

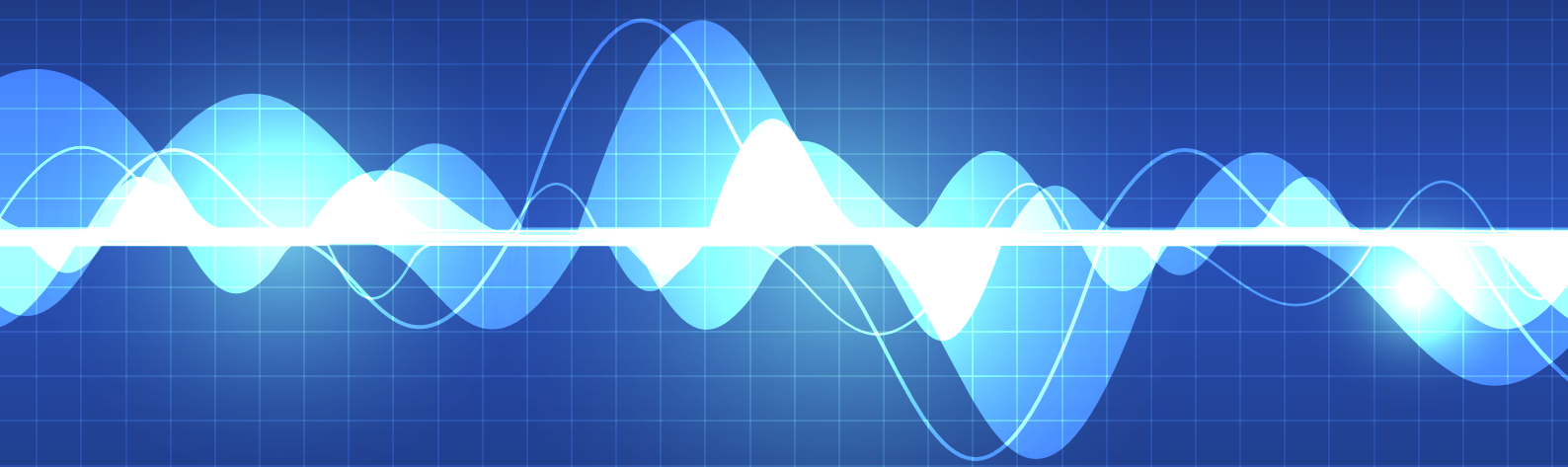
Chain Valley Colliery

Quarterly attended noise monitoring

Quarter 1 - 2021

Prepared for Great Southern Energy Pty Ltd (trading as DeltaCoal)

April 2021





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Chain Valley Colliery

Quarterly attended noise monitoring - Quarter 1 2021

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April 2021

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Chain Valley Colliery

Quarterly attended noise monitoring - Quarter 1 2021

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Date

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22 April 2021

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22 April 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 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. It is of note that Modification 3 (Mod 3) of the DC was approved by the NSW Department of Planning, Industry and Environment (DPIE) in June 2020, and Delta Coal is currently in the process of updating the NMP to reflect any changes to, or additional, operational noise conditions.

The NMP requires noise monitoring to occur on a quarterly basis. This report presents the results and findings of attended noise monitoring conducted during the first quarter (Q1) of 2021, on 24 and 25 March 2021.

The following material was referenced as part of this assessment:

- DPIE, Development Consent SSD-5465, as modified on in June 2020 (current as of the monitoring date 24 March 2021);
- NSW Environment Protection Authority (EPA), Environment Protection License 1770, as varied on 2 April 2019 (current as of the monitoring date 24 March 2021);
- Chain Valley Colliery Noise Management Plan, approved by NSW Department of Planning and Environment on 12 March 2014;
- NSW EPA, Industrial Noise Policy (INP), 2000;
- NSW EPA, Industrial Noise Policy application notes, 2017; and
- NSW EPA, Noise Policy for Industry (NPfi), 2017.

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	Evening	Night	Night
	$L_{Aeq,15\text{ minute}}$ dB	$L_{Aeq,15\text{ minute}}$ dB	$L_{Aeq,15\text{ minute}}$ dB	$L_{A1,1\text{ minute}}$ 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

It is of note that the noise limits outlined in the DC and EPL are inconsistent, with the EPL appearing to contain a typographical error for the noise limits applicable at EPL Point 23 (R22).

The DC outlines noise limits of $L_{Aeq,15\text{ minute}}$ 46 dB for the day, evening and night periods, along with an $L_{A1,1\text{ minute}}$ noise limit of 46 dB. However, the EPL outlines noise limits of $L_{Aeq,15\text{ minute}}$ 46 dB for the day and evening periods, and night period noise limits of $L_{Aeq,15\text{ minute}}$ 36 dB and $L_{A1,1\text{ minute}}$ of 45 dB.

For the purpose of this assessment, it has been assumed that the R22 (EPL Point 23) noise limits outlined in the EPL are a typographical error and as such, the noise limits specified in the DC have been used for assessing compliance at R22.

The DC specifies the following meteorological conditions under which noise limits do not apply:

- 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.

The EPL specifies the following meteorological conditions under which noise limits do not apply:

- 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; or
- stability category G temperature inversion conditions.

If noise limits are satisfied adopting the EPL meteorological conditions exclusion rules, then the DC noise limits will also be met.

For this assessment, the recorded L_{Amax} has been used as a conservative estimate of the $L_{A1,1\text{ minute}}$. The INP application notes (EPA 2013) state that the EPA accepts sleep disturbance analysis based on either the $L_{A1,1\text{ minute}}$ or L_{Amax} metrics, with the L_{Amax} resulting in a more conservative assessment of site noise emissions.

The DC and EPL state that modifying factor corrections shall be applied to the measured site noise levels before comparison to the relevant noise limits, where applicable, in accordance with Section 4 of the INP. The INP application notes state that Section 4 of the INP has been withdrawn and that Fact Sheet C of the NPfI (EPA 2017) now applies for the application of modifying factors.

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 2.2.

Table 2.2 One-third octave low frequency noise threshold levels

One-third octave $L_{Zeq,15\text{ minute}}$ 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 $L_{Aeq,15\text{ minute}}$ 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 2.2 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 Chain Valley Colliery, attended noise monitoring surveys were completed at representative locations, in accordance with the approved NMP.

Noise monitoring locations required as per the NMP, as well as two additional locations (R12 and R13) as per the EPL, and their coordinates are listed in Table 3.1 and are shown in Figure 3.1.

Table 3.1 Attended noise monitoring locations

Monitoring location	Assessment location	Description	Coordinates (MGA56)	
			Easting	Northing
ATN001 ¹	R8 (EPL Point 9)	Griffith Street, Mannering Park	364140	6330594
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 ²	R22 (EPL Point 23)	Cams Boulevard, Chain Valley Bay	366425	6331135
R12 ³	R12 (EPL Point 13)	Lakeshore Avenue, Kingfisher Shores	365185	6329352
R13 ⁴	R13 (EPL Point 14)	Karoola Avenue, Kingfisher Shores	365391	6329169

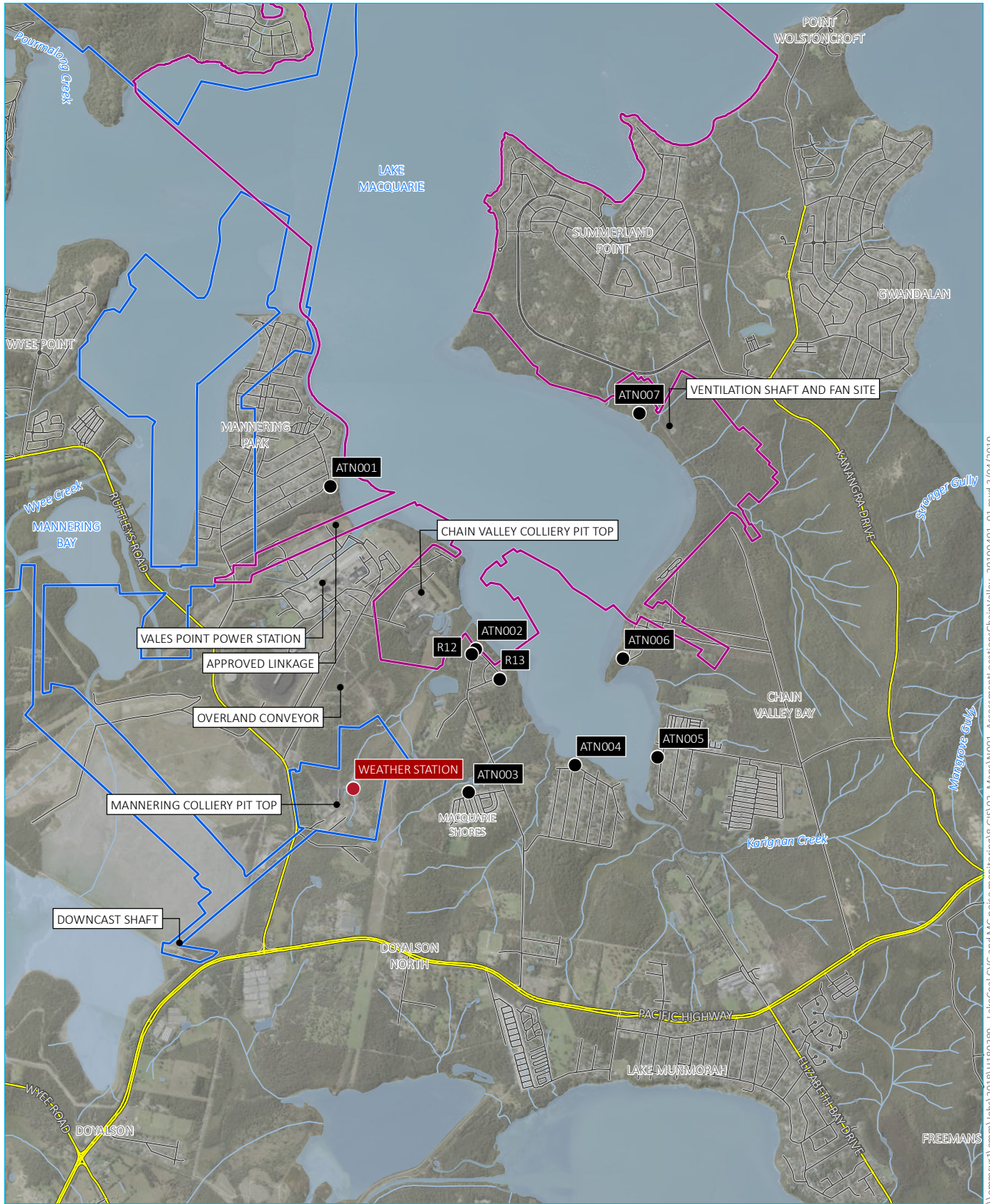
- Notes:
1. Noise monitoring location ATN001 (for R9) is also representative of assessment location R8, however R8 has higher (less stringent) noise limits.
 2. Due to access issues, noise monitoring for ATN007 was conducted at an intermediate location with site contributions calculated back to R22.
 3. Noise monitoring at R12 is conducted as required by the EPL. This is completed in conjunction with ATN002 as this monitoring location is representative of both R11 and R12.
 4. Noise monitoring at R13 is conducted as required by the EPL.

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

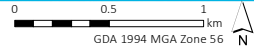
3.2 Instrumentation

Two Brüel & Kjær (B&K) 2250 Type 1 sound analysers (s/n 2759405 and 3008201) 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 86311). 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).



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



KEY

- ▭ Chain Valley Colliery development consent boundary
- ▭ Mannerling 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

\\emmsvr1\emm\jobs\2018\180389 - LakeCoal CVC and MC noise monitoring\GIS\02_Maps\W001_AssessmentLocationsChainValley_20190401_01.mxd 3/04/2019

3.3 Determination of stability category

For the purpose of this assessment and as required by the DC, EPL and NMP, stability categories were determined for each 15-minute attended monitoring period. The stability category data for the monitoring period was obtained from Mannering Colliery's meteorological station located to the north of the site (refer 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) ($^{\circ}\text{C}/100\text{ m}$)
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

Chain Valley Colliery noise contribution 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 for 15 minutes at each monitoring location during the day, evening and night periods on 24 and 25 March 2021. Results of attended noise measurements are summarised in Table 4.1.

The meteorological data for the monitoring period was sourced from Mannering Colliery's meteorological station to determine applicability of noise limits in accordance with the DC and EPL. In accordance with the DC, noise limits were not applicable during 16 of the 27 measurements, due to wind speeds greater than 3 m/s or the presence of atmospheric stability category F at the time of the measurements. In accordance with the EPL, noise limits were not applicable during six of the 27 measurements, due to wind speeds greater than 3 m/s at the time of the measurements.

Low frequency noise was conservatively assessed by comparison of the total measured one-third octave L_{Aeq} noise levels to the NPfI one-third octave low frequency noise thresholds for measurements when the site was audible. Measured noise levels exceeded the relevant LFN threshold levels during the evening and night-time measurements at ATN007. A 2 dB positive adjustment was found to be relevant and was applied to the estimated site $L_{Aeq,15\text{ minute}}$ noise contributions (as shown in Table 4.1).

Site noise was inaudible during 21 of the 27 measurements. Typically, when a particular source is not audible above local ambient noise levels, the likely L_{Aeq} noise contribution of that source is generally at least 10 dB below the measured background (L_{A90}) level. The measured total $L_{A90,15\text{ minute}}$ noise level was at or below the relevant $L_{Aeq,15\text{ minute}}$ limit for five of the 21 measurements (where site noise was inaudible). The measurements, for which the measured total $L_{A90,15\text{ minute}}$ noise level was above the relevant noise limit, were noted to have been influenced by noise from the Vales Point Power Station, road traffic and/or natural sounds (eg insects, bird noise, wind in foliage etc.). Therefore, Chain Valley Colliery noise contributions were considered to be below (satisfied) the relevant noise limits during all 21 measurements where site noise was inaudible.

At the monitoring locations where site noise was audible, Chain Valley Colliery noise contributions were below (satisfied) the relevant noise limits.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	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	24/3	16:11 (Day)	44	46	55	57	66	80	70	Nil	IA	N/A	38	N/A	3.9 m/s @ 290° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Wind in foliage and resident noise frequently audible. Distant traffic, car passbys and dogs barking occasionally audible.
ATN001	24/3	19:49 (Eve.)	44	48	53	55	60	70	64	Nil	IA	N/A	38	N/A	1.0 m/s @ 304° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Distant traffic, dogs barking, resident noise, wind in foliage and car passbys occasionally audible.
ATN001	25/3	01:00 (Night)	40	42	43	44	45	55	64	Nil	IA	IA	38	45	0.7 m/s @ 281° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Distant traffic frequently audible.
ATN002	24/3	15:04 (Day)	44	46	49	52	55	58	68	Nil	IA	N/A	49	N/A	4.0 m/s @ 282° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible.
ATN002	24/3	20:17 (Eve.)	43	45	48	47	57	69	69	Nil	IA	N/A	49	N/A	0.4 m/s @ 292° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Local traffic and passbys audible once. Distant dog barking briefly audible.
ATN002	25/3	01:34 (Night)	43	44	46	48	49	52	70	Nil	<44	<44	49	54	0.8 m/s @ 229° F class stability N/Y	'N/A' / Nil	CVC forklift occasionally audible. VPPS hum and insects consistently audible.
ATN003	24/3	14:45 (Day)	40	42	48	50	59	66	65	Nil	IA	N/A	36	N/A	4.0 m/s @ 282° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible. Local noise from village including traffic. Distant traffic occasionally audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	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	24/3	21:00 (Eve.)	46	48	49	49	50	60	66	Nil	IA	N/A	36	N/A	0.7 m/s @ 336° E class stability Y/Y	Nil / Nil	CVC inaudible. MC just audible to inaudible. VPPS hum consistently audible. Insects and frogs consistently audible. Distant traffic audible on occasion.
ATN003	25/3	02:00 (Night)	40	42	43	44	45	51	66	Nil	<40	44	36	45	0.9 m/s @ 269° E class stability Y/Y	Nil / Nil	CVC forklift occasionally audible. MC plant noise occasionally inaudible. VPPS hum, insects and frogs consistently audible.
ATN004	24/3	16:35 (Day)	36	40	58	60	70	78	65	Nil	IA	N/A	35	N/A	2.6 m/s @ 285° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum consistently audible. Bird noise frequently audible. Wind in foliage, distant traffic, car passbys and dogs barking occasionally audible.
ATN004	24/3	19:04 (Eve.)	39	42	50	54	61	66	62	Nil	IA	N/A	35	N/A	1.1 m/s @ 305° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum, insects and frogs consistently audible. Bird noise frequently audible. Distant traffic occasionally audible.
ATN004	24/3	23:03 (Night)	39	42	43	44	46	51	61	Nil	IA	IA	35	45	0.6 m/s @ 346° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum and insects consistently audible.
ATN005	24/3	16:59 (Day)	40	44	48	51	54	60	62	Nil	IA	N/A	35	N/A	2.5 m/s @ 284° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum and lapping water consistently audible. Bird noise and wind in foliage frequently audible.
ATN005	24/3	18:20 (Eve.)	40	43	48	51	56	63	62	Nil	IA	N/A	35	N/A	1.5 m/s @ 304° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum consistently audible. Bird noise and wind in foliage frequently audible. Local traffic, distant traffic and dogs barking occasionally audible.
ATN005	24/3	23:28 (Night)	39	41	43	44	46	57	62	Nil	IA	IA	35	45	0.8 m/s @ 334° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum and insects consistently audible. Distant traffic briefly audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	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			
ATN006	24/3	17:20 (Day)	37	39	43	45	52	59	60	Nil	IA	N/A	37	N/A	2.2 m/s @ 284° A class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum and nearby pump (unrelated to CVC) consistently audible. Bird noise frequently audible. Wind in foliage, resident noise and distant traffic occasionally audible.
ATN006	24/3	18:00 (Eve.)	37	39	41	43	50	64	59	Nil	IA	N/A	37	N/A	1.3 m/s @ 297° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum and nearby pump (unrelated to CVC) consistently audible. Bird noise frequently audible. Distant traffic occasionally audible.
ATN006	25/3	01:51 (Night)	37	39	42	44	46	48	65	Nil	IA	IA	37	45	1.2 m/s @ 259° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum, nearby pump (unrelated to CVC) insects and frogs consistently audible. Bird noise and fish jumping occasionally audible.
ATN007 ⁴	24/3	14:09 (Day)	49	50	51	52	54	61	71	Nil	41	N/A	46 ⁵	N/A	4.3 m/s @ 280° A class stability N/N	'N/A' / 'N/A'	CVC vent fan consistently audible and dominant. Birds and wind in trees consistently audible.
ATN007 ⁴	24/3	21:48 (Eve.)	48	49	50	51	51	57	72	2 dB	43 (41+2)	N/A	46 ⁵	N/A	0.8 m/s @ 355° F class stability N/Y	'N/A' / Nil	CVC vent fan consistently audible and dominant. VPPS hum consistently audible in the background. Insects consistently audible.
ATN007 ⁴	25/3	01:00 (Night)	48	49	50	51	51	55	72	2 dB	43 (41+2)	42	46 ⁵	46	0.7 m/s @ 281° E class stability Y/Y	Nil / Nil	CVC vent fan consistently audible and dominant. Insects consistently audible.
R12	24/3	15:04 (Day)	44	46	49	52	55	58	68	Nil	IA	N/A	49	N/A	4.0 m/s @ 282° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible.

Table 4.1 Chain Valley Colliery attended noise monitoring results – Q1 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (DC/EPL) (Y/N)	Exceedance, dB (DC/EPL)	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	24/3	20:17 (Eve.)	43	45	48	47	57	69	69	Nil	IA	N/A	49	N/A	0.4 m/s @ 292° E class stability Y/Y	Nil / Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Local traffic and passbys audible once. Distant dog barking briefly audible.
R12	25/3	01:34 (Night)	43	44	46	48	49	52	70	Nil	<44	<44	49	53	0.8 m/s @ 229° F class stability N/Y	'N/A' / Nil	CVC forklift occasionally audible. VPPS hum and insects consistently audible.
R13	24/3	15:21 (Day)	44	48	56	59	63	75	67	Nil	IA	N/A	43	N/A	4.1 m/s @ 277° A class stability N/N	'N/A' / 'N/A'	CVC inaudible. VPPS hum consistently audible. Insects, birds and wind in foliage consistently audible. Local traffic and passbys frequently audible.
R13	24/3	20:35 (Eve.)	42	45	47	48	49	51	61	Nil	IA	N/A	43	N/A	0.5 m/s @ 333° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum consistently audible. Insects consistently audible. Distant dog barking briefly audible.
R13	25/3	01:26 (Night)	44	46	55	57	66	80	70	Nil	IA	N/A	43	49	0.8 m/s @ 229° F class stability N/Y	'N/A' / Nil	CVC inaudible. VPPS hum consistently audible. Wind in foliage and resident noise frequently audible. Distant traffic, car passbys and dogs barking occasionally audible.

- Notes:
1. Modifying factor adjustment for low frequency noise in accordance with Fact sheet C of the NPfi (refer to Section 2.2).
 2. For assessment purposes the L_{Amax} and the L_{A1,1 minute} are interchangeable.
 3. Meteorological data were taken as an average over 15 minutes from Mannering Colliery's weather station (Refer to Section 5.1).
 4. 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 ATN007 (R22/EPL Point 23).
 5. For the purposes of this assessment, the noise limits specified in the DC have been used for assessing compliance at monitoring location ATN007 (R22/EPL Point 23).
 6. Modifying factor adjustments for low frequency noise only apply under the standard and/or noise-enhancing meteorological conditions in accordance with Fact Sheet C of the NPfi (refer to Section 2.2).
 7. 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 24 and 25 March 2021.

The meteorological data for the monitoring period was sourced from Mannering Colliery's meteorological station to determine applicability of noise limits in accordance with the DC and EPL. In accordance with the DC, noise limits were not applicable during 16 of the 27 measurements, due to wind speeds greater than 3 m/s or the presence of atmospheric stability category F at the time of the measurements. In accordance with the EPL, noise limits were not applicable during six of the 27 measurements, due to wind speeds greater than 3 m/s at the time of the measurements.

The assessment of noise contributions from site included consideration of modifying factors for noise characteristics where relevant and in accordance with the NPfI. A modifying factor adjustment for low frequency noise was applicable 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 $L_{Aeq,15\text{ minute}}$ noise contribution for the evening and night-time measurements at ATN007 before comparison to the relevant noise limit.

Chain Valley Colliery noise contributions for this round (Q1) of noise monitoring were below (satisfied) the relevant noise limits at all monitoring locations as outlined in the DC and NMP, where applicable. A technical non-compliance was recorded at ATN007 with respect to the EPL noise limits due to an expected typographical error.

References

Chain Valley Colliery Noise Management Plan, 2014.

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

NSW Environment Protection Authority, Environment Protection License 1770, 2019.

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

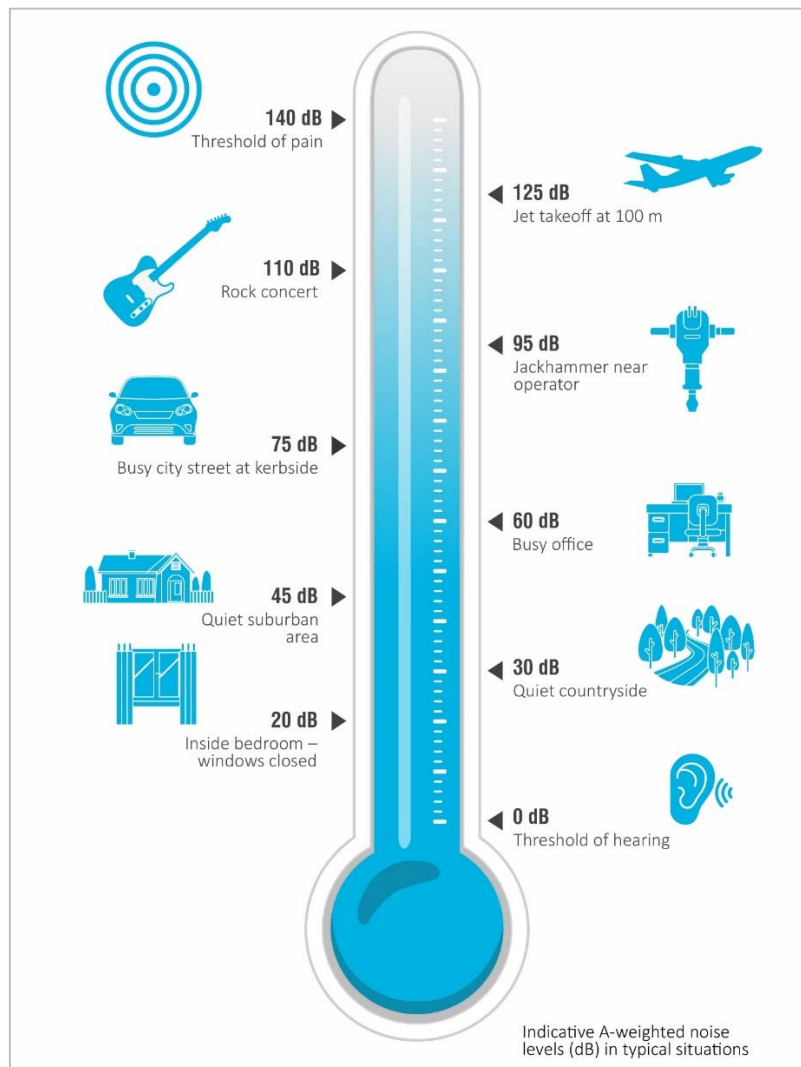


Figure A.1 Common noise levels

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**:
- implement best management practice, including all reasonable and feasible noise mitigation measures, to minimise the construction, operational and transport noise generated by the development;
 - 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;
 - minimise the noise impacts of the development during meteorological conditions under which the noise limits in this consent do not apply (see Appendix 8);
 - 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;
 - carry out a comprehensive noise audit of the development in conjunction with each independent environmental audit; and
 - 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
	<i>L_{Aeq}(15 min)</i>	<i>L_{Aeq}(15 min)</i>	<i>L_{Aeq}(15 min)</i>
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:
- 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**;
 - describe the measures that would be implemented to ensure compliance with the noise criteria and operating conditions in this consent;
 - 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
 - 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.

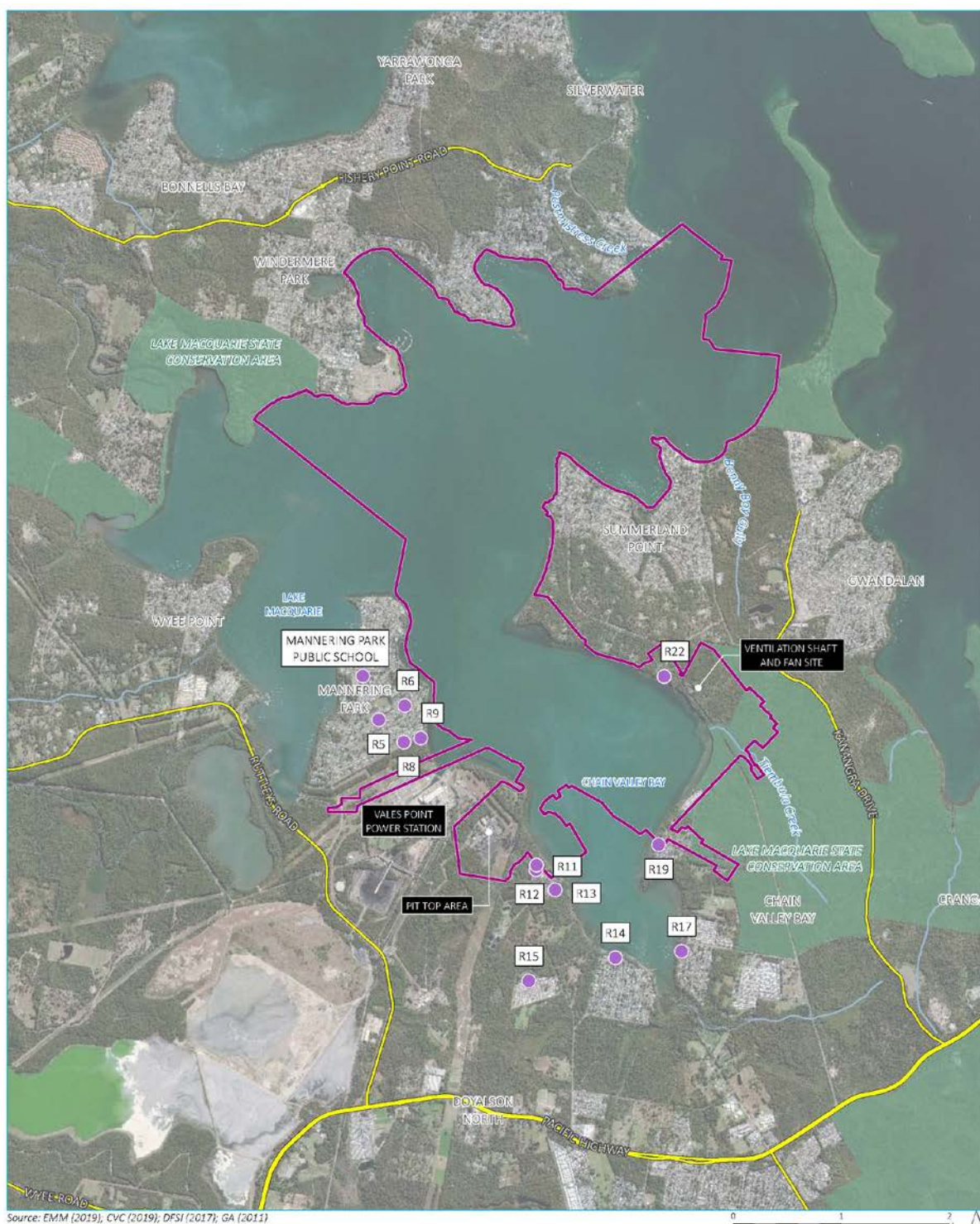
The Applicant **must** implement the Noise Management Plan as approved by the **Planning Secretary**.

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



Source: EMM (2019), CVC (2019), DFSI (2017), GA (2011)

0 1 2 km
GDA 1994 MGA Zone 56

KEY

- Assessment location
- Chain Valley Colliery development consent boundary
- Main road
- Watercourse/crainage line
- NPWS reserve

Assessment locations

Chain Valley Colliery
Modification 3



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

Environment Protection Licence

Licence - 1770

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

Environment Protection Licence

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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:

Environment Protection Licence



Licence - 1770

- 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 meteorological 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 LAeq(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 than 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,

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(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.

Environment Protection Licence



Licence - 1770

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

Environment Protection Licence

Licence - 1770

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:
- the date and time of the complaint;
 - the method by which the complaint was made;
 - any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
 - the nature of the complaint;
 - 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: C28079

EQUIPMENT TESTED: Sound Level Calibrator

Manufacturer: Svantek
Type No: SV-36 Serial No: 86311
Owner: EMM Consulting
Suite 01, 20 Chandos St
St Leonards NSW 2065

Tests Performed: Measured output pressure level was found to be:

Parameter	Pre-Adj	Adj Y/N	Output: (db re 20 μ Pa)	Frequency: (Hz)	THD&N (%)
Level 1:	NA	N	94.06	999.99	0.89
Level 2:	NA	N	113.95	999.98	0.32
Uncertainty:			± 0.11 dB	$\pm 0.05\%$	$\pm 0.20\%$
Uncertainty (at 95% c.l.) k=2					

CONDITIONS OF TEST:

Ambient Pressure: 998 hPa ± 1.5 hPa Relative Humidity: 56 % $\pm 5\%$

Temperature: 22 °C $\pm 2^\circ$ C

Date of Calibration: 20/10/2020

Issue Date: 20/10/2020

Acu-Vib Test Procedure: AVP02 (Calibrators)

Test Method: AS IEC 60942 - 2017

CHECKED BY: *AB* AUTHORISED SIGNATURE:

Jack Kieft
Jack Kieft

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.

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%.



Accredited Lab. 9262
Acoustic and Vibration
Measurements



HEAD OFFICE
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02) 96808233
Mobile: 0413 809806
Web site: www.acu-vib.com.au

The Calibrator described in this report has been tested to the requirements of the standard IEC 60942-[Ed 4]:2017-11.

The tests described in Annex B of the standard (Periodic tests) were carried out under the environmental conditions listed above to the following clauses:

Clause	Test description
B4.6	Sound Pressure Level (By comparison with a reference calibrator).
B4.7	Frequency (By measurement with a calibrated frequency meter).
B4.8	Total distortion and noise. (By measurement with a calibrated Noise and Distortion meter).

Notes:

1. The calibrator was calibrated with the main axis vertical and facing down.
2. No corrections have been made for atmospheric pressure, temperature or humidity.

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.

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%.

----0000000000----

CERTIFICATE OF CALIBRATION

CERTIFICATE No.: **SLM 25410 & FILT 5368**

Equipment Description: Sound Level Meter

Manufacturer: B & K

Model No: 2250 **Serial No:** 3008201

Microphone Type: B&K 4189 **Serial No:** 2983733

Preamplifier Type: B&K ZC0032 **Serial No:** 22666

Filter Type: 1/3 Octave **Serial No:** 3008201

Comments: All tests passed for class 1.
(See over for details)

Owner: EMM Consulting
Ground Floor, Suite 01, 20 Chandos St
St Leonards NSW 2065

Ambient Pressure: 1002 hPa \pm 1.5 hPa

Temperature: 23 °C \pm 2° C **Relative Humidity:** 29% \pm 5%

Date of Calibration: 21/08/2019 **Issue Date:** 21/08/2019

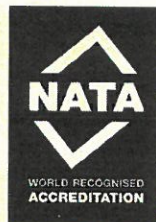
Acu-Vib Test Procedure: AVP10 (SLM) & AVP06 (Filters)

CHECKED BY: *LAB*

AUTHORISED SIGNATURE:

Fein Soc

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.



HEAD OFFICE
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Accredited Lab. No. 9262
Acoustic and Vibration
Measurements

Page 1 of 2
AVCERT10 Rev. 1.3 15.05.18

CERTIFICATE No.: SLM 25410 & FILT 5368

The performance characteristics listed below were tested. The tests are based on the relevant clauses of IEC 61672-3:2013


Tests Performed:	<i>Clause</i>	<i>Result</i>
<i>Absolute Calibration</i>	10	Pass
<i>Acoustical Frequency Weighting</i>	12	Pass
<i>Self Generated Noise</i>	11.1	Entered
<i>Electrical Noise</i>	11.2	Entered
<i>Long Term Stability</i>	15	Pass
<i>Electrical Frequency Weightings</i>	13	Pass
<i>Frequency and Time Weightings</i>	14	Pass
<i>Reference Level Linearity</i>	16	Pass
<i>Range Level Linearity</i>	17	NA
<i>Toneburst</i>	18	Pass
<i>Peak C Sound Level</i>	19	Pass
<i>Overload Indicator</i>	20	Pass
<i>High Level Stability</i>	21	Pass

Statement of Compliance: The sound level meter submitted for testing has successfully completed the class 1 periodic tests of IEC 61672-3:2013, for the environmental conditions under which the tests were performed. As public evidence was available, from an independent organization responsible for approving the results of pattern evaluation tests performed in accordance with IEC 61672-2:2013, to demonstrate that the model of sound level meter fully conformed to the requirements in IEC 61672-1:2013, the sound level meter submitted for testing conforms to the class 1 requirements of IEC61672-1:2013. A full technical report is available if required.

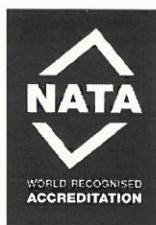
This Sound Level Meter included an Octave Filter Set. Tests were based on IEC 1260: 1995 and AS/NZS 4476 - 1997 and were conducted to test the following performance characteristics:

1. Relative attenuation clause 5.3

Date of Calibration: 21/08/2019 **Issue Date:** 21/08/2019

Checked by: 

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.



Accredited Lab. No. 9262
Acoustic and Vibration
Measurements



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Unit 14, 22 Hudson Ave. Castle Hill NSW 2154
Tel: (02) 96808133 Fax: (02)96808233
Mobile: 0413 809806
web site: www.acu-vib.com.au

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 \pm 1.5 hPa

Temperature: 24 °C \pm 2° C **Relative Humidity:** 53% \pm 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 Kiehl*

Accredited for compliance with ISO/IEC 17025 - Calibration
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