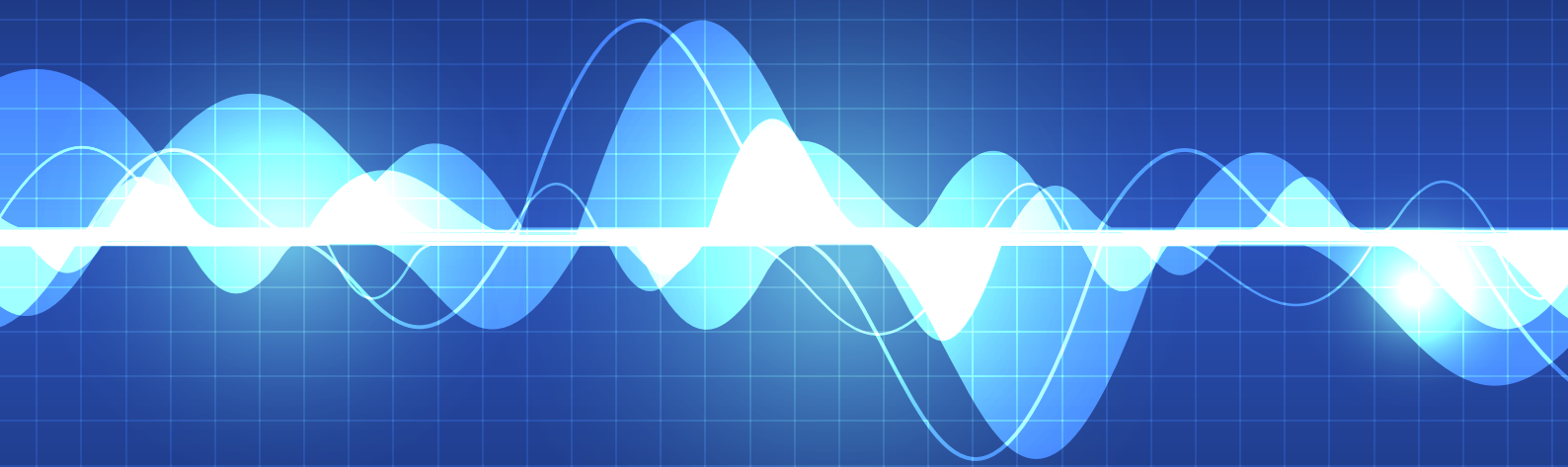


Mannering Colliery

Monthly attended noise monitoring

July 2021

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





Servicing projects throughout Australia and internationally

SYDNEY

Ground Floor, 20 Chandos Street
St Leonards NSW 2065
T 02 9493 9500

NEWCASTLE

Level 3, 175 Scott Street
Newcastle NSW 2300
T 02 4907 4800

BRISBANE

Level 1, 87 Wickham Terrace
Spring Hill QLD 4000
T 07 3648 1200

ADELAIDE

Level 1, 70 Pirie Street
Adelaide SA 5000
T 08 8232 2253

MELBOURNE

Ground Floor, 188 Normanby Road
Southbank VIC 3006
T 03 9993 1905

PERTH

Level 6, 191 St Georges Terrace
Perth WA 6000

CANBERRA

PO Box 9148
Deakin ACT 2600

Manning Colliery

Monthly attended noise monitoring - July 2021

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

EMM Newcastle
Level 3, 175 Scott Street
Newcastle NSW 2300

T 02 4907 4800

E info@emmconsulting.com.au

www.emmconsulting.com.au

Mannering Colliery

Monthly attended noise monitoring - July 2021

Report Number

H210018 RP1

Client

Great Southern Energy Pty Ltd (trading as Delta Coal)

Date

12 August 2021

Version

Final

Prepared by**Approved by**

**Teanuanua Villierme**

Senior Acoustic Consultant

12 August 2021

Katie Teyhan

Associate

12 August 2021

This report has been prepared in accordance with the brief provided by the client and has relied upon the information collected at the time and under the conditions specified in the report. All findings, conclusions or recommendations contained in the report are based on the aforementioned circumstances. The report is for the use of the client and no responsibility will be taken for its use by other parties. The client may, at its discretion, use the report to inform regulators and the public.

© Reproduction of this report for educational or other non-commercial purposes is authorised without prior written permission from EMM provided the source is fully acknowledged. Reproduction of this report for resale or other commercial purposes is prohibited without EMM's prior written permission.

Table of Contents

1	Introduction	1
2	Noise limits	2
2.1	Overview	2
2.2	Adopted noise limits	2
2.3	Adjustment to noise limits under certain meteorological conditions	2
2.4	Low frequency noise	3
3	Assessment methodology	5
3.1	Attended noise monitoring	5
3.2	Instrumentation	5
3.3	Determination of stability category	7
4	Review of data and discussion	8
5	Conclusion	11
	References	12

Appendices

Appendix A	Glossary of acoustic terms	A.1
Appendix B	Project approval extract	B.1
Appendix C	EPL extract	C.1
Appendix D	Calibration certificates	D.2

Tables

Table 2.1	Attended noise monitoring locations and noise limits (revised NMP)	2
Table 2.2	One-third octave low frequency noise threshold levels	3
Table 3.1	Attended noise monitoring locations	5
Table 3.2	Stability categories and temperature lapse rates	7
Table 4.1	Mannering Colliery attended noise monitoring results – July 2021	9
Table A.1	Glossary of acoustic terms	A.2
Table A.2	Perceived change in noise	A.2

Figures

Figure 3.1	Attended noise monitoring and assessment locations	6
------------	--	---

1 Introduction

EMM Consulting Pty Limited (EMM) was engaged to complete 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 Mannering Colliery Noise Management Plan (NMP), prepared to satisfy the requirements of the project approval MP06_0311 (PA) and Environment Protection License (EPL) 191. It is of note that Modification 5 of the site PA (Mod 5 approval) was approved by the NSW Department of Planning, Industry and Environment (DPIE) in June 2020, and Delta Coal have revised the NMP which has been submitted to DPIE for approval to reflect any changes to, or additional, operational noise conditions. It is noted that the revised NMP incorporates noise management for both Delta Coal's Chain Valley Colliery and Mannering Colliery.

Noise monitoring is required to occur on a monthly basis for Mannering Colliery. This report presents the results and findings of attended noise monitoring conducted on 27 July 2021.

The following material was referenced as part of this assessment:

- DPIE, PA MP06_0311, as modified on 5 June 2020 (current as of the monitoring date 27 July 2021);
- Environment Protection Authority (EPA), EPL 191, as varied on 14 April 2021 (current as of the monitoring date 27 July 2021);
- NSW EPA, Industrial Noise Policy (INP), 2000;
- NSW EPA, Noise Policy for Industry (NPfI), 2017;
- Mannering Colliery Noise Management Plan (currently approved NMP), updated following Mannering Colliery Modification 4 approval (Mod 4 approval) (approved by DPIE 4 December 2019); and
- Chain Valley Colliery and Mannering Colliery Noise Management Plan (revised NMP – DPIE approval pending), updated following Mannering Colliery Mod 5 approval.

The noise limits in the revised NMP (Mod 5) are more stringent than those provided in the currently approved NMP (Mod 4) and hence have been adopted for the monitoring undertaken on 27 July 2021). This includes the +5 dB adjustment to noise limits during 'very noise-enhancing' meteorological conditions in accordance with NPfI, as stated in the PA and revised NMP. This is discussed further in Section 2.

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

2 Noise limits

2.1 Overview

Manning Colliery noise limits are provided in Table 1, Condition 2 of Schedule 3 of the PA. The EPL references the PA with respect to noise limits. Extracts of the relevant sections of the PA and EPL pertaining to noise are provided in Appendix B and Appendix C, respectively.

The currently approved NMP was prepared in line with the Mod 4 approval and in accordance with the INP (superseded noise policy). Delta Coal have revised the NMP to reflect any changes to or additional operational noise conditions from the Mod 5 approval. The noise assessment locations in the PA have not changed following the Mod 5 approval and hence the three attended noise monitoring locations adopted in the currently approved NMP for the purpose of determining compliance remain representative of the noise assessment locations outlined in the PA. The noise limits in the PA (Mod 5) are generally more stringent than those in the Mod 4 approval and the currently approved NMP.

2.2 Adopted noise limits

As the noise limits in the revised NMP (DPIE approval pending) are more stringent than those outlined in the currently approved NMP, the noise limits from the revised NMP have been adopted for this round of noise monitoring.

The Manning Colliery attended noise monitoring program is undertaken on a monthly basis during the evening and night periods. The attended noise monitoring locations and relevant limits as per the revised NMP are summarised in Table 2.1.

Table 2.1 Attended noise monitoring locations and noise limits (revised NMP)

Attended noise monitoring location	Assessment locations	Day	Evening	Night	Night
		$L_{Aeq,15\text{ minute}}, \text{ dB}$	$L_{Aeq,15\text{ minute}}, \text{ dB}$	$L_{Aeq,15\text{ minute}}, \text{ dB}$	$L_{A1,1\text{ minute}}, \text{ dB}$
RA1	4, 5, 6	40	36	36	46
RA2	7, 8	40	40	40	45
RA3	9, 11, 18, 20	40	39	39	49

For this assessment, the recorded L_{Amax} has been used as a conservative estimate of the $L_{A1,1\text{ minute}}$. 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.

2.3 Adjustment to noise limits under certain meteorological conditions

The currently approved NMP 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 with wind speeds greater than 2 m/s at 10 m above ground level; or

- stability category G temperature inversion conditions.

However, the PA (Mod 5) states the following:

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Noise Policy for Industry (EPA, 2017).

Section 5.2 of the NPfI states that noise limits applicable under ‘very noise-enhancing’ conditions (as listed above) should be the limits that apply under ‘standard’ or ‘noise-enhancing’ conditions plus 5 dB. This implies that there will be no periods when noise limits do not apply due to meteorological conditions. As per Fact Sheet D of the NPfI, ‘standard’ or ‘noise-enhancing’ conditions are defined as follows:

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 speed up to 3 m/s at 10 m above ground level. Night: stability categories A-D with wind speed up to 3 m/s at 10 m above ground level and/or stability category F with wind speed up to 2 m/s at 10 m above ground level.

Therefore, as per the PA (Mod 5) and revised NMP and in accordance with the NPfI, this assessment has adopted a +5 dB adjustment to the limits shown in Table 2.1 when monitoring is undertaken during ‘very noise-enhancing’ conditions (outside the ‘standard’ and ‘noise-enhancing’ conditions). This is indicated in Table 4.1 where relevant.

2.4 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, which has been reproduced in Table 2.2.

Table 2.2 One-third octave low frequency noise threshold levels

One-third octave $L_{\text{Zeq},15 \text{ minute}}$ 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 adjustments for low frequency noise are to be applied to the site $L_{\text{Aeq},15 \text{ minute}}$ noise contribution where the site ‘C-weighted’ minus site ‘A-weighted’ noise emission level is found to be 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 2 dB positive adjustment to measured/predicted A-weighted levels applies for the day period and a 5 dB positive adjustment to measured/predicted A-weighted levels applies for the evening/night 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 threshold values in Table 2.2 to identify the relevant modifying factor adjustment (if applicable). This method for the application of modifying factors for low frequency noise has been adopted for this assessment as discussed in Section 4.

It is of note that low frequency noise adjustments only apply under the 'standard' or 'noise-enhancing' meteorological conditions in accordance with Fact sheet C of the NPfI. Refer to Section 2.3 for the definitions of 'standard' and 'noise-enhancing' meteorological conditions.

3 Assessment methodology

3.1 Attended noise monitoring

To quantify noise emissions from Mannering Colliery, 15-minute operator-attended noise monitoring surveys were completed at representative locations as per the revised NMP.

Attended noise monitoring locations 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	Description	Coordinates (MGA56)	
		Easting	Northing
RA1	Pacific Highway, Doyalson	364646	6327221
RA2	Macquarie Shores Home Village, Doyalson North	365164	6328332
RA3	Tall Timbers Road (northern end), Kingfisher Shores	365069	6328953

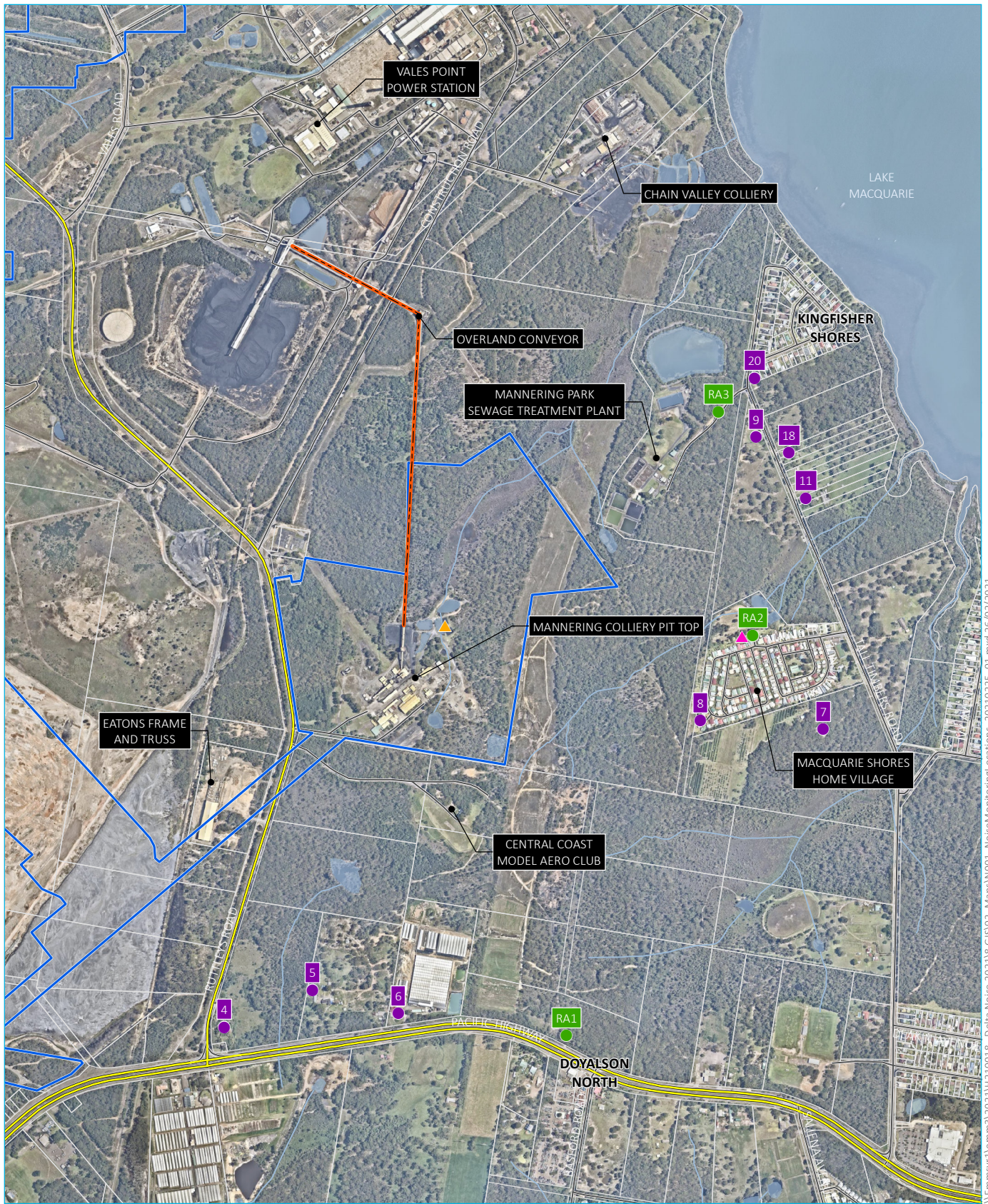
The attended noise monitoring generally consists of two 15-minute operator-attended noise monitoring surveys at each monitoring location, one survey during the evening period and one survey during the night period as per the revised NMP. For this round of monthly (July 2021) monitoring, four (an additional three) 15-minute operator-attended noise monitoring surveys were undertaken at RA2 (Macquarie Shores Home Village) during the night period between 3 am and 6 am. Noise complaints from the Macquarie Shores Home Village in relation to Mannering Colliery Operations are typically received by Delta Coal within that period and hence this period has been targeted for compliance monitoring purposes. The monitoring surveys at RA1 and RA3 for the night period (one survey at each location) were also undertaken during this period.

As per the revised NMP, attended noise monitoring is scheduled considering the occurrence of regular operations at Mannering Colliery. Noise monitoring is generally planned to avoid scheduled down-time or maintenance. Regular operations (ie coal production) were occurring during the entire monitoring period. This was confirmed by Delta Coal before the start of each monitoring survey during the night period.

3.2 Instrumentation

A Brüel & Kjær 2250 Type 1 sound analyser (s/n 2759405) was used to conduct 15-minute attended measurements and record one-third octave frequency and statistical noise indices. The sound analyser was calibrated before and on completion of the evening and night surveys 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).



Source: EMM (2021); NearMap (2019); DFSI (2017)

KEY

- Manning Colliery project approval boundary
- Alignment of overland conveyor to VPPS
- Main road
- Local road
- Watercourse/drainage line
- Waterbody
- Cadastral boundary
- Assessment location
- Attended monitoring location
- ▲ Continuous monitoring location
- ▲ Meteorological station

0 250 500
m
GDA 1994 MGA Zone 56

Attended noise monitoring and assessment locations

Manning Colliery
Figure 3.1

\\emmsvr1\emms3\2021\10018 - Delta Noise 2021\8 615\02 - Maps\W001_Noise\MonitoringLocations_20210225_01.mxd 26/02/2021

3.3 Determination of stability category

For the purpose of this assessment and as required by the revised 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 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) ($^{\circ}\text{C}/100\text{ m}$)
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: NPfi (EPA 2017).

4 Review of data and discussion

Results of attended noise measurements are summarised in Table 4.1. Mannering 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 where applicable). Attended noise monitoring was completed during the evening and night periods on 27 July 2021.

The meteorological data for the monitoring period was sourced from Mannering Colliery's meteorological station to determine applicability of the noise limits in accordance with the revised NMP. Meteorological conditions were 'standard' or 'noise-enhancing' at the time of the monitoring and, in accordance with the revised NMP, the standard noise limits shown in Table 2.1 applied for all nine 15-minute attended noise measurements.

Site noise was inaudible during the night measurement at RA1 and the evening measurements at RA2 and RA3. 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. The measured $L_{A90,15 \text{ minute}}$ noise level was no greater than 10 dB above the relevant $L_{Aeq,15 \text{ minute}}$ limit during the evening measurements at RA2 and RA3. During the night measurement at RA1, the measured $L_{A90,15 \text{ minute}}$ noise level (ie 48 dB $L_{A90,15 \text{ minute}}$) was noted to have been influenced by noise from road traffic noise. Therefore, the site $L_{Aeq,15 \text{ minute}}$ noise contributions during the night measurement at RA1 and evening measurements at RA2 and RA3 are considered to have satisfied the relevant noise limits.

Where site noise was audible, during the evening measurement at RA1 and night measurements at RA2 and RA3, site noise contributions satisfied the relevant noise limits.

Low frequency noise was assessed by comparing the site one-third octave noise levels to the NPfI one-third octave LFN thresholds when the site was audible. In accordance with the NPfI, LFN modifying factors were found to be not relevant at any of the locations.

Mannering Colliery noise contributions ($L_{Aeq,15 \text{ minute}}$ and L_{Amax}) were determined to be below (ie satisfied) the more stringent noise limits (as provided in the Mod 5 approval) at all locations for this round of noise monitoring, as per the revised NMP.

Table 4.1 Mannering Colliery attended noise monitoring results – July 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ (Very noise-enhancing?)	Noise limits ⁴ , dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	Mod. factor ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
RA2	27/7	3:00 (Night)	38	40	41	42	44	58	63	N/A	<39	<39	0.3 m/s @ 232° F class stability (No)	40	45	Nil	MC CHP noise just audible to inaudible. VPPS hum consistently audible (dominant). Distant traffic and birds occasionally audible.
RA3	27/7	3:30 (Night)	41	43	45	47	50	59	65	N/A	<39	<39	0.8 m/s @ 342° F class stability (No)	39	49	Nil	MC CHP noise just audible to inaudible. VPPS hum consistently audible (dominant). Birds occasionally audible.
RA2	27/7	4:00 (Night)	39	41	43	45	48	63	64	N/A	<40	<40	1.0 m/s @ 1° E class stability (No)	40	45	Nil	MC CHP noise audible, although inaudible at times. VPPS hum consistently audible (dominant). Distant traffic and birds occasionally audible.
RA1	27/7	4:34 (Night)	41	48	59	64	69	76	67	N/A	IA	IA	0.9 m/s @ 344° E class stability (No)	36	46	Nil	MC inaudible. Traffic on the Pacific Highway consistently audible. VPPS hum audible during lulls in traffic. Patrons at nearby petrol station audible during lulls in traffic.
RA2	27/7	5:00 (Night)	39	41	43	45	48	60	64	N/A	<40	<40	1.3 m/s @ 334° E class stability (No)	40	45	Nil	MC CHP noise audible, although inaudible at times. VPPS hum consistently audible (dominant). Local traffic, distant traffic and birds occasionally audible.
RA2	27/7	6:00 (Night)	37	39	49	46	63	69	63	N/A	<39	<39	1.7 m/s @ 342° E class stability (No)	40	45	Nil	MC CHP noise audible, although inaudible at times. VPPS hum consistently audible (dominant). Local traffic, distant traffic and birds occasionally audible.
RA1	27/7	20:52 (Eve.)	38	39	56	61	67	75	64	N/A	<36	N/A	1.6 m/s @ 18° F class stability (No)	36	N/A	Nil	MC CHP noise just audible during lulls in traffic. VPPS hum audible during lulls in traffic. Traffic on the Pacific Highway frequently audible. Wind in foliage occasionally audible.
RA2	27/7	21:15 (Eve.)	38	40	42	43	45	48	62	N/A	IA	N/A	1.7 m/s @ 31° F class stability (No)	40	N/A	Nil	MC inaudible. VPPS hum consistently audible (dominant). Distant traffic, wind in foliage and birds occasionally audible.

Table 4.1 Mannering Colliery attended noise monitoring results – July 2021

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Meteorological conditions ³ (Very noise-enhancing?)	Noise limits ⁴ , dB		Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	Mod. factor ¹	L _{Aeq}	L _{Amax} ²		L _{Aeq}	L _{Amax} ²		
RA3	27/7	21:43 (Eve.)	39	41	43	44	46	58	65	N/A	IA	N/A	0.8 m/s @ 21° F class stability (No)	39	N/A	Nil	MC inaudible. VPPS hum consistently audible (dominant). Insects just audible. Distant traffic, wind in foliage, dog barking and birds occasionally audible.

- Notes:
1. Modifying factor in accordance with Fact sheet C of the NPfl (refer to Section 2.4).
 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. As per the revised NMP (pending DPIE approval).
 5. IA = inaudible.
 6. N/A = not applicable.

5 Conclusion

EMM has completed a review of mine noise from Mannering Colliery within the surrounding community based on attended measurements conducted on 27 July 2021.

The meteorological data for the monitoring period was sourced from Mannering Colliery's meteorological station to determine applicability of the noise limits in accordance with the revised NMP. Meteorological conditions were 'standard' or 'noise-enhancing' at the time of the monitoring and, in accordance with the revised NMP, the standard noise limits applied for all nine 15-minute attended noise measurements.

The assessment of noise contributions from site included consideration of modifying factors for certain noise characteristics, such as low frequency noise, in accordance with the NPfI. Modifying factors were found to be not relevant at all monitoring locations.

Mannering Colliery noise contributions were below (ie satisfied) the relevant noise limits at all locations as per the revised NMP.

References

Mannering Colliery Noise Management Plan, 2019.

Chain Valley Colliery and Mannering Colliery Noise Management Plan (DPIE approval pending), 2020.

NSW Department of Planning and Environment, Project Approval MP 06_0311, 2020.

NSW Environment Protection Authority, Environment Protection License 191, 2021.

NSW Environment Protection Authority, Industrial Noise Policy, 2000.

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 the decibel (dB), the unit of noise measurement. Table A.2 gives an indication as to what an average person perceives about changes in noise levels in the environment.

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

Examples of common noise levels are provided in Figure A.1.

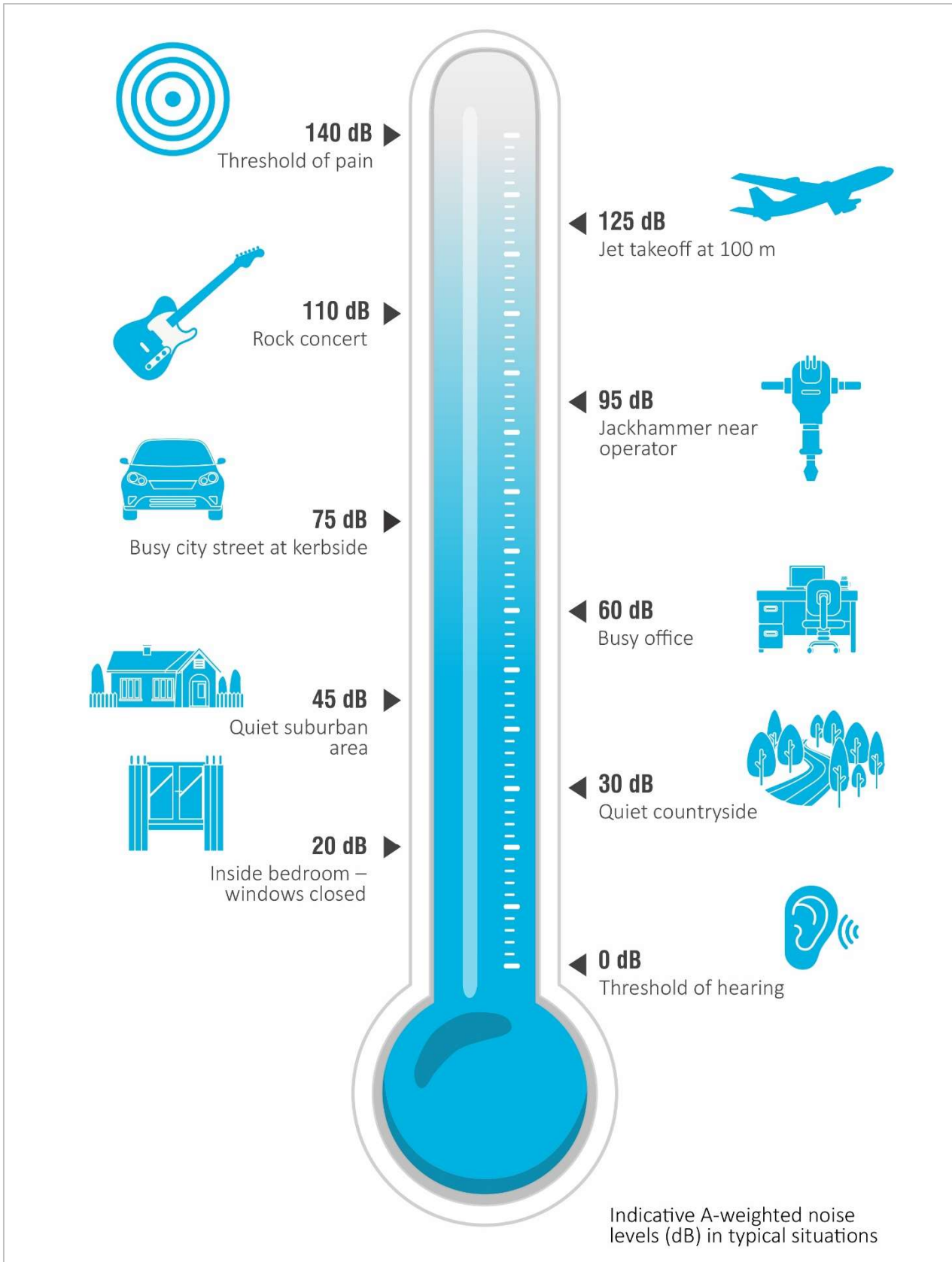


Figure A.1 Common noise levels

Appendix B

Project approval extract

SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS

NOISE

Construction Noise

1. The Applicant must ensure that the noise generated by any construction work is managed in accordance with the requirements outlined in the *Interim Construction Noise Guideline* (DECC, 2009).

Operational Noise Criteria

2. Except for the carrying out of construction works, the Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence^a on privately-owned land.

Table 1: Operational noise criteria dB(A)

Noise Assessment Location	Day	Evening	Night	Night
	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{Aeq} (15 min)	L _{A1} (1 min)
4 – di Rocco	40	36	36	46
5 - Keighran	40	39	39	49
6 – Swan	40	37	37	47
7 – Druitt	40	35	35	45
8 – Macquarie Shores Home Village	42	42	42	47
9 - Jeans	40	37	37	47
11 - Jeans	40	36	36	46
18 - Jeans	40	36	36	46
20 – Knight and all other privately-owned residences	40	36	36	46

^a The Noise Assessment Locations referred to in Table 1 are shown in Appendix 4.

Noise generated by the development must be monitored and measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the *NSW Noise Policy for Industry* (EPA, 2017).

3. The noise criteria in Table 1 do not apply if the Applicant has an agreement with the owner/s of the relevant residence or land to exceed the noise criteria, and the Applicant has advised the Department in writing of the terms of this agreement.

Noise Operating Conditions

- 3A. The Applicant must:
 - (a) take all reasonable steps to minimise noise from construction and operational activities, including low frequency noise and other audible characteristics, associated with the development;
 - (b) implement reasonable and feasible noise attenuation measures on all plant and equipment that will operate in noise sensitive areas;
 - (c) operate a comprehensive noise management system commensurate with the risk of impact;
 - (d) take all reasonable steps to minimise the noise impacts of the development during noise-enhancing meteorological conditions when the noise criteria in this consent do not apply (see NPfI);
 - (e) carry out regular attended noise monitoring (at least once a month, unless otherwise agreed by the Planning Secretary) to determine whether the development is complying with the relevant conditions of this consent;

- (f) regularly assess the noise monitoring data and modify or stop operations on the site to ensure compliance with the relevant conditions of this consent; and
- (g) implement reasonable and feasible measures to further enclose the structure housing the coal crusher in order to further mitigate noise from operational activities.

3B. The Applicant must decommission the surface rotary breaker identified in the Statement of Commitments at Appendix 3, within 3 months of approval of Modification 5.

Noise Management Plan

3C. The Applicant must prepare a Noise Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:

- (a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;
- (b) describe the measures to be implemented to ensure:
 - i. compliance with the noise criteria and operating conditions in this consent;
 - ii. best practice management is being employed; and
 - iii. noise impacts of the development are minimised during noise-enhancing meteorological conditions when the noise criteria in this consent do not apply (see NPfl);
- (c) describe the noise management system in detail; and
- (d) include a monitoring program that:
 - i. uses a combination of real-time and supplementary attended monitoring to evaluate the performance of the development;
 - ii. monitors noise at the nearest and/or most affected residences;
 - iii. includes a program to calibrate and validate the real-time noise monitoring results with the attended monitoring results over time;
 - iv. adequately supports the noise management system;
 - v. includes a protocol for distinguishing noise emissions of the development from any neighbouring developments; and
 - vi. includes a protocol for identifying any noise-related exceedance, incident or non-compliance and for notifying the Department and relevant stakeholders of any such event.

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

SUBSIDENCE

4. The Applicant **must limit its coal extraction methods on the site to first workings only, and must not undertake second workings.**

5. Deleted.

SOIL AND WATER

Discharge

- 6. The Applicant **must** only discharge water from the site as expressly provided for by its EPL.
- 7. The Applicant **must** investigate, assess and report on the ecological interactions of minewater discharged from the site with the aquatic ecology of the unnamed creek and wetlands (and associated vegetation) between the minewater discharge point/s and Lake Macquarie. This report must:
 - (a) be prepared in consultation with EPA by suitably qualified expert/s whose appointment/s have been approved by the Planning Secretary;
 - (b) be submitted to the Planning Secretary by the end of March 2009; and
 - (c) assess the probable alterations in the local ecology attributable to previous and proposed minewater discharges and any future cessation of minewater discharge flows.

Water Management Plan

- 8. The Applicant **must** prepare a Water Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:
 - (a) be prepared in consultation with DPIE Water by suitably qualified expert/s whose appointment/s have been approved by the Planning Secretary;
 - (b) be submitted the Planning Secretary by the end of March 2009; and
 - (c) include a:
 - Site Water Balance;

Appendix C

EPL extract

Environment Protection Licence

Licence - 191

- L4.1 The licensee must not cause, permit or allow any waste to be received at the premises, except the wastes expressly referred to in the column titled “Waste” and meeting the definition, if any, in the column titled “Description” in the table below.

Any waste received at the premises must only be used for the activities referred to in relation to that waste in the column titled “Activity” in the table below.

Any waste received at the premises is subject to those limits or conditions, if any, referred to in relation to that waste contained in the column titled “Other Limits” in the table below.

This condition does not limit any other conditions in this licence.

Code	Waste	Description	Activity	Other Limits
NA	Waste	Any other waste received on the premises for storage, treatment, processing, sorting or disposal and which receipt is not a scheduled activity under Schedule 1 of the POEO Act, as in force from time to time.		
NA	General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2014	As specified in each particular resource recovery exemption	N/A

- L4.2 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by the licence.

- L4.3 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an environment protection licence.

L5 Noise limits

Note: Noise limits are not specified as a condition of this licence. Noise limits are prescribed with the conditions of Project Approval 06_0311 granted under the *Environmental Planning and Assessment Act 1979*. Under the *Environmental Planning and Assessment Act 1979* the Department of Planning is the appropriate authority in respect of the administration and regulation of the Project Approval.

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.

Appendix D

Calibration certificates

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

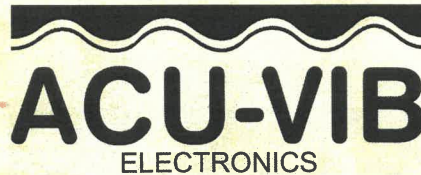
Temperature: 24 °C \pm 2° C **Relative Humidity:** 53% \pm 5%

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
The results of the tests, calibration and/or measurements included in this document are traceable to Australian/national standards.



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

Accredited Lab. No. 9262
Acoustic and Vibration
Measurements

Page 1 of 2
AVCERT10 Rev. 1.3 15.05.18

CERTIFICATE OF CALIBRATION

CERTIFICATE No: C28053

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 was found to be:

Parameter	Pre-Adj	Adj Y/N	Output: (db re 20 μ Pa)	Frequency: (Hz)	THD&N (%)
Level 1:	NA	N	94.13	1000.00	1.26
Level 2:	NA	N	114.04	1000.00	0.50
Uncertainty:			± 0.11 dB	$\pm 0.05\%$	$\pm 0.20\%$
Uncertainty (at 95% c.l.) k=2					

CONDITIONS OF TEST:

Ambient Pressure: 995 hPa ± 1.5 hPa **Relative Humidity:** 57 % $\pm 5\%$

Temperature: 24 $^{\circ}$ C $\pm 2^{\circ}$ C

Date of Calibration: 15/10/2020

Issue Date: 16/10/2020

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.

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

