

# Mannering Colliery

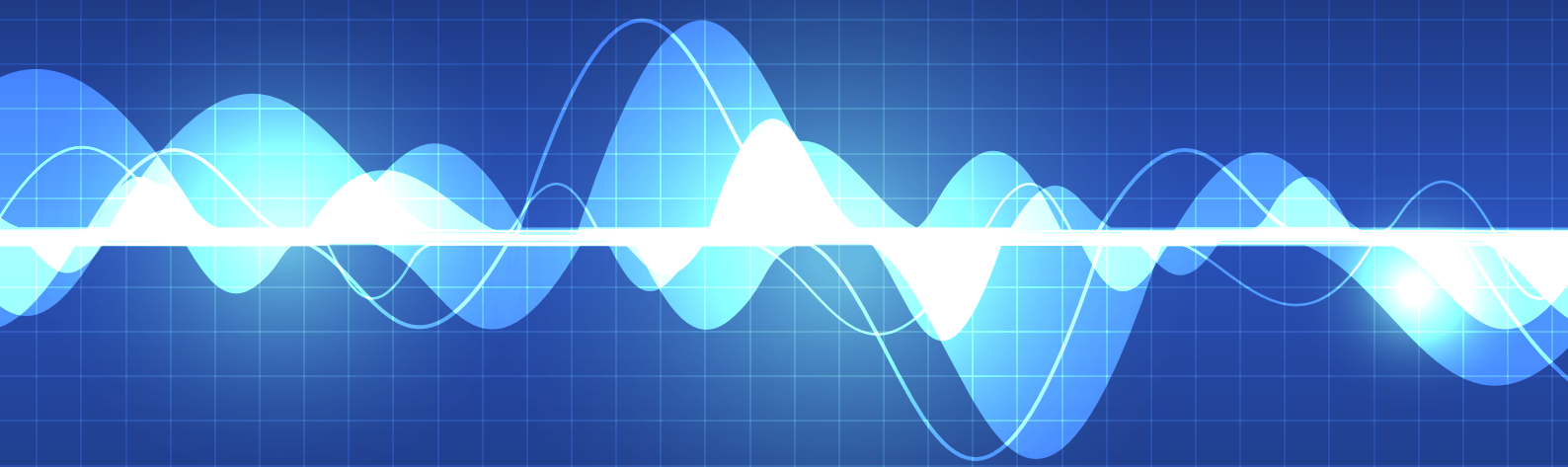
Quarterly attended noise monitoring

Quarter 2 - 2019

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

July 2019





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# Mannering Colliery

Quarterly attended noise monitoring - Quarter 2 2019

## Report Number

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H180389 RP1

## Client

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Great Southern Energy Pty Ltd (trading as DeltaCoal)

## Date

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18 July 2019

## Version

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v1 Final

## Prepared by

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**Teanuanua Villierme**  
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18 July 2019

## Approved by

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18 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 operator attended noise surveys on behalf of DeltaCoal Pty Limited (DeltaCoal).

The purpose of the monitoring was to address requirements of the approved Mannering Colliery Noise Monitoring Program (NMP), prepared to satisfy the requirements of the project approval MP06\_0311 (PA) and Environment Protection License (EPL) 191.

Noise monitoring is required to occur on a quarterly basis. This report presents the results and findings of attended noise monitoring conducted during the second quarter of 2019 on 11 June 2019.

The following material was referenced as part of this assessment:

- Department of Planning and Environment (DPE), Project Approval MP06\_0311, as modified on 18 August 2016 (current as of the monitoring date 11 June 2019);
- Environment Protection Authority (EPA), Environment Protection License (EPL) 191, as varied on 1 April 2019 (current as of the monitoring date 11 June 2019);
- Mannering Colliery Noise Monitoring Program (NMP), approved by DPE in April 2016;
- 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

Manning Colliery noise limits are provided in Table 1, Condition 1 of Appendix 4B of the PA. EPL 191 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 A and B of this report, respectively. The approved NMP adopts three attended noise monitoring locations that are representative of residences outlined in the PA. The noise monitoring locations and relevant criteria are summarised in Table 2.1.

**Table 2.1 Noise impact assessment criteria**

Monitoring location	Assessment location	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	42	42	41	49
RA2	7, 8	39	39	39	47
RA3	9, 11, 18, 20	39	39	39	49

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

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

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 the  $L_{Amax}$  resulting in a more conservative assessment of site noise emissions.

The PA states that modification factor corrections in the INP application notes (2017) shall be applied to the measured mine noise levels where applicable. The INP application notes INP state that Fact Sheet C of the NPfl (EPA 2017) now applies for the application of modifying factors.

### 2.2 Low frequency noise criteria

Appendix 4A Condition 5 of the PA states that noise generated by Manning Colliery 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 NPfl are to be used when assessing certain characteristics of a noise source.

Fact sheet C of the NPfl (EPA 2017) provides guidelines for applying modifying factor corrections to account for low frequency noise emissions. The NPfl 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 values in Table C2 of the NPfl (EPA 2017), which has been reproduced in Table 2.2 below.

**Table 2.2 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 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 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 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 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 correction (if applicable). This method for the application of modification factors for low frequency noise has been applied to this assessment as presented in Section 4.

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.

# 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 approved NMP.

Noise monitoring locations required as per the NMP and their coordinates are listed in Table 3.1 and are shown in Figure 3.1.

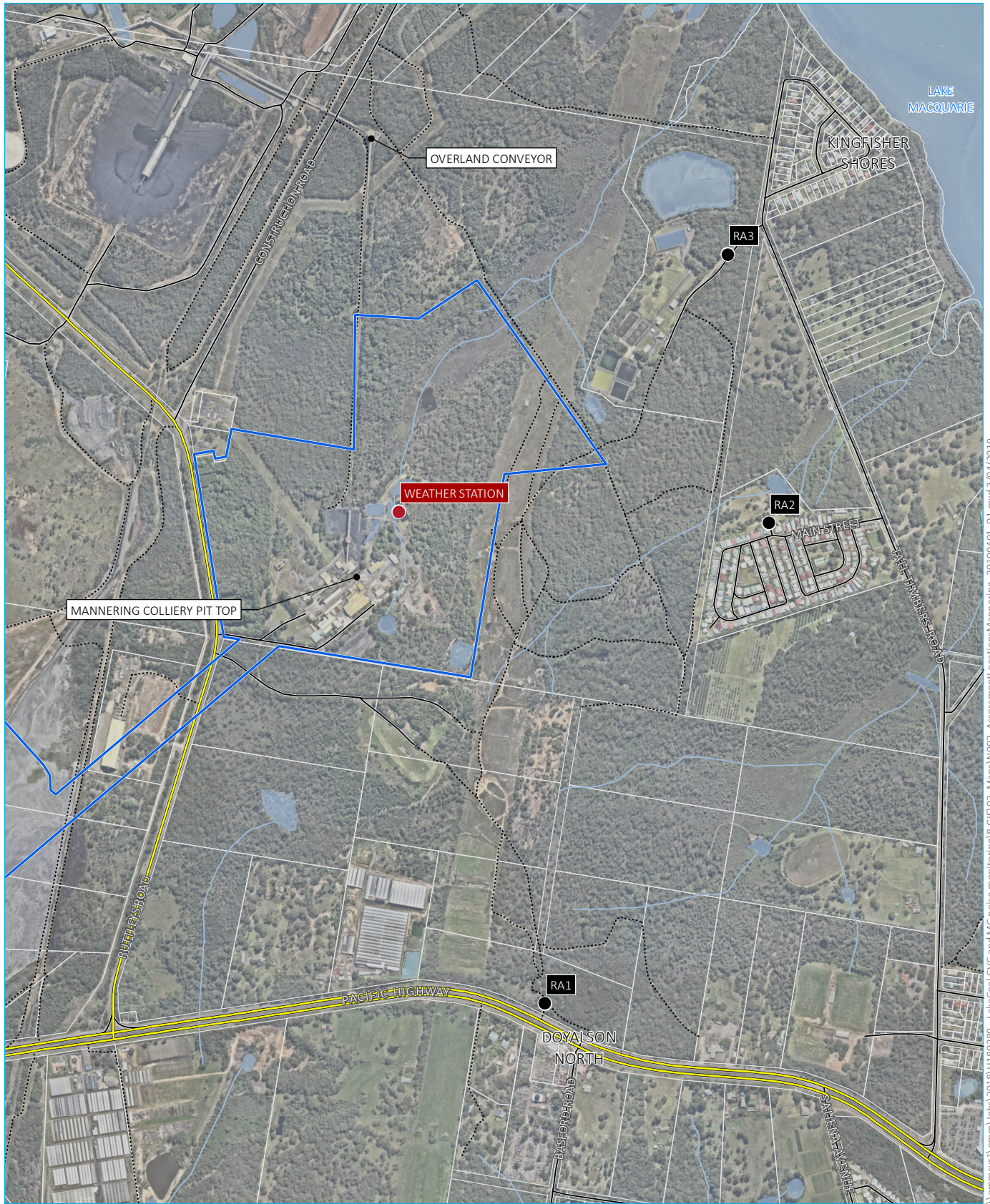
**Table 3.1** Attended noise monitoring locations

Monitoring location	Description	MGA56	
		Easting	Northing
RA1	Pacific Highway, Doyalson	364646	6327221
RA2	Short Street, Macquarie Shores Village	365164	6328332
RA3	Tall Timbers Road (northern end), Kingfisher Shores	365069	6328953

## 3.2 Instrumentation

Brüel & Kjær 2250 and 2270 Type 1 sound analysers (s/n 2759405 and 3027603, respectively) 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). 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 analyser (where applicable) and/or via post-analysis of data (e.g. low-pass filtering).



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



**KEY**

- Mannering Colliery project approval boundary
- Main road
- Local road
- Vehicular track
- Watercourse/drainage line
- Waterbody
- Cadastral boundary
- Noise monitoring location
- Weather station

Site boundary and noise monitoring locations

Mannering Colliery noise monitoring  
Figure 3.1



\\vemmsvr1\emms\jobs\2018\H180389 - LakeCoal CVC and MC noise monitoring\GIS\02\_Maps\W002\_AssessmentLocations\Mannering\_20190401\_01.mxd 3/04/2019

### 3.3 Determination of stability category

For the purpose of this assessment and as required by the PA, EPL and NMP, stability categories were determined for each 15-min attended monitoring periods. This was completed using the sigma-theta (ST) method as per Appendix E of the INP (EPA 2000). The ST data for the monitoring period was obtained from Mannering Colliery meteorological station located to the north of the site (refer Figure 3.1).

Table E1 of the INP (EPA 2000) is reproduced in Table 3.2 and presents the stability categories and associated ranges in temperature lapse rates.

**Table 3.2 Stability categories and temperature lapse rates**

Stability category	Temperature lapse rate ( $\Delta T$ ) ( $^{\circ}\text{C}/100\text{ m}$ )
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

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 (e.g. removing higher frequencies that are not mine related i.e. above 630 Hz where applicable). Attended noise monitoring was completed on 11 June 2019.

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 PA. In accordance with the PA, noise limits were applicable during all 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. Site noise was inaudible at all locations during the daytime and evening measurements. Therefore, in accordance with the NPfI, modifying factors for LFN were found to be not relevant for these measurements and hence were not applied to estimated site noise levels for the daytime and evening measurements at any of the locations.

Typically, when a particular source is not audible above local ambient noise levels, the likely contribution of that source is generally at least 10 dB below the measured background ( $L_{A90}$ ) level. Therefore, site  $L_{Aeq}$  noise contributions were below the relevant limits at all locations.

Site noise was audible at all locations during the night-time measurements. Site  $L_{Aeq,15\text{ minute}}$  satisfied the relevant limits at all locations. Site  $L_{Amax}$  satisfied the relevant limits at most locations. The exception was at location RA3, where the site  $L_{Amax}$  (or  $L_{A1,1min}$ ) was measured above the relevant limit. Mannering Colliery has indicated that this noise event was related to an emergency alarm testing at the time, which is currently under investigation. Since this event, Mannering Colliery has introduced a protocol to restrict such event from occurring during the night-time period. Furthermore, as part of the investigation, Mannering Colliery are currently auditing their on-site audio alarms with opportunities for noise reduction at offsite receivers.

**Table 4.1 Mannering Colliery attended noise monitoring results – Q2 2019**

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions <sup>3</sup> limits apply (Y/N)	Exceedance, dB	Comments
			L <sub>Amin</sub>	L <sub>A90</sub>	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>	L <sub>Ceq</sub>	LFN mod. factor <sup>1</sup>	L <sub>Aeq</sub>	L <sub>Amax</sub> <sup>2</sup>	L <sub>Aeq</sub>	L <sub>Amax</sub> <sup>2</sup>			
RA1	11/6	15:36 (Day)	47	58	65	70	68	75	71	Nil	IA	N/A	42	N/A	3.0 m/s @186 B class stability Y	Nil	Site noise inaudible. Road traffic noise consistent. Bird noise frequent.
RA1	11/6	19:34 (Eve.)	45	52	64	72	69	78	69	Nil	IA	N/A	42	N/A	0.3 m/s @318 F class stability Y	Nil	Site noise inaudible. Road traffic noise and insects consistent.
RA1	11/6	23:35 (Night)	39	40	56	66	61	72	64	Nil	41 (39+2)	39	41	49	0.3 m/s @168 F class stability Y	Nil	MC hum consistently audible with alarms audible on occasion. Insects and Road traffic noise consistent.
RA2	11/6	15:19 (Day)	34	37	44	56	46	67	55	Nil	IA	N/A	39	N/A	1.9 m/s @147 A class stability Y	N/A	Site noise inaudible. Insects and bird noise consistent and dominant. Wind in trees, ducks nearby and residents occasionally audible. Distant traffic frequently audible.
RA2	11/6	18:45 (Eve.)	36	38	40	46	41	50	61	Nil	IA	N/A	39	N/A	0.3 m/s @194 D class stability Y	Nil	Site noise inaudible. Insects noise consistent. Distant and local traffic frequent. Aircraft noise occasional. Vales Point Power Station hum consistently audible.
RA2	11/6	22:59 (Night)	39	41	43	45	44	48	63	Nil	38	39	39	47	0.3 m/s @193 F class stability Y	N/A	MC conveyor noise audible throughout measurement. Bird noise and distant traffic audible on one occasion. Vales Point Power Station hum consistently audible. CVC horn noise occasionally audible.
RA3	11/6	15:39 (Day)	33	36	50	62	53	71	63	Nil	IA	N/A	39	N/A	2.1 m/s @188 B class stability Y	Nil	Site noise inaudible. Insects and bird noise consistent. Local traffic on Tall Timbers Rd frequent. Wind in foliage occasionally audible. Car passby on two occasions. Vales Point Power Station hum consistently audible.

**Table 4.1 Mannering Colliery attended noise monitoring results – Q2 2019**

Location	Date	Start time	Total noise levels, dB							Site contributions, dB			Noise limits, dB		Meteorological conditions <sup>3</sup> limits apply (Y/N)	Exceedance, dB	Comments
			L <sub>Amin</sub>	L <sub>A90</sub>	L <sub>Aeq</sub>	L <sub>A10</sub>	L <sub>A1</sub>	L <sub>Amax</sub>	L <sub>Ceq</sub>	LFN mod. factor <sup>1</sup>	L <sub>Aeq</sub>	L <sub>Amax</sub> <sup>2</sup>	L <sub>Aeq</sub>	L <sub>Amax</sub> <sup>2</sup>			
RA3	11/6	19:06 (Eve.)	39	41	43	50	44	57	65	Nil	IA	N/A	39	N/A	0.3 m/s @225 F class stability Y	Nil	<b>Site noise inaudible.</b> Local traffic noise frequent. Aircraft noise occasional. Vales Point Power Station hum consistently audible. Waste Water Treatment Pump noise consistently audible.
RA3	11/6	23:23 (Night)	44	46	47	53	49	56	67	Nil	≤39	56	39	49	0.5 m/s @175 F class stability Y	Nil/7	<b>MC conveyor noise barely audible throughout measurement, with alarms audible on occasion.</b> Vales Point Power Station hum consistently audible and dominant.

- Notes:
1. Modifying factor correction for low frequency noise in accordance with fact sheet C of the NPfl (refer Section 2.2).
  2. For assessment purposes the L<sub>Amax</sub> and the L<sub>A1,1 minute</sub> are interchangeable.
  3. Meteorological data were taken as an average over 15 minutes from Mannering Colliery weather station (Refer to Section 5.1).
  4. IA = inaudible.
  5. 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 11 June 2019.

The applicability of noise limits was assessed in accordance with the site's PA with reference to Mannering Colliery's meteorological station located to the north of the site. In accordance with the PA, noise limits were applicable during all nine measurements.

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

Mannering Colliery noise contributions were inaudible during all daytime and evening measurements and hence determined to be below (satisfied) the relevant noise limits for these measurements. During the night period measurements when site noise was audible, site  $L_{Aeq,15\text{ minute}}$  noise contribution satisfied the relevant limits. The night-time site  $L_{Amax}$  (or  $L_{A1,1min}$ ) satisfied the relevant limits at RA1 and RA2, however was measured above the relevant limit at RA3.



# References

Manning Colliery Noise Monitoring Program, 2016.

NSW Department of Planning and Environment, Project Approval MP 06\_0311, 2016.

NSW Environment Protection Authority, Environment Protection License 191.

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.

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Appendix A

# Glossary of acoustic terms

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

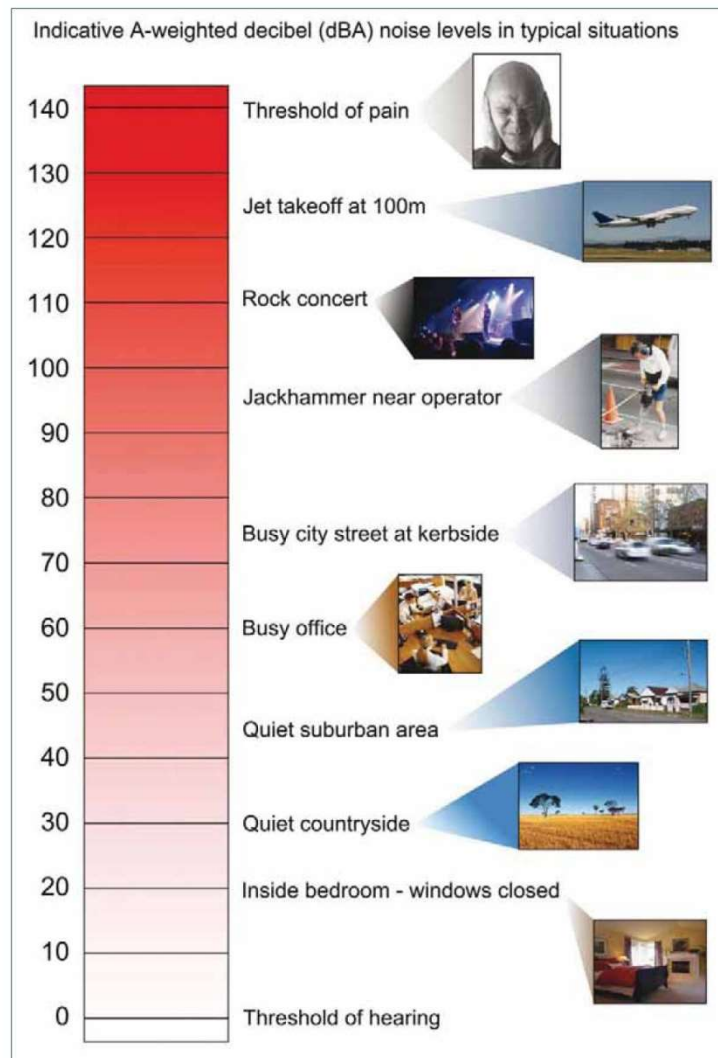
**Table A.1**      **Glossary of acoustic terms**

<b>Term</b>	<b>Description</b>
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 <sub>A1</sub>	The 'A-weighted' noise level which is exceeded 1% of the time.
L <sub>A1,1 minute</sub>	The 'A-weighted' noise level exceeded for 1% of the specified time period of 1 minute.
L <sub>A10</sub>	The 'A-weighted' noise level which is exceeded 10% of the time. It is approximately equivalent to the average of maximum noise level.
L <sub>A90</sub>	Commonly referred to as the background noise level. The 'A-weighted' noise level exceeded 90% of the time.
L <sub>Aeq</sub>	The energy average noise from a source. This is the equivalent continuous 'A-weighted' sound pressure level over a given period. The L <sub>Aeq,15 minute</sub> descriptor refers to an L <sub>Aeq</sub> noise level measured over a 15-minute period.
L <sub>Amin</sub>	The minimum 'A-weighted' noise level received during a measuring interval.
L <sub>Amax</sub>	The maximum root mean squared 'A-weighted' sound pressure level (or maximum noise level) received during a measuring interval.
L <sub>Ceq</sub>	The equivalent continuous 'C-weighted' sound pressure level over a given period. The L <sub>Ceq,15 minute</sub> descriptor refers to an L <sub>Ceq</sub> 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



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

**Figure A.1 Common noise levels**

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Appendix B

# Project approval extract

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## SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS

### NOISE

#### Noise Impact Criteria

- The Proponent **must** ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately owned land.

Table 1: Noise limits dB(A)

Day <i>L<sub>Aeq</sub>(15 min)</i>	Evening <i>L<sub>Aeq</sub>(15 min)</i>	Night		Location (as listed in Appendix 4)
		<i>L<sub>Aeq</sub>(15 min)</i>	<i>L<sub>A1</sub>(1 min)</i>	
49	49	35	49	4 – di Rocco
47	47	35	49	5 – Keighran
44	44	35	49	6 – Swan
43	43	43	50	7 – Druitt
46	46	46	50	8 – May
45	45	45	52	9 – Jeans
40	40	40	52	11 – Jeans
43	43	43	52	18 – Jeans
44	44	44	52	20 – Knight and all other Chain Valley Bay residences

Note: The location of the land referred to in Table 1 is shown on the figure in Appendix 4.

Noise generated by the project is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time-to-time). Appendix 4A 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 Proponent has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

This condition only has effect prior to recommencement of underground coal extraction at Mannering Colliery. At all other times, conditions 1 to 4 of Appendix 4B have effect in its place.

#### Noise Mitigation

- The Proponent **must** prepare a report on potential noise mitigation measures for noisy equipment and activities undertaken on the site to the satisfaction of the **Secretary**. This report must be:
  - prepared by a suitably qualified acoustic expert;
  - submitted to the **Secretary** by the end of September 2008; and
  - accompanied by an action plan for the implementation of any reasonable and feasible recommendations of the report.

#### Noise Monitoring

- The Proponent **must** prepare a Noise Monitoring Program for the project to the satisfaction of the **Secretary**. This program must:
  - be submitted to the **Secretary** by the end of September 2008;
  - be revised in consultation with the EPA and be submitted to the Secretary by the end of April 2016; and**
  - include the use of **continuous and** attended noise monitoring measures to monitor the performance of the project.

The Proponent **must** implement the approved Noise Monitoring Program as approved from time to time by the **Secretary**.

#### SUBSIDENCE

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

## APPENDIX 4A: NOISE COMPLIANCE ASSESSMENT

### Applicable Meteorological Conditions

1. The noise criteria in Tables 1 and 2 in Appendix 4B are to apply under all meteorological conditions except the following:
  - (a) wind speeds greater than 3m/s at 10 metres above ground level;
  - (b) stability category F temperature inversion conditions and wind speeds greater than 2 m/s at 10 m above ground level; or
  - (c) stability category G temperature inversion conditions.

### 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 located on the site.

### Compliance Monitoring

3. Attended monitoring is to be used to evaluate compliance with the relevant conditions of this approval.
4. This monitoring must be carried out at least once a month (at least two weeks apart) for the first 12 months following recommencement of underground coal extraction, and then quarterly thereafter, unless the Secretary directs otherwise.

*Note: The Secretary may direct that the frequency of attended monitoring increase or decrease at any time during the life of the project.*

5. Unless the Secretary agrees otherwise, 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 4B: ALTERNATE NOISE CONDITIONS

- From the recommencement of underground coal extraction at Mannering Colliery until 18 months thereafter, the Proponent **must** ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1 at any residence on privately-owned land.

*Table 1: Noise limits dB(A)*

Day <i>L<sub>Aeq</sub>(15 min)</i>	Evening <i>L<sub>Aeq</sub>(15 min)</i>	Night		Location
		<i>L<sub>Aeq</sub>(15 min)</i>	<i>L<sub>A1</sub>(1 min)</i>	
40	40	40	49	4 – di Rocco
43	43	41	49	5 – Keighran
42	42	41	49	6 – Swan
39	39	39	47	7 – Druitt
46	46	46	47	8 – May
41	41	41	51	9 – Jeans
39	39	39	49	11 – Jeans
39	39	39	51	18 – Jeans
40	40	40	51	20 – Knight and all other Chain Valley Bay residences

*Note: The location of the land referred to in Table 1 is shown on the figure in Appendix 4.*

Noise generated by the project is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time-to-time). Appendix 4A 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 Proponent has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

- Following the expiry of the 18 month period referred to in condition 1 above, the Proponent **must** ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 2 at any residence on privately-owned land.

*Table 2: Noise limits dB(A)*

Day <i>L<sub>Aeq</sub>(15 min)</i>	Evening <i>L<sub>Aeq</sub>(15 min)</i>	Night		Location
		<i>L<sub>Aeq</sub>(15 min)</i>	<i>L<sub>A1</sub>(1 min)</i>	
40	40	40	49	4 – di Rocco
41	41	41	49	5 – Keighran
41	41	41	49	6 – Swan
39	39	39	47	7 – Druitt
45	45	43	47	8 – May
41	41	41	51	9 – Jeans
39	39	39	49	11 – Jeans
39	39	39	51	18 – Jeans
40	40	40	51	20 – Knight and all other Chain Valley Bay residences

*Note: The location of the land referred to in Table 2 is shown on the figure in Appendix 4.*

Noise generated by the project is to be measured in accordance with the relevant requirements of the *NSW Industrial Noise Policy* (as may be updated from time-to-time). Appendix 4A 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 Proponent has an agreement with the owner/s of the relevant residence or land to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

3. The Proponent **must** prepare a report on all noise mitigation measures required to achieve the noise limits in Table 2 to the satisfaction of the Secretary. This report must:
  - (a) be prepared by a suitably qualified and experienced acoustic consultant whose appointment has been approved by the Secretary;
  - (b) be prepared in consultation with EPA, and submitted to the Department for approval within 6 months after recommencement of underground coal extraction; and
  - (c) include an action plan for the implementation of any reasonable and feasible recommendations of the report.

The Proponent **must** implement the noise mitigation measures prior to the expiry of the 18 month period referred to in condition 1 above.

4. The Proponent **must** prepare a Noise Compliance Report for the project to the satisfaction of the Secretary. The report must:
  - (a) be prepared by a suitably qualified acoustic consultant, whose appointment has been approved by the Secretary;
  - (b) be prepared in consultation with EPA, and be submitted for approval within 6 months of the expiry of the 18 month period referred to in condition 1 above; and
  - (c) investigate and evaluate the effectiveness of the noise mitigation measures required under condition 3 and compliance with the noise limits in Table 2.

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Appendix C

## EPL extract

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# 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

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Appendix D

# Calibration certificates

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# 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

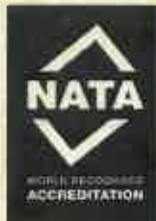
**Acu-Vib Test Procedure:** AVP10 (SLM) & AVP06 (Filters)

**CHECKED BY:** 

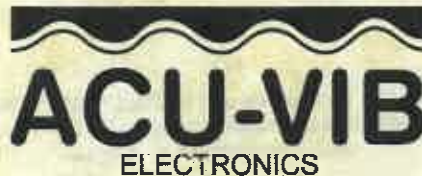
**AUTHORISED SIGNATURE:** 

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.



Accredited Lab. No. 9262  
Acoustic and Vibration  
Measurements



**HEAD OFFICE**  
Unit 14, 22 Hudson Ave. Castle Hill NSW 2154  
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Mobile: 0413 809806  
web site: [www.acu-vib.com.au](http://www.acu-vib.com.au)

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AVCERT10 Rev. 1.3 05.02.18

**CERTIFICATE OF CALIBRATION**

No: CDK1902917

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**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).

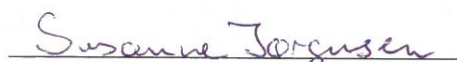
**RESULTS**

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: 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 µPa)	Frequency: (Hz)	THD&N (%)
Level 1:	NA	N	93.81	989.84	1.58
Level 2:	NA	N	NA	NA	NA
<b>Uncertainty:</b>			±0.11 dB	±0.05%	±0.20 %
Uncertainty (at 95% c.i.) k=2					

**CONDITION OF TEST:**

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

**Temperature:** 20 °C ±2° C

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

**Acu-Vib Test Procedure:** AVP02 (Calibrators)

**Test Method:** AS IEC 60942 - 2017

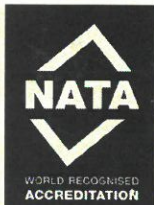
**CHECKED BY:** *[Signature]*    **AUTHORISED SIGNATURE:** .....

*[Signature]*  
Jack Kieft

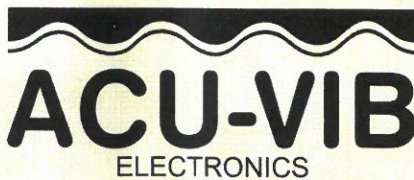
.Accredited for compliance with ISO/IEC 17025 - Calibration

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%.



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