</b> Dozer operations faintly audible at times <b>Other Noise Events:</b> Birds 38-72
		2	A	61	51	44	29	41	25	I/A	
		3	A	57	48	40	31	38	27	I/A	
		4	A	59	51	41	31	39	27	N/M	
		5	A	72	50	41	30	40	26	N/M	
		6	A	70	51	43	32	42	28	I/A	
Evening 3 04/12/2024 20:44 1.4 – 1.8 m/s S 23°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	E	51	49	48	45	47	43	38 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 35-46 <b>Other Noise Events:</b> Insects 46-51
		2	E	50	49	48	45	47	43	39 L <sub>Aeq</sub>	
Night 3 04/12/2024 22:01 1.2 – 2.5 m/s SE 23-24°C 3027586	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	F	50	48	48	43	46	42	38 L <sub>Aeq</sub> 44 L <sub>A1</sub>	<b>Site Related Noise Events:</b> Dozer operations 24-44 <b>Other Noise Events:</b> Insects 47-51
		2	E	51	51	50	44	47	42	34 L <sub>Aeq</sub> 41 L <sub>A1</sub>	
		3	E	49	47	46	43	45	41	32 L <sub>Aeq</sub> 40 L <sub>A1</sub>	
		4	E	46	45	45	43	44	41	29 L <sub>Aeq</sub> 37 L <sub>A1</sub>	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



### 5.1.4 Operator Attended Noise Survey Results – EPL Monitoring Location N9

Results of the operator attended noise surveys at N9 are provided in **Table 14**, **Table 15** and **Table 16**. Monitoring location N9 represents residential receptors located to the northwest of the site in High Range.

**Table 14 Operator Attended EPL Noise Survey Results – N9 – High Range (Day 1)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 1 03/12/2024 07:10 5.0 – 6.9 m/s NNW 25-27°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	D	64	55	50	39	46	35	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Birds 42-77 Wind 48-60
		2	D	77	58	52	41	49	37	I/A	
		3	D	71	57	51	40	48	37	I/A	
		4	D	64	53	48	39	45	36	I/A	
		5	D	64	57	49	39	46	36	I/A	
		6	D	61	52	47	38	44	34	I/A	
Evening 1 02/12/2024 19:20 1.2 – 1.3 m/s NW 30-32°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	F	61	49	42	35	40	32	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Birds 37-71 Animals 40-55 Aircraft 38-47 Train 44-46
		2	G	71	52	46	43	46	39	I/A	
Night 1 03/09/2024 0:08 0 – 2.2 m/s SE 22-23°C 3027586	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	G	51	49	48	46	47	44	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Birds 42-55 Animals 48-52
		2	G	50	49	49	47	48	45	I/A	
		3	F	51	50	49	46	47	43	I/A	
		4	G	55	48	47	45	46	42	I/A	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 15 Operator Attended EPL Noise Survey Results – N9 – High Range (Day 2)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 2 04/12/2024 7:15 0.9 – 2.5 m/s SE 26-24°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	D	69	58	47	34	45	30	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Birds 42-75 Insects 33-48
		2	D	61	47	37	30	37	26	I/A	
		3	D	71	48	37	31	38	28	I/A	
		4	D	75	57	44	31	47	27	I/A	
		5	D	64	55	43	29	42	25	I/A	
		6	D	66	53	43	30	41	26	I/A	
Evening 2 03/12/2024 19:15 1.7 – 1.8 m/s W 24-25°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	E	70	58	47	31	46	29	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Insects 32-55 Dog 55-71
		2	E	71	54	43	39	44	33	I/A	
Night 2 03/12/2024 23:37 Calm 21°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	E	52	48	47	45	46	43	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Train 48-52 Insects 44-48 Aircraft 45-50
		2	F	50	48	47	44	45	42	I/A	
	3	F	52	51	46	44	45	43	I/A		
	4	E	47	46	45	43	44	41	I/A		
	45 dBA L <sub>A1</sub> (1min)										

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.



**Table 16 Operator Attended EPL Noise Survey Results – N9 – High Range (Day 3)**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 3 05/12/2024 07:13 1.8 – 3.6 m/s SSE 23-27°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	D	72	58	47	34	46	30	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Birds 49-72 Insects 35-56 Aircraft 36-38
		2	C	65	55	45	33	43	30	I/A	
		3	D	67	54	44	32	42	28	I/A	
		4	D	67	54	46	31	43	26	I/A	
		5	B	65	59	50	30	47	26	I/A	
		6	B	69	50	40	28	40	25	I/A	
Evening 3 04/09/2024 19:47 2.2 – 2.7 m/s SE 23-24°C 3027586	35 dBA L <sub>Aeq</sub> (15min)	1	E	59	43	40	35	38	32	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Birds 42-59 Traffic 39-44 Insects 39-40
		2	E	52	44	43	38	41	36	I/A	
Night 3 04/09/2024 23:30 1.2 – 2.5 m/s SSE 22-23°C 3027586	35 dBA L <sub>Aeq</sub> (15min) 45 dBA L <sub>A1</sub> (1min)	1	E	50	48	48	43	46	42	I/A	<b>Site Related Noise Events:</b> Inaudible <b>Other Noise Events:</b> Insects 47-51 Traffic 49-50
		2	E	51	51	50	44	47	42	I/A	
		3	E	49	47	46	43	45	41	I/A	
		4	E	46	45	45	43	44	41	I/A	

Note: N/M = Not Measurable, I/A = Inaudible

Note 1: Mine owned receiver – criteria not applicable.





### 5.1.5 Operator Attended Noise Survey Results – NMP Monitoring Location N1 (Bow Hills)

Results of the operator attended noise surveys at N1 are provided in **Table 17**. Monitoring location N1 represents residential receptors located to the east of the site in Bow Hills.

**Table 17 Operator Attended NMP Noise Survey Results – N1 – Bow Hills**

Period Date/Start Time Weather SLM Details	Criteria <sup>1</sup>	Number	Stability Category	Primary Noise Descriptor						Mine Contribution, (dBA)	Description
				L <sub>Amax</sub> (dBA)	L <sub>A1</sub> (dBA)	L <sub>A10</sub> (dBA)	L <sub>A90</sub> (dBA)	L <sub>Aeq</sub> (dBA)	L <sub>Amin</sub> (dBA)		
Day 02/12/2024 13:42 2.7 m/s NW 32°C 3029485	50 dBA L <sub>Aeq</sub> (15min)	1	D	61	54	49	35	45	32	32 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 31-35 <b>Other Noise Events:</b> Traffic 42-55 Wind 41-48 Birds 55-60
Evening 02/12/2024 19:22 1.3 m/s NW 32°C 3029485	50 dBA L <sub>Aeq</sub> (15min)	1	E	68	52	47	39	44	36	31 L <sub>Aeq</sub>	<b>Site Related Noise Events:</b> Dozer operations 30-35 <b>Other Noise Events:</b> Traffic 50-55 Birds 64 Aircraft 48
Night 02/12/2024 23:32 0.7 m/s W 22°C 3027586	50 dBA L <sub>Aeq</sub> (15min)	1	F	72	60	57	51	54	49	37 L <sub>Aeq</sub> 43 L <sub>A1</sub>	<b>Site Related Noise Events:</b> Dozer operations 33-43 <b>Other Noise Events:</b> Train 53-72 Traffic 61

Note 1: A private agreement between NCOPL and the residents of N1 Bow Hills of 50 dBA L<sub>Aeq</sub>(15minute) is in place. This new level of 50 dBA L<sub>Aeq</sub>(15minute) replaces the levels identified in Conditions 1-3, Schedule 4 of PA 08\_0144 Mod 2 and the identical limits contained in condition L3 of Environment Protection Licence No 1278



## 6.0 Conclusion

SLR was engaged by Narrabri Coal Operations Pty Ltd to conduct attended noise monitoring for the Narrabri Mine in accordance with the Narrabri Mines' Noise Management Plan, Environment Protection Licence and Project Approval.

Operator attended noise monitoring was conducted at five locations in order to determine the noise performance of the Narrabri Mine, with compliance achieved at all privately owned receiver locations.





# Appendix A Acoustic Terminology

## **Narrabri Mine Noise Monitoring**

**Quarter Ending December 2024 Summary Noise Report**

**Narrabri Coal Operations Pty Ltd**

SLR Project No.: 610.018063.00173

24 December 2024

### 1 Sound Level Or Noise Level

The terms “sound” and “noise” are almost interchangeable, except that in common usage “noise” is often used to refer to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure capable of evoking the sense of hearing. The human ear responds to changes in sound pressure over a very wide range. The loudest sound pressure to which the human ear responds is ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or Lp are commonly used to represent sound pressure level. The symbol la represents a-weighted sound pressure level. The standard reference unit for sound pressure levels expressed in decibels is  $2 \times 10^{-5}$  pa.

### 2 “A” Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an “a-weighting” filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing.

People’s hearing is most sensitive to sounds at mid frequencies (500 hz to 4000 hz), and less sensitive at lower and higher frequencies. Thus, the level of a sound in dba is a good measure of the loudness of that sound. Different sources having the same dba level generally sound about equally loud.

A change of 1 dBA or 2 dBA in the level of a sound is difficult for most people to detect, whilst a 3 dBA to 5 dBA change corresponds to a small but noticeable change in loudness. A 10 dBA change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

Other weightings (eg b, c and d) are less commonly used than a-weighting. Sound levels measured without any weighting are referred to as “linear”, and the units are expressed as dB(lin) or db.

### 3 Sound Power Level

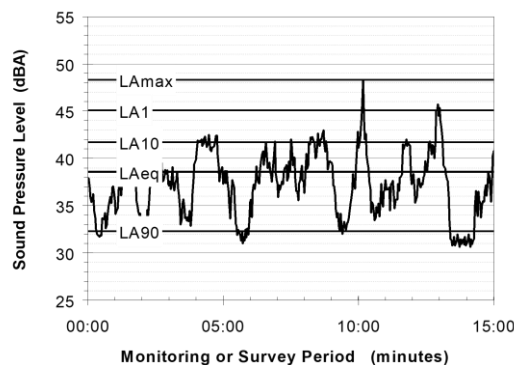
The sound power of a source is the rate at which it emits acoustic energy. As with sound pressure levels, sound power levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or Lw, or by the reference unit  $10^{-1}$

The relationship between sound power and sound pressure may be likened to an electric radiator, which is characterised by a power rating, but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

### 4 STATISTICAL NOISE LEVELS

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels LAn, where LAn is the a-weighted sound pressure level exceeded for n% of a given measurement period. For example, the LA1 is the noise level exceeded for 1% of the time, LA10 the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

- LA1 the noise level exceeded for 1% of the 15 minute interval.
- LA10 the noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.
- LA90 the noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.
- LAeq the a-weighted equivalent noise level (basically the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

When dealing with numerous days of statistical noise data, it is sometimes necessary to define the typical noise levels at a given monitoring location for a particular time of day. A standardised method is available for determining these representative levels.

This method produces a level representing the “repeatable minimum” LA90 noise level over the daytime and night-time measurement periods, as required by the EPA. In addition the method produces mean or “average” levels representative of the other descriptors (LAeq, LA10, etc).

### 5 Tonality

Tonal noise contains one or more prominent tones (ie distinct frequency components), and is normally



Regarded as more offensive than “broad band” noise. 7. Impulsiveness

## 6 Impulsiveness

An impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.

## 7 Frequency Analysis

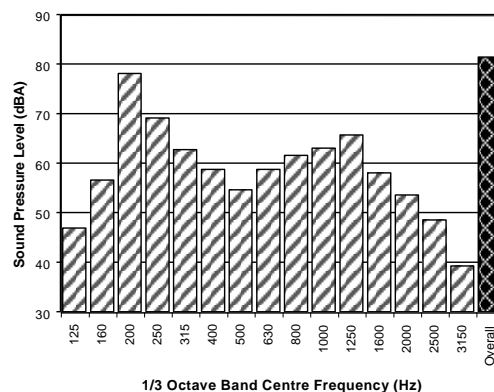
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal. This analysis was traditionally carried out using analogue electronic filters, but is now normally carried out using fast fourier transform (fft) analysers.

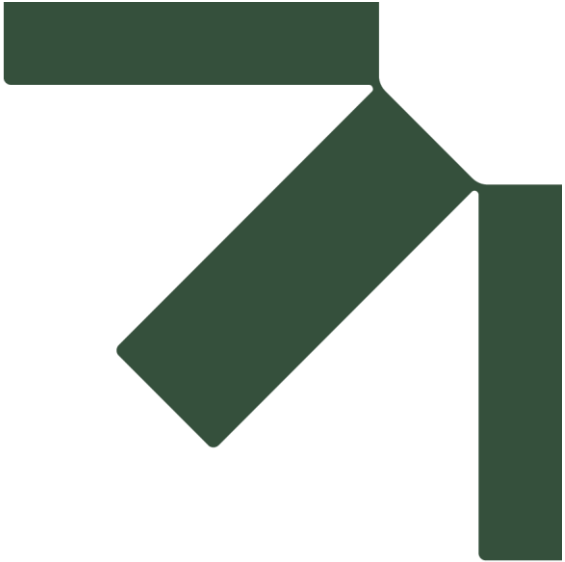
The units for frequency are hertz (hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (3 bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands





# Appendix B Calibration Certificates

## **Narrabri Mine Noise Monitoring**

**Quarter Ending December 2024 Summary Noise Report**

**Narrabri Coal Operations Pty Ltd**

SLR Project No.: 610.018063.00173

24 December 2024

## CERTIFICATE OF CALIBRATION

CERTIFICATE NO: **SLM37864**

EQUIPMENT TESTED: Sound Level Meter

**Manufacturer:** B&K  
**Type No:** 2270      **Serial No:** 3027586  
**Mic. Type:** B&K 4189      **Serial No:** 3232163  
**Pre-Amp. Type:** ZC0032      **Serial No:** 29527  
**Filter Type:** 1/3 Octave      **Test No:** F037862  
**Owner:** SLR Consulting Australia Pty Ltd  
120 High Street  
North Sydney, NSW 2060

**Tests Performed:** IEC 61672-3:2013 & IEC 61260-3:2016

**Comments:** All Test passed for Class 1. (See overleaf for details)

**CONDITIONS OF TEST:**

<b>Ambient Pressure</b>	1005 hPa ±1 hPa	<b>Date of Receipt :</b>	31/10/2023
<b>Temperature</b>	23 °C ±1° C	<b>Date of Calibration :</b>	08/11/2023
<b>Relative Humidity</b>	49 % ±5%	<b>Date of Issue :</b>	08/11/2023

**Acu-Vib Test Procedure:** AVP10 (SLM) & AVP06 (Filters)

**CHECKED BY:** *KS*

**AUTHORISED**

**SIGNATURE:** *Alan See*

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%.

**Acu-Vib Electronics**  
ACOUSTICS AND VIBRATIONS

Head Office & Calibration Laboratory  
Unit 14, 22 Hudson Avenue, Castle Hill NSW 2154  
(02) 9680 8133  
www.acu-vib.com.au



WORLD RECOGNISED  
ACCREDITATION  
Accredited Laboratory  
No. 9262  
Acoustic and Vibration  
Measurements





Sydney Calibration Laboratory  
 Unit 21, 1 Talavera Road, Macquarie Park NSW 2113, Australia  
 Accredited for compliance with ISO/IEC 17025 - Calibration. Laboratory No. 1301



## CERTIFICATE OF CALIBRATION

Certificate No: CAU2400840

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### CALIBRATION OF:

Sound Level Meter:	Brüel & Kjær	2270	No: 3029485
Microphone:	Brüel & Kjær	4189	No: 3260622
Preamplifier:	Brüel & Kjær	ZC-0032	No: 30123
Supplied Calibrator:	None		
Software version:	BZ7222 Version 4.7.6	Pattern Approval:	-
Instruction manual:	BE1712-22	Identification:	N/A

### CUSTOMER:

SLR Consulting Australia Pty Ltd  
 202 Submarine School, Sub Base Platypus  
 North Sydney NSW 2060

### CALIBRATION CONDITIONS:

Preconditioning: 4 hours at 23 °C  
 Environment conditions: *see actual values in Environmental conditions sections*

### SPECIFICATIONS:

The Sound Level Meter has been calibrated in accordance with the requirements as specified in IEC61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The measurements included in this document are traceable to Australian / International standards through accredited calibration of all relevant reference equipment.

### PROCEDURE:

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System B&K 3630 with application software type 7763 (version 8.6 - DB: 8.60) and test procedure 2270-4189.

### RESULTS:

	Initial calibration		Calibration prior to repair/adjustment
X	Calibration without repair/adjustment		Calibration after repair/adjustment

The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor  $k = 2$  providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with EA-4/02 from elements originating from the standards, calibration method, effect of environmental conditions and any short time contribution from the device under calibration.

Date of Calibration: 29/08/2024

Certificate issued: 29/08/2024

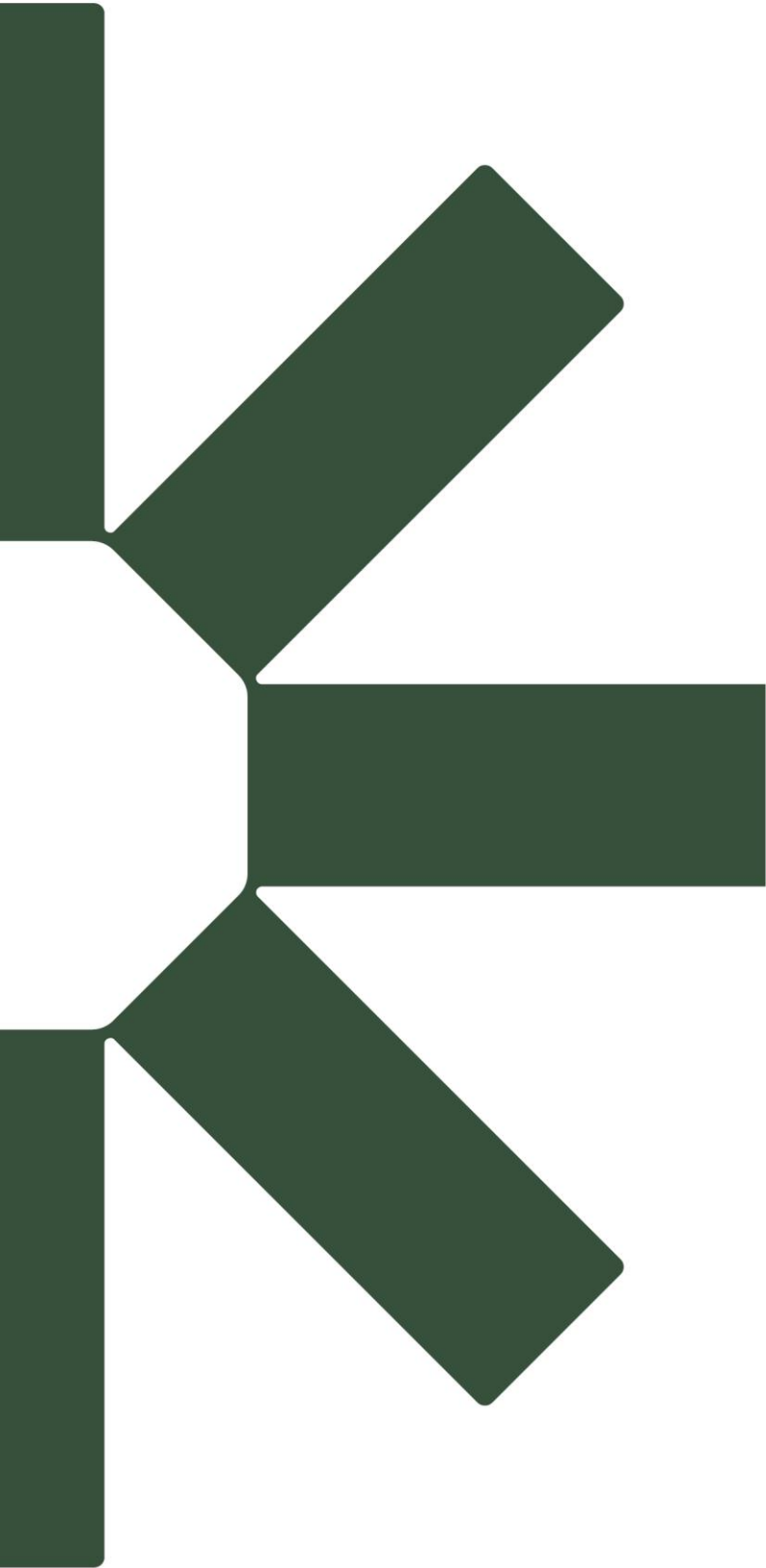
Barath Chandar Rajendran  
 Calibration Technician

Sajeeb Tharayil  
 Approved signatory

**Reproduction of the complete certificate is allowed. Parts of the certificate may only be reproduced after written permission.**







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