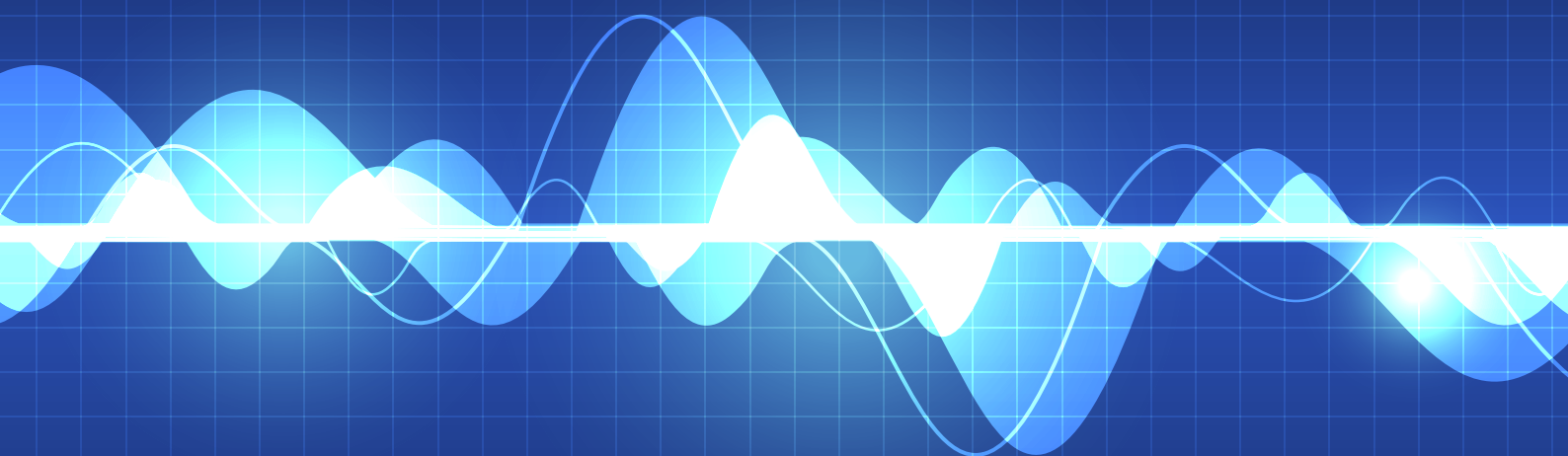


Ashton Coal

Monthly attended noise monitoring
July 2019

Prepared for Ashton Coal Operations Pty Ltd
July 2019





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Ashton Coal

Monthly attended noise monitoring - July 2019

Report Number

H190081 RP6

Client

Ashton Coal Operations Pty Ltd

Date

26 July 2019

Version

v2-0 Final

Prepared by**Approved by**

**Lucas Adamson**

Acoustic Consultant

26 July 2019

Katie Teyhan

Associate

26 July 2019

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.

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1 Introduction

EMM Consulting Pty Limited (EMM) was engaged to complete monthly attended noise surveys on behalf of Ashton Coal Operations Pty Ltd (Ashton Coal).

The purpose of the monitoring was to address requirements of the approved Ashton Coal Noise Management Plan (NMP), prepared to satisfy the requirements of the Development Consent DA 309-11-2001-I (DC) and Environment Protection License (EPL) 11879.

This report presents the results and findings of attended noise monitoring conducted on 9 July 2019.

The following material was referenced as part of this assessment:

- Department of Planning and Environment (DPE), Development Consent 309-11-2001-I, as modified on 20 June 2016 (current as of 9 July 2019);
- Environment Protection Authority (EPA), Environment Protection License 11879, as varied on 27 March 2019 (current as of 9 July 2019);
- Ashton Coal Project Noise Management Plan (NMP), approved by DPE on 10 October 2017 (current as of 9 July 2019);
- NSW EPA, Industrial Noise Policy (INP), 2000;
- NSW EPA, Industrial Noise Policy Application notes, 2017; and
- NSW EPA, Noise Policy for Industry (NPfi), 2017.

2 Glossary of acoustic terms

Several technical terms are discussed in this report. These are explained in Table 2.1.

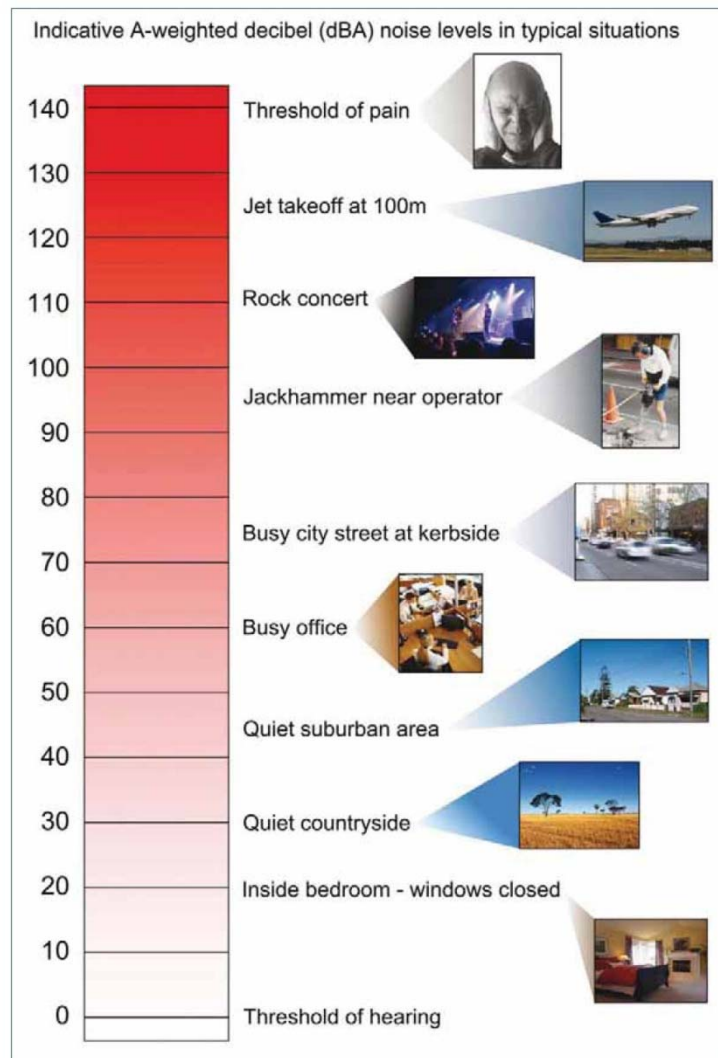
Table 2.1 Glossary of acoustic terms

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 2.2 gives an indication as to what an average person perceives about changes in noise levels. Examples of common noise levels are provided in Figure 2.1.

Table 2.2 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



Source: Road Noise Policy (Department of Environment, Climate Change and Water 2011)

Figure 2.1 Common noise levels

3 Noise limits

3.1 Operational and sleep disturbance noise limits

Ashton Coal noise limits are provided in Table 1, Condition 2 of Appendix 6 of the DC and Condition L4.1 of the EPL. Extracts of the relevant sections of the DC and EPL pertaining to noise are provided in Appendix A and B, respectively. The approved NMP adopts three attended noise monitoring locations that are representative of residences outlined in the DC. The noise monitoring locations and relevant criteria are summarised in Table 3.1.

Table 3.1 Noise impact assessment criteria

Monitoring 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
N2	38	38	36	46
N3	38	38	36	46
N4	38	38	36	46

The DC and the EPL specify 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 metres above ground level; and
- temperature inversion conditions greater than 3°C/100m.

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 state that the EPA accepts sleep disturbance analysis based on either the $L_{A1,1\text{ minute}}$ or L_{Amax} metrics (EPA 2013), with use of L_{Amax} resulting in a more conservative assessment.

The DC and EPL state that modification factor corrections in the application notes to the INP (2017) shall be applied to the measured mine noise levels where applicable. The application notes to the INP state that Fact Sheet C of the NPfi (EPA 2017) now applies regarding the application of modifying factors.

3.2 Cumulative noise criteria

Ashton Coal cumulative noise limits are provided in Condition 5 and Condition 6 of Schedule 3 of the DC. An extract of the conditions relevant to cumulative noise criteria is provided here.

5. The Applicant must implement all reasonable and feasible measures to ensure that the noise generated by the Ashton Mine Complex combined with the noise generated by other mines in the vicinity does not exceed the criteria in Table 4 at any residence on any privately-owned land or on more than 25 per cent of any privately-owned land (except for the noise affected residential receivers in Table 1).

Table 4: Cumulative Noise Criteria dB(A) L_{Aeq} (period)

Location	Day	Evening	Night
Camberwell Village	55	45	40
All other privately-owned land	50	45	40

Cumulative noise is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy. Appendix 8 sets out the requirements for evaluating compliance with these criteria.

6. If the cumulative noise generated by the Ashton Mine Complex combined with the noise generated by other coal mines in the vicinity exceeds the criteria in Table 5 at any residence on privately-owned land or more than 25 per cent of any privately-owned land (except for the noise-affected residential receivers in Table 1), then upon receiving a written request from the landowner, the Applicant must, together with the relevant mines, acquire the land on an equitable basis as possible, in accordance with the procedures in conditions 7 and 8 of schedule 4.

Table 5: Cumulative Noise Acquisition Criteria dB(A) L_{Aeq} (period)

Location	Day	Evening	Night
Camberwell Village	60	50	45
All other privately-owned land	55	50	45

Cumulative noise is to be measured in accordance with the relevant requirements of the NSW Industrial Noise Policy. Appendix 8 sets out the requirements for evaluating compliance with these criteria.

3.3 Low frequency noise criteria

Condition 3 of Appendix 8 of the DC and L4.3 of the EPL state that noise generated by Ashton Coal is to be measured in accordance with the relevant requirements of the INP. The INP application notes state that Section 4 of the INP has been withdrawn and the modifying factor adjustments outlined in Fact Sheet C of the NPfI are to be used when assessing the characteristics of a noise source.

Fact sheet C of the NPfI (EPA 2017) provides guidelines for applying modifying factor corrections 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 spectrum and potential increased annoyance.

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 values in Table C2 of the NPfI (EPA 2017), which has been reproduced in Table 3.2 below.

Table 3.2 One-third octave low-frequency noise thresholds

One-third octave $L_{Zeq,15\text{ minute}}$ threshold level													
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 correction is to be applied 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 3.2 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 3.2 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.

Hence, where relevant 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 analyser ($L_{Ceq}-L_{Aeq}$). Where this was deemed to be 15 dB or greater, the measured one-third octave frequencies have been compared to the values in Table 3.2 to identify the relevant modifying factor correction (if applicable). This method has been applied to this assessment as presented in Section 5.

It is of note that the NPfl (EPA 2017) states that low-frequency noise corrections only apply under the standard or noise-enhancing (i.e. applicable) meteorological conditions.

4 Assessment methodology

4.1 Attended noise monitoring

To quantify noise emissions from Ashton Coal, 15-minute attended noise monitoring surveys were completed at representative locations as per the approved NMP. Noise monitoring locations and their coordinates are listed in Table 4.1 and are shown in Figure 4.1.

Table 4.1 Attended noise monitoring locations

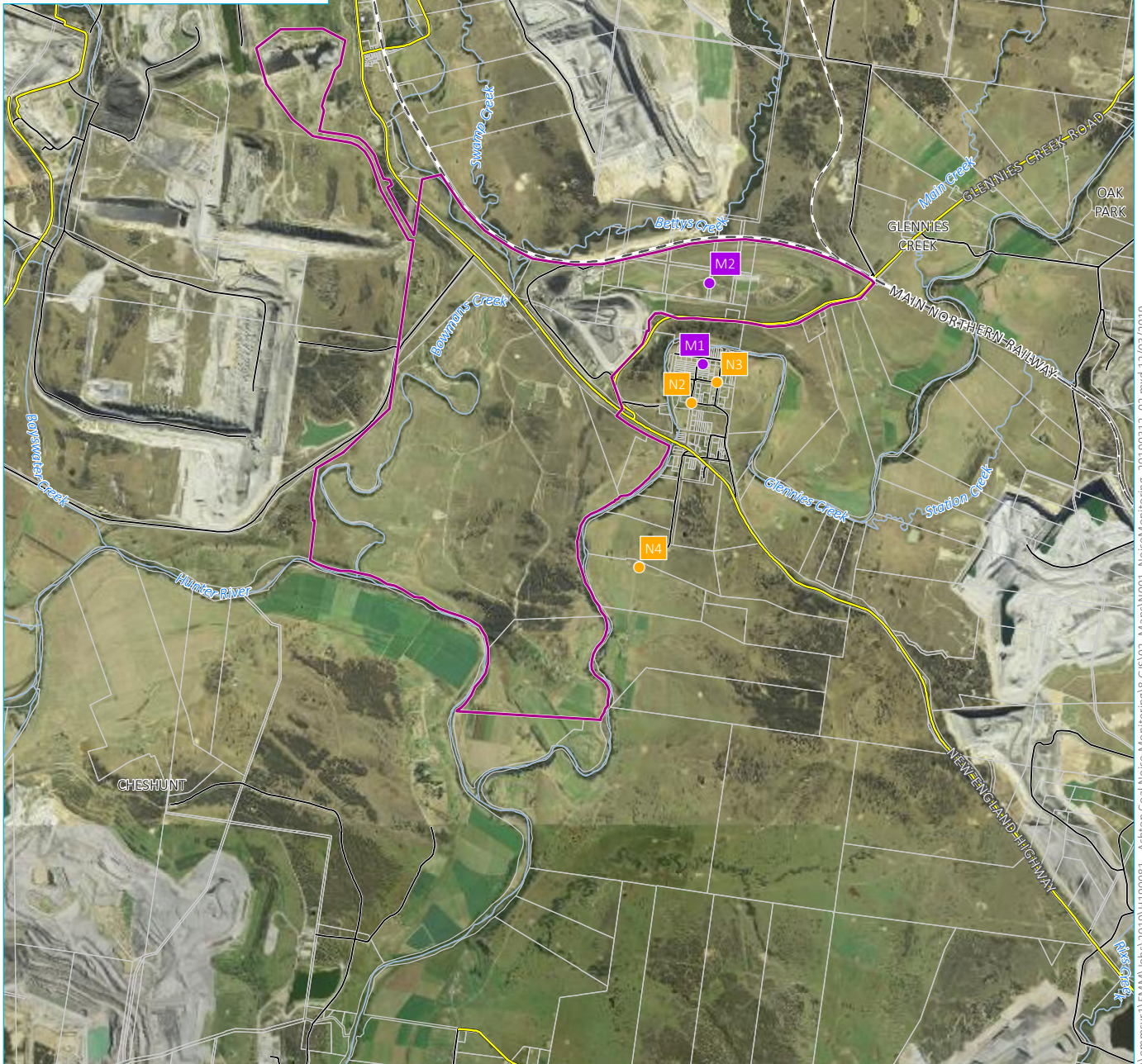
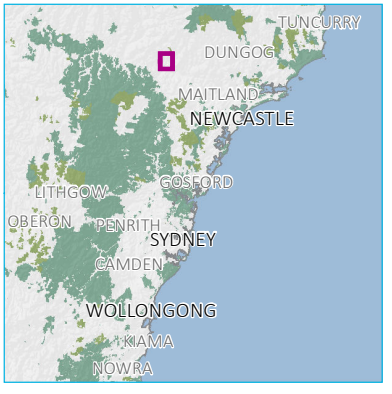
Monitoring location	Description	MGA56	
		Easting	Northing
N2	Camberwell Village (west)	320297	6405670
N3	Camberwell Village (north east)	320554	6405839
N4	South of New England Highway	319776	6404101

Attended noise monitoring is scheduled to be “unannounced” and, to EMM’s knowledge, Ashton Coal were not aware of the monitoring prior to its commencing. Noise monitoring is avoided during any scheduled downtime or major maintenance. Information provided by Ashton Coal after the noise monitoring was completed confirmed that regular operations were occurring during the monitoring period.

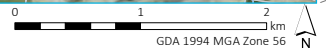
Where possible throughout each survey, the operator has quantified the contribution of each significant noise source. This was done by matching audible sounds with the response of the analyser (where applicable) and/or via post-analysis of data (e.g. low pass filtering).

4.2 Instrumentation

Brüel & Kjær 2250 and Brüel & Kjær 2270 Type 1 sound analysers (s/n 2759405 and 3027603) were used to conduct 15-minute attended measurements and record 1/3 octave frequency and statistical noise indices. The sound analysers were calibrated before and on completion of the survey using a Brüel & Kjær type 4230 calibrator (s/n 1276091). The instrumentation’s calibration certificates are provided in Appendix C.



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



KEY

- Site boundary
- Noise monitoring location
- Meteorological station
- Rail line
- Main road
- Local road
- Watercourse/drainage line
- Cadastral boundary

Noise monitoring locations and Ashton colliery boundary

Ashton Coal
Monthly attended noise monitoring
Figure 4.1

\\emmsvr1\EMM\Jobs\2019\H\190081 - Ashton Coal Noise Monitoring\GIS\02_Maps\N001_NoiseMonitoring_20190312_02.mxd 12/03/2019

4.3 Attended noise monitoring exceedance procedure

Ashton Coal has developed an attended monitoring exceedance procedure that is to be implemented if measurements show Ashton Coal noise emissions are above the relevant noise criteria. This response plan is implemented if site noise levels are determined to be above the relevant noise criteria and when noise limits are applicable due to suitable meteorological conditions. The following noise management initiatives are implemented:

- Consultant will record the reading and advise Ashton Coal of the exceedance. Ashton Coal will implement remedial action as required.
- A follow up measurement is to be conducted (within 75 minutes after the first measurement and no earlier than 10 pm).
- If the follow up measurement indicates that site noise levels are above the relevant noise criteria and that noise limits are applicable, the consultant will record the result, note the site has failed and is deemed a 'noise affected night' at that location. An additional monitoring test should be scheduled to be undertaken at the same location within one week and move on to the next monitoring location.
- If the follow up measurement indicates that site noise levels are below the relevant noise criteria and that noise limits are applicable, the consultant will record the result, note the site has passed, schedule an additional monitoring test to be undertaken at the location within one week and move on to the next monitoring location.

4.4 Determination of stability category

This assessment determined the stability categories throughout the attended monitoring period using the direct measurement method as per Appendix E2 of the INP (EPA 2000).

The temperature lapse rate between the two weather stations (M1 – Sentinex Unit 40 located in Camberwell Village and M2 – Ashton Coal 'repeater' meteorological station located in the north eastern open cut (NEOC) area) was calculated using the following formula:

$$\text{Temperature lapse rate} = (\Delta T) \times (100/(\Delta H))$$

Where:

- ΔT = temperature measured at M2 (at 10 metres above ground level) minus temperature measured at M1 (at 10 metres above ground level); and
- ΔH = the vertical height difference between M2 and M1 (equal to 73 metres).

Table E5 of the INP (EPA 2000) is reproduced in Table 4.2 and presents the stability categories and associated ranges in temperature lapse rates.

Table 4.2 **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).

Other meteorological data, such as wind speed, has been sourced directly from meteorological station M2 since it is more representative of the weather conditions nearer to the noise sources.

5 Review of data and discussion

5.1 Summary

Results of attended noise measurements are summarised in Table 5.1. Ashton Coal contribution and total mine noise were determined for each survey using in-field observations and post-analysis of data as required (e.g. removing higher frequencies that are not mine related i.e. above 630 Hz). Attended monitoring was completed on 9 July 2019.

The meteorological data for the monitoring period was sourced from Ashton Coal's two weather stations (M1 and M2) to determine applicability of criteria in accordance with the DC and EPL. Noise limits were not applicable during the measurement at N4 due to temperature inversion conditions greater than 3°C/100m.

Low frequency noise was assessed by comparison of the measured Ashton Coal one-third octave L_{Aeq} noise levels to the NPfI one-third octave low-frequency noise thresholds, when the site was audible. Measured noise levels did not exceed the relevant LFN thresholds during any of the measurements where Ashton Coal was audible. Therefore, in accordance with the NPfI, LFN modifying factors were found to be not relevant and hence were not applied to estimated site noise levels at any of the locations.

At all locations where site noise was audible, Ashton Coal noise contributions and cumulative mine noise contributions were below (i.e. complied with) the relevant noise limits, where applicable.

Table 5.1 Ashton Coal attended noise monitoring results –July 2019

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions ³ limits apply (Y/N)	Exceedance, dB	Comments
			L _{Amin}	L _{A90}	L _{Aeq}	L _{A10}	L _{A1}	L _{Amax}	L _{Ceq}	LFN mod. factor ¹	L _{Aeq}	L _{Amax} ²	L _{Aeq}	L _{Amax} ²			
N2	9/7	23:38	39	41	57	52	72	80	61	Nil	≤36	37	36	46	2.7 m/s @ 289° E class stability 0.8°C/100m VTG Y	Nil	Site noise consistently audible including conveyor noise. Traffic on the New England Highway and another mine in the vicinity consistently audible. Dogs barking and a train on the main line (unrelated to Ashton Coal) occasionally audible.
N3	9/7	23:38	39	42	45	48	51	65	59	Nil	≤36	37	36	46	2.7 m/s @ 289° E class stability 0.8°C/100m VTG Y	Nil	Site noise consistently audible including conveyor noise. Traffic on the New England Highway, another mine in the vicinity and frogs consistently audible. Train on the main line (unrelated to Ashton Coal) audible for approx. 4 minutes. Distant dogs barking and bird noise occasionally audible.
N4	10/7	00:07	33	36	43	46	51	65	57	Nil	<25	35	36	46	2.8 m/s @ 268° F class stability 4.4°C/100m VTG N	N/A	Site noise occasionally audible including engine revs. Traffic on the New England Highway and frogs consistently audible. Other mines in the vicinity, distant dogs barking and livestock occasionally audible.

- Notes:
1. Modifying factor correction for low frequency noise in accordance with Fact Sheet C of the NPfl (refer Section 3.3).
 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 the Ashton Coal weather station (Refer to Section 5.1). VTG assumes the temperature sensors on the two weather stations are in proper working order and calibrated to manufacturers requirements.
 4. IA = inaudible.
 5. N/A = not applicable.

5.2 N2 - Camberwell Village (west)

Ashton Coal operations were consistently audible during the operator-attended noise survey including conveyor noise. The Ashton Coal mine noise contribution was estimated at up to $L_{Aeq,15\text{ minute}} \leq 36$ dB. Conveyor noise from site generated an estimated L_{Amax} 37 dB. Ashton Coal noise contributions complied with the DC and EPL noise limits. Other ambient noise sources included another mine in the vicinity, traffic on the New England Highway, nearby dogs barking and a train on the main line (unrelated to Ashton Coal).

Mining operations in the vicinity were consistently audible during the operator-attended noise survey at monitoring location N2. The total cumulative mine noise contribution was estimated to be $L_{Aeq,night}$ 37 dB ($L_{Aeq,15\text{ minute}}$ 40 dB - 3 dB as per NPfI methodology) which is below the cumulative mine noise night-time criterion (i.e. $L_{Aeq,night}$ 40 dB). Therefore, the total cumulative mine $L_{Aeq,night}$ noise contribution was below the cumulative mine noise criterion.

5.3 N3 - Camberwell Village (north east)

Ashton Coal operations were consistently audible during the operator-attended noise survey including conveyor noise. The Ashton Coal mine noise contribution was estimated at up to $L_{Aeq,15\text{ minute}} \leq 36$ dB. Conveyor noise from site generated an estimated L_{Amax} 37 dB. Ashton Coal noise contributions complied with the DC and EPL noise limits. Other ambient noise sources included another mine in the vicinity, traffic on the New England Highway, frogs, bird noise, distant dogs barking and a train on the main line (unrelated to Ashton Coal).

Mining operations in the vicinity were consistently audible during the operator-attended noise survey at monitoring location N3. The total cumulative mine noise contribution was estimated to be $L_{Aeq,night}$ 37 dB ($L_{Aeq,15\text{ minute}}$ 40 dB - 3 dB as per NPfI methodology) which is below the cumulative mine noise night-time criterion (i.e. $L_{Aeq,night}$ 40 dB). Therefore, the total cumulative mine $L_{Aeq,night}$ noise contribution was below the cumulative mine noise criterion.

5.4 N4 - South of New England Highway

Ashton Coal operations were occasionally audible during the operator-attended noise survey including engine revs from site. The Ashton Coal mine noise contribution was estimated at up to $L_{Aeq,15\text{ minute}} < 25$ dB. Engine revs from site generated an estimated L_{Amax} 35 dB. Ashton Coal noise contributions complied with the DC and EPL noise limits. Other ambient noise sources included other mines in the vicinity, traffic on the New England Highway, frogs, distant dogs barking and livestock.

Mining operations in the vicinity were consistently audible during the operator-attended noise survey at monitoring location N4. The total cumulative mine noise contribution was estimated to be $L_{Aeq,night} < 32$ dB ($L_{Aeq,15\text{ minute}} < 35$ dB - 3 dB as per NPfI methodology) which is below the cumulative mine noise night-time criterion (i.e. $L_{Aeq,night}$ 40 dB). Therefore, the total cumulative mine $L_{Aeq,night}$ noise contribution was below the cumulative mine noise criterion.

6 Conclusion

EMM has completed a review of mine noise from Ashton Coal within the surrounding community based on attended measurements conducted on 9 July 2019.

The applicability of noise limits was assessed with reference to Ashton Coal's two meteorological stations (M1 and M2) located to the east of the site. Noise limits were not applicable during the measurement at N4 due to temperature inversion conditions greater than 3°C/100m.

The assessment of noise contributions from site included consideration of modifying factors for noise characteristics where relevant and in accordance with the INP.

Ashton Coal noise contributions and cumulative mine noise contributions were at or below (satisfied) the relevant noise limits (had they applied) at all monitoring locations for this round of monitoring.

References

Ashton Coal Noise Management Plan, 2017.

NSW Department of Planning and Environment, Development Consent DA309-11-2001-I, 2016.

NSW Environment Protection Authority, Environment Protection License 11879.

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

Project approval extract

APPENDIX 6 ALTERNATE NOISE CONDITIONS

NOISE

Application

- Conditions 2 to 3 below have effect during times when open cut mining operations are not being undertaken at the Ashton Mine Complex, in the opinion of the Secretary.

Noise Criteria

- Except for the noise-affected land in Table 1 of Schedule 3, the Applicant must ensure that the noise generated by the development does not exceed the criteria in Table 1 at any residence on privately-owned land or on more than 25 per cent of any privately-owned land.

Table 1: Noise Criteria dB(A)

Receiver No.	Receiver	Day (L_{Aeq} (15min))	Evening (L_{Aeq} (15min))	Night (L_{Aeq} (15min))	Night (L_{A1} (1 min))
-	All privately-owned land	38	38	36	46

Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy*. Appendix 8 sets out the requirements for evaluating compliance with these criteria.

However, these noise criteria do not apply if the Applicant has an agreement with the relevant owner/s of the residence/land to generate higher noise levels, and the Applicant has advised the Department in writing of the terms of this agreement.

Additional Noise Mitigation Measures

- Upon receiving a written request from the owner of any residence on any privately-owned land where subsequent operational noise monitoring shows the noise generated by the development exceeds the noise limits in Table 2, the Applicant must implement additional reasonable and feasible noise mitigation measures (such as double glazing, insulation, and/or air conditioning) at the residence in consultation with the owner.

If within 3 months of receiving this request from the landowner, the Applicant and the landowner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Secretary for resolution.

Table 2: Additional Noise Mitigation Criteria dB(A) L_{Aeq} (15min)

Receiver No.	Receiver	Day (L_{Aeq} (15min))	Evening (L_{Aeq} (15min))	Night (L_{Aeq} (15min))
-	All privately-owned land	38	38	38

Notes:

- Noise generated by the development is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy*. Appendix 8 sets out the requirements for evaluating compliance with these criteria.
- For this condition to apply, the exceedance of the criteria must be systemic.

APPENDIX 8 NOISE COMPLIANCE ASSESSMENT

Compliance Monitoring

1. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this approval.
2. Data collected for the purposes of determining compliance with the relevant conditions of this approval is to be excluded under the following meteorological conditions:
 - 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 measures at 10 m above ground level; and
 - d) temperature inversion conditions greater than 3°C/100m.
3. Unless otherwise agreed with the Secretary, this monitoring is to be carried out in accordance with the relevant requirements relating 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) equipment used to collect noise data, and conformity with Australian Standards relevant to such equipment; and
 - c) modifications to noise data collected, including for the exclusion of extraneous noise and/or penalties for modifying factors apart from adjustments for duration.
4. To the extent that there is any inconsistency between the Industrial Noise Policy and the requirements set out in this Appendix, the Appendix prevails to the extent of the inconsistency.

Determination of Meteorological Conditions

5. Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located in the vicinity of the site (as required by condition 18 of Schedule 3).

Appendix B

EPL extract

Environment Protection Licence

Licence - 11879



13	Noise monitoring	Attended noise monitoring at coordinates 320554, 6405839 (Easting, Northing) identified as N3 on Figure 1.
14	Noise monitoring	Attended noise monitoring at coordinates 320297, 6405670 (Easting, Northing) identified as N2 on Figure 1.
15	Noise monitoring	Attended noise monitoring at coordinates 319776, 6404101 (Easting, Northing) identified as N4 on Figure 1.

P1.5 For the purposes of condition P1.1, P1.3 and P1.4 Figure 1 refers to the plan titled *"Ashton Underground Mine Environment Protection Licence 11879 Premises Boundary, Monitoring & Infrastructure"* dated 1/6/17 EPA Ref DOC17/375653-02.

3 Limit Conditions

L1 Pollution of waters

L1.1 Except as may be expressly provided in any other condition of this licence, the licensee must comply with section 120 of the Protection of the Environment Operations Act 1997.

L2 Concentration limits

L2.1 Flares must be operated by the licensee such that there is no visible emission other than for a total period of no more than 5 minutes in any 2 hours, except for heat haze.

L3 Waste

L3.1 The licensee must not cause, permit or allow any waste to be received at the premises unless specified in this licence.

L4 Noise limits

L4.1 Noise from the premises must not exceed the limits specified in the table below:

Location	Day LAeq(15 minute)	Evening LAeq(15 minute)	Night LAeq(15 minute)	Night LAeq(1 minute)
----------	---------------------	-------------------------	-----------------------	----------------------

Environment Protection Licence



Licence - 11879

Any residence not owned by the licensee or not subject to an agreement between the licensee and the residence owner as to an alternative noise limit.	38	38	36	46
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- L4.2 For the purpose of Condition L2.1:
- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sundays and Public Holidays,
 - Evening is defined as the period from 6pm to 10pm, and
 - Night is defined as the period from 10pm to 7am Monday to Saturday and 10pm to 8am Sundays and Public Holidays
- L4.3 Noise from the premises must be measured at the most affected point on or within the residential boundary or at the most affected point within 30m of the dwelling where the dwelling is more than 30m from boundary to determine compliance with the LAeq(15 minute) noise limits in condition L2.1. Where it can be demonstrated that direct measurement of noise from the premises is impractical, the EPA may accept alternative means of determining compliance. See Chapter 11 of the NSW Industrial Noise Policy. The modification factors presented in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise level where applicable.
- L4.4 Noise from the premises is to be measured or computed at 1m from the dwelling facade to determine compliance with condition L2.1 (LA1 (1 minute) noise limit).
- L4.5 The noise emission limits identified in condition L2.1 apply under the following meteorological conditions:
- wind speeds up to 3m/s at 10m above ground level; and
 - temperature inversion conditions up to 3 degrees C/100m.
- L4.6 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 13,14,15

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)	-	36
Night	Night-LA1 (1 minute)	-	46

Appendix C

Calibration certificates

CERTIFICATE OF CALIBRATION

CERTIFICATE No: 24152

EQUIPMENT TESTED: Sound Level Calibrator

Manufacturer: B & K
Type No: 4230 **Serial No:** 1276091
Owner: EMM Consulting
Level 1, 146 Hunter 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	93.81	989.84	1.58
Level 2:	NA	N	NA	NA	NA
Uncertainty:			± 0.11 dB	$\pm 0.05\%$	$\pm 0.20\%$
Uncertainty (at 95% c.i.) k=2					

CONDITION OF TEST:

Ambient Pressure: 1004 hPa ± 1.5 hPa **Relative Humidity:** 47% $\pm 5\%$

Temperature: 20 $^{\circ}$ C $\pm 2^{\circ}$ C

Date of Calibration: 14/02/2019 **Issue Date:** 15/02/2019

Acu-Vib Test Procedure: AVP02 (Calibrators)

Test Method: AS IEC 60942 - 2017

CHECKED BY: *[Signature]* **AUTHORISED SIGNATURE:** *[Signature]*

Jack Kiehl

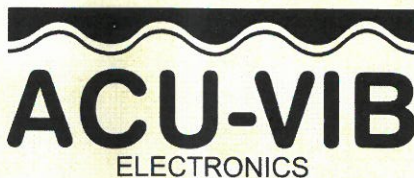
.Accredited for compliance with ISO/IEC 17025 - Calibration

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

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

CERTIFICATE OF CALIBRATION

No: CDK1902917

Page 1 of 12

CALIBRATION OF

Sound Level Meter:	Brüel & Kjær Type 2270	No: 3027603	Id: -
Microphone:	Brüel & Kjær Type 4189	No: 3195772	
Preamplifier:	Brüel & Kjær Type ZC-0032	No: 28589	
Supplied Calibrator:	None		
Software version:	BZ7222 Version 4.7.5	Pattern Approval:	PTB1.63-4093056 / 1.63-4093058
Instruction manual:	BE1712-22		

CUSTOMER

EMM Consulting
Suite 1, Level 10, 87 Wickham Terrace
4000 Spring Hill
Queensland, Australia

CALIBRATION CONDITIONS

Preconditioning: 4 hours at 23°C ± 3°C
Environment conditions: *See actual values in **Environmental conditions** sections.*

SPECIFICATIONS

The Sound Level Meter Brüel & Kjær Type 2270 has been calibrated in accordance with the requirements as specified in IEC 61672-1:2013 class 1. Procedures from IEC 61672-3:2013 were used to perform the periodic tests. The accreditation assures the traceability to the international units system SI.

PROCEDURE

The measurements have been performed with the assistance of Brüel & Kjær Sound Level Meter Calibration System 3630 with application software type 7763 (version 8.0 - DB: 7.30) by using procedure B&K proc 2270, 4189 (IEC 61672:2013).

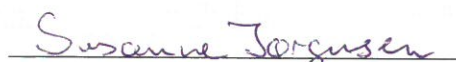
RESULTS


Calibration Mode: **Calibration as received.**

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

Date of calibration: 2019-04-12

Date of issue: 2019-04-12


Susanne Jørgensen
Calibration Technician


Mikail Önder
Approved Signatory

CERTIFICATE OF CALIBRATION

CERTIFICATE No.: **SLM 22129 & FILT 4384**

Equipment Description: Sound Level Meter

Manufacturer: B & K

Model No: 2250 **Serial No:** 2759405

Microphone Type: 4189 **Serial No:** 2888134

Filter Type: 1/3 Octave **Serial No:** 2759405

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

Owner: EMGA Mitchell McLennan
Ground Floor, Suite 01, 20 Chandos St
St Leonards NSW 2065

Ambient Pressure: 1008 hPa \pm 1.5 hPa

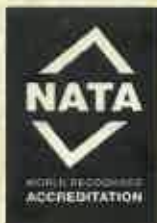
Temperature: 25 °C \pm 2° C **Relative Humidity:** 48% \pm 5%

Date of Calibration: 07/02/2018 **Issue Date:** 09/02/2018

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

CHECKED BY:  **AUTHORISED SIGNATURE:** 

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.



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