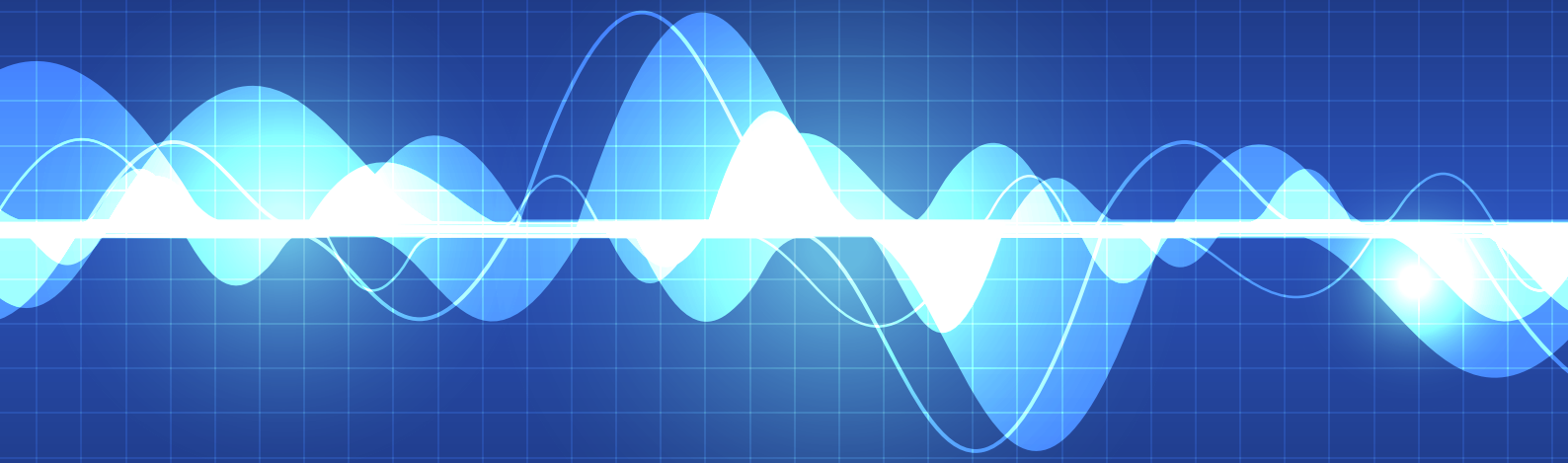
Chain Valley Colliery

Quarterly attended noise monitoring
Quarter 4 - 2021

Prepared for Great Southern Energy Pty Ltd (trading as Delta Coal)
December 2021



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Report Number

H210018 RP10

Client

Great Southern Energy Pty Ltd (trading as Delta Coal)

Date

14 December 2021

Version

v1 Draft

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14 December 2021

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14 December 2021

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1 Introduction

EMM Consulting Pty Limited (EMM) was engaged to undertake operator-attended noise surveys on behalf of Great Southern Energy Pty Ltd (Delta Coal).

The purpose of the noise monitoring was to address requirements of the approved Chain Valley Colliery Noise Management Plan (NMP), prepared to satisfy the requirements of the Development Consent SSD-5465 (DC) and Environment Protection License (EPL) 1770.

Compliance noise monitoring is required to occur on a quarterly basis for Chain Valley Colliery (CVC or the site). This report presents the results and findings for the fourth quarter (Q4) of 2021 from attended noise monitoring conducted on 6 and 8 December 2021.

The following material was referenced as part of this assessment:

- NSW Department of Planning, Industry and Environment (DPIE), Development Consent SSD-5465, as modified (Modification 4) July 2021 (current as of the monitoring date 8 December 2021);
- NSW Environment Protection Authority (EPA), Environment Protection License 1770, as varied on 2 April 2019 (current as of the monitoring date 8 December 2021);
- Chain Valley Colliery Noise Management Plan (currently approved NMP), approved by NSW Department of Planning and Environment on 12 March 2014;
- Chain Valley Colliery and Mannering Colliery Noise Management Plan (revised NMP – DPIE approval pending), updated following Chain Valley Colliery Modification 3 (Mod 3) approval;
- NSW EPA, Industrial Noise Policy (INP), 2000;
- NSW EPA, Industrial Noise Policy application notes, 2017; and
- NSW EPA, Noise Policy for Industry (NPfI), 2017.

It is of note that Delta Coal is currently in the process of updating the NMP to reflect changes associated with Modification 3 (Mod 3) of the DC which was approved by the DPIE in June 2020. Modification 4 (Mod 4) of the DC was subsequently approved by DPIE in July 2021, however no changes to the CVC noise requirements resulted from the Mod 4 approval. Delta Coal have submitted a revised NMP to DPIE for approval to reflect any changes to, or additional, operational noise conditions. The revised NMP incorporates noise management for both Delta Coal's CVC and Mannering Colliery (MC).

The CVC noise monitoring locations and associated noise limits in the revised NMP are generally consistent with those provided in the approved NMP. The CVC noise limits in the revised NMP have not changed from the approved NMP; however, the revised NMP provides two additional noise monitoring locations and associated noise limits for CVC, consistent with those provided in the EPL. For the purpose of this assessment, the CVC noise monitoring requirements in the revised NMP have been adopted for the monitoring undertaken on 6 and 8 December 2021. These are discussed further in Section 2 and Section 3.

A glossary of acoustic terms relevant to this report is provided in Appendix A.

2 Noise limits

2.1 Operational and sleep disturbance noise limits

Chain Valley Colliery noise limits are provided in Table 1, Condition 7 of Schedule 3 of the DC and Conditions L5.1 and L5.2 of the EPL. Extracts of the relevant sections of the DC and EPL pertaining to noise are provided in Appendix B and Appendix C, respectively. Assessment locations and relevant noise impact assessment criteria are summarised in Table 2.1.

Table 2.1 Noise impact assessment criteria

Assessment location	Day $L_{Aeq,15\ minute}$, dB	Evening $L_{Aeq,15\ minute}$, dB	Night $L_{Aeq,15\ minute}$, dB	Night $L_{A1,1\ minute}$, dB
R8 (EPL Point 9)	38	38	38	45
R11 (EPL Point 12)	49	49	49	54
R12 (EPL Point 13)	49	49	49	53
R13 (EPL Point 14)	43	43	43	49
R15 (EPL Point 16)	36	36	36	45
R19 (EPL Point 20)	37	37	37	45
R22 (EPL Point 23)	46	46	46	46
All other privately-owned land	35	35	35	45

Appendix 8 of the DC states meteorological conditions under which noise limits do not apply as follows:

- during periods of rain or hail;
- average wind speed at microphone height exceeds 5 m/s;
- wind speeds greater than 3 m/s at 10 m above ground level; or
- temperature inversion conditions greater than 3°C/100 m.

Condition L5.4 of the EPL states meteorological conditions under which noise limits do not apply as follows:

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

The last point refers to 'very noise-enhancing' conditions which are considered outside the 'standard' or 'noise-enhancing' meteorological conditions defined in Table D1 of Fact Sheet D of the NPfI. Table D1 of the NPfI is reproduced in Table 2.2.

Table 2.2 Standard and noise-enhancing meteorological conditions

Meteorological conditions	Meteorological parameters
Standard meteorological conditions	Day/evening/night: stability categories A-D with wind speed up to 0.5 m/s at 10 m above ground level.
Noise-enhancing meteorological conditions	Day/evening: stability categories A-D with wind light winds (up to 3 m/s at 10 m above ground level). Night: stability categories A-D with light winds (up to 3 m/s at 10 m above ground level) and/or stability category F with winds up to 2 m/s at 10 m above ground level.

Source: NPfI.

Further, Fact Sheet E of the NPfI (point 6 of Section E1) provides additional guidance on monitoring the performance of a site against 'suitable' noise limits placed in the consent/environment protection licence. Noise limits are based on 'achievable' noise levels under the 'standard' and/or 'noise-enhancing' meteorological conditions (refer to Table 2.2). Where meteorological conditions are considered 'very noise-enhancing', a positive adjustment of 5 dB applies to noise limits for 'standard' or 'noise-enhancing' meteorological conditions.

In accordance with the NPfI and for consistency between the DC and EPL, where 'very noise-enhancing' meteorological conditions were present during a noise survey, a positive adjustment of 5 dB has been applied to the noise limits stated in the DC and EPL (refer to Table 2.1). This approach means that noise limits will always be applicable, with or without a positive adjustment of 5 dB, depending on whether meteorological conditions are 'very noise-enhancing' or not.

For this assessment, the recorded L_{Amax} has been used as a conservative estimate of the $L_{A1,1\ minute}$. The INP application notes (EPA 2017) state that the EPA accepts sleep disturbance analysis based on either the $L_{A1,1\ minute}$ or L_{Amax} metrics, with the L_{Amax} resulting in a more conservative assessment of site noise emissions.

The DC and EPL state that all modifying factor adjustments must be applied as appropriate to the measured site noise levels before comparison to the relevant noise limits, where applicable. Fact Sheet C of the NPfI outlines the method for assessing the presence of noise with annoying characteristics and applying the relevant modifying factor adjustment(s) to measured site noise at a residential receiver.

2.1 CVC long term goals

Long-term goals for CVC are provided in Condition 8(d) of Schedule 3 of the DC, which states:

> 8. The Applicant must:
>
> (d) use its best endeavours to achieve the long-term noise goals in Table 2, where reasonable and feasible, and report on progress towards achieving these goals in each Annual Review;

The long-term goals for CVC in Table 2 of the DC are summarised in Table 2.3 for the relevant assessment locations.

Table 2.3 CVC long-term goals

Assessment location	Day $L_{Aeq,15\ minute}$, dB	Evening $L_{Aeq,15\ minute}$, dB	Night $L_{Aeq,15\ minute}$, dB
R11 (EPL Point 12)	41	41	41
R12 (EPL Point 13)	41	41	41
R13 (EPL Point 14)	41	41	41
R22 (EPL Point 23)	40	40	40

As stated in Appendix 9 of the DC, Delta Coal is committed to the progressive implementation of feasible measures to target long-term noise goals which are designed to reduce noise emissions from CVC. For the purpose of this compliance noise monitoring assessment, site $L_{Aeq,15\ minute}$ noise contributions have also been compared to the long-term goals.

2.2 Low frequency noise criteria

Condition 5 in Appendix 8 of the DC and L5.9 of the EPL state that noise generated by Chain Valley Colliery is to be measured in accordance with the relevant requirements of the INP. The INP application notes state that modifying factor adjustments outlined in Fact Sheet C of the NPfI are to be used when assessing certain characteristics of a noise source such as low frequency noise.

Fact sheet C of the NPfI provides guidelines for applying modifying factor adjustments to account for low frequency noise emissions. The NPfI specifies that a difference of 15 dB or more between site 'C-weighted' and site 'A-weighted' noise emission levels identifies the potential for an unbalanced noise spectrum and potential increased annoyance at a residential receiver.

Where a difference of 15 dB or more between site 'C-weighted' and site 'A-weighted' noise emission levels is identified, the one-third octave noise levels recorded should be compared to the low frequency noise threshold values in Table C2 of the NPfI (EPA 2017), which has been reproduced in Table 2.4.

Table 2.4 One-third octave low frequency noise threshold levels

	One-third octave $L_{Zeq,15\ minute}$ threshold levels												
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

The following modifying factor corrections for low frequency noise are to be applied to the site $L_{Aeq,15\ minute}$ noise contribution where the site 'C-weighted' and site 'A-weighted' noise emission level is 15 dB or more and:

- where any of the one-third octave noise levels in Table 2.2 are exceeded by up to and including 5 dB and cannot be mitigated, a 2 dB positive adjustment to measured/predicted A-weighted levels applies for the evening/night period; or
- where any of the one-third octave noise levels in Table 2.2 are exceeded by more than 5 dB and cannot be mitigated, a 5 dB positive adjustment to measured/predicted A-weighted levels applies for the evening/night period and a 2 dB positive adjustment applies for the daytime period.

Hence, where possible throughout each survey the operator has estimated the difference between site 'C-weighted' and site 'A-weighted' noise emission levels by matching audible sounds with the response of the sound analyser (L_{Ceq}-L_{Aeq}). Where this was found to be 15 dB or greater, the measured one-third octave frequencies have been compared to the values in Table 2.4 to identify the relevant modifying factor adjustments (if applicable). This method for the application of modifying adjustments for low frequency noise has been applied to this assessment as presented in Section 4.

It is of note that the NPfI states that low frequency noise modifying factor adjustments only apply under the standard or noise-enhancing meteorological conditions as per Fact Sheet D of the NPfI.

3 Assessment methodology

3.1 Attended noise monitoring

To quantify noise emissions from CVC, attended noise monitoring surveys were completed at representative locations, in accordance with the revised NMP.

Attended noise monitoring locations as per the revised NMP, and their coordinates are listed in Table 3.1 and are shown in Figure 3.1.

Table 3.1 Attended noise monitoring locations

Attended noise monitoring location	Assessment location	Description	Coordinates (MGA56)	
			Easting	Northing
ATN001	R8 (EPL Point 9)	Griffith Street, Mannering Park	363990	6330529
ATN002	R11 (EPL Point 12)	Lakeshore Avenue, Kingfisher Shores	365218	6329388
ATN003	R15 (EPL Point 16)	Short Street, Macquarie Shores	365165	6328323
ATN004	R14	Lloyd Avenue, Chain Valley Bay	365949	6328530
ATN005	R17	Teragalin Drive, Chain Valley Bay	366560	6328590
ATN006	R19 (EPL Point 20)	Sunset Parade, Chain Valley Bay	366305	6329321
ATN007[1]	R22 (EPL Point 23)	Cams Boulevard, Chain Valley Bay	366425	6331135
R12	R12 (EPL Point 13)	Lakeshore Avenue, Kingfisher Shores	365185	6329352
R13	R13 (EPL Point 14)	Karoola Avenue, Kingfisher Shores	365391	6329169

Notes: 1. Due to access issues, noise monitoring for ATN007 was conducted at an intermediate location within the site boundary and site noise contributions calculated back to R22.

Condition M4.1 of the EPL specifies additional noise monitoring requirements to determine compliance, including the following:

- locations of monitoring – EPL points listed in Table 3.1;
- frequency of monitoring – quarterly and at least two months between monitoring periods;
- periods of monitoring:
  - for three out of four quarterly periods – each day, evening and night periods for a minimum of 15 minutes. Night period monitoring must be undertaken between the hours of 1 am and 4 am; and
  - for one out of four quarterly periods – day period monitoring must be undertaken for a minimum of 1.5 hours (six 15-minute periods); evening period monitoring must be undertaken for a minimum of 30 minutes (two 15-minue periods); night period monitoring must be undertaken for a minimum of 1 hour (four 15-minute periods).
- days of monitoring – each quarterly monitoring must be undertaken on a different day of the week excluding Saturday, Sundays and public holidays.

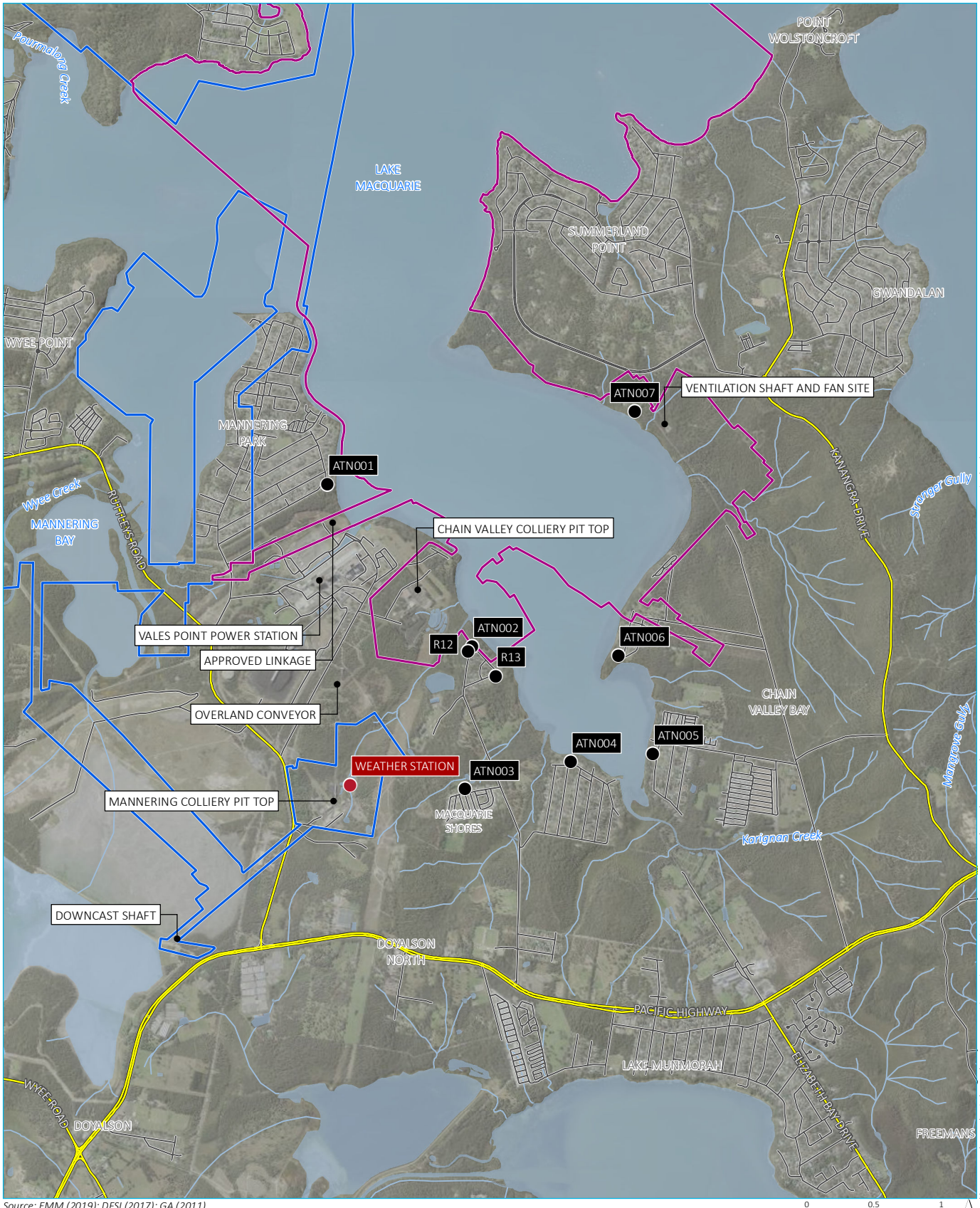
In accordance with the preceding, this round of quarterly attended noise monitoring (Q4 2021) was undertaken on Monday 6 and Wednesday 8 December 2021 which is more than two months since the last quarterly round of monitoring (Q3 2021) conducted on Friday 17, Thursday 23 and Friday 24 September 2021.

As per the revised NMP, attended noise monitoring is scheduled considering the occurrence of regular operations at CVC. Noise monitoring avoids scheduled down-time or maintenance. Regular operations were occurring during this round of noise monitoring.

3.2 Instrumentation

Two Brüel & Kjær (B&K) 2250 Type 1 sound analysers (s/n 2759405 and 3029363) were used to conduct 15-minute attended measurements and record one-third octave frequency and statistical noise indices. The sound analysers were calibrated before and on completion of the survey using a Svantek Type SV 36 calibrator (s/n 79952). Instrumentation calibration certificates are provided in Appendix D.

Where possible throughout each survey, the operator has quantified the contribution of site noise and other significant noise sources. This was done by matching audible sounds with the response of the sound analyser (where applicable) and/or via post-analysis of data (eg low-pass filtering).



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Source: EMM (2019); DFSI (2017); GA (2011)

0 0.5 1 km

GDA 1994 MGA Zone 56

N

KEY

- Chain Valley Colliery development consent boundary
- Mannering Colliery project approval boundary
- Noise monitoring location
- Weather station
- Main road
- Local road
- Watercourse/drainage line
- Waterbody

Site boundary and noise monitoring locations

Chain Valley Colliery noise monitoring
Figure 3.1

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3.3 Determination of stability category

For the purpose of this assessment and as required by the DC, EPL and revised NMP, stability categories were determined for each 15-minute attended monitoring period. The stability category data for the monitoring period as well as the average wind data (speed and direction) were obtained from MC's meteorological station located to the south of the site (refer to Figure 3.1).

The stability categories and associated ranges in temperature lapse rates are presented in Table 3.2.

Table 3.2 Stability categories and temperature lapse rates

Stability category	Temperature lapse rate (ΔT) (°C/100 m)
A	$\Delta T < -1.9$
B	$-1.9 \leq \Delta T < -1.7$
C	$-1.7 \leq \Delta T < -1.5$
D	$-1.5 \leq \Delta T < -0.5$
E	$-0.5 \leq \Delta T < 1.5$
F	$1.5 \leq \Delta T < 4.0$
G	$\Delta T \geq 4.0$

Source: INP (EPA 2000).

4 Review of data and discussion

Noise contribution from CVC was determined for each survey using in-field observations and post-analysis of data as required (eg removing higher frequencies that are not mine related). Attended noise monitoring was completed on 6 and 8 December 2021. Monitoring surveys occurred at all monitoring locations for 15 minutes during the day, evening and night periods as per the EPL. Results for this Q4 2021 attended noise monitoring are summarised in Table 4.1.

The meteorological data for the monitoring period was sourced from Mannering Colliery's meteorological station to determine if a positive adjustment of 5 dB to the noise limits was applicable due to 'very noise-enhancing' meteorological conditions as per the NPfI. Meteorological conditions were 'very noise-enhancing' due to average wind speeds greater than 3 m/s or atmospheric stability category F in combination with average wind speeds greater than 2 m/s for four of the 27 noise measurements (at locations ATN002, R12, R13 and ATN006). Therefore, a positive adjustment of 5 dB was applied to the noise limits for these measurements as indicated in Table 4.1. The standard noise limits as shown in Table 2.1 applied for all other noise measurements.

Site noise was inaudible during 24 of the 27 measurements. Typically, when a particular source is not audible above local ambient noise levels, the likely contribution of that source is at least 10 dB below the measured background (L_{A90}) level. For all of the measurements where site noise was inaudible, the measured L_{A90} noise levels were no more than 5 dB above the relevant $L_{Aeq,15\ minute}$ limits. Hence, site $L_{Aeq,15\ minute}$ noise contributions were likely below the relevant limits during these measurements.

At the one noise monitoring location where site noise was audible; ATN007 (day, evening and night), CVC noise contributions satisfied the relevant noise limits.

With regard to LFN modifying factor adjustments, these have not been applied to locations where CVC was deemed to be inaudible. Measured site noise levels exceeded the relevant LFN threshold levels during the evening and night-time measurements at ATN007. Therefore, in accordance with the NPfI, a 2 dB positive adjustment was applied to the estimated site $L_{Aeq,15\ minute}$ noise contributions for these measurements (as shown in Table 4.1).

Site $L_{Aeq,15\ minute}$ noise contributions were also compared to the long-term noise goals (refer to Table 2.3) for the relevant locations (ie R11, R12, R13 and R22). Site $L_{Aeq,15\ minute}$ noise contributions satisfied the relevant long-term goals at R11 (ATN002), R12 and R13 during the day, evening and night periods. However, during the daytime measurements at R22 (ATN007), site $L_{Aeq,15\ minute}$ noise contributions exceeded the relevant long-term goals by 2 dB, and during the evening and night-time measurements at R22 (ATN007), site $L_{Aeq,15\ minute}$ noise contributions (inclusive of the 2 dB positive adjustment for LFN) exceeded the relevant long-term goals by 4 dB.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions[3] Very noise-enhancing?	Exceedance, dB	Comments
			L_{Amin}	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	L_{Ceq}	LFN mod. factor[1]	L_{Aeq}	L_{Amax}[2]	L_{Aeq}	L_{Amax}[2]			
ATN001	6/12	15:14 (Day)	41	43	56	52	70	79	68	Nil	IA	N/A	38	N/A	1.6 m/s @ 63° A class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Resident noise frequently audible. Dogs barking, bird noise and traffic passbys occasionally audible.
ATN001	6/12	20:02 (Eve.)	41	43	50	50	62	74	65	Nil	IA	N/A	38	N/A	1.1 m/s @ 39° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Resident noise frequently audible. Dogs barking, bird noise, aircraft noise, wind in foliage and traffic passbys occasionally audible.
ATN001	8/12	01:19 (Night)	41	42	44	45	45	62	63	Nil	IA	IA	38	45	0.5 m/s @ 262° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
ATN002	6/12	15:57 (Day)	38	42	52	52	64	73	68	Nil	IA	N/A	54 (49+5)	N/A	3.9 m/s @ 61° A class stability Yes	Nil	CVC inaudible. VPPS hum consistently audible. Bird noise, resident noise, insects and frogs consistently audible. Dogs barking and traffic passbys occasionally audible.
ATN002	6/12	21:16 (Eve.)	35	37	39	40	42	49	59	Nil	IA	N/A	49	N/A	0.7 m/s @ 46° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. People at nearby residence frequently audible. Distant traffic and dogs barking occasionally audible.
ATN002	8/12	02:06 (Night)	39	41	43	46	48	49	65	Nil	IA	IA	49	54	1.0 m/s @ 229° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
ATN003	6/12	15:39 (Day)	31	38	52	58	62	70	57	Nil	IA	N/A	36	N/A	1.6 m/s @ 69° A class stability No	Nil	CVC inaudible. Nearby residential construction, insects and frogs consistently audible. Distant traffic occasionally audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions[3] Very noise-enhancing?	Exceedance, dB	Comments
			L_{Amin}	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	L_{Ceq}	LFN mod. factor[1]	L_{Aeq}	L_{Amax}[2]	L_{Aeq}	L_{Amax}[2]			
ATN003	6/12	20:45 (Eve.)	38	40	42	43	46	63	58	Nil	IA	N/A	36	N/A	1.6 m/s @ 57° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic occasionally audible.
ATN003	8/12	01:45 (Night)	36	38	39	40	42	50	62	Nil	IA	IA	36	45	0.2 m/s @ 198° F class stability No	Nil	CVC inaudible. MC CHP noise consistently audible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic and birds occasionally audible.
ATN004	6/12	16:33 (Day)	32	35	45	48	57	64	58	Nil	IA	N/A	35	N/A	1.7 m/s @ 53° A class stability No	Nil	CVC inaudible. Bird noise, insects and frogs consistently audible. Dogs barking, aircraft noise, wind in foliage and traffic passbys occasionally audible.
ATN004	6/12	19:37 (Eve.)	29	31	41	44	53	59	54	Nil	IA	N/A	35	N/A	1.7 m/s @ 41° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise and distant traffic frequently audible. Traffic passbys occasionally audible.
ATN004	6/12	22:31 (Night)	32	35	36	38	39	45	53	Nil	IA	IA	35	45	1.3 m/s @ 37° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
ATN005	6/12	16:56 (Day)	29	32	38	40	48	58	53	Nil	IA	N/A	35	N/A	1.7 m/s @ 61° A class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise and distant traffic frequently audible. Resident noise occasionally audible.
ATN005	6/12	18:47 (Eve.)	29	33	40	44	50	59	52	Nil	IA	N/A	35	N/A	1.2 m/s @ 54° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise frequently audible. Resident noise, dogs barking and distant traffic occasionally audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions[3] Very noise-enhancing?	Exceedance, dB	Comments
			L_{Amin}	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	L_{Ceq}	LFN mod. factor[1]	L_{Aeq}	L_{Amax}[2]	L_{Aeq}	L_{Amax}[2]			
ATN005	6/12	23:04 (Night)	30	33	37	39	46	49	52	Nil	IA	IA	35	45	1.9 m/s @ 23° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible.
ATN006	6/12	17:16 (Day)	30	33	45	43	58	72	53	Nil	IA	N/A	37	N/A	1.8 m/s @ 57° A class stability No	Nil	CVC inaudible. Insects and frogs consistently audible. Bird noise, resident noise and distant traffic frequently audible. Aircraft noise occasionally audible.
ATN006	6/12	18:27 (Eve.)	29	31	42	43	55	67	50	Nil	IA	N/A	42 (37+5)	N/A	2.5 m/s @ 65° F class stability Yes	Nil	CVC inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Bird noise and distant traffic frequently audible. Resident noise occasionally audible.
ATN006	8/12	02:53 (Night)	36	38	43	44	54	59	61	Nil	IA	IA	37	45	2.2 m/s @ 178° D class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Birds occasionally audible. Aircraft flying above audible on one occasion.
ATN007[4]	6/12	17:43 (Day)	47	49	50	51	52	54	70	Nil	42	N/A	46[5]	N/A	1.4 m/s @ 63° F class stability No	Nil	CVC vent fan consistently audible. Insects and frogs consistently audible. Bird noise frequently audible. Distant traffic and wind in foliage occasionally audible.
ATN007[4]	6/12	18:00 (Eve.)	47	49	50	51	52	61	70	2 dB	44 (42+2)	N/A	46[5]	N/A	1.4 m/s @ 73° F class stability No	Nil	CVC vent fan consistently audible. Insects and frogs consistently audible. Bird noise, distant traffic and wind in foliage occasionally audible.
ATN007[4]	8/12	03:28 (Night)	48	49	50	50	51	52	71	2 dB	44 (42+2)	42	46[5]	46	1.1 m/s @ 187° F class stability No	Nil	CVC vent fan consistently audible. VPPS hum consistently audible in the background. Insects consistently audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q4 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions[3] Very noise-enhancing?	Exceedance, dB	Comments
			L_{Amin}	L_{A90}	L_{Aeq}	L_{A10}	L_{A1}	L_{Amax}	L_{Ceq}	LFN mod. factor[1]	L_{Aeq}	L_{Amax}[2]	L_{Aeq}	L_{Amax}[2]			
R12	6/12	15:57 (Day)	38	42	52	52	64	73	68	Nil	IA	N/A	54 (49+5)	N/A	3.9 m/s @ 61° A class stability Yes	Nil	CVC inaudible. VPPS hum consistently audible. Bird noise, resident noise, insects and frogs consistently audible. Dogs barking and traffic passbys occasionally audible.
R12	6/12	21:16 (Eve.)	35	37	39	40	42	49	59	Nil	IA	N/A	49	N/A	0.7 m/s @ 46° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. People at nearby residence frequently audible. Distant traffic and dogs barking occasionally audible.
R12	8/12	02:06 (Night)	39	41	43	46	48	49	65	Nil	IA	IA	49	53	1.0 m/s @ 229° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible.
R13	6/12	16:14 (Day)	32	36	46	50	57	63	57	Nil	IA	N/A	48 (43+5)	N/A	3.2 m/s @ 75° A class stability Yes	Nil	CVC inaudible. Bird noise, insects and frogs consistently audible. Dogs barking, wind in foliage and traffic passbys occasionally audible.
R13	6/12	21:33 (Eve.)	35	37	46	51	54	67	54	Nil	IA	N/A	43	N/A	1.3 m/s @ 41° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Distant traffic, wind in tree foliage and dog barking occasionally audible.
R13	8/12	02:24 (Night)	41	43	48	51	52	53	60	Nil	IA	IA	43	49	0.5 m/s @ 197° F class stability No	Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Local traffic briefly audible.

Notes:
1. Modifying factor adjustment for low frequency noise in accordance with Fact sheet C of the NPfI (refer to Section 0).
2. For assessment purposes the L_{Amax} and the $L_{A1,1\ minute}$ are interchangeable.
3. Meteorological data including wind speed, wind direction and stability category (SC) were taken as an average over 15 minutes from Mannering Colliery's weather station (Refer to Section 3.3).
4. A positive adjustment of 5 dB to the noise limit(s) was applicable due to the presence of 'very noise-enhancing' meteorological conditions as per the revised NMP and NPfI.
5. Due to access issues, noise monitoring for ATN007 was conducted at an intermediate location. Total noise levels shown were measured at the alternative location and site contributions were calculated back to R22/EPL Point 23.
6. IA = inaudible, N/A = not applicable.

5 Conclusion

EMM has completed a review of mine noise from Chain Valley Colliery within the surrounding community based on attended measurements conducted on 6 and 8 December 2021.

The meteorological data for the monitoring period was sourced from Mannering Colliery's meteorological station to determine if the standard noise limits applied as per the revised NMP or if a positive adjustment of 5 dB to the noise limits was applicable due to 'very noise-enhancing' meteorological conditions in accordance with the NPfI. Meteorological conditions were 'very noise-enhancing' due to average wind speeds greater than 3 m/s or atmospheric stability category F in combination with average wind speeds greater than 2 m/s for three of the 27 noise measurements. Therefore, a positive adjustment of 5 dB was applied to the noise limits for the relevant measurements.

The assessment of noise contributions from site included consideration of modifying factors for annoying noise characteristics, where relevant, and in accordance with the NPfI. A modifying factor for LFN was applicable at ATN007 during the evening and night-time measurements. Therefore, in accordance with the NPfI, a 2 dB positive adjustment was applied to the estimated site $L_{Aeq,15\ minute}$ noise contribution for these measurements before comparison to the relevant noise limits.

CVC $L_{Aeq,15\ minute}$ and L_{Amax} noise contributions for this round (Q4) of noise monitoring satisfied the relevant noise limits at all monitoring locations as outlined in the DC, EPL and revised NMP.

CVC $L_{Aeq,15\ minute}$ noise contributions were also compared to the long-term noise goals applicable at R11, R12, R13 and R22. CVC $L_{Aeq,15\ minute}$ noise contributions satisfied the relevant long-term goals during all measurements at R11, R12 and R13. However, during the daytime measurements at R22 (ATN007), site $L_{Aeq,15\ minute}$ noise contributions exceeded the relevant long-term goals by 2 dB, and during the evening and night-time measurements at R22 (ATN007), site $L_{Aeq,15\ minute}$ noise contributions (inclusive of the 2 dB positive adjustment for LFN) exceeded the relevant long-term goals by 4 dB.

References

Chain Valley Colliery Noise Management Plan (approved NMP), 2014.

Chain Valley Colliery and Mannering Colliery Noise Management Plan (revised NMP – DPIE approval pending).

NSW Department of Planning and Environment, Development Consent SSD5465, 2020.

NSW Environment Protection Authority, Environment Protection License 1770, 2019 (superseded).

NSW Environment Protection Authority, Environment Protection License 1770, 2021.

NSW Environment Protection Authority, Industrial Noise Policy, 2000.

NSW Environment Protection Authority, Industrial Noise Policy application notes, 2017.

NSW Environment Protection Authority, Noise Policy for Industry, 2017.

Appendix A

Glossary of acoustic terms

Several technical terms are discussed in this report. These are explained in Table A.1.

Table A.1 Glossary of acoustic terms

Term	Description
dB	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
L_{A1}	The 'A-weighted' noise level which is exceeded 1% of the time.
$L_{A1,1\ minute}$	The 'A-weighted' noise level exceeded for 1% of the specified time period of 1 minute.
L_{A10}	The 'A-weighted' noise level which is exceeded 10% of the time. It is approximately equivalent to the average of maximum noise level.
L_{A90}	Commonly referred to as the background noise level. The 'A-weighted' noise level exceeded 90% of the time.
L_{Aeq}	The energy average noise from a source. This is the equivalent continuous 'A-weighted' sound pressure level over a given period. The $L_{Aeq,15\ minute}$ descriptor refers to an L_{Aeq} noise level measured over a 15-minute period.
L_{Amin}	The minimum 'A-weighted' noise level received during a measuring interval.
L_{Amax}	The maximum root mean squared 'A-weighted' sound pressure level (or maximum noise level) received during a measuring interval.
L_{Ceq}	The equivalent continuous 'C-weighted' sound pressure level over a given period. The $L_{Ceq,15\ minute}$ descriptor refers to an L_{Ceq} noise level measured over a 15 minute period. C-weighting can be used to measure low frequency noise.
Day period	Monday – Saturday: 7 am to 6 pm, on Sundays and Public Holidays: 8 am to 6 pm.
Evening period	Monday – Saturday: 6 pm to 10 pm, on Sundays and Public Holidays: 6 pm to 10 pm.
Night period	Monday – Saturday: 10 pm to 7 am, on Sundays and Public Holidays: 10 pm to 8 am.
Temperature inversion	A meteorological condition where the atmospheric temperature increases with altitude.

It is useful to have an appreciation of decibels (dB), the unit of noise measurement. Table A.2 gives an indication as to what an average person perceives about changes in noise levels. Examples of common noise levels are provided in Figure A.1.

Table A.2 Perceived change in noise

Change in sound pressure level (dB)	Perceived change in noise in surrounding environment
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

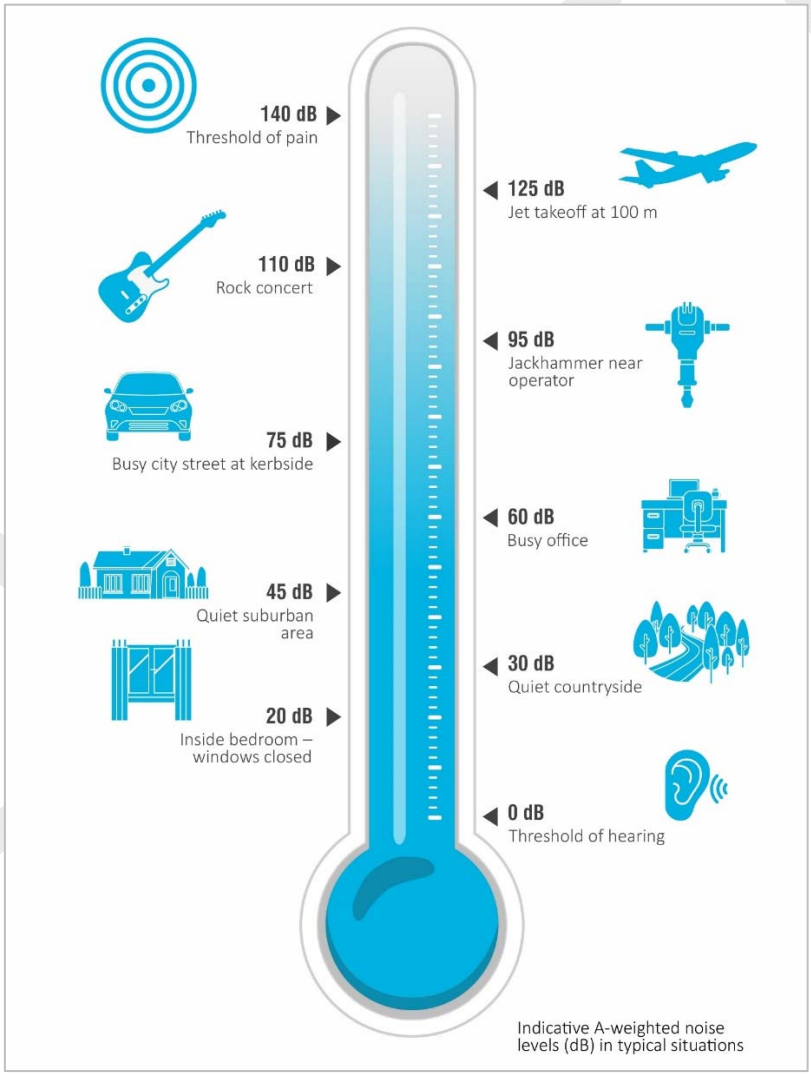

Figure A.1 Common noise levels

Appendix B

Project approval extract

must commission a suitably qualified person, whose appointment has been approved by the Planning Secretary at least one month prior to undertaking the audit, to conduct an Independent Traffic Audit of the development. This audit must:

(a) be undertaken without prior notice to the Applicant, and in consultation with TfNSW, NCC, CC Council and the CCC;

(b) assess the impact of the development on the performance and safety of the road network, including a review of:
- haulage records;
- accident records on the haulage route, infringements relating to the code of conduct and any incidents involving haulage vehicles;
- community complaints register; and

(c) assess the effectiveness of the Road Transport Protocol; and, if necessary, recommend measures to reduce or mitigate any adverse (or potentially adverse) impacts.

5. Within 1 month of receiving the audit report, or as otherwise agreed by the Planning Secretary, the Applicant must submit a copy of the report to the Planning Secretary, with a detailed response to any of the recommendations contained in the audit report, including a timetable for the implementation of any measures proposed to address the recommendations in the audit report.

A summary of the audit report must be included in the Annual Review.

Alternative Coal Transport Options

6. Prior to 31 December 2014, and every three years thereafter, the Applicant must prepare and submit to the Planning Secretary for approval, a study of the reasonable and feasible options to reduce or eliminate the use of public roads to transport coal from the development, unless otherwise agreed by the Planning Secretary. The assessment must include:

(a) an analysis of the capital, construction and operating costs of the alternative transport options; and

(b) quantified social and environmental impacts associated with road and rail transport.

NOISE

Noise Impact Assessment Criteria

7. The Applicant must ensure that the noise generated by the development at any residence on privately-owned land does not exceed the criteria for the location in Table 1 nearest to that residence.

Table 1: Noise Criteria dB(A)

Location	***Day***	***Evening***	***Night***	
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{A1(1\ min)}$
R8	38	38	38	45
R11	49	49	49	54
R12	49	49	49	53
R13	43	43	43	49
R15	36	36	36	45
R19	37	37	37	45
R22	46	46	46	46
all other privately-owned land	35	35	35	45

Notes:
- *To interpret the locations referred to in Table 1, see Appendix 6 and the EIS; and*
- *Noise generated by the development is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 8 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.*

However, these criteria do not apply if the Applicant has a written agreement with the relevant landowner to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Operating Conditions

8. The Applicant must:
   (a) implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational and transport noise generated by the development;
   (b) regularly assess the noise monitoring and meteorological data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this consent;
   (c) minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 8);
   (d) use its best endeavours to achieve the long-term noise goals in Table 2, where reasonable and feasible, and report on progress towards achieving these goals in each Annual Review;
   (e) carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and
   (f) prepare an action plan to implement any additional reasonable and feasible onsite noise mitigation measures identified by each audit;

   to the satisfaction of the Planning Secretary.

Table 2: Long-term Noise Goals dB(A)

Location	***Day***	***Evening***	***Night***
	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$	$L_{Aeq(15\ min)}$
R11 – R13	41	41	41
R22	40	40	40

Notes:

- *To interpret the locations referred to in Table 2, see Appendix 6 and the EIS; and*
- *Noise generated by the development is to be measured in accordance with the relevant requirements, and exemptions (including certain meteorological conditions), of the NSW Industrial Noise Policy. Appendix 8 sets out the meteorological conditions under which these criteria apply, and the requirements for evaluating compliance with these criteria.*

Noise Management Plan

9. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:
   (a) be prepared in consultation with the EPA and submitted to the Planning Secretary for approval within 4 months of the date of this consent, unless otherwise agreed by the Planning Secretary;
   (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 including the mitigation measures that would be implemented to minimise noise during construction and operations, including on and off site road noise generated by vehicles associated with the development; and
   (d) include a monitoring program that:
      - uses attended monitoring to evaluate the compliance of the development against the noise criteria in this consent;
      - evaluates and reports on:
        - the effectiveness of the on-site noise management system; and
        - compliance against the noise operating conditions; and
      - defines what constitutes a noise incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any noise incidents.

The Applicant must implement the Noise Management Plan as approved by the Planning Secretary.

AIR QUALITY

Odour

10. The Applicant must ensure that no offensive odours are emitted from the site, as defined under the POEO Act.

APPENDIX 6
NOISE RECEIVER LOCATIONS

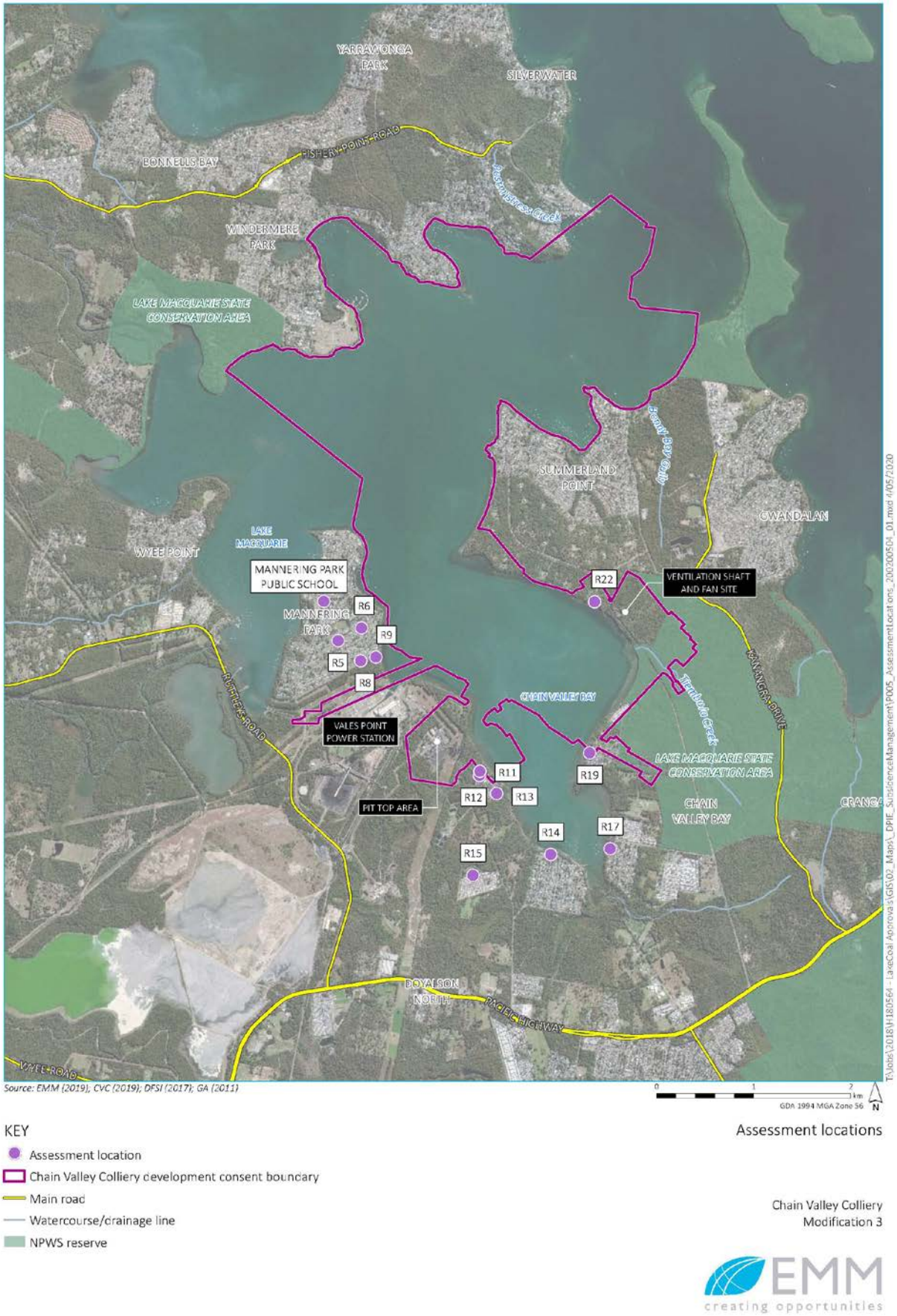

Figure 1: *Noise Receiver Locations*

APPENDIX 8
NOISE COMPLIANCE ASSESSMENT

Applicable Meteorological Conditions

1. The noise criteria in Table 1 of the conditions are to apply under all meteorological conditions except the following:
   (a) during periods of rain or hail;
   (b) average wind speed at microphone height exceeds 5 m/s;
   (c) wind speeds greater than 3 m/s measured at 10 m above ground level; or
   (d) temperature inversion conditions greater than 3°C/100 m.

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 described in condition 14 of schedule 3.

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 4 times in each calendar year (ie at least once every 3 months), unless the Planning Secretary directs otherwise.

5. Unless otherwise agreed with the Planning 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.

Appendix C

EPL extract

	Protection of the Environment Operations (Waste) Regulation 2014.

L5 Noise limits

L5.1 Noise generated at the premises that is measured at each noise monitoring point established under this licence must not exceed the noise levels specified in Column 4 of the table below for that point during the corresponding time periods specified in Column 1 when measured using the corresponding measurement parameters listed in Column 2.

POINT 12

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	49
Evening	Evening-LAeq (15 minute)	-	49
Night	Night-LAeq (15 minute)	-	49
Night	Night-LA1 (1 minute)	-	54

POINT 13

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	49
Evening	Evening-LAeq (15 minute)	-	49
Night	Night-LAeq (15 minute)	-	49
Night	Night-LA1 (1 minute)	-	53

POINT 14

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	43
Evening	Evening-LAeq (15 minute)	-	43
Night	Night-LAeq (15 minute)	-	43
Night	Night-LA1 (1 minute)	-	49

POINT 16

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	36
Evening	Evening-LAeq (15 minute)	-	36
Night	Night-LAeq (15 minute)	-	36
Night	Night-LA1 (1 minute)	-	45

POINT 20

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	37
Evening	Evening-LAeq (15 minute)	-	37
Night	Night-LAeq (15 minute)	-	37
Night	Night-LA1 (1 minute)	-	45

POINT 23

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	46
Evening	Evening-LAeq (15 minute)	-	46
Night	Night-LAeq (15 minute)	-	36
Night	Night-LA1 (1 minute)	-	45

POINT 9

Time period	Measurement parameter	Measurement frequency	Noise level dB(A)
Day	Day-LAeq (15 minute)	-	38
Evening	Evening-LAeq (15 minute)	-	38
Night	Night-LAeq (15 minute)	-	38
Night	Night-LA1 (1 minute)	-	45

L5.2 The licensee must ensure that noise generated on the premises does not exceed:

a) 35 LAeq(15min) during the day, evening or night at any privately owned land nearest to the residence apart from those receivers identified in Condition 5.1; and
b) 45 LA1(1min) during the night at any privately owned land nearest to the residence apart from those receivers identified in Condition 5.1.

Note: The licensee may provide to the EPA written evidence of any agreement with a landholder which is subject to the above noise limits. The written evidence may be submitted with a licence variation to remove the landholder from the above tables.

L5.3 For the purpose of condition L5.1 and condition L5.2:
(a) Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and public holidays;
(b) Evening is defined as the period 6pm to 10pm, and
(c) Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sunday and public holidays.

L5.4 The noise limits set out in condition L5.1 and condition L5.2 apply under all meterorological conditions except for any one of the following:
(a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or
(b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
(c) Stability category G temperature inversion conditions.

L5.5 For the purpose of condition L5.4:
(a) the meteorological data to be used for determining meteorological conditions is the data recorded at the meteorological station identified in this licence as EPA Identification Point 26.
(b) Stability category temperature inversion conditions are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the *NSW industrial Noise Policy* (EPA 2000)

Note: The weather station must be designed, commissioned and operated in a manner to obtain the necessary parameters required under the above condition.

L5.6 For the purpose of determining the noise generated at the premises the licensee must use a Class 1 or Class 2 noise monitoring device as defined by AS IEC61672.1 and AS IEC61672.2-2004, or other noise monitoring equipment accepted by the EPA in writing.

L5.7 To determine compliance:

1. With the $L_{Aeq(15\ min)}$ noise limits in condition L5.1 and condition L5.2, the licensee must locate noise monitoring equipment;

(a) within 30 metres of a dwelling facade (but not closer than 3 metres) where any dwelling on the property is situated more then 30 metres from the property boundary that is closest to the premises;

(b) approximately on the boundary where any dwelling is situated 30 metres or less from the property boundary that is closest to the premises, or, where applicable,

(c) within approximately 50 metres if the boundary of a national park or nature reserve.

2. With the LA1(1 minute) noise limits in condition L5.1 and L5.2, the noise monitoring equipment must be located within 1 metre of a dwelling facade.

3. With the noise limits in condition L5.1 and condition L5.2, the noise monitoring equipment must be located;

(a) at the most affected point at a location where there is no dwelling at the location, or

(b) at the most affected point within an area at a location prescribed by conditions L5.7 1(a) or L5.7 1(b).

L5.8 A non-compliance of condition L5.1 or condition L5.2 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 L5.7 1(a) and L5.7 1(b), and /or
b) at a point other than the most affected point at a location.

L5.9 For the purposes 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.

4 Operating Conditions

O1 Activities must be carried out in a competent manner

O1.1 Licensed activities must be carried out in a competent manner.
This includes:
a) the processing, handling, movement and storage of materials and substances used to carry out the activity; and
b) the treatment, storage, processing, reprocessing, transport and disposal of waste generated by the activity.

O2 Maintenance of plant and equipment

O2.1 All plant and equipment installed at the premises or used in connection with the licensed activity:
a) must be maintained in a proper and efficient condition; and
b) must be operated in a proper and efficient manner.

O3 Dust

O3.1 The premises must be maintained in a condition which minimises or prevents the emission of dust on or from the premises.

O3.2 Activities occurring in or on the premises must be carried out in a manner that will minimise the generation of wind-blown or traffic generated dust.

M3 Testing methods - concentration limits

M3.1 Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:
a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The *Protection of the Environment Operations (Clean Air) Regulation 2010* requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".

M3.2 Subject to any express provision to the contrary in this licence, monitoring for the concentration of a pollutant discharged to waters or applied to a utilisation area must be done in accordance with the Approved Methods Publication unless another method has been approved by the EPA in writing before any tests are conducted.

M4 Environmental monitoring

Requirement to monitor noise

M4.1 To determine compliance with condition L5.1, attended noise monitoring must be undertaken in accordance with conditions L5.7 and L5.8, and

(a) at each one of the locations listed in condition L5.1;
(b) occur quarterly within the reporting period of the Environment Protection Licence with at least 2 months between monitoring periods;
(c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 15 minutes for three of the quarters;
(d) the night time 15 minute attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;
(e) the night time LA1 (1 min) attended monitoring in accordance with c) must be undertaken between the hours of 1am and 4am;
(f) one quarterly monitoring must occur during each day, evening and night period as defined in the NSW Industrial Noise Policy (EPA 2000) for a minimum of 1.5 hours during the day; 30 minutes during the evening; and 1 hours during the night, and
(g) each quarterly monitoring must be undertaken on a different day(s) of the week not including Saturdays, Sundays and public holidays; and
(h) these monitoring conditions take effect in the 2015 Reporting period.

Note: The intention of this condition is that quarterly monitoring be undertaken at each sensitive receiver. That at each sensitive receiver monitoring is undertaken over a range of different days excluding

weekends and public holidays during the reporting period so as to be representative of operating hours. That night time 15 minute attended monitoring and the LA1 (1min) monitoring for three of the quarters be undertaken at worst case being the most stable atmospheric conditions and when noise would be most intrusive to sleep. All of the sensitive receivers do not have to be monitored on the same day, evening and night for sub condition f.

M4.2 For the Annual Reporting Period ending March 2015 the EPA will accept all monitoring required by the current Department of Planning and Environment consent (usually quarterly monitoring for noise as dB(A) Leq15minutes) for compliance with noise monitoring requirements in this licence, as a single report attached to the Annual Return for the premises.

M5 Weather monitoring

M5.1 At the point(s) identified below, the licensee must monitor (by sampling and obtaining results by analysis) the parameters specified in Column 1 of the table below, using the corresponding sampling method, units of measure, averaging period and sampling frequency, specified opposite in the Columns 2, 3, 4 and 5 respectively.

POINT 26

Parameter	Sampling method	Units of measure	Averaging period	Frequency
Rainfall	AM-4	millimetres	24 hours	Continuous
Wind Direction at 10 metres	AM-2 & AM-4	Degrees	1 hour	Continuous
Wind Speed	AM-2 & AM-4	metres per second	1 hour	Continuous
Temperature at 10 metres	AM-4	degrees Celsius	1 hour	Continuous
Sigma Theta	AM-2 & AM-4	Degrees	15 minutes	Continuous
Relative humidity	AM-4	percent	1 hour	Continuous

M6 Recording of pollution complaints

M6.1 The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.

M6.2 The record must include details of the following:
a) the date and time of the complaint;
b) the method by which the complaint was made;
c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
d) the nature of the complaint;
e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the

Appendix D

Calibration certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE NO: C30591

EQUIPMENT TESTED : Sound Level Calibrator

Manufacturer: Svantek
Type No: SV-36 **Serial No:** 79952
Owner: EMM Consulting Pty Ltd
L3, 175 Scott Street
Newcastle, NSW 2300
Tests Performed: Measured Output Pressure level, Frequency & Distortion
Comments: See Details overleaf. All Test Passed.

Parameter	Pre-Adj	Adj Y/N	Output: (dB re 20 µPa)	Frequency (Hz)	THD&N (%)
Level1:	NA	N	94.12 dB	999.99 Hz	1.58 %
Level2:	NA	N	114.05 dB	999.99 Hz	1.12 %
Uncertainty			±0.11 dB	±0.05%	±0.20 %
Uncertainty (at 95% c.l.) k=2					

CONDITION OF TEST:

Ambient Pressure 1007 hPa ±1 hPa
Temperature 21 °C ±1° C
Relative Humidity 43 % ±5%

Date of Receipt : 16/09/2021
Date of Calibration : 16/09/2021
Date of Issue : 16/09/2021

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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ilac-MRA

DANAK
CAL Reg.No. 307
Member of EA MLA

CERTIFICATE OF CALIBRATION

No: CDK2007931

CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2250	No: 3029363	Id: -
Microphone:	Brüel & Kjær Type 4189	No: 3260501	
PreAmplifier:	Brüel & Kjær Type ZC-0032	No: 30109	
Supplied Calibrator:	None		
Software version:	BZ7222 Version 4.7.6	Pattern Approval:	-
Instruction manual:	BE1712-22		

CUSTOMER

EMM Consulting
Ground Floor, Suite 1
20 Chandos Street
2065 St Leonards
New South Wales, Australia

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C

Environment conditions: *See actual values in sections.*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2250 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 8.2 - DB: 8.20) by using procedure B&K proc 2250, 4189 (IEC 61672:2013).

RESULTS

Calibration Mode: **Calibration as received.**

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: 2020-11-26

Date of issue: 2020-11-26

Lene Petersen
Calibration Technician

Erik Bruus
Approved Signatory

CERTIFICATE OF CALIBRATION

CERTIFICATE NO.: SLM 26291 & FILT 5615

Equipment Description:	Sound Level Meter		
Manufacturer:	B & K		
Model No:	2250	**Serial No:**	2759405
Microphone Type:	4189	**Serial No:**	2888134
Preamplifier Type:	ZC0032	**Serial No:**	16037
Filter Type:	1/3 Octave	**Serial No:**	2759405
Comments:	All tests passed for class 1. (See over for details)		
Owner:	EMM Consulting Level 3, 175 Scott Street Newcastle, NSW 2300		
Ambient Pressure:	1007 hPa ±1.5 hPa		
Temperature:	24 °C ±2° C	**Relative Humidity:**	53% ±5%
Date of Calibration:	05/02/2020	**Issue Date:**	05/02/2020
Acu-Vib Test Procedure:	AVP10 (SLM) & AVP06 (Filters)		

CHECKED BY: JKB **AUTHORISED SIGNATURE:** ..... Jack Kiett

Accredited for compliance with ISO/IEC 17025 - Calibration
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.

NATA
WORLD RECOGNISED ACCREDITATION

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Accredited Lab. No. 9262
Acoustic and Vibration Measurements