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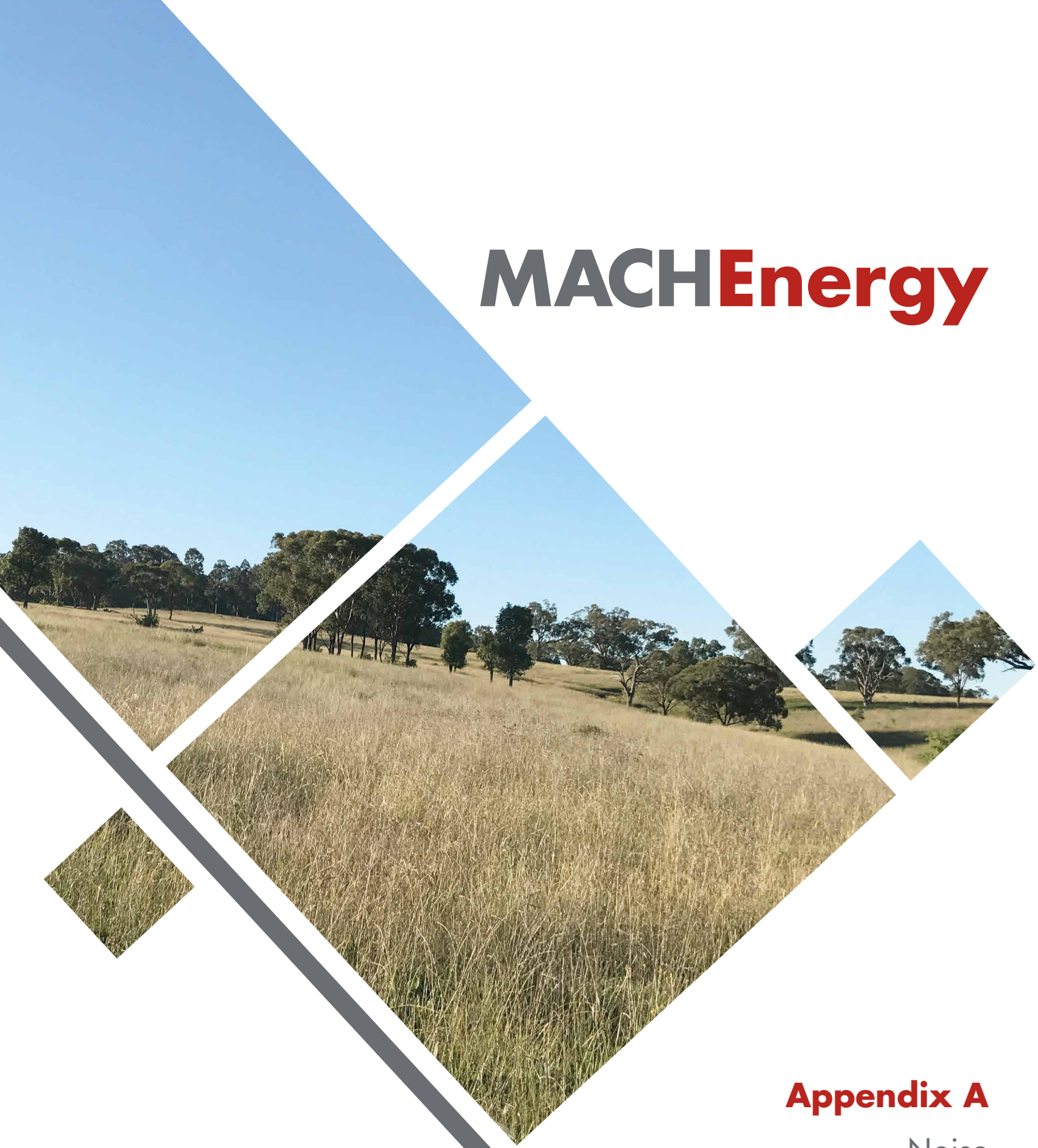

Appendix A

Noise Assessment

ACOUSTICS AND AIR

MOUNT PLEASANT OPERATION

RAIL MODIFICATION NOISE ASSESSMENT

REPORT NO. 15402-D
VERSION A

DECEMBER 2017

PREPARED FOR

MACH ENERGY AUSTRALIA PTY LTD

WILKINSON MURRAY

DOCUMENT CONTROL

Version	Status	Date	Prepared By	Reviewed By
A	Final	19 December 2017	Roman Haverkamp	Rob Bullen

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APPENDICES

1 INTRODUCTION

1.1 Overview of the Mount Pleasant Operation

The Mount Pleasant Operation Development Consent DA 92/97 was granted on 22 December 1999. The Mount Pleasant Operation was also approved under the *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) in 2012 (EPBC 2011/5795).

MACH Energy Australia Pty Ltd (MACH Energy) acquired the Mount Pleasant Operation from Coal and Allied Operations Pty Ltd (Coal & Allied) on 4 August 2016. MACH Energy commenced construction activities at the Mount Pleasant Operation in November 2016 and commenced mining operations in October 2017, in accordance with Development Consent DA 92/97 and EPBC 2011/5795.

The approved Mount Pleasant Operation includes the construction and operation of an open cut coal mine and associated rail spur and product coal loading infrastructure located approximately three kilometres (km) north-west of Muswellbrook in the Upper Hunter Valley of New South Wales (NSW) (Figures 1-1 and 1-2).

The mine is approved to produce up to 10.5 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal. Up to approximately nine trains per day of thermal coal products from the Mount Pleasant Operation will be transported by rail to the port of Newcastle for export or to domestic customers for use in electricity generation.

MACH Energy lodged a Mine Optimisation Modification (Modification 3) in 2017 with the intent to extend the permitted period of mining operations to 22 December 2026 and extend the Eastern Out of Pit Emplacement.

1.2 Overview of the Modification (Modification 4)

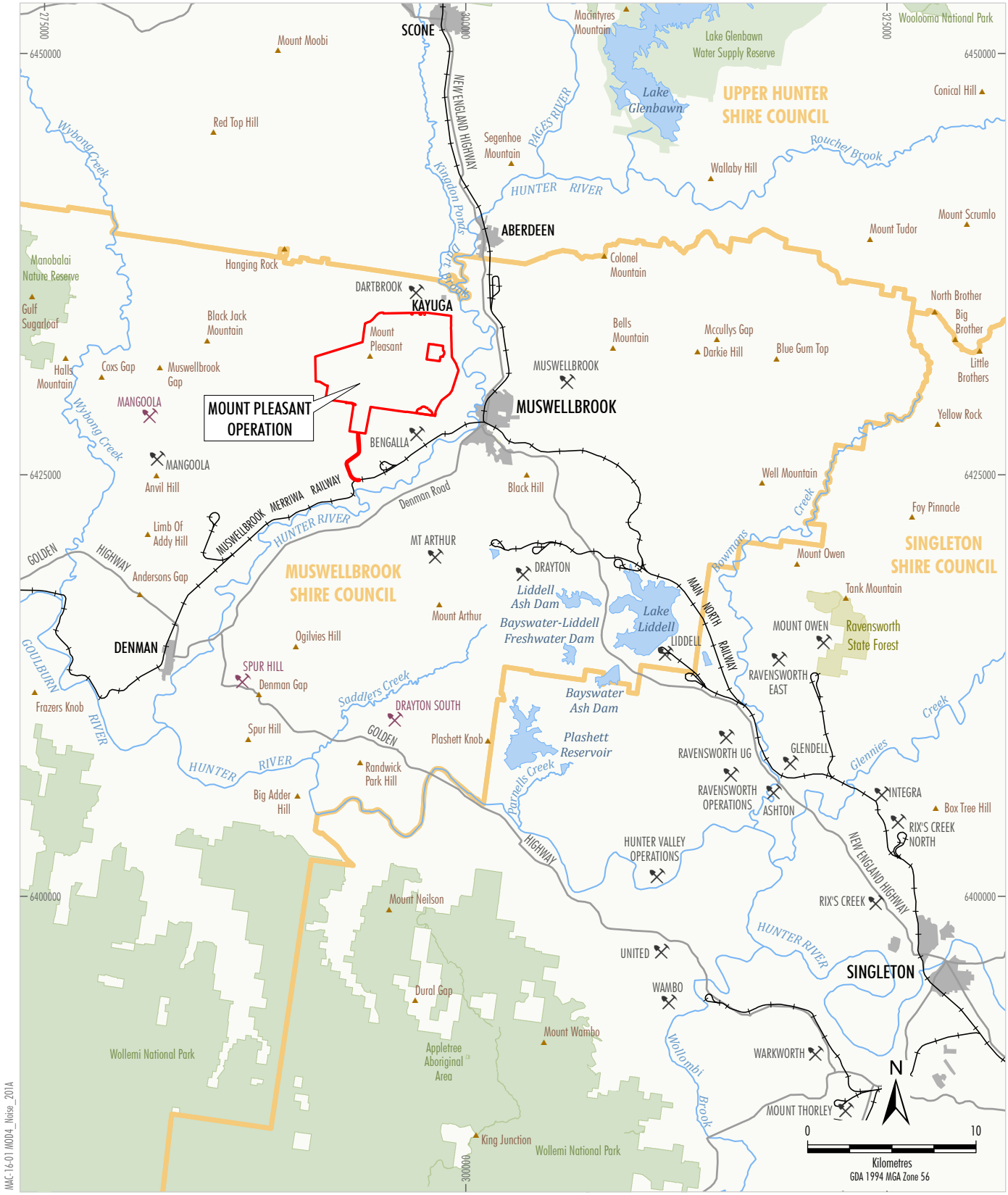
The ultimate extent of the approved Bengalla Mine open cut intersects the approved Mount Pleasant Operation rail spur.

While the intersection of the Bengalla Mine open cut with the approved Mount Pleasant Operation rail infrastructure is still some years away, MACH Energy is proposing a Rail Modification to obtain approval for future rail and/or conveyor product transport facilities to manage this future interaction.

The Rail Modification (Modification 4) would primarily comprise:

- duplication of the approved rail spur, rail loop and associated conveyor and rail loading systems;
- duplication of the Hunter River water supply pump station and associated water pipeline that currently follows the rail spur alignment; and
- demolition and removal of the redundant approved infrastructure within the extent of the Bengalla Mine, once the new rail, product loading and water supply infrastructure has been commissioned and is fully operational.

The Rail Modification would not alter the number of approved train movements on the rail network or operational workforce of the Mount Pleasant Operation.



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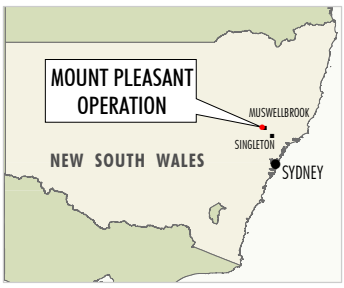

LEGEND

- Mining Operation
- Proposed Mining Operations (Application Lodged)
- Mining Lease Boundary (Mount Pleasant)
- Railway
- Local Government Boundary
- State Forest
- National Parks and Wildlife Estate

Source: Geoscience Australia (2006); NSW Division of Resources & Geoscience (2017); Land and Property Information (2017)

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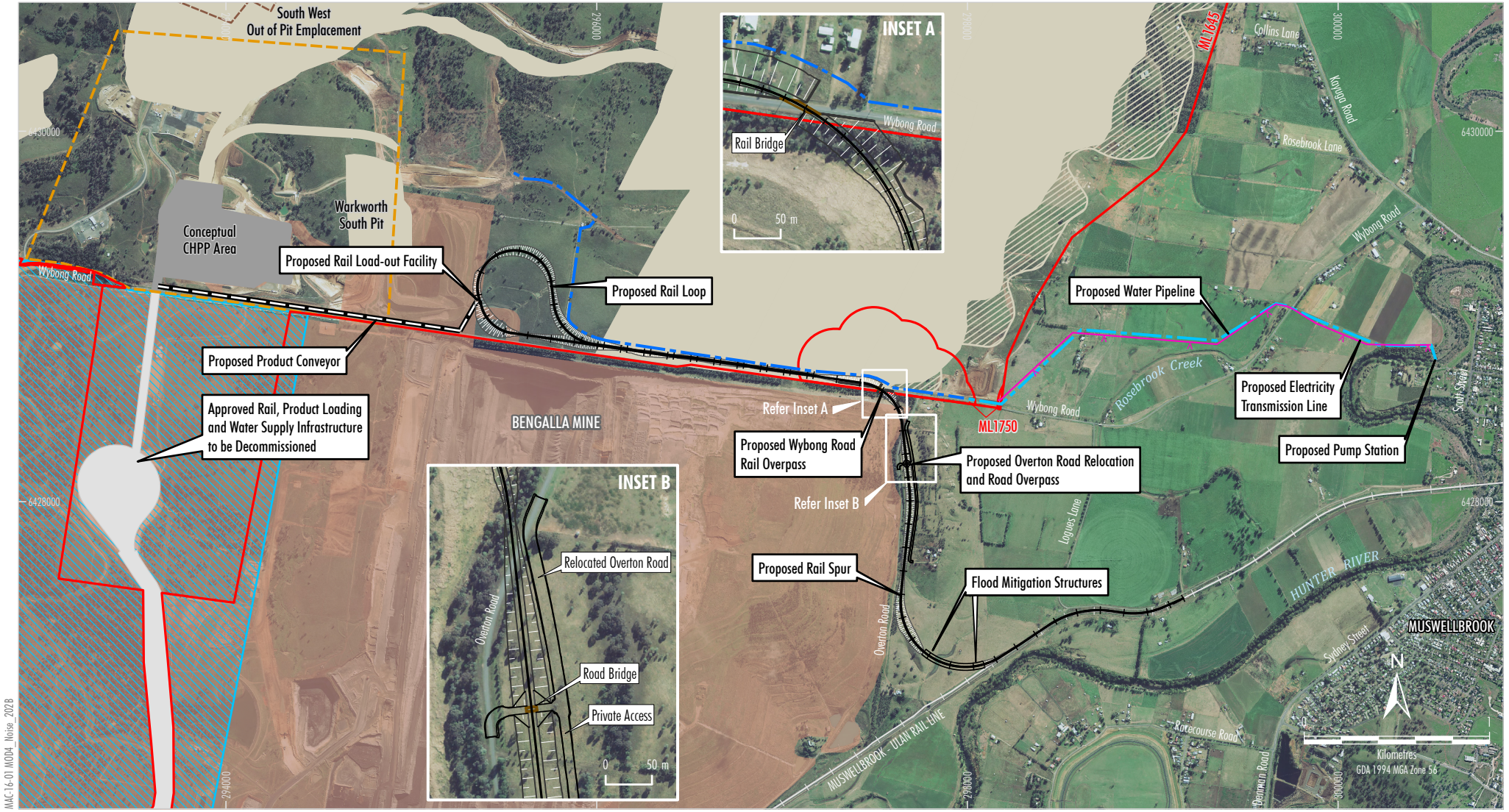
MOUNT PLEASANT OPERATION

Regional Location

Figure 1-1



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LEGEND

- Mining Lease Boundary
- Infrastructure Area Envelope
- Indicative Off-site Coal Transport Infrastructure
- Approximate Extent of Approved Surface Development (1997 EIS Year 20)*
- Conveyor/Services Corridor Envelope
- Bengalla Mine Approved Disturbance Boundary (SSD-5170)

Subject to Separate Modification (Modification 3)

- Emplacement Extension
- Area Relinquished for Overburden Emplacement and Major Infrastructure

Key Elements of the Modification #

- Proposed Rail
- Proposed Product Conveyor
- Proposed Water Pipeline - Above Ground
- Proposed Water Pipeline - Buried
- Proposed Pump Station Electricity Transmission Line

Notes:
* Excludes some project components such as water management infrastructure, infrastructure within the Infrastructure Area Envelope, off-site coal transport infrastructure, road diversions, access tracks, topsoil stockpiles, power supply, temporary offices, other ancillary works and construction disturbance.

Modification would also include additional minor components not shown, e.g. access tracks, rail signalling and electricity supply, etc.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Geoscience (2017); Department of Planning and Environment (2016); MACH Energy (2017)
Orthophoto: MACH Energy (July 2017)

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MOUNT PLEASANT OPERATION

General Arrangement of the Key Modification Elements

Figure 1-2

2 NOISE SENSITIVE RECEIVERS

2.1 Overview of Receivers Surrounding the Mount Pleasant Operation

A detailed list identifying all the above noise sensitive receivers (including Eastings and Northings in Map Grid of Australia 84 coordinates, Zone 56) is provided in Appendix B. Figure 2-1 shows all noise sensitive receivers surrounding the Mount Pleasant Operation.

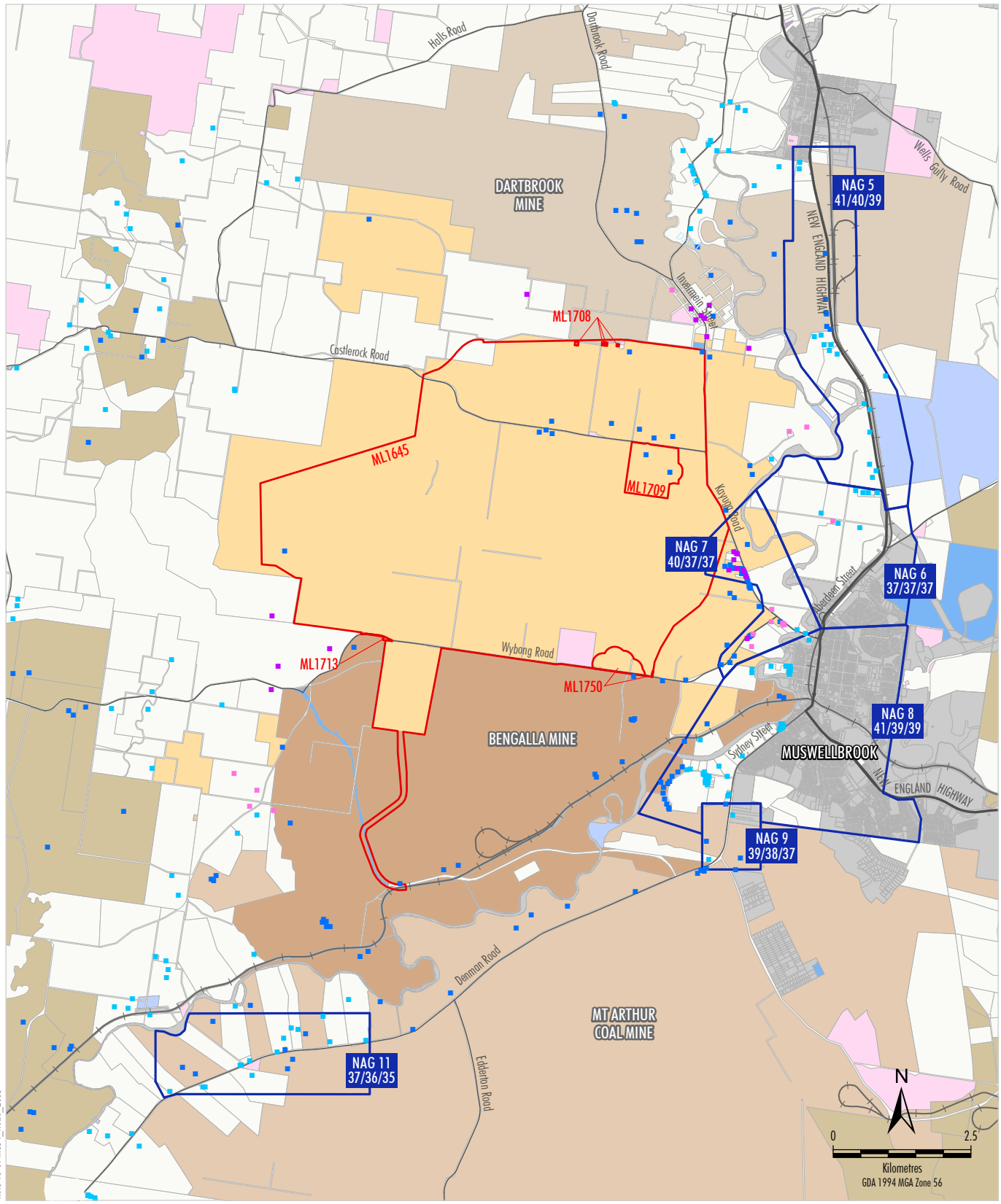
For ease of reference, privately-owned residences have been grouped into eleven (11) Noise Assessment Groups (NAGs) for previous assessments of the approved operation prior to Modification 3. The NAGs are defined in Appendix 6 of Development Consent DA 92/97.

For completeness a number of additional residences have been added for the Modification 3 noise assessment (both within and outside NAGs), based on a contemporary review of land ownership and residential receivers in the vicinity of the Mount Pleasant Operation. The dwelling verification investigation also identified that a number of locations that have previously been assessed as privately-owned dwellings do not have habitable buildings, are now commercial spaces, are now abandoned, or are now mine-owned. Figure 2-1 reflects the changes resulting from the contemporary review of surrounding land ownership and residential receivers.

The noise assessment conducted for Modification 3 also recommended that the boundary of some of the NAGs be modified to include nearby receivers and proximal land to avoid inconsistent outcomes. The revised NAGs are illustrated in Figure 2-1.

2.2 Receivers Potentially Impacted by Modification

The noise assessment considers all identified surrounding noise sensitive receivers potentially impacted by the Rail Modification. These comprise of privately-owned dwellings and mine-owned dwellings located to the east, south and south-east of the Mount Pleasant Operation. The assessment focuses on the privately-owned dwellings and mine-owned dwellings located inside NAGs 7, 8 and 9 and isolated mine-owned dwellings located to the west of NAG 8 and south of the Mount Pleasant Operation. The Rail Modification is not expected to impact on the other identified noise sensitive receivers.



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LEGEND

- Mining Lease Boundary
- Muswellbrook and Upper Hunter LEPs Zones B2, B5, IN1, SP2, R2, R5, RE1, RE2 and W1
- Crown
- Crown/State of NSW
- The State of NSW
- Muswellbrook Shire Council
- Upper Hunter Shire Council
- Mount Pleasant Controlled
- Bengalla Controlled
- Dartbrook Controlled
- Mt Arthur Controlled
- Other Mining/Resource Company Controlled
- Privately Owned Land

- Mine-owned Dwelling
- Privately-owned Residence - MPO Acquisition on Request
- Privately-owned Residence - MPO Mitigation on Request
- Other Privately-owned Residence
- Revised Noise Assessment Group (NAG)
- 37/36/35 Default NAG Noise Criteria for Day/Evening/Night

Source: NSW Land & Property Information (2017); NSW Division of Resources & Geoscience (2017)

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MOUNT PLEASANT OPERATION

Noise Sensitive Receivers and Revised Noise Assessment Groups

Figure 2-1

3 OPERATIONAL NOISE CRITERIA

3.1 Development Consent DA 92/97 Assessment Criteria

Development Consent DA 92/97 has set noise criteria for the Mount Pleasant Operation in accordance with the *NSW Industrial Noise Policy* (*INP*) (EPA, 2000).

Noise related conditions of Development Consent DA 92/97 which discuss noise criteria, acquisition criteria and additional mitigation criteria are reproduced in this section.

Where relevant reference is made in the following discussion to the 2010 Environmental Assessment (the EA) noise results (EMGA Mitchell McLennan, 2010).

3.1.1 Noise Criteria

Condition 3, Schedule 3 of Development Consent DA 92/97 requires MACH Energy to ensure that the noise generated by the development does not exceed the criteria in Table 3-1 at any residence on privately-owned land or on more than 25 percent (%) of any privately-owned land. The criteria are specified in units of A-weighted decibels (dBA).

The criteria specified in Table 3-1 do not apply to the noise-affected land subject to acquisition upon request conditions (Section 3.1.3) or if the Applicant has a written agreement with the relevant landowner to exceed the criteria, and the Applicant has advised the NSW Department of Planning and Environment (DP&E) in writing of the terms of this agreement.

Table 3-1 Noise Criteria (dBA)

Location		Day	Evening	Night	
		$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{A1,1min}$
NAG 1[1]	260, 261	37	37	37	45
	258[2]	40	40	40	45
	259	39	39	39	45
	All other privately-owned land	35	35	35	45
NAG 2	272	36	36	36	45
	All other privately-owned land	35	35	35	45
NAG 3[1]	139, 154, 240[2]	40	40	40	45
	241[2]	39	39	39	45
	All other privately-owned land	35	35	35	45
NAG 4	169	36	36	36	45
	All other privately-owned land	35	35	35	45
NAG 5	All privately-owned land	41	40	39	45
NAG 6[1]	205[2]	41	41	41	45
	203, 242[2]	40	40	40	45
	202	39	39	39	45
	204	38	38	38	45
	All other privately-owned land	37	37	37	45
NAG 7[1]	68, 74, 279[2]	43	42	42	45
	86, 290[2]	42	42	42	45
	77	42	41	41	45

	Location	Day	Evening	Night	
		$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{A1,1min}$
	79, 80, 231[3]	41	41	41	45
	78[2]	41	40	40	45
	All other privately-owned land	40	37	37	45
NAG 8	35	42	41	41	45
	289	41	40	40	45
	23, 84	40	40	40	45
	All other privately-owned land	41	39	39	45
NAG 9	All privately-owned land	39	38	37	45
NAG 10	All privately-owned land	35	35	35	45
NAG 11	All privately-owned land	37	36	35	45
	All other privately- owned land	35	35	35	45

Source: Development Consent DA 92/97
Notes:
1. The EA (EMGA Mitchell McLennan, 2010) predicted maximum noise levels of 40 dBA at receiver 257 (located in NAG 1), 39 dBA at receiver 140 (located in NAG 3), 38 dBA at receiver 198 (located in NAG 6) and 42 dBA at receiver 83 (located in NAG 7). While these EA predictions are not reflected in Table 3-1, receivers 257 and 140 are entitled to noise mitigation upon request under Development Consent DA 92/97.
2. Following a detailed investigation of land ownership as described in Section 2, it was established that these receivers are no longer present/inhabited.
3. Following a detailed investigation of land ownership as described in Section 2, receiver 231 is now characterised as receiver 526.

- To identify the locations referred to in Table 3-1, see Figure 2-1.
- Noise generated by the development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions), of the *NSW INP*.

3.1.2 Cumulative Noise Criteria

Condition 5, Schedule 3 of Development Consent DA 92/97 requires MACH Energy to implement all reasonable and feasible measures to ensure that the noise generated by the development combined with the noise generated by other mines in the area does not exceed the criteria in Table 3-2 at any residence on privately-owned land or on more than 25 % of any privately-owned land. These criteria do not apply to the noise-affected land subject to acquisition upon request conditions (Section 3.1.3).

Table 3-2 Cumulative Noise Criteria (dBA)

Location	Day	Evening	Night
	$L_{Aeq\ (period)}$	$L_{Aeq\ (period)}$	$L_{Aeq\ (period)}$
NAG 8, 9	55	45	40
All other privately-owned land	50	45	40

Source: Development Consent DA 92/97
Notes:

- To identify the locations referred to in Table 3-2, see Figure 2-1; and
- Cumulative noise is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the *NSW INP*.

3.1.3 Acquisition Criteria

Condition 1, Schedule 3 of Development Consent DA 92/97 requires MACH Energy, upon receiving a written request for acquisition from the owner of the land listed in Table 3-3, to acquire the land in accordance with the procedures in Condition 6 and Condition 7 of Schedule 4.

Table 3-3 Land Subject to Acquisition upon Request

Receiver	Receiver
43, 44 - J.B. Moore	143, 161, ~~237~~[2] - J.S. & N.M. Lonergan
45 - B.A. & T.E. Strachan	147 - M.J. & R.G. Adnum
47 - B.L. & M.L. Bates	156 - J.E. & J.L. Lonergan
67 - J.M. Simpson	158 - J.M. Hoath
96 - R.P. Grey	159, ~~236~~[2] - J.E. & M.S. Ducey
~~101 - C. Austin~~[1] (MACH Energy)	~~129 – R.M. & S.D. Fanell~~[1] (MACH Energy)
102 - A. Mather	~~130 – M.J. Farrell~~[1] (MACH Energy)
~~107 – B.L. Wilton~~[1] (MACH Energy)	~~135, 309 – K.J. & G.M. Yore~~[1] (MACH Energy)
108 - J.S. Gibson	~~146 – C.R & N.J. Hoath~~[2]
112 - B.D. Barry	153 - G.M. Casey
118 - J. & C. Hayes	157 - R.B. Parkinson & S.A. Peberdy
120, 308 - D.L. & P.A. Moore	~~229 – C. Horne~~[2]
121 - C & J.M. Moore	~~263 – R.R. & J.M. Hamilton~~[1] (MACH Energy)
~~137, 138 A – D.H. MacIntyre~~[2]	~~C – P.M. Yore~~[1] (MACH Energy)
~~D – S. Yore~~[1] (MACH Energy)	-

After: Development Consent DA 92/97
Notes:

- To identify the locations referred to in Table 3-3, see Figure 2-1; and
- All land is noise affected, except receiver 67 which is air quality affected.

1. It is noted that these receivers are now owned by MACH Energy.
2. It is noted that following investigation, no dwellings appear to be present at the locations of these previously identified receivers (e.g. habitable building not present, building abandoned, or building used for commercial purposes).

Condition 4, Schedule 3 of Development Consent DA 92/97 requires MACH Energy to acquire the relevant land in Table 3-4 in accordance with the procedures in Condition 6 and Condition 7 of Schedule 4, if:

- the noise generated by the Mount Pleasant Operation exceeds the criteria in Table 3-4 at any residence on privately-owned land or on more than 25 % of any privately-owned land; and
- MACH Energy receives a written request for acquisition from the landowner.

Table 3-4 Noise Acquisition Criteria (dBA)

Location	Day	Evening	Night
	$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{Aeq,15min}$
All privately-owned land in NAG 1, NAG 2, NAG 3, NAG 4, and NAG 10	40	40	40
All privately-owned land in NAG 5	46	45	44
All privately-owned land in NAG 6	42	42	42
All privately-owned land in NAG 7	45	42	42
All privately-owned land in NAG 8	46	44	44
All privately-owned land in NAG 9	44	43	42
All privately-owned land in NAG 11	42	41	40
All other privately-owned land	40	40	40

Source: Development Consent DA 92/97
Notes:
- To identify the locations referred to in Table 3-4, see Figure 2-1;
- Noise generated by the development is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions), of the *NSW INP*; and
- For this condition to apply, the exceedances of the criteria must be systematic.

Condition 6, Schedule 3 of Development Consent DA 92/97 requires MACH Energy to acquire the land in Table 3-5 on as equitable a basis as possible with the relevant mines in accordance with the procedures in Condition 6 and Condition 7 of Schedule 4, if:

- the noise generated by the Mount Pleasant Operation combined with the noise generated by other mines in the area exceeds the criteria in Table 3-5 at any residence on privately-owned land or on more than 25 % of privately-owned land; and
- MACH Energy receives a written request for acquisition from the landowner.

Table 3-5 Cumulative Noise Acquisition Criteria (dBA)

Location	Day	Evening	Night
	$L_{Aeq\ (period)}$	$L_{Aeq\ (period)}$	$L_{Aeq\ (period)}$
NAG 8, 9	60	50	45
All other privately-owned land	55	50	45

Source: Development Consent DA 92/97
Notes:
- To identify the locations referred to in Table 3-5, see Figure 2-1;
- Cumulative noise is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions), of the *NSW INP*; and
- For this condition to apply, the exceedances of the criteria must be systematic.

3.1.4 Additional Mitigation Criteria

Condition 2, Schedule 3 of Development Consent DA 92/97 requires MACH Energy, upon receiving a written request from the owner of any residence on the land listed in Table 3-6 or Table 3-3, to implement additional noise and/or dust mitigation measures (such as double-glazing, insulation, air filters, first flush roof water drainage system and/or air conditioning) at the residence in consultation with the landowner. These measures must be reasonable and feasible and related to the noise and/or dust impacts on the residence.

Table 3-6 Land where Additional Noise Mitigation Measures are Available on Request

Receiver	Receiver
68 - Googe	203 - Millard
74 - Sormaz	~~205 – Dapkos Pty Ltd~~[1]
77 - Purser	~~231~~ 526 – Wicks[2]
~~78~~[1], 80 - W.J. Adnum	~~240 – MacIntyre~~[1]
79 - W.J. & D.W. Adnum	~~242 – Raphael~~[1]
86, ~~290~~[1] - Cowtime Investments Pty Ltd	257 - Lane
139 - Upton	258 - Ellis
140 - Dapkos Pty Limited	259 - Peel
154 – Standing	~~279 – Parkinson~~[1]

After: Development Consent DA 92/97
Notes:

- To identify the locations referred to in Table 3-6, see Figure 2-1.

1. It is noted that following investigation, no dwellings appear to be present at the locations of these previously identified receivers (e.g. habitable building not present, building abandoned, or building used for commercial purposes).
2. It is noted that this receiver number was revised following the dwelling investigation completed for Modification 3.

The Consent Condition also states that if within three (3) months of receiving this request from the owner, MACH Energy and the owner 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.

3.2 Proposed Changes to Development Consent DA 92/97 Assessment Criteria

As described in the noise assessment for Modification 3, some of the noise criteria set in Development Consent DA 92/97 are considered to have resulted from processing or transcription errors and some new receivers have also been identified. Therefore, some changes are proposed to provide noise criteria consistent with the Development Consent DA 92/97 noise criteria for all receivers identified in the recent verification process conducted by MACH Energy.

The proposed changes include:

- updating Table 3 of Development Consent DA 92/97 as per the Note 1 of Table 3-1, that is ensuring that specific criteria are included for receivers 83, 140, 198 and 257 based on the predicted noise levels described in the EA;
- including receiver 136 in Table 1 of Development Consent DA 92/97 (land subject to acquisition upon request) based on previous predictions for neighbouring properties;
- updating Table 3 of Development Consent DA 92/97 with specific criteria for newly identified (additional) receivers 35b, 86b, 140c, 195d, 258a and 526; and
- updating Tables 1, 2 and 3 of Development Consent DA 92/97 with regard to the current land ownership and dwelling presence/habitability status, as annotated on Tables 3-1, 3-3 and 3-6.

Tables 3-7 to 3-9 summarise the proposed noise criteria and land subject to additional mitigation or acquisition upon request to be included in Development Consent DA 92/97. In addition, it is suggested that NAGs should be deleted where the default NAG criteria are consistent with the lowest available project-specific noise criteria under the *NSW INP* (Table 3-9).

Table 3-7 Proposed Land Subject to Acquisition upon Request

Receiver	Receiver
43, 44 - J.B. Moore	121 - C & J.M. Moore
45 - B.A. & T.E. Strachan	136 - D.G. Yore
47 - B.L. & M.L. Bates	143, 161 - J.S. & N.M. Lonergan
67 - J.M. Simpson	147 - M.J. & R.G. Adnum
96 - R.P. Grey	156 - J.E. & J.L. Lonergan
102 - A. Mather	158 - J.M. Hoath
108 - J.S. Gibson	159 - J.E. & M.S. Ducey
112 - B.D. Barry	153 - G.M. Casey
118 - J. & C. Hayes	157 - R.B. Parkinson & S.A. Peberdy
120, 308 - D.L. & P.A. Moore	

Note:
- Updated receivers are highlighted in green. Receivers that have been identified as no longer present or inhabitable based on the dwelling verification investigation, or are now mine-owned, have been removed.

Table 3-8 Proposed Land Subject to Additional Noise and/or Air Quality Mitigation Measures upon Request

Receiver	Receiver
68 - Googe	140, 140c - Dapkos Pty Limited
74 - Sormaz	154 - Standing
77 - Purser	203 - Millard
80 - W.J. Adnum	257 - Lane
79 - W.J. & D.W. Adnum	258 - Ellis
86 - Cowtime Investments Pty Ltd	259 - Peel
139 - Upton	526 - Wicks

Note:
- Updated receivers are highlighted in green. Receivers that have been identified as no longer present or inhabitable based on the dwelling verification investigation, or are now mine-owned, have been removed.

Table 3-9 Proposed Noise Criteria (dBA)

Location		Day	Evening	Night	
		$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{Aeq,15min}$	$L_{A1,1min}$
N/A[1]	139, 154, 257, 258a	40	40	40	45
	140, 259	39	39	39	45
	260, 261	37	37	37	45
	169, 272	36	36	36	45
NAG 5	All privately-owned land[2]	41	40	39	45
NAG 6	140c	41	41	41	45
	203	40	40	40	45
	86b, 202	39	39	39	45
	198, 204	38	38	38	45
	All other privately-owned land	37	37	37	45
NAG 7	68, 74	43	42	42	45
	86	42	42	42	45
	77	42	41	41	45
	79, 80, 526	41	41	41	45
	83	40	39	39	45
	All other privately-owned land	40	37	37	45
NAG 8	35, 35b	42	41	41	45
	289	41	40	40	45
	23, 84	40	40	40	45
	All other privately-owned land	41	39	39	45
NAG 9	All privately-owned land	39	38	37	45
NAG 11	All privately-owned land	37	36	35	45
	All other privately-owned land	35	35	35	45

Notes:

- Updated receivers are highlighted in green. Receivers that have been identified as no longer present or inhabitable based on the dwelling verification investigation, or are now mine-owned, have been removed. NAGs are as per the recommendations described in Section 2 of the noise assessment for the Mine Optimisation Modification.

1. As described in Section 2 of the noise assessment for the Mine Optimisation Modification, it is recommended that NAGs with default criteria of 35 dBA (all periods) should be removed (i.e. NAGs 1, 2, 3, 4 and 10) as they do not represent areas with elevated default noise criteria.
2. Inclusive of additional receiver 195d.

3.3 NSW Government Voluntary Land Acquisition and Mitigation Policy

In 2014, the NSW Government released the *Voluntary Land Acquisition and Mitigation Policy* (DP&E, 2014). This guideline provides some useful context in regard to characterising the practical implications of exceedances of the *NSW INP* criteria (Table 3-10) and the application of the *NSW INP* to the assessment of noise on vacant land.

Table 3-10 Characterisation of Noise Impacts & Potential Treatments

Residual Noise Exceeds INP Criteria By	Characterisation of Impacts	Potential Treatment
0-2dB(A) above the project-specific noise level (PSNL)	Impacts are considered to be **negligible**	The exceedances would not be discernible by the average listener and therefore would not warrant receiver based treatments or controls.
3-5dB(A) above the PSNL in the INP but the development would contribute less than 1dB to the total industrial noise level	Impacts are considered to be **marginal**	Provide mechanical ventilation/comfort condition systems to enable windows to be closed without compromising internal air quality/amenity.
3-5dB(A) above the PSNL in the INP and the development would contribute more than1dB to the total industrial noise level	Impacts are considered to be **moderate**	As for marginal impacts but also upgraded façade elements like windows, doors, roof insulation etc. to further increase the ability of the building façade to noise levels.
>5dB(A) above the PSNL in the INP	Impacts are considered to be **significant**	Provide mitigation as for moderate impacts and see voluntary land acquisition provisions below.

Source: DP&E (2014)
Note:
- dB = decibels.

3.4 Background Noise Survey

It should be noted that in accordance with the *NSW INP*, PSNLs or noise criteria are established as an emergence over background noise levels (i.e. background noise level + 5 dB) which would normally require a background noise survey in the vicinity of the site and surrounding noise sensitive receivers.

However, it is considered that no background noise monitoring was warranted for the Rail Modification since Mount Pleasant Operation noise criteria are already set in Development Consent DA 92/97 for both individual receivers and all other receivers in the NAGs (Section 3.1).

3.5 Modifying Factor Adjustments

Where a noise source contains certain annoying characteristics, such as low frequency noise, the *NSW INP* states that a penalty should be applied to measured or predicted noise levels before comparing to the relevant criteria.

Once the Mount Pleasant Operation is operational, monitoring results would be assessed with respect to modifying factors (including for low frequency noise) in accordance with the approved Noise Management Plan. If noise generated by the Mount Pleasant Operation is found to contain annoying characteristics (such as dominant low frequency content), the appropriate modifying factor would be applied to measured noise levels and assessed against noise criteria.

4 ASSESSMENT METHODOLOGY

4.1 General Methodology

In order to understand potential noise impacts associated with the Rail Modification, the noise model prepared for Modification 3 was revised to include the proposed changes.

Based on the planned mine sequence of the Mount Pleasant Operation, the geographic spread of operations in consideration of the proximity to nearby noise sensitive receivers, and maximum operational material movements in the schedule, three (3) scenarios had been selected to represent Modification 3, namely Years 2018, 2021 and 2025.

The proposed Modification, if approved, would commence construction by first quarter (Q1) 2020 and would take 12 to 18 months, and therefore assessment year 2021 was used as the basis for modelling the operational noise implications of the Rail Modification.

Because the section of rail spur located within the mining leases of the site is of a material length, three (3) rail scenarios were evaluated:

1. Train loading (train load-out bin operating and locomotives slowly moving around the rail loop);
2. Train loading + train waiting (train load-out bin operating, locomotives of first train slowly moving around the rail loop, and locomotives of second train waiting on rail spur section within the mining leases of the site); and
3. Train approaching and loading (train approaching the rail loop on rail spur section within the mining leases of the site followed by the loading process involving the train load-out bin and locomotives slowly moving around the rail loop).

Modelling has shown that the scenario with a train approaching and loading would generate the highest operational noise levels and compliance with this scenario would indicate compliance with the other two (2) scenarios. Therefore, the first two (2) scenarios require no further assessment.

The assessment models the total noise at each relevant receiver from the operation of the Mount Pleasant Operation incorporating the Rail Modification. Total predicted operational noise levels are then compared against the relevant noise criteria set in Development Consent DA 92/97 (Section 3.1) to determine whether the Mount Pleasant Operation incorporating the Rail Modification would trigger any noise exceedances.

The infrastructure and rail movements associated with the Rail Modification would be operating on a 24-hour and seven-day basis. Therefore, noise levels associated with the Rail Modification were predicted for the day (7.00 am-6.00 pm), evening (6.00 pm-10.00 pm) and night (10.00 pm-7.00 am) assessment periods.

Noise associated with the duplication of the Hunter River water supply pump station and associated water pipeline was addressed as part of this assessment. Given the distance separating the proposed water supply pump station and the closest receivers and the fact that the pumps will either be submerged inside wells or enclosed inside the pump station building, no noise impact is expected to result from the operation of the water supply pump station. Operational noise associated with the proposed the water supply pump station is therefore not further discussed as part of this assessment.

4.2 Noise Model Procedures

Operational noise levels at nearby receivers have been calculated using the Environmental Noise Model (ENM) (a proprietary computer program from RTA Technology Pty Ltd). This modelling software is recommended by the *NSW INP* and has been previously accepted by the NSW Environmental Protection Authority (EPA) for use in environmental noise assessments.

The ENM takes account of the location of nearby noise sensitive receivers and surrounding terrain. In addition, the model takes into account noise attenuation due to geometric spreading of sound over distance, atmospheric absorption, shielding and the effect of acoustically soft ground. It can also be used to predict noise levels under various meteorological conditions, defined by a combination of temperature gradient, wind speed and wind direction.

4.3 Meteorological Conditions

The *NSW INP* generally directs the use of a single set of adverse meteorological data to use in the assessment of noise impacts. However, the assessment adopts a more rigorous approach where noise levels at sensitive receivers are calculated under a varied set of existing meteorological conditions (wind speed and direction and temperature inversion strength), using data obtained from the CALMET meteorological model for the Mount Pleasant Operation. Measured statistical occurrences of these conditions over a discrete period are then applied to the results, and a 10^{th} percentile exceedance level calculated (i.e. the level that is exceeded 10% of the time), which is then compared with relevant criteria.

For consistency reasons, the meteorological data used for the Modification 3 noise assessment was also used for the Rail Modification.

4.4 Noise Sources Associated with Modification Operations

Operational noise associated with the Mount Pleasant Operation incorporating the Rail Modification was calculated based on the same sound power levels (SWLs) as used for Modification 3. Indicative SWLs for the relocated rail infrastructure items and rail movements relevant to the Rail Modification are reproduced in Table 4-1 for ease of reference.

Table 4-1 Indicative Sound Power Levels and Number of Plant Items

Fleet/ Infrastructure Item	Location/Function	Number of Equipment	Sound Power Level L_{Aeq} (dBA)
Train Load-out Bin	Infrastructure area	1	103
Overland Conveyor system	Infrastructure area	-	83/m (enclosed but conveyor idlers unmitigated)
Locomotive (train loading)	Rail loop	3	101
Locomotive (train approaching rail loop at 40 km per hour [km/hr])	Rail spur	3	117
96 Wagons (train approaching rail loop at 40 km/hr)	Rail spur	-	125

5 OPERATIONAL NOISE ASSESSMENT

5.1 Operational Noise

The 10th percentile $L_{Aeq,15min}$ intrusive noise levels and levels under calm isothermal conditions for the day, evening and night time assessment periods were calculated using the ENM for each of the noise sensitive residential receivers described in Section 2.2. The relevant mine-owned receivers are included for the purpose of information for MACH Energy only.

Predicted noise levels associated with the Mount Pleasant Operation incorporating the Rail Modification are included in Appendix C. Noise levels presented are rounded to the nearest dBA, and where appropriate, incorporate the identified pro-active and reactive mitigation measures described in the Modification 3 noise assessment (e.g. ceasing operation of a small number of noisy mobile mining equipment, such as drills). Note that only the receivers with predicted exceedances (in the absence of pro-active and reactive mitigation measures) are presented as mitigated. The implementation of pro-active and reactive mitigation measures would also benefit other receivers surrounding the Mount Pleasant Operation.

In order to understand if, and by how much, noise levels have increased with the proposed Modification, the 2021 noise predictions reported as part of the Modification 3 noise assessment have also been included in the Appendix C table of predictions. Appendix C shows that 10th percentile exceedance levels increase by up to 1 dB at some of the identified privately-owned receivers. Such an increase in noise levels is considered negligible and would be undetectable to the human ear.

It should be noted that for some of the privately-owned receivers, the noise levels presented in Appendix C show lower levels for Modification 4 than for Modification 3. This is due to the fact that for those receivers, noise predictions associated with Modification 4 relate to noise levels with integrated pro-active and reactive management measures in place whilst Modification 3 predictions relate to noise levels in the absence of pro-active and reactive mitigation measures.

Appendix C indicates that predicted noise levels associated with the Mount Pleasant Operation incorporating the Rail Modification would comply with the noise criteria set in Development Consent DA 92/97 when considering the identified pro-active and reactive mitigation measures described in the Modification 3 noise assessment and the proposed changes to the Consent criteria (Section 3.2).

5.2 Cumulative Noise

If approved, the Mount Pleasant Operation incorporating the Rail Modification would operate concurrently with the Mt Arthur Coal Mine, the Bengalla Mine, the Muswellbrook Coal Mine and the Dartbrook Mine (should it re-commence). In this event, receivers may potentially be exposed to noise from all five (5) industrial sources simultaneously.

The assessment of cumulative impacts considers the total and relative noise contributions from the Mount Pleasant Operation incorporating the Rail Modification, and the following neighbouring mines (all shown on Figure 1-1):

- Mt Arthur Coal Mine – Project Approval 09_0062 MOD 1, approved in 2014.
- Bengalla Mine – Project Approval SSD-5170, approved in 2015.
- Dartbrook Mine – Project Approval MOD 129-8-2005, approved in 2005.
- Muswellbrook Coal Mine – Development Application 205/2002, approved in 2016.

The contribution of noise from the Mt Arthur Coal Mine, the Bengalla Mine, the Muswellbrook Coal Mine and the Dartbrook Mine has been taken from predictions of noise emissions included in the following documents:

- *Mt Arthur Coal Open Cut Modification – Noise and Blasting Assessment* prepared by Wilkinson Murray (2013).
- *Bengalla Continuation of Mining Project – Acoustic Impact Assessment* prepared by Bridges Acoustics (2013).
- *Proposed Modification to the Dartbrook Coal Mine Development Consent – Assessment Report* prepared by NSW Department of Planning (2005).
- *Muswellbrook Coal Continuation Project Noise and Vibration Impact Assessment* prepared by EMM Consulting (2016).

It should be noted that subsequent modifications for the above projects were also considered as part of the cumulative noise assessment and it was found they resulted in no material changes to the above assessments relevant to the assessment of the Rail Modification.

The methodology used for assessment of cumulative impacts was to logarithmically sum the predicted day, evening and night time noise levels for each mine for key receivers. The overall cumulative noise levels are then reported against the cumulative noise criteria set in Development Consent DA 92/97 (Table 3-2).

With regards to the Muswellbrook Coal Mine, the western-most receiver modelled (EMM Consulting, 2016) is further to the east than the eastern-most receiver modelled for the Rail Modification. The two (2) assessments therefore do not have any modelled sensitive receivers in common. However, review of the predicted noise levels at the closest receivers suggests cumulative noise levels including the Muswellbrook Coal Mine would easily comply with the relevant criteria.

The assessment of cumulative noise impacts is undertaken in consideration of the average L_{Aeq} noise level over the entire daytime period (7.00 am to 6.00 pm, a period of eleven [11] hours), evening period (6.00 pm to 10.00 pm, a period of four [4] hours) and night period (10.00 pm to 7.00 am, a period of nine [9] hours), rather than the 10^{th} percentile $L_{Aeq,15min}$ noise level within that period as is required for the assessment of operational noise impacts (Section 5.1). Noise predictions associated with the Mount Pleasant Operation incorporating the Rail Modification represent $L_{Aeq,period}$ levels as calculated using the ENM. Because no $L_{Aeq,period}$ levels were readily available for the other identified mines, the reported $L_{Aeq,15min}$ noise levels were conservatively converted to $L_{Aeq,period}$ levels by subtracting 3 dB.

For the purposes of cumulative assessment, the closest available corresponding noise prediction years for the three (3) other mining projects were selected. Only one set of predictions were available for the Dartbrook Mine, therefore these predictions were assumed for the 2021 cumulative assessment year. The summation of the various noise predictions used for the cumulative assessment is summarised below:

- Cumulative Year 2021 = Modification (Year 2021) + Mt Arthur Coal Mine (Year 2022) + Bengalla Mine (Year 8) + Dartbrook Mine.

Assessment of cumulative impacts was undertaken for all identified privately-owned receivers at which there is predicted noise level data for the Rail Modification and where relevant the Mt Arthur Coal Mine, the Bengalla Mine or the Dartbrook Mine. Noise predictions for those receivers were based on point source calculations. The predicted cumulative noise levels are presented in Appendix D.

The predicted noise levels from the Mount Pleasant Operation incorporating the Rail Modification relate to the $L_{Aeq,period}$ noise levels averaged over all recorded meteorological conditions over all day, evening or night periods within the worst case season.

Appendix D indicates that all cumulative noise predictions with the Rail Modification comply with the cumulative noise criteria set in Development Consent DA 92/97 (Table 3-2). Predicted levels would also comply with the cumulative noise acquisition criteria set in Development Consent DA 92/97 (Table 3-5).

It should also be noted that cumulative noise levels with the proposed Modification are found to increase by up to 1 dB at some of the identified privately-owned receivers. Such an increase in noise levels is considered negligible and would be undetectable to the human ear.

5.3 Potential for Sleep Disturbance

The noise model was also used to analyse potential L_{Amax} noise levels likely to arise from the Rail Modification. The instantaneous noise sources and their typical L_{Amax} SWL that may have the potential to disturb sleep can be summarised as follows:

- Train Load-out bin 114 dBA L_{Amax}
- Bunching and stretching of trains on rail spur 119 dBA L_{Amax}

Bunching and stretching noise associated with trains travelling along the spur has conservatively been addressed as part of this sleep disturbance assessment. It is function of how well maintained the rolling stock used by the Mount Pleasant Operation is and does not necessarily occur.

The predicted night time L_{Amax} noise levels at the identified receivers are presented in Appendix E and rounded to the nearest dBA. The predictions are based on 10th percentile exceedance levels. Sleep arousal noise predictions would generally be lower than those presented in Appendix E.

L_{Amax} noise levels are compared with the Development Consent DA 92/97 $L_{A1,1min}$ criterion of 45 dBA. Mine-owned receivers are included for the purpose of information only for MACH Energy.

Review of the noise predictions presented in Appendix E indicates that L_{Amax} noise levels due to night operations from the Mount Pleasant Operation incorporating the Rail Modification are predicted to be below the $L_{A1,1min}$ criterion set in Development Consent DA 92/97 at all privately-owned receivers.

5.4 Vacant Land Assessment

A contemporary assessment of potential impacts on vacant land has been conducted in accordance with the NSW Government's *Voluntary Land Acquisition and Mitigation Policy* (DP&E, 2014). Under the policy, landowners are eligible for voluntary land acquisition rights when noise generated by the development contributes to exceedances of the recommended maximum noise levels in Table 2.1 of the NSW *INP* on more than 25% of privately owned land, and a dwelling could be built on that land under existing planning controls.

The vacant land assessment noise criteria, based on the recommended maximum noise levels in Table 2.1 of the NSW *INP*, are summarised in Table 5-1. The criteria apply to $L_{Aeq,Period}$ noise levels as opposed to $L_{Aeq,15min}$ noise levels.

Table 5-1 Vacant Land Assessment Noise Criteria

Indicative Noise Amenity Area	Time of Day	Vacant Land Assessment Criteria (dBA)
Rural	Day	55 $L_{eq,11hr}$
	Evening	50 $L_{eq,4hr}$
	Night	45 $L_{eq,9hr}$
Suburban	Day	60 $L_{eq,11hr}$
	Evening	50 $L_{eq,4hr}$
	Night	45 $L_{eq,9hr}$
Urban	Day	65 $L_{eq,11hr}$
	Evening	55 $L_{eq,4hr}$
	Night	50 $L_{eq,9hr}$

The vacant land assessment for the Rail Modification was based on noise contours generated for Modification 3 and the difference in noise predictions between Modification 3 and the Rail Modification at the south-east receivers. To be conservative, the vacant land assessment was conducted against the more stringent night time vacant land assessment criteria and no correction was applied to account for the fact that the assessment is based on $L_{Aeq,Period}$ noise levels as opposed to $L_{Aeq,15min}$ noise levels (i.e. in the mining sector, $L_{Aeq,15min}$ noise levels are conservatively converted to $L_{Aeq,period}$ levels by subtracting 3 dB).

Based on the conservative methodology described above, no exceedances were found on any privately-owned vacant land.

6 CONSTRUCTION NOISE & VIBRATION

Construction of the rail infrastructure, rail spur, and the Hunter River water supply pump station and associated water pipeline may potentially impact on the surrounding community and needs to be addressed as part of this assessment.

6.1 Construction Noise in the Vicinity of the Mount Pleasant Operation

6.1.1 Description of Construction Activities

Construction/development activities in the vicinity of the Mount Pleasant Operation consist of two (2) major construction components requiring two (2) separate mobile fleets:

- construction of the rail infrastructure including conveyor system, load-out bin and rail loop (up to approximately 12 months); and
- construction of the rail spur adjoining rail loop and inside the mining leases of the site (up to approximately 12 months).

An indicative construction fleet for both construction components, and corresponding SWLs, is summarised in Table 6-1.

Table 6-1 Indicative Noise Sources & Sound Power Levels - Construction in Vicinity of Mount Pleasant Operation

Construction Component	Number of Item(s)	Item Description	Indicative Sound Power Level per Item (dBA)
Construction of rail infrastructure (conveyor system, load out bin, and rail loop)	1	Piling Rig	115
	1	Mobile Crane	112
	1	Dozer	116
	2	Truck	108
	1	Excavator	112
	1	Grader	112
	1	Compactor	108
	1	Water Cart	112
Construction of rail spur adjoining to rail loop (inside mining leases of the site)	2	Scraper	108
	1	Dozer	116
	1	60-70 t Excavator	111
	2	Articulated Truck	110
	1	Grader	112
	1	Water Cart	112
	1	Compactor	108

Construction/development activities within the Mount Pleasant Operation mining leases would be undertaken up to 24 hrs per day, seven days per week. However, construction/development activities with the potential to generate material noise at privately-owned receivers in the vicinity of the Project would generally take place during daytime hours (7.00 am to 6.00 pm).

A correction of -5 dB was applied to the total sound power level for each construction component to account for time correction, as the entire construction fleet would not always operate concurrently (i.e. all plant items are not expected to be operating all the time).

The estimated total SWL from the concurrent operation of all construction plant is 117 dBA and 116 dBA for the construction of the rail infrastructure (conveyor system, load-out bin and rail loop) and the rail spur (adjoining the rail loop and within the mining leases of the site), respectively.

6.1.2 Assessment Methodology

Noise from construction/development activities in the vicinity of the mine site was predicted using the ENM.

As perceived by receivers in the vicinity of the Rail Modification, noise from activities associated with the construction of the rail infrastructure, rail loop and rail spur section within the mining leases of the site would largely be indistinguishable from operational mining activities given that similar plant would be deployed and that construction activities would occur in areas adjacent to operational mining activities. Therefore, the noise criteria set in Development Consent DA 92/97 (Table 3-1) are used to assess compliance of construction noise in the vicinity of the mine site.

The construction of the rail infrastructure and rail spur section within the mining leases is expected to take up to approximately 12 months and as such, it was conservatively assumed both construction components would occur simultaneously.

Predicted construction noise levels have been combined with the predicted operational noise levels of the Mount Pleasant Operation incorporating Modification 3, with the combined noise level compared against the noise criteria set in Development Consent DA 92/97 (Table 3-1).

6.1.3 Noise Predictions

Appendix F provides the predicted construction noise levels for all identified receivers in the vicinity of the Rail Modification. The noise predictions are given as daytime levels resulting under 10th percentile meteorological conditions and rounded to the nearest dBA. Mine-owned receivers are included for the purpose of information only.

Review of noise predictions indicates that noise levels due to construction/development activities in the vicinity of the Mount Pleasant Operation are predicted to be below the daytime $L_{Aeq,15min}$ criterion set in Development Consent DA 92/97 at all privately-owned receivers.

6.2 Construction Noise Outside Mining Leases

6.2.1 Description of Construction Activities

Rail Spur

Construction/development activities would include the construction of the non-network rail spur from the boundary of the mining leases, to the main line (Muswellbrook-Ulan Rail Line) (Figure 1-2).

Construction/development activities associated with the rail spur would last for up to approximately 12 months and would generally occur during the day (7.00 am to 6.00 pm). Where practical, works outside of standard construction hours would prioritise lesser noise generating activities (e.g. welding and electrical works).

The construction of the rail spur outside the mining leases would involve two (2) construction areas requiring two (2) separate mobile fleets:

- construction of the rail spur and bridge at the Wybong Road rail overpass (up to approximately 12 months); and
- construction of the remainder of the rail spur (up to approximately 12 months).

An indicative construction fleet for both construction components, and corresponding SWLs, is summarised in Table 6-2.

Table 6-2 Indicative Noise Sources & Sound Power Levels - Construction of Rail Spur (Outside Mining Leases)

Construction Component	Number of Item(s)	Item Description	Indicative Sound Power Level per Item (dBA)
Construction of rail spur and bridge at Wybong Road underpass	2	Scraper	108
	1	Dozer	116
	1	60-70 t Excavator	111
	2	Articulated Truck	110
	1	Grader	112
	1	Water Cart	112
	1	Compactor	108
Construction of rail spur outside Wybong Road underpass	2	Scraper	108
	1	Dozer	116
	1	60-70 t Excavator	111
	2	Articulated Truck	110
	1	Grader	112
	1	Water Cart	112
	1	Compactor	108

A correction of -5 dB was applied to the total sound power level for each construction component to account for time correction, as the entire construction fleet would not always operate concurrently.

The estimated total SWL from the concurrent operation of all construction plant associated with each of the two (2) construction components is 116 dBA.

The Rail Modification includes demolition of the approved Mount Pleasant Operation rail spur once the relocated rail spur is commissioned. Noise generated by this activity does not require to be modelled as the activity would be short-term and would be minor in comparison to nearby mining operations at the Bengalla Mine.

Hunter River Water Supply Pump Station & Associated Water Pipeline

Construction/development activities would include the construction of the water pipeline from the boundary of the mining leases to the Hunter River, and the Hunter River water supply pump station (Figure 1-2).

Construction/development activities associated with the water supply pump station and water pipeline would last for up to approximately 12 months and would occur during standard *ICNG* construction hours only.

An indicative construction fleet for both construction components, and corresponding SWLs, is summarised in Table 6-3. The fleet associated with the construction of the pump station relates to the loudest construction phase, namely earthmoving works.

Table 6-3 Indicative Noise Sources & Sound Power Levels - Construction of Hunter River Water Supply Pump Station & Associated Water Pipeline

Construction Component	Number of Item(s)	Item Description	Indicative Sound Power Level per Item (dBA)
Construction of water pipeline	2	5 t Excavator	97
	1	Franna Crane	105
	1	Whacker packer	110
	1	Truck	100
Construction of pump station (earthmoving works)	1	15 t Excavator	105
	2	Truck	100

A correction of -5 dB was applied to the total sound power level for each construction component to account for time correction, as the entire construction fleet would not always operate concurrently.

The estimated total SWL from the concurrent operation of all construction plant is 107 dBA and 102 dBA for the construction of the water pipeline and pump station, respectively.

6.2.2 Construction Noise Criteria

As noise associated with the construction/development activities outside mining leases would be distinct to mining operational noise levels (i.e. given the distance separating mining operations from sections of the rail spur, water pipeline and the pump station), this construction noise has been assessed against the recommended noise management levels described in the *Interim Construction Noise Guideline* or *ICNG* (NSW Department of Environment and Climate Change [DECC], 2009), provided in Table 6-4. This is considered justified given relevant receivers would be potentially exposed to temporary and short-term construction-related impacts (i.e. associated with the construction of the rail spur in a linear fashion), rather than longer-term operational impacts.

Table 6-4 Construction Noise Guideline Noise Management Levels

Time of Day	Management Level $L_{Aeq,15min}$	How to Apply
Recommended standard hours: Monday to Friday 7.00 am to 6.00 pm Saturday 8.00 am to 1.00 pm No work on Sundays or public holidays	Noise affected RBL + 10 dBA	The noise affected level represents the point above which there may be some community reaction to noise: • Where the predicted or measured $L_{Aeq,15\ min}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise: • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences). 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours:	Noise affected RBL + 5 dBA	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2.

Source: DECC (2009).

It should be noted that MACH Energy would carry out construction of the non-network rail spur outside recommended standard hours (e.g. in the afternoon on a Saturday or on a Sunday during the day). This is considered to be justified as it could allow continuity of work for the construction crew which would assist in reducing the length of the construction period and therefore the period of impact at receivers. Where practical, works outside of the standard construction hours would prioritise lesser noise generating activities (e.g. welding and electrical works).

As such, the 'noise affected' $L_{Aeq,15min}$ level selected for the construction assessment is Rating Background Level (RBL) + 10 dBA during recommended standard hours and RBL + 5 dBA outside recommended standard hours for all privately-owned receivers.

Based on RBLs used to establish the noise criteria set in Development Consent DA 92/97 (Table 3-1), the daytime 'noise affected' $L_{Aeq,15min}$ levels selected for the construction assessment are summarised as follows:

- NAG 7 – 40 dBA and 45 dBA outside and inside recommended standard hours, respectively;
- NAG 8 – 41 dBA and 46 dBA outside and inside recommended standard hours, respectively; and
- NAG 9 – 39 dBA and 44 dBA outside and inside recommended standard hours, respectively.

6.2.3 Assessment Methodology

Noise from the construction works associated with the rail spur outside mining leases, water pipeline and pump station was predicted using the ENM.

Activities associated with the construction of the rail spur/water pipeline would by nature progressively move along the proposed rail spur corridor/pipeline route. Construction noise levels were determined by modelling the working area on the closest point of the Mount Pleasant Operation rail spur/water pipeline route to each receiver.

6.2.4 Noise Predictions

Rail Spur

Appendix G summarises the predicted rail spur construction noise levels at the identified receivers and rounded to the nearest dBA. The noise predictions are given as daytime levels resulting under 10th percentile meteorological conditions. Mine-owned receivers are included for the purpose of information only.

17 and 21 privately-owned receivers would exceed the noise affected levels inside and outside recommended standard hours, respectively. A summary of those receivers predicted to exceed criteria for works inside and outside recommended standard hours is provided in Table 6-5.

Table 6-5 Summary of Potential Exceedances at Privately-Owned Receivers

Exceedance Level	Inside daytime recommended standard hours	Outside daytime recommended standard hours
1 to 2 dB	Receivers 206, 215, 216, 217, 218, 219, 220, 221 and 225	Receiver 538
3 to 5 dB	Receivers 19, 20*, 21*, 207, 222, 223 and 224	Receivers 207b, 213 and 214
6 to 10 dB	-	Receivers 19, 20*, 21*, 206, 207, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224 and 225
>10 dB	Receiver 23	Receiver 23

* Note: Formerly subject to acquisition rights from the Mt Arthur Mine (extinguished 31 December 2016).

It is important to note that those exceedances would only occur for a limited period of time during which the construction fleet is working at, or near, the closest point of the rail spur to the receivers in question. Most of the time, construction noise levels would comply with *ICNG*'s recommended noise affected levels when the construction fleet is working further away along the proposed rail spur corridor.

Noise levels due to construction/development activities along the proposed rail spur are predicted to be below the highly noise affected level of 75 dBA $L_{Aeq,15min}$ criterion set in the *ICNG* at all privately-owned receivers.

Hunter River Water Pipeline

Appendix H summarises the predicted water pipeline construction noise levels at the identified receivers and rounded to the nearest dBA. The noise predictions are given as daytime levels resulting under 10th percentile meteorological conditions. Mine-owned receivers are included for the purpose of information only.

Ten (10) privately-owned receivers are predicted to exceed the noise affected levels during recommended standard hours. A summary of those receivers predicted to exceed the relevant criteria is provided in Table 6-6.

Table 6-6 Summary of Potential Exceedances at Privately-Owned Receivers

Exceedance Level	Inside daytime recommended standard hours
1 to 2 dB	Receivers 67[1] and 532
3 to 5 dB	Receivers 289, 530, 531 and 533
6 to 10 dB	Receivers 527, 528 and 529
>10 dB	Receiver 68[2]

Notes:
1. Receiver subject to acquisition upon request in Development Consent DA 92/97 for operational noise.
2 Receiver subject to mitigation upon request in Development Consent DA 92/97 for operational noise.

It is important to note that those exceedances would only occur for a limited period of time during which the construction fleet is working at, or near, the closest point of the pipeline to the receivers in question. Most of the time, construction noise levels would comply with the *ICNG*'s recommended noise affected levels when the construction fleet is working further away along the proposed water pipeline route.

Noise levels due to construction/development activities along the proposed water pipeline route are predicted to be below the highly noise affected level of 75 dBA $L_{Aeq,15min}$ set in the *ICNG* at all privately-owned receivers.

Hunter River Water Supply Pump Station

Appendix H summarises the predicted pump station construction noise levels at the identified receivers and rounded to the nearest dBA. The noise predictions are given as daytime levels resulting under 10th percentile meteorological conditions. Mine-owned receivers are included for the purpose of information only.

Three (3) privately-owned receivers are predicted to exceed the noise affected levels during recommended standard hours. A summary of those receivers predicted to exceed the relevant criteria is provided in Table 6-7.

Table 6-7 Summary of Potential Exceedances at Privately-Owned Receivers

Exceedance Level	Inside daytime recommended standard hours
1 to 2 dB	-
3 to 5 dB	Receivers 527, 528 and 529
6 to 10 dB	-

Noise levels due to construction/development activities associated with the pump station are predicted to be below the highly noise affected level of 75 dBA $L_{Aeq,15min}$ criterion set in the *ICNG* at all privately-owned receivers.

6.3 Construction Vibration Associated with Rail Spur (Outside Mining Leases)

Construction vibration is assessed in accordance with *Assessing Vibration: a technical guideline* (New South Wales Department of Environment & Conservation, 2006) and *Evaluation and measurement for vibration in buildings* BS 7385-2:1993.

Vibration during construction works are determined to be from intermittent sources (such as plant and equipment) and are associated with two main types of impact: disturbance at human receivers and potential architectural/structural damage to buildings. The *Construction Noise Strategy* (Transport for NSW [TfNSW], 2016) sets out safe working distances to achieve the human response criteria.

Table 6-2 summarises the equipment that would be used for the rail spur construction component outside mining leases. Of the equipment proposed to be used for this component of the Mount Pleasant Operation, the compactor has the greatest potential to cause vibration impacts. The *Construction Noise Strategy* (TfNSW, 2016) describes that a vibratory roller weighing 7-13 tonnes, which is believed to generate comparable vibration levels as a compactor, requires the following safe working distances:

- Cosmetic Damage (BS 7385): **15 metres** (m); and
- Human Response (OH&E Vibration Guideline): **100 m**.

All sensitive receivers are located greater than 15 m from the rail spur. Therefore, no cosmetic damage to nearby receivers is expected.

Receiver 23 is located within 100 m of the proposed rail spur. Therefore, vibration exceeding the Human Response criteria (OH&E Vibration Guideline) may occur at this receiver.

It is important to note that potential exceedances would only occur for a limited period of time during which the construction fleet is working at, or near, the closest point of the rail spur to receiver 23. Most of the time, construction vibration levels would comply with Human Response criteria when the construction fleet is working further away along the proposed rail spur corridor. Therefore, no further construction vibration mitigation measures are considered to be required.

A historic heritage structure has been identified approximately 135 m from the proposed rail spur. German Standard *Vibrations in Building – Part 3: Effects on structures* DIN 4150-3 sets a cosmetic damage limit of 3 millimetres per second (mm/s) for heritage buildings. Based on the construction fleet listed in Table 6-2, vibration levels are expected to comply with the relevant cosmetic damage limit at the identified historic heritage structure.

7 RAIL NOISE & VIBRATION

7.1 Introduction

As described in Section 1 the Rail Modification proposes to relocate the approved rail infrastructure from the west to the east of the Bengalla Mine. As a result of those changes, a private rail spur would be constructed between the Mount Pleasant Operation and the Muswellbrook-Ulan Rail Line.

The section of the proposed rail spur located within the Mount Pleasant Operation's mining leases was addressed in Section 5 as part of overall industrial noise generated by the site. This section addresses potential noise impact associated with the spur section located outside mining leases.

7.2 Rail Noise Criteria

Appendix 3 of the *Rail Infrastructure Noise Guideline (RING)* (EPA, 2013) deals with non-network rail lines on or exclusively servicing industrial sites.

Where a non-network rail line exclusively servicing one or more industrial sites extends beyond the boundary of the industrial premises, noise from this section of track should be assessed against the recommended acceptable L_{Aeq} noise level from industrial noise sources for the relevant receiver type and indicative noise amenity area, as shown in Table 2.1 of the *INP* reproduced below.

INP Table 2.1 Recommended L_{Aeq} noise levels from industrial noise sources

Type of Receiver	*Indicative Noise Amenity*	*Time of Day*	*Acceptable L_{Aeq} Noise Level – dB(A)*
Residence	*Rural*	*Day*	*50*
		Evening	*45*
		Night	*40*

7.3 Rail Noise Assumptions & Methodology

The *RING* does not make any provisions on how to assess the zone where a private rail spur connects to the main line. However, rail noise impacts at receivers are typically determined based on the proximity to either the private rail spur or the main line (i.e. if a receiver is closer to the main line than the private spur, it would be assessed as per the main line noise criteria).

In this situation, no proximal privately-owned receivers are found to be closer to the private rail spur than to the main line. Notwithstanding, a quantitative assessment against Appendix 3 of the *RING* has been undertaken.

Consistent with the *RING*, the assessment for non-network rail lines must consider the rail alignment from the boundary of the mining leases, to the main line (Muswellbrook-Ulan Rail Line).

Rail spur noise levels at nearby receivers have been predicted using the ENM to allow for consideration of local meteorological data consistent with the operational noise assessment (Section 5).

Noise levels and spectra were established using the TfNSW standard rail noise database for locomotives and freight wagons. The database levels where necessary can be adjusted for speed, locomotive type and length of trains.

Because of adverse weather conditions present at night and the more stringent night time noise criterion set in the *RING* for non-network rail lines (40 dBA $L_{Aeq,period}$), the proposed rail spur noise assessment focuses on the night time period (10.00pm – 7.00am).

Noise modelling was based on the following assumptions:

- Average train movements of one (1) train or two (2) train movements per night (10.00pm - 7.00am);
- Configuration of three (3) locomotives and 96 wagons; and
- Average speed of 70 kilometres per hour (km/hr) on the proposed rail spur section adjacent to the Muswellbrook-Ulan Rail Line and 60 km/hr for the remaining section of rail spur outside mining leases.

Wheel defects of rolling stock can make a material difference to potential rail noise impacts. As such, predicted noise levels are presented for rolling stock with both low wheel defects and medium wheel defects.

7.4 Rail Noise Impacts

Appendix I presents the predicted noise levels considering local meteorology at the 58 closest and potentially most impacted receivers. The receivers include 23 privately-owned receivers and 35 mine-owned receivers where noise criteria do not apply.

Review of Appendix I indicates noise levels generated by the rail spur would exceed the *RING* criteria for non-network rail lines on or exclusively servicing industrial sites at three (3) privately-owned receivers with low wheel defects and ten (10) privately-owned receivers with medium wheel defects.

A summary of those receivers predicted to exceed criteria with both low wheel defects and medium wheel defects is provided in Table 7-1.

Table 7-1 Summary of Potential Exceedances at Privately-Owned Receivers

Exceedance Level	Low Wheel Defects	Medium Wheel Defects
1 to 2 dB	Receivers 20* and 21*	Receivers 221, 222, 223, 224 and 225
3 to 5 dB	-	Receivers 19, 20*, 21* and 207
6 to 10 dB	-	-
>10 dB	Receiver 23	Receiver 23

* Note: Formerly subject to acquisition rights from the Mt Arthur Mine (extinguished 31 December 2016).

With medium wheel defects, privately-owned receivers 19, 20, 21 and 207 would be afforded voluntary mitigation upon request rights in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (DP&E, 2014). With low wheel defects, no privately-owned receivers would be afforded voluntary mitigation upon request rights.

For both low and medium wheel defects, receiver 23 would be afforded voluntary acquisition upon request rights in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (DP&E, 2014).

The Mount Pleasant Operation is approved to export product coal via rail using the approved rail loop located in the south-west corner of the mine site and the approved rail spur joining the Muswellbrook-Ulan Rail Line approximately 6 km to the west of the proposed rail spur location. As such, the Mount Pleasant Operation is approved to generate an average of six (6) train movements per 24 hours (e.g. four [4] during the day and two [2] at night) and up to 18 train movements per 24 hours on the Muswellbrook-Ulan Rail Line section running passed the proposed rail spur.

Due to the location of the proposed rail spur relative to the Muswellbrook-Ulan Rail Line (Figure 1-2), the identified receivers located on the southern side of Muswellbrook-Ulan Rail Line would not experience increased noise levels due to the operation of the proposed rail spur as the spur would shift the approved Mount Pleasant Operation train movements from the main line to the private spur (located further away from the receivers as it is on the northern side of the Muswellbrook-Ulan Rail Line). All ten (10) privately-owned receivers identified as exceeding the *RING* criteria are located to the south of the main line.

Preliminary noise calculations have demonstrated that noise levels generated by rail movements would remain unchanged to one (1) decimal place at the southern receivers with or without the proposed rail spur. In other words, whether the approved Mount Pleasant Operation train movements use the rail spur or the Muswellbrook-Ulan Rail Line would not make any difference to the noise experienced by the southern receivers. Therefore, the proposed rail spur is not expected to impact on the southern receivers, including the ten (10) privately-owned receivers identified as exceeding the *RING* criteria.

7.5 Rail Vibration

It should be noted that an assessment of rail vibration was conducted in accordance with *Assessing Vibration: a technical guideline* (EPA, 2006) which indicated that the risk of excessive vibration and exceedance of the relevant criterion would be low for any receiver more than 30 to 50 m from the railway. Given there are no receivers less than 50 m from the Mount Pleasant Operation rail spur, no rail vibration impacts are therefore expected to be associated with the Mount Pleasant Operation rail spur.

A historic heritage structure has been identified approximately 135 m from the proposed rail spur. German Standard *Vibrations in Building – Part 3: Effects on structures* DIN 4150-3 sets a cosmetic damage limit of 3 mm/s for heritage buildings. Operational rail vibration levels are expected to comply with the relevant cosmetic damage limit at the identified historic heritage structure.

8 CONCLUSION

This assessment has considered the potential noise impacts associated with the Mount Pleasant Operation incorporating the Rail Modification.

In summary, with the implementation of the proposed management measures the Rail Modification would not materially change the noise impacts of the approved Mount Pleasant Operation.

8.1 Operational Noise

- Predicted 10th percentile exceedance levels are shown to increase by up to 1 dB at some of the identified privately-owned receivers with the Rail Modification in place. Such an increase in noise levels is considered negligible and would be undetectable to the human ear.
- Predicted noise levels associated with the Mount Pleasant Operation incorporating the Rail Modification would comply with the noise criteria set in Development Consent DA 92/97 when considering the identified pro-active and reactive mitigation measures described in the Modification 3 noise assessment and the proposed changes to the Consent criteria.
- Operational noise associated with the duplication of the Hunter River water supply pump station and associated water pipeline is expected to comply with the relevant noise criteria.

8.2 Vacant Land Assessment

- A vacant land assessment was conducted in accordance with the contemporary *Voluntary Land Acquisition and Mitigation Policy*.
- The vacant land assessment was based on noise contours generated for Modification 3 and the difference in noise predictions between Modification 3 and the Rail Modification at the south-east receivers. To be conservative, the vacant land assessment was conducted against the more stringent night time vacant land assessment criteria and no correction was applied to account for the fact that the assessment is based on $L_{Aeq,Period}$ noise levels as opposed to $L_{Aeq,15min}$ noise levels.
- Based on the conservative methodology described above, no exceedances were found on any privately-owned land.

8.3 Cumulative Noise

- Assessment of cumulative impacts was undertaken for all privately-owned receivers potentially impacted by noise from the Rail Modification and where relevant the Mt Arthur Coal Mine, the Bengalla Mine or the Dartbrook Mine.
- Cumulative noise predictions with the proposed Modification are found to increase by up to 1 dB at some of the identified privately-owned receivers. Such an increase in noise levels is considered negligible and would be undetectable to the human ear.

- All cumulative noise predictions comply with the cumulative noise criteria and cumulative noise acquisition criteria set in Development Consent DA 92/97 at modelled privately-owned receivers.

8.4 Sleep Disturbance

- L_{Amax} noise levels due to night operations of the Mount Pleasant Operation incorporating the Rail Modification are predicted to be below the $L_{A1,1min}$ criterion in Development Consent DA 92/97 at all modelled privately-owned receivers.

8.5 Construction Noise

- Noise levels due to construction/development activities in the vicinity of the Mount Pleasant Operation are predicted to be below the daytime $L_{Aeq,15min}$ criterion set in Development Consent DA 92/97 at all privately-owned receivers.
- Noise levels due to construction/development activities associated with the proposed rail spur and the Hunter River water supply pump station and pipeline are predicted to be below the highly noise affected level of 75 dBA $L_{Aeq,15min}$ criterion set in the *ICNG* at all privately-owned receivers.
- Within recommended standard hours, 17 privately-owned receivers are predicted to exceed *ICNG*'s noise affected levels due the construction of the proposed rail spur. Outside recommended standard hours, 21 receivers are predicted to experience exceedances of the noise affected levels due to the construction of the proposed rail spur. Those exceedances would only occur for a limited period of time during which the construction fleet is working at, or near, the closest point of the rail spur to the receivers in question. Most of the time, construction noise levels would comply with *ICNG*'s recommended noise affected levels when the construction fleet is working further away along the proposed rail spur.
- Ten (10) privately-owned receivers are predicted to exceed the *ICNG*'s noise affected levels due to the construction of the proposed water pipeline. Those exceedances would only occur for a limited period of time during which the construction fleet is working at, or near, the closest point of the pipeline route to the receivers in question. Most of the time, construction noise levels would comply with *ICNG*'s recommended noise affected levels when the construction fleet is working further away along the proposed water pipeline route.
- Three (3) privately-owned receivers are predicted to exceed the *ICNG*'s noise affected levels due the construction of the proposed pump station.

8.6 Construction Vibration

- A construction vibration assessment established that no cosmetic damage to nearby receivers and historic heritage structures is expected.

- Vibration exceeding the Human Response criteria may occur at receiver 23. However, potential exceedances would only occur for a limited period of time during which the construction fleet is working at, or near, the closest point of the rail spur to receiver 23. Most of the time, construction vibration levels would comply with Human Response criteria when the construction fleet is working further away along the proposed rail spur corridor. Therefore, no further construction vibration mitigation measures are considered to be required.

8.7 Rail Noise

- The *RING* does not make any provisions on how to assess the zone where a private rail spur connects to the main line. However, rail noise impacts at receivers are typically determined based on the proximity to either the private rail spur or the main line (i.e. if a receiver is closer to the main line than the private spur, it would be assessed as per the main line noise criteria).
- No privately-owned receivers are found to be closer to the private rail spur than to the main line. Notwithstanding, a quantitative assessment against the relevant criteria has been undertaken.
- Noise predictions generated by the rail spur would exceed the *RING* criteria for non-network rail lines on or exclusively servicing industrial sites at three (3) privately-owned receivers with low wheel defects and ten (10) privately-owned receivers with medium wheel defects.
- With medium wheel defects, privately-owned receivers 19, 20, 21 and 207 would be afforded voluntary mitigation upon request rights in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (DP&E, 2014). With low wheel defects, no privately-owned receivers would be afforded voluntary mitigation upon request rights.
- For both low and medium wheel defects, receiver 23 would be afforded voluntary acquisition upon request rights in accordance with the *Voluntary Land Acquisition and Mitigation Policy* (DP&E, 2014).
- Notwithstanding, preliminary noise calculations have demonstrated that noise levels generated by rail movements would remain unchanged at the receivers located on the southern side of the Muswellbrook-Ulan Rail Line with or without the proposed rail spur. Those receivers include all ten (10) privately-owned receivers identified as exceeding the *RING* criteria. Therefore, the proposed rail spur is not expected to impact on the southern receivers.

8.8 Rail Vibration

- Assessment of rail vibration indicated that the risk of excessive vibration and exceedance of the relevant criterion would not be expected at any of the identified receivers.
- Operational rail vibration levels are expected to comply with the relevant cosmetic damage limit at the nearby receivers and historic heritage structures.

9 REFERENCES

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APPENDIX A

GLOSSARY OF TERMS & DEFINITIONS

GLOSSARY OF TERMS & DEFINITIONS

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors, which are demonstrated in the graph below, are here defined.

Maximum Noise Level (L_{Amax}) – The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

L_{A1} – The L_{A1} level is the noise level which is exceeded for 1 percent (%) of the sample period. During the sample period, the noise level is below the L_{A1} level for 99% of the time.

L_{A10} – The L_{A10} level is the noise level which is exceeded for 10% of the sample period. During the sample period, the noise level is below the L_{A10} level for 90% of the time. The L_{A10} is a common noise descriptor for environmental noise and road traffic noise.

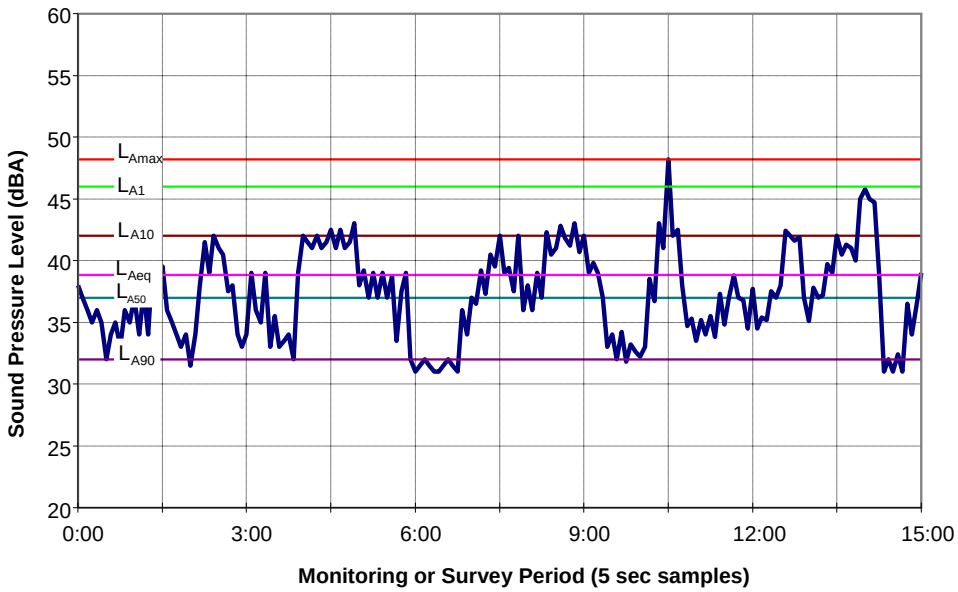
L_{A90} – The L_{A90} level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the L_{A90} level for 10% of the time. This measure is commonly referred to as the background noise level.

L_{Aeq} – The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

ABL – The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the 10th percentile (lowest 10th percent) background level (L_{A90}) for each period.

RBL – The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period – daytime, evening and night time.

Typical Graph of Sound Pressure Level vs Time



APPENDIX B

NOISE SENSITIVE RECEIVERS

Table B-1 Privately Owned Dwellings

Receiver ID	NAG	Landholders	Easting	Northing
4	9	JR SCRIVEN	299202	6425195
19	8	DP ENGLEBRECHT	299120	6426779
20	8	KB & JA BARNETT	298866	6426826
21	8	MJ MCGOLDRICK	298804	6426823
23	8	JABETIN PTY LTD	299047	6427361
35	8	C HORNE	299980	6428580
35b	8	C HORNE	299986	6428649
43	1	JB MOORE	292318	6429012
44	1	JB MOORE	291384	6428700
45	1	BA & TE STRACHAN	291263	6428277
47	1	BL & ML BATES	291276	6429615
67	7	JM SIMPSON	299896	6429202
68	7	RK & NV GOOGE	299976	6429057
74	7	N & M SORMAZ	300003	6429277
77	7	DM PURSER	300332	6429501
79	7	DW ADNUM	300572	6429448
80	7	WJ ADNUM	300556	6429470
82	8	CK BIRCH	301020	6429170
83	7	LG & CM KELMAN	300956	6429298
84	8	GE PITMAN	300800	6429358
84b	n/a	GE PITMAN	291180	6437472
86	7	COWTIME INVESTMENTS PTY LTD	300342	6429734
86b	6	COWTIME INVESTMENTS PTY LTD	301865	6431879
96	7	RP GRAY	299879	6430321
102	7	AJPS MATHER	299829	6430440
108	7	JS GIBSON	299715	6430470
112	7	BD BARRY	299566	6430447
118	7	JM & CA HAYES	299655	6430627
120	7	DL & PA MOORE	299721	6430731
120c	7	DL & PA MOORE	299698	6430741
121	7	C & JM MOORE	299656	6430778
136	3	DG YORE	300336	6432453
139	3	RW & LP UPTON	300659	6432952
140	3	DAPKOS PTY LTD	300978	6433030
140c	6	DAPKOS PTY LTD	301236	6431474
143	3	JS & NM LONERGAN	299928	6434457
147	3	MJ & RG ADNUM	299165	6434674
153	3	GM CASEY	295898	6435444
154	3	PD & F STANDING	298537	6435520
156	3	JE & JL LONERGAN	298882	6435173
157	3	RB PARKINSON	298965	6434977
161	3	JS & NM LONERGAN	299209	6435244
158	3	JM HOATH	299063	6435063
159	3	JE & MS DUCEY	299127	6435011

Receiver ID	NAG	Landholders	Easting	Northing
169	4	L GREENSILL and J WATTUS	298868	6436638
171	4	L GREENSILL and J WATTUS	299038	6436955
172	4	RL & CE THOMPSON	299157	6437224
173	4	TL KING and JA WARD	298878	6437773
174	4	TJ & ML POWER	298908	6437676
175	4	TJ & ML POWER	298928	6437622
176	4	JAF & LA ALLAN	298988	6437509
177	4	FW & HM & SA WHEATLEY	298731	6438046
178	4	PA NEELY	299347	6438053
179	4	FW WHEATLEY	299191	6438159
180	4	F.A. WHEATLEY & SON PTY LTD	299230	6438233
180b	4	F.A. WHEATLEY & SON PTY LTD	299562	6438055
180c	n/a	F.A. WHEATLEY & SON PTY LTD	299444	6438872
181	4	K.L. & H.R. DAY PTY LTD	300474	6437756
181c	4	K.L. & H.R. DAY PTY LTD	300023	6437409
182	5	JG & AJ SADLER	300849	6437839
182b	5	JG & AJ SADLER	300843	6437724
189	5	OB O'BRIEN	301236	6434698
190	5	OB O'BRIEN	301113	6434682
191	5	JA & JE FIBBINS	301421	6434533
192	5	IG & CW INGLE	301290	6434531
193	5	GM & KL SMITH	301529	6434365
193c	5	GM & KL SMITH	302406	6433964
194	5	TC & JBA HARRIS	302021	6433456
195	5	T & RK YOUNG	302121	6432949
196	n/a	T & RK YOUNG	302234	6432240
197	5	T & RK YOUNG	302117	6432365
195d	5	T & RK YOUNG	302170	6432128
198	6	TJ & NP GOLDRICK	301994	6431847
199	6	NA BURLING	302094	6431842
200	5	R EASTON	302258	6431847
202	6	DN RAPHAEL	301546	6431292
204	6	DN RAPHAEL	301940	6431205
203	6	RF & MA MILLARD	301451	6431324
206	8	WJ HARDES	299806	6427069
207	8	SW & KL BARKLEY	299389	6426888
207b	8	SW & KL BARKLEY	299537	6426696
212	8	DR & CJ TUBB	299568	6426381
212b	8	DR & CJ TUBB	299544	6426341
213	8	ENGLEBRECHT RACING STABLES PTY LTD	299175	6426554
214	8	AL THOMSON-WEIR and RC WEIR	299183	6426574
215	8	WJ & CB MCINTOSH	299184	6426607
216	8	NJ KEEVERS	299187	6426634
217	8	RRA FARNSWORTH	299192	6426663
218	8	SY JOHNSON	299137	6426583
219	8	GL & KL ANDREWS	299139	6426600

Receiver ID	NAG	Landholders	Easting	Northing
220	8	RA BYRNES and MA MOLLER	299144	6426635
221	8	TD BARRON	299150	6426680
222	8	ML & EA SWEENEY	299154	6426716
223	8	MC & LJ DOBIE	299125	6426722
224	8	DL ROBINSON	299097	6426732
225	8	MR CRANFIELD and JR GLEESON	299204	6426692
249	10	TW ROOTS	290948	6423468
252	1	RM & KF MERRICK	289457	6424899
252b	1	RM & KF MERRICK	289575	6424546
257	1	PG & CM LANE	291302	6426071
258a	1	NJ & RY ELLIS	291000	6426441
258b	1	NJ & RY ELLIS	290584	6426756
259	1	MR PEEL	290868	6426152
260	1	PSJ MURRAY	291002	6426002
261	1	PR ELLIS	290650	6425665
266	1	RB PARKINSON	289024	6427910
267	1	JE & JL LONERGAN	289455	6428815
271	2	DE KILGANNON and DS MACDOUGALL	289009	6434418
272	2	GC SPARRE	290603	6433696
272b	2	GC SPARRE	290597	6433720
273	2	IJ & CM RICHARDS	289237	6435180
283	9	SRP & RF RAY	299633	6425990
288	8	LA & JM WEBSTER	300479	6427545
288b	8	LA & JM WEBSTER	300493	6427559
289	8	RA & EA LAWMAN	300328	6428692
292	10	GR & MK WALSH	290611	6422527
296a	11	JM WILD	291746	6422103
296b	11	JM WILD	291623	6422133
298	11	MG & LJ LATHAM	291487	6421945
300	11	MG & LJ LATHAM	291365	6421702
302a	11	MJ & MJ DUNCAN	290914	6421267
302b	11	MJ & MJ DUNCAN	290695	6421456
302c	11	MJ & MJ DUNCAN	290718	6421463
310	4	RL & CE THOMPSON	299130	6437280
311	5	GM & KL SMITH	301388	6434419
401	n/a	JL & DG DAY	289649	6437858
402	n/a	PC BRITTAN	290201	6438459
407	n/a	AD LONERGAN	291736	6437533
413a	n/a	MJH LUMBY	288634	6436895
413b	n/a	MJH LUMBY	288465	6437096
415	n/a	SJ FRANKLAND	288448	6436265
416	n/a	RV MITCHELL	287602	6434882
417	n/a	M & JA CASTELLANA	288300	6435593
418	n/a	PB WATTS	287814	6435336
419	n/a	KM BATES and TG WOODS	288703	6436630
421	2	GW RICHARDS	289314	6435713

Receiver ID	NAG	Landholders	Easting	Northing
422a	n/a	ME DANIELS	297505	6438903
422b	n/a	ME DANIELS	297482	6438920
434	n/a	GJ & RL JONES	299588	6438940
436	4	MEDEGATE PTY LTD	299863	6438778
437	4	BG & S CANVIN	299729	6438830
453a	n/a	SC & ME DEVER	288345	6434693
453b	n/a	SC & ME DEVER	288307	6434751
454	n/a	AP & PE MCMANUS	287912	6434470
456	n/a	GT KEAST	286641	6434111
458	n/a	HJ WRIGHT	288254	6433349
462a	n/a	SH JENNAR	286648	6429789
462b	n/a	SH JENNAR	286662	6429918
463	n/a	IV & CA INGOLD	286574	6429559
464	1	KL BALMER and JL SMITH	289097	6428232
465	n/a	FN & WL GOOGE	288366	6427931
466	1	GT MCNEILL	289103	6426847
467	1	MWJ & LC WALTON	290367	6427991
468a	n/a	S.R. & J.W. LAWSON (LINDISFARNE) PTY LTD	288665	6422488
468b	n/a	S.R. & J.W. LAWSON (LINDISFARNE) PTY LTD	288416	6422514
468c	n/a	S.R. & J.W. LAWSON (LINDISFARNE) PTY LTD	288743	6422667
470	n/a	JI & PJ BROWN	289351	6423345
471	n/a	PJ BROWN	289165	6423423
472a	n/a	JDM MARKHAM	289360	6423043
472b	n/a	JDM MARKHAM	289390	6423191
474	n/a	AA & BT MEYER	289062	6422372
475	11	EJ & CA DENTON	290869	6421541
476	n/a	LA & CA MACPHERSON	289424	6420978
477a	11	MW TURNER	290064	6421064
477b	11	MW TURNER	290021	6421067
481	n/a	RL WILKS	288731	6420218
482	n/a	DJ PHILLIPS	288291	6420169
483	n/a	RW JONES	287961	6420256
484	n/a	TR & KM PAULSEN	288865	6419989
485a	n/a	PR & M BURGMANN	288070	6419004
485b	n/a	PR & M BURGMANN	288065	6419050
485c	n/a	PR & M BURGMANN	287991	6419081
485d	n/a	PR & M BURGMANN	287936	6419095
485e	n/a	PR & M BURGMANN	287940	6419101
487a	11	E RANKIN	292323	6421876
487b	11	E RANKIN	292203	6422343
488a	n/a	E & WJ RANKIN	292981	6421910
488b	10	E & WJ RANKIN	292667	6422644
526	7	DL WICKS	300537	6429477
527	8	DJ & GH CORK	300600	6428695
528	8	AS CHICK	300622	6428693
529	8	TH HAMILTON and AM SMITH	300641	6428693

Receiver ID	NAG	Landholders	Easting	Northing
530	8	SC & NJ BULLARD and JM HARRISON	300678	6428689
531	8	GJ & EA MUNZENBERGER	300678	6428670
532	8	VL ROSE	300677	6428649
533	8	MJ BROWN	300673	6428627
534	8	EE MARKS	300673	6428611
535	8	GL & DN HORTON	300665	6428593
536	8	LJ CUMMINS	300665	6428573
537	8	TJ D'HERVILLE	300664	6428556
538	8	KD POWER and T VERO	300511	6427651
539	8	PH CURTAIN and CA SINGLETON	300540	6427645
541	8	JG HINDER and VG MATHEWS	300560	6427606
542	8	PE & GJ CHAPMAN	300550	6427597
543	8	KD CLOSE	300534	6427590
544	8	DS & RM NEWTON	300523	6427578
545	8	JA GREEN	300509	6427568
547	5	LA & FK & G BRYANT	302122	6433354

Table B-2 Generic Privately Owned Dwellings

Receiver ID	NAG	Landholder	Easting	Northing
286c	8	MUSWELLBROOK SHIRE COUNCIL	299871	6426726

Table B-3 Generic Privately Owned Dwellings

Receiver ID	NAG	Township	Easting	Northing
A	n/a	Muswellbrook	302102	6430586
B	6	Muswellbrook	301213	6429518
C	8	Muswellbrook	300746	6428837
D	8	Muswellbrook	300102	6427193
E	8	Muswellbrook	299763	6426870
F	8	Muswellbrook	300871	6428333
G	8	Muswellbrook	300716	6427800
H	6	Muswellbrook	301710	6430134
I	4	Aberdeen	300579	6437917
J	6	Muswellbrook	301420	6429816
K	8	Muswellbrook	301411	6428853
L	8	Muswellbrook	301463	6429196
M	8	Muswellbrook	301381	6428637

Table B-4 Mine Owned Dwellings

Receiver ID	Landholders	Easting	Northing
1aa	COAL & ALLIED OPERATIONS PTY LTD*	297760	6434394
1ab	COAL & ALLIED OPERATIONS PTY LTD*	299084	6434398
1ac	COAL & ALLIED OPERATIONS PTY LTD*	299171	6427655
1ad	COAL & ALLIED OPERATIONS PTY LTD*	293038	6436801
1ae	COAL & ALLIED OPERATIONS PTY LTD*	298783	6428442
1af	COAL & ALLIED OPERATIONS PTY LTD*	299585	6428763
1ag	COAL & ALLIED OPERATIONS PTY LTD*	299664	6428876
1ah	COAL & ALLIED OPERATIONS PTY LTD*	299928	6429225
1ai	COAL & ALLIED OPERATIONS PTY LTD*	299941	6429237
1aj	COAL & ALLIED OPERATIONS PTY LTD*	299957	6429246
1ak	COAL & ALLIED OPERATIONS PTY LTD*	299970	6429257
1al	COAL & ALLIED OPERATIONS PTY LTD*	299984	6429267
1am	COAL & ALLIED OPERATIONS PTY LTD*	300113	6429779
1an	COAL & ALLIED OPERATIONS PTY LTD*	299662	6429937
1ao	COAL & ALLIED OPERATIONS PTY LTD*	299585	6430014
1ap	COAL & ALLIED OPERATIONS PTY LTD*	299957	6430106
1aq	COAL & ALLIED OPERATIONS PTY LTD*	299951	6430122
1ar	COAL & ALLIED OPERATIONS PTY LTD*	299932	6430141
1as	COAL & ALLIED OPERATIONS PTY LTD*	299935	6430177
1at	COAL & ALLIED OPERATIONS PTY LTD*	299909	6430242
1au	COAL & ALLIED OPERATIONS PTY LTD*	299892	6430283
1av	COAL & ALLIED OPERATIONS PTY LTD*	299868	6430351
1aw	COAL & ALLIED OPERATIONS PTY LTD*	299796	6430380
1ax	COAL & ALLIED OPERATIONS PTY LTD*	299851	6430393
1ay	COAL & ALLIED OPERATIONS PTY LTD*	299812	6430453
1az	COAL & ALLIED OPERATIONS PTY LTD*	299792	6430458
1ba	COAL & ALLIED OPERATIONS PTY LTD*	299775	6430463
1h	COAL & ALLIED OPERATIONS PTY LTD*	299751	6430465
1i	COAL & ALLIED OPERATIONS PTY LTD*	299682	6430469
1j	COAL & ALLIED OPERATIONS PTY LTD*	299662	6430475
1k	COAL & ALLIED OPERATIONS PTY LTD*	299624	6430483
1l	COAL & ALLIED OPERATIONS PTY LTD*	299647	6430484
1m	COAL & ALLIED OPERATIONS PTY LTD*	299491	6430502
1n	COAL & ALLIED OPERATIONS PTY LTD*	299591	6430533
1o	COAL & ALLIED OPERATIONS PTY LTD*	291505	6430779
1p	COAL & ALLIED OPERATIONS PTY LTD*	299901	6430903
1q	COAL & ALLIED OPERATIONS PTY LTD*	299508	6431522
1r	COAL & ALLIED OPERATIONS PTY LTD*	298205	6432838
1s	COAL & ALLIED OPERATIONS PTY LTD*	298547	6432870
1t	COAL & ALLIED OPERATIONS PTY LTD*	296360	6432912
1u	COAL & ALLIED OPERATIONS PTY LTD*	296125	6432941
1v	COAL & ALLIED OPERATIONS PTY LTD*	296249	6432975
1w	COAL & ALLIED OPERATIONS PTY LTD*	297943	6432993
1x	COAL & ALLIED OPERATIONS PTY LTD*	297436	6433106
1y	COAL & ALLIED OPERATIONS PTY LTD*	296351	6433138

Receiver ID	Landholders	Easting	Northing
1z	COAL & ALLIED OPERATIONS PTY LTD*	299218	6434300
2aa	BENGALLA MINING COMPANY PTY LTD	298331	6426589
2ab	BENGALLA MINING COMPANY PTY LTD	298490	6426604
2ac	BENGALLA MINING COMPANY PTY LTD	297160	6426689
2ad	BENGALLA MINING COMPANY PTY LTD	298534	6426700
2ae	BENGALLA MINING COMPANY PTY LTD	297138	6426742
2af	BENGALLA MINING COMPANY PTY LTD	298640	6426782
2ah	BENGALLA MINING COMPANY PTY LTD	298721	6426869
2ai	BENGALLA MINING COMPANY PTY LTD	297630	6426965
2aj	BENGALLA MINING COMPANY PTY LTD	298760	6427327
2ak	BENGALLA MINING COMPANY PTY LTD	297826	6427710
2al	BENGALLA MINING COMPANY PTY LTD	297792	6427732
2b	BENGALLA MINING COMPANY PTY LTD	297852	6427737
2c	BENGALLA MINING COMPANY PTY LTD	300562	6428120
2d	BENGALLA MINING COMPANY PTY LTD	300480	6428149
2e	BENGALLA MINING COMPANY PTY LTD	298361	6428430
2f	BENGALLA MINING COMPANY PTY LTD	297839	6428516
2i	BENGALLA MINING COMPANY PTY LTD	299426	6428718
2m	BENGALLA MINING COMPANY PTY LTD	292759	6429036
2n	BENGALLA MINING COMPANY PTY LTD	293017	6423526
2o	BENGALLA MINING COMPANY PTY LTD	292327	6423973
2p	BENGALLA MINING COMPANY PTY LTD	292261	6423976
2q	BENGALLA MINING COMPANY PTY LTD	292187	6424053
2r	BENGALLA MINING COMPANY PTY LTD	292257	6424062
2s	BENGALLA MINING COMPANY PTY LTD	292211	6424104
2t	BENGALLA MINING COMPANY PTY LTD	293595	6424750
2u	BENGALLA MINING COMPANY PTY LTD	294390	6425005
2v	BENGALLA MINING COMPANY PTY LTD	294658	6425080
2w	BENGALLA MINING COMPANY PTY LTD	291605	6425845
2x	BENGALLA MINING COMPANY PTY LTD	298374	6426394
2y	BENGALLA MINING COMPANY PTY LTD	298380	6426499
2z	BENGALLA MINING COMPANY PTY LTD	298456	6426569
3a	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	301401	6434809
3b	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	301340	6434861
3c	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	299283	6435042
3d	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	301334	6435087
3e	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	301328	6435119
3f	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	301318	6435356
3g	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	299242	6435789
3i	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	300387	6436168
3j	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	301316	6436179
3k	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	298996	6436300
3l	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	297899	6436391
3m	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	297973	6436398
3n	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	299587	6436753
3o	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	297890	6436905
3p	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	297515	6436960

Receiver ID	Landholders	Easting	Northing
3q	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	297714	6436969
3r	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	297666	6438671
3s	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	297229	6438705
5	COAL OPERATIONS AUSTRALIA LTD	299157	6425521
5aa	COAL OPERATIONS AUSTRALIA LTD	299058	6424990
5ab	COAL OPERATIONS AUSTRALIA LTD	299687	6425010
5ac	COAL OPERATIONS AUSTRALIA LTD	299155	6425038
5ad	COAL OPERATIONS AUSTRALIA LTD	299776	6425222
5ae	COAL OPERATIONS AUSTRALIA LTD	298482	6426106
5f	COAL OPERATIONS AUSTRALIA LTD	298437	6426197
5g	COAL OPERATIONS AUSTRALIA LTD	298396	6426283
5h	COAL OPERATIONS AUSTRALIA LTD	289883	6421305
5i	COAL OPERATIONS AUSTRALIA LTD	291557	6421390
5j	COAL OPERATIONS AUSTRALIA LTD	289652	6421415
5k	COAL OPERATIONS AUSTRALIA LTD	291647	6421569
5l	COAL OPERATIONS AUSTRALIA LTD	291885	6422030
5m	COAL OPERATIONS AUSTRALIA LTD	293829	6422109
5n	COAL OPERATIONS AUSTRALIA LTD	290201	6422253
5o	COAL OPERATIONS AUSTRALIA LTD	290884	6422545
5p	COAL OPERATIONS AUSTRALIA LTD	293237	6422604
5q	COAL OPERATIONS AUSTRALIA LTD	294513	6422770
5r	COAL OPERATIONS AUSTRALIA LTD	295707	6423944
5s	COAL OPERATIONS AUSTRALIA LTD	295980	6424187
5t	COAL OPERATIONS AUSTRALIA LTD	296636	6424340
5u	COAL OPERATIONS AUSTRALIA LTD	297868	6424610
5v	COAL OPERATIONS AUSTRALIA LTD	290216	6424813
5w	COAL OPERATIONS AUSTRALIA LTD	290173	6424829
5x	COAL OPERATIONS AUSTRALIA LTD	290260	6424898
5y	COAL OPERATIONS AUSTRALIA LTD	298996	6424939
5z	COAL OPERATIONS AUSTRALIA LTD	299118	6424976
7	COAL OPERATIONS AUSTRALIA LTD	298474	6426128
7b	MUSWELLBROOK COAL COMPANY LTD	287608	6421748
7c	MUSWELLBROOK COAL COMPANY LTD	287636	6421806
7d	MUSWELLBROOK COAL COMPANY LTD	288584	6426059
7e	MUSWELLBROOK COAL COMPANY LTD	287898	6427950
7f	MUSWELLBROOK COAL COMPANY LTD	286867	6428574
7g	MUSWELLBROOK COAL COMPANY LTD	287944	6432756
7h	MUSWELLBROOK COAL COMPANY LTD	288913	6434308
7i	MUSWELLBROOK COAL COMPANY LTD	288166	6434615
7j	MUSWELLBROOK COAL COMPANY LTD	289298	6434616
7k	MUSWELLBROOK COAL COMPANY LTD	289566	6436695
8a	MANGOOLA COAL OPERATIONS PTY LTD	286721	6420297
8b	MANGOOLA COAL OPERATIONS PTY LTD	286950	6420594
8c	MANGOOLA COAL OPERATIONS PTY LTD	286885	6420606
8d	MANGOOLA COAL OPERATIONS PTY LTD	287322	6421776
8e	MANGOOLA COAL OPERATIONS PTY LTD	286763	6422241
8f	MANGOOLA COAL OPERATIONS PTY LTD	287200	6425415

Receiver ID	Landholders	Easting	Northing
8g	MANGOOLA COAL OPERATIONS PTY LTD	287670	6427813
8h	MANGOOLA COAL OPERATIONS PTY LTD	287584	6427890
8i	MANGOOLA COAL OPERATIONS PTY LTD	286574	6428569
101	MACH ENERGY AUSTRALIA PTY LTD	299841	6430413
107	COAL & ALLIED OPERATIONS PTY LTD*	299733	6430469
129	COAL & ALLIED OPERATIONS PTY LTD*	298060	6432528
130	COAL & ALLIED OPERATIONS PTY LTD*	298497	6432215
135	COAL & ALLIED OPERATIONS PTY LTD*	299992	6432182
231	COAL & ALLIED OPERATIONS PTY LTD*	300494	6429496
246	BENGALLA MINING COMPANY PTY LTD	292872	6423435
263	COAL & ALLIED OPERATIONS PTY LTD*	291463	6427224
211	COAL OPERATIONS AUSTRALIA LTD	299511	6426190
274	MUSWELLBROOK COAL COMPANY LTD	288803	6435159
299	COAL OPERATIONS AUSTRALIA LTD	291514	6421734
309	COAL & ALLIED OPERATIONS PTY LTD*	299946	6432340

* The ownership of this land is subject to the acquisition of the Mount Pleasant Operation by MACH Energy Australia Pty Ltd.

Table B-5 Commercial Receivers

Receiver ID	Landholders	Easting	Northing
2ag	BENGALLA MINING COMPANY PTY LTD	298505	6426785
3h	ANGLO COAL (DARTBROOK MANAGEMENT) PTY LTD	298907	6435815
5e	COAL OPERATIONS AUSTRALIA LTD	298433	6426136
6	MUSWELLBROOK RACE CLUB LTD	298605	6426135
83b	LG & CM KELMAN	300909	6429329
183	K.L. & H.R. DAY PTY LTD	300857	6437446
195e	T & RK YOUNG	302034	6432899
205	DAPKOS PTY LTD	301126	6431439
208	FK & WDG ALMOND and PW HUME	299174	6426781
212c	DR & CJ TUBB	299539	6426270
280	MONADELPHOUS PROPERTIES PTY LTD	299773	6426105
281	JR & JA BUCKLEY	299691	6426050
282	JE ANDERSON and KL & J CAMPBELL and MV & DJ & SE & TP HALLETT	299620	6425915
285	THE NEW SOUTH WALES GREYHOUND BREEDERS OWNERS & TRAINERS ASSOCIATION LTD	300280	6427411
285b	THE NEW SOUTH WALES GREYHOUND BREEDERS OWNERS & TRAINERS ASSOCIATION LTD	300172	6427476
285c	THE NEW SOUTH WALES GREYHOUND BREEDERS OWNERS & TRAINERS ASSOCIATION LTD	300136	6427524
286	MUSWELLBROOK SHIRE COUNCIL	300360	6427448
286d	MUSWELLBROOK SHIRE COUNCIL	300709	6429052
287	TELSTRA CORPORATION LTD	300454	6427537
291	MUSWELLBROOK SHIRE COUNCIL	299972	6426608
305	RH ENGLEBRECHT	299173	6426508
308	DL & PA MOORE	299667	6430746
315	FK & WDG ALMOND and PW HUME	299208	6426836
540	GRENTELL PTY LTD	300569	6427621
546	SJ SCOTT	300302	6427587

APPENDIX C

OPERATIONAL NOISE PREDICTIONS

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)										Consent Noise Criteria Day / Evening / Night
		Modification 3 Predictions					Modification 4 Predictions					
		Calm Isothermal		P10[1]			Calm Isothermal		P10[1]			
		Day	Eve / Night	Day	Eve	Night	Day	Eve / Night	Day	Eve	Night	
Privately-Owned Residential Receivers												
4	9	<20	<20	32	34	34	<20	<20	33	35	34	39 / 38 / 37
19	8	21	20	36	39	38	22	21	36	39[2]	39	41 / 39 / 39
20	8	21	20	36	39	38	22	21	37	39[2]	39	41 / 39 / 39
21	8	21	20	36	39	38	22	21	37	39[2]	39	41 / 39 / 39
23	8	22	22	37	39[2]	39	24	24	38	40[2]	40	40 / 40 / 40
35	8	26	22	38	41	40	29	27	39	40[2]	41	42 / 41 / 41
35b	8	26	22	38	41[3]	40[3]	28	27	39	40[2,3]	38[2]	41 / 39 / 39
67	7	27	23	39	43	41	27	25	39	43	41	Acquisition
68	7	27	23	39	41[2]	41	28	25	39	41[2]	41	43 / 42 / 42
74	7	26	23	39	41[2]	41	27	24	39	41[2]	41	43 / 42 / 42
77	7	28	23	39	40	39	28	24	39	40	39	42 / 41 / 41
79	7	27	22	38	40	39	28	23	38	40	39	41 / 41 / 41
80	7	27	22	38	40	39	28	23	38	40	39	41 / 41 / 41
82	8	26	21	37	39	38	26	22	37	39	39	41 / 39 / 39
83	7	26	21	37	39[3]	39[3]	27	22	37	38[2,3]	37[2]	40 / 37 / 37
84	8	27	22	37	40	39	27	23	37	40	40	40 / 40 / 40
86	7	28	23	39	40	39	29	24	39	40	39	42 / 42 / 42
96	7	31	26	42	37	35	31	26	42	37	36	Acquisition
102	7	31	26	42	36	34	31	26	42	36	35	Acquisition
108	7	31	26	43	34	33	31	26	43	34	33	Acquisition
112	7	30	27	40	34	33	30	27	40	34	33	Acquisition
118	7	32	27	42	34	33	32	27	42	34	33	Acquisition

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)										Consent Noise Criteria Day / Evening / Night
		Modification 3 Predictions					Modification 4 Predictions					
		Calm Isothermal		P10[1]			Calm Isothermal		P10[1]			
		Day	Eve / Night	Day	Eve	Night	Day	Eve / Night	Day	Eve	Night	
120	7	32	27	42	35	34	32	27	42	35	34	Acquisition
120c	7	32	27	42	35	34	32	27	42	35	34	Acquisition
121	7	32	27	42	34	33	32	27	42	34	33	Acquisition
206	8	22	20	36	38	37	24	23	36	39	38	41 / 39 / 39
207	8	21	20	36	39	38	22	22	36	39	38	41 / 39 / 39
207b	8	21	20	35	38	37	22	21	36	39	38	41 / 39 / 39
212	8	20	<20	34	37	36	21	20	35	38	37	41 / 39 / 39
212b	8	20	<20	34	37	36	21	20	35	38	37	41 / 39 / 39
213	8	20	<20	35	38	37	21	20	36	39	38	41 / 39 / 39
214	8	20	20	35	38	37	21	20	36	39	38	41 / 39 / 39
215	8	21	20	35	38	37	21	20	36	39	38	41 / 39 / 39
216	8	21	20	35	38	37	21	20	36	39	38	41 / 39 / 39
217	8	21	20	36	38	37	21	21	36	39	38	41 / 39 / 39
218	8	21	20	35	38	37	21	20	36	39	38	41 / 39 / 39
219	8	21	20	36	38	37	21	20	36	39	38	41 / 39 / 39
220	8	21	20	36	38	37	21	20	36	39	38	41 / 39 / 39
221	8	21	20	36	38	37	21	21	36	39	38	41 / 39 / 39
222	8	21	20	36	39	38	22	21	36	39	38	41 / 39 / 39
223	8	21	20	36	39	38	22	21	36	39	38	41 / 39 / 39
224	8	21	20	36	39	38	22	21	36	39[2]	39	41 / 39 / 39
225	8	21	20	36	38	37	21	21	36	39	38	41 / 39 / 39
283	9	<20	<20	34	36	35	20	<20	34	37	36	39 / 38 / 37
288	8	24	21	35	38	37	26	25	36	39	37	41 / 39 / 39

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)										Consent Noise Criteria Day / Evening / Night
		Modification 3 Predictions					Modification 4 Predictions					
		Calm Isothermal		P10[1]			Calm Isothermal		P10[1]			
		Day	Eve / Night	Day	Eve	Night	Day	Eve / Night	Day	Eve	Night	
288b	8	24	21	35	38	37	26	25	36	39	37	41 / 39 / 39
289	8	26	22	38	39[2]	39	27	25	39	39[2]	40	41 / 40 / 40
526	7	27	23	38	40[3]	39[3]	28	23	38	38[2,3]	37[2]	40 / 37 / 37
527	8	25	21	38	38[2]	38	27	24	38	38[2]	39	41 / 39 / 39
528	8	25	21	38	38[2]	38	27	24	38	38[2]	39	41 / 39 / 39
529	8	25	21	38	38[2]	38	27	24	38	38[2]	39	41 / 39 / 39
530	8	25	21	38	39	38	27	24	38	38[2]	39	41 / 39 / 39
531	8	25	21	38	39	38	27	24	38	38[2]	39	41 / 39 / 39
532	8	25	21	38	39	38	27	24	38	38[2]	39	41 / 39 / 39
533	8	25	21	38	39	38	27	24	38	38[2]	39	41 / 39 / 39
534	8	25	21	38	39	38	27	25	38	38[2]	39	41 / 39 / 39
535	8	25	21	38	39	38	27	25	38	38[2]	39	41 / 39 / 39
536	8	25	21	38	39	38	27	25	38	38[2]	39	41 / 39 / 39
537	8	25	21	38	39	38	27	25	38	38[2]	38	41 / 39 / 39
538	8	24	21	36	38	37	27	25	36	39	37	41 / 39 / 39
539	8	24	21	36	38	37	27	25	36	39	37	41 / 39 / 39
541	8	24	21	35	38	37	26	25	36	39	37	41 / 39 / 39
542	8	24	21	35	38	37	26	25	36	39	37	41 / 39 / 39
543	8	24	21	35	38	37	27	25	36	39	37	41 / 39 / 39
544	8	24	21	35	38	37	26	25	36	39	37	41 / 39 / 39
545	8	24	21	35	38	37	26	25	36	39	37	41 / 39 / 39

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)										Consent Noise Criteria Day / Evening / Night
		Modification 3 Predictions					Modification 4 Predictions					
		Calm Isothermal		P10[1]			Calm Isothermal		P10[1]			
		Day	Eve / Night	Day	Eve	Night	Day	Eve / Night	Day	Eve	Night	
Mine-Owned Residential Receivers[4]												
1ac	n/a	23	22	38	41	40	27	27	39	42	41	n/a[4]
1ae	n/a	25	25	40	44	42	35	35	42	45	43	n/a[4]
1af	n/a	25	23	39	43	41	28	27	39	43	42	n/a[4]
1ag	n/a	26	23	39	42	41	28	26	39	43	41	n/a[4]
1ah	n/a	27	23	39	43	41	27	24	39	43	41	n/a[4]
1ai	n/a	27	23	39	43	41	27	24	39	43	41	n/a[4]
1aj	n/a	27	23	40	43	41	27	24	40	43	41	n/a[4]
1ak	n/a	26	23	40	43	41	27	24	40	43	41	n/a[4]
1al	n/a	26	23	39	43	41	27	24	39	43	41	n/a[4]
1am	n/a	28	24	39	40	39	29	24	40	40	39	n/a[4]
1an	n/a	28	26	41	40	38	28	26	41	40	38	n/a[4]
1ao	n/a	28	26	40	39	36	28	26	40	39	36	n/a[4]
1ap	n/a	30	25	41	39	38	30	25	41	39	38	n/a[4]
1aq	n/a	30	25	41	39	38	30	25	41	39	38	n/a[4]
1ar	n/a	30	25	41	39	38	30	25	41	39	38	n/a[4]
1as	n/a	30	25	41	39	37	30	25	41	39	37	n/a[4]
1at	n/a	30	25	41	38	37	30	25	41	38	37	n/a[4]
1au	n/a	30	25	41	38	36	31	26	41	38	36	n/a[4]
1av	n/a	31	26	42	36	35	31	26	42	38	36	n/a[4]
1aw	n/a	31	26	42	36	34	31	26	42	36	35	n/a[4]
1ax	n/a	31	26	42	36	35	31	26	42	36	35	n/a[4]
1ay	n/a	31	26	42	36	34	31	26	42	36	35	n/a[4]

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)										Consent Noise Criteria Day / Evening / Night
		Modification 3 Predictions					Modification 4 Predictions					
		Calm Isothermal		P10[1]			Calm Isothermal		P10[1]			
		Day	Eve / Night	Day	Eve	Night	Day	Eve / Night	Day	Eve	Night	
1az	n/a	31	26	42	35	34	31	26	42	35	34	n/a[4]
1ba	n/a	31	26	42	34	33	31	26	42	35	34	n/a[4]
1h	n/a	31	26	42	34	33	31	26	43	35	34	n/a[4]
1i	n/a	31	26	43	34	33	31	26	43	34	33	n/a[4]
1j	n/a	31	26	43	34	33	31	27	43	34	33	n/a[4]
1k	n/a	31	27	43	33	33	31	27	43	33	33	n/a[4]
1l	n/a	31	26	43	34	33	31	27	43	34	33	n/a[4]
1m	n/a	30	27	36	33	32	30	27	36	33	32	n/a[4]
1n	n/a	32	27	44	33	32	32	27	44	34	33	n/a[4]
1p	n/a	33	26	41	36	35	33	26	41	36	35	n/a[4]
2aa	n/a	20	<20	36	39	38	21	20	36	40	39	n/a[4]
2ab	n/a	21	<20	36	39	38	21	20	36	40	39	n/a[4]
2ac	n/a	<20	<20	30	35	34	<20	<20	30	35	34	n/a[4]
2ad	n/a	21	<20	36	39	38	21	20	37	40	39	n/a[4]
2ae	n/a	<20	<20	28	35	34	<20	<20	28	35	34	n/a[4]
2af	n/a	21	20	37	40	39	22	21	37	40	39	n/a[4]
2ah	n/a	21	20	37	40	39	22	21	37	40	39	n/a[4]
2ai	n/a	21	20	36	41	39	21	21	36	41	39	n/a[4]
2aj	n/a	22	21	38	41	40	23	23	38	42	41	n/a[4]
2ak	n/a	24	24	37	41	40	25	25	37	42	40	n/a[4]
2al	n/a	24	24	36	40	38	25	26	36	40	39	n/a[4]
2b	n/a	24	24	38	41	40	25	25	38	41	40	n/a[4]
2c	n/a	25	21	36	39	38	28	27	37	39	38	n/a[4]

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)										Consent Noise Criteria Day / Evening / Night
		Modification 3 Predictions					Modification 4 Predictions					
		Calm Isothermal		P10[1]			Calm Isothermal		P10[1]			
		Day	Eve / Night	Day	Eve	Night	Day	Eve / Night	Day	Eve	Night	
2d	n/a	25	21	37	39	38	29	27	37	40	38	n/a[4]
2e	n/a	25	25	39	44	42	36	36	43	47	45	n/a[4]
2f	n/a	25	26	39	43	41	42	42	46	50	48	n/a[4]
2i	n/a	24	24	39	43	42	28	28	40	44	42	n/a[4]
2t	n/a	<20	<20	30	32	31	<20	<20	30	32	32	n/a[4]
2u	n/a	22	21	33	35	34	22	22	33	35	34	n/a[4]
2v	n/a	26	25	34	36	35	26	25	34	35	35	n/a[4]
2x	n/a	20	<20	36	39	38	21	<20	36	39	38	n/a[4]
2y	n/a	20	<20	36	39	38	21	20	36	40	38	n/a[4]
2z	n/a	20	<20	36	39	38	21	20	36	40	38	n/a[4]
5	9	<20	<20	33	35	35	20	<20	33	36	35	n/a[4]
5aa	n/a	<20	<20	32	34	33	<20	<20	32	35	34	n/a[4]
5ab	n/a	<20	<20	31	33	33	<20	<20	32	34	33	n/a[4]
5ac	n/a	<20	<20	32	34	33	<20	<20	32	35	34	n/a[4]
5ad	n/a	<20	<20	32	34	33	<20	<20	32	34	34	n/a[4]
5ae	n/a	20	<20	35	38	37	20	<20	35	38	37	n/a[4]
5f	n/a	20	<20	35	38	37	20	<20	35	39	38	n/a[4]
5g	n/a	20	<20	36	38	37	20	<20	36	39	38	n/a[4]
5r	n/a	27	26	31	33	33	26	26	32	33	33	n/a[4]
5s	n/a	25	25	32	34	33	25	25	32	34	33	n/a[4]
5t	n/a	23	23	32	34	33	23	23	32	34	33	n/a[4]
5u	n/a	20	<20	32	34	33	20	<20	32	35	34	n/a[4]
5y	n/a	<20	<20	32	34	33	<20	<20	32	35	34	n/a[4]

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)										Consent Noise Criteria Day / Evening / Night
		Modification 3 Predictions					Modification 4 Predictions					
		Calm Isothermal		P10[1]			Calm Isothermal		P10[1]			
		Day	Eve / Night	Day	Eve	Night	Day	Eve / Night	Day	Eve	Night	
5z	n/a	<20	<20	32	34	33	<20	<20	32	35	34	n/a[4]
7	8	20	<20	35	38	37	20	<20	35	39	37	n/a[4]
101	7	31	26	42	36	34	31	26	42	36	35	n/a[4]
107	7	31	26	43	34	33	31	26	43	35	34	n/a[4]
211	9	20	<20	34	37	36	20	<20	35	37	36	n/a[4]
231	7	28	23	38	40	39	28	23	38	40	39	n/a[4]

Notes:

1. Noise levels predicted to result under 10th percentile meteorological conditions as described in Section 4.3 (indicated by 'P10').
2. P10 noise level predicted to result with integrated pro-active and reactive management measures in place. Note that a mitigated level is only presented for receivers where exceedances of the relevant criteria were predicted in the absence of pro-active and reactive management measures. The implementation of pro-active and reactive management measures would also benefit other receivers surrounding the Mount Pleasant Operation.
3. Receiver would comply with proposed noise criteria summarised in Table 3-9 of report.
4. Consent noise criteria do not apply to mine-owned residences.

APPENDIX D

CUMULATIVE NOISE PREDICTIONS

Rec ID	NAG	$L_{Aeq,period}$ Noise Levels[1]													Cumulative Noise Criteria Day / Eve /Night
		Mount Pleasant Operation incorporating the Modification			Mt Arthur Coal Mine			Bengalla Mine			Dartbrook Mine	Cumulative Noise			
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night		Day	Eve	Night	
4	9	29	33	33	24	34	34	27	27	33	-[2]	32	37	38	55 / 45 / 40
19	8	32	37	37	23	35	35	30	30	31	-[2]	35	39	39	55 / 45 / 40
20	8	33	37	37	23	35	35	31	31	31	-[2]	35	40	40	55 / 45 / 40
21	8	33	37	37	24	35	35	31	31	31	-[2]	35	40	40	55 / 45 / 40
23	8	34	38	38	22	34	34	31	31	30	-[2]	36	40	40	55 / 45 / 40
35	8	35	38	38	19	32	32	31	31	30	-[2]	37	40	39	55 / 45 / 40
35b	8	35	38	37	19	32	32	31	31	30	-[2]	37	40	39	55 / 45 / 40
206	8	32	36	36	22	33	33	30	30	31	-[2]	34	38	39	55 / 45 / 40
207	8	32	36	36	22	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
207b	8	32	36	36	22	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
212	8	31	35	35	22	34	34	28	28	31	-[2]	33	38	38	55 / 45 / 40
212b	8	31	35	35	22	34	34	28	28	31	-[2]	33	38	38	55 / 45 / 40
213	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
214	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
215	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
216	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
217	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
218	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
219	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
220	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
221	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
222	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
223	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
224	8	32	37	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40
225	8	32	36	36	23	35	35	30	30	31	-[2]	34	39	39	55 / 45 / 40

Rec ID	NAG	$L_{Aeq,period}$ Noise Levels[1]												Cumulative Noise Criteria Day / Eve /Night
		Mount Pleasant Operation incorporating the Modification			Mt Arthur Coal Mine			Bengalla Mine			Dartbrook Mine	Cumulative Noise		
		Day	Eve	Night	Day	Eve	Night	Day	Eve	Night		Day	Eve	Night	
283	9	30	34	34	22	33	33	28	28	32	-[2]	32	37	38	55 / 45 / 40
288	8	32	36	35	22	33	33	30	30	31	-[2]	34	38	38	55 / 45 / 40
288b	8	32	36	35	22	33	33	30	30	31	-[2]	34	38	38	55 / 45 / 40
538	8	33	36	36	22	33	33	30	30	31	-[2]	35	38	38	55 / 45 / 40
539	8	33	36	36	22	33	33	30	30	31	-[2]	35	38	38	55 / 45 / 40
541	8	32	36	35	22	33	33	30	30	31	-[2]	34	38	38	55 / 45 / 40
542	8	32	36	35	22	33	33	30	30	31	-[2]	34	38	38	55 / 45 / 40
543	8	32	36	36	22	33	33	30	30	31	-[2]	34	38	38	55 / 45 / 40
544	8	32	36	35	22	33	33	30	30	31	-[2]	34	38	38	55 / 45 / 40
545	8	32	36	35	22	33	33	30	30	31	-[2]	34	38	38	55 / 45 / 40

Notes:

1. $L_{Aeq,period}$ refers to the L_{eq} noise level measured over the entire daytime period (7.00am-6.00pm), evening period (6.00pm-10.00pm), or night period (10.00pm-7.00am).
2. No noise predictions were available as this receiver is not considered to be impacted by the mine.

APPENDIX E

SLEEP AROUSAL NOISE PREDICTIONS

Receiver ID	NAG	L_{Amax} Noise Level (dBA)		$L_{A1,1min}$ Consent Criterion
		Train Load Out Bin	Benching / Stretching	
Privately-Owned Residential Receivers				
4	9	34	35	45
19	8	39	41	45
20	8	39	40	45
21	8	39	40	45
23	8	41	43	45
35	8	41	42	45
35b	8	40	42	45
67	7	41	42	45
68	7	41	42	45
74	7	41	41	45
77	7	39	39	45
79	7	39	39	45
80	7	39	39	45
82	8	39	39	45
83	7	39	39	45
84	8	40	40	45
86	7	39	39	45
96	7	36	38	45
102	7	33	36	45
108	7	33	36	45
112	7	34	33	45
118	7	34	34	45
120	7	34	34	45
120c	7	33	33	45
121	7	38	38	45
206	8	39	40	45
207	8	38	40	45
207b	8	37	39	45
212	8	37	38	45
212b	8	38	39	45
213	8	38	39	45
214	8	38	40	45
215	8	38	40	45
216	8	38	40	45
217	8	38	40	45
218	8	38	39	45
219	8	38	39	45
220	8	38	40	45
221	8	39	40	45
222	8	39	40	45
223	8	39	41	45
224	8	38	40	45
225	8	36	39	45

Receiver ID	NAG	L_{Amax} Noise Level (dBA)		$L_{A1,1min}$ Consent Criterion
		Train Load Out Bin	Benching / Stretching	
283	9	38	38	45
288	8	38	38	45
288b	8	40	40	45
289	8	39	40	45
526	7	39	40	45
527	8	39	39	45
528	8	39	39	45
529	8	39	39	45
530	8	39	39	45
531	8	39	39	45
532	8	39	39	45
533	8	39	39	45
534	8	39	39	45
535	8	39	39	45
536	8	38	39	45
537	8	37	38	45
538	8	38	38	45
539	8	38	38	45
541	8	38	38	45
542	8	38	38	45
543	8	38	38	45
544	8	38	38	45
545	8	22	31	45
Mine-Owned Residential Receivers[1]				
1ac	n/a	41	44	n/a[1]
1ae	n/a	43	47	n/a[1]
1af	n/a	42	43	n/a[1]
1ag	n/a	41	43	n/a[1]
1ah	n/a	41	42	n/a[1]
1ai	n/a	41	42	n/a[1]
1aj	n/a	41	42	n/a[1]
1ak	n/a	41	42	n/a[1]
1al	n/a	41	42	n/a[1]
1am	n/a	39	40	n/a[1]
1an	n/a	38	39	n/a[1]
1ao	n/a	36	38	n/a[1]
1ap	n/a	38	39	n/a[1]
1aq	n/a	38	39	n/a[1]
1ar	n/a	38	39	n/a[1]
1as	n/a	37	38	n/a[1]
1at	n/a	37	38	n/a[1]
1au	n/a	36	37	n/a[1]
1av	n/a	36	38	n/a[1]
1aw	n/a	35	37	n/a[1]
1ax	n/a	35	37	n/a[1]

Receiver ID	NAG	L_{Amax} Noise Level (dBA)		$L_{A1,1min}$ Consent Criterion
		Train Load Out Bin	Benching / Stretching	
1ay	n/a	35	37	n/a[1]
1az	n/a	34	36	n/a[1]
1ba	n/a	34	36	n/a[1]
1h	n/a	34	36	n/a[1]
1i	n/a	34	36	n/a[1]
1j	n/a	34	36	n/a[1]
1k	n/a	33	33	n/a[1]
1l	n/a	33	35	n/a[1]
1m	n/a	33	32	n/a[1]
1n	n/a	33	33	n/a[1]
1p	n/a	35	35	n/a[1]
2aa	n/a	39	42	n/a[1]
2ab	n/a	39	41	n/a[1]
2ac	n/a	35	35	n/a[1]
2ad	n/a	39	41	n/a[1]
2ae	n/a	34	34	n/a[1]
2af	n/a	39	40	n/a[1]
2ah	n/a	39	40	n/a[1]
2ai	n/a	39	39	n/a[1]
2aj	n/a	41	43	n/a[1]
2ak	n/a	40	41	n/a[1]
2al	n/a	39	40	n/a[1]
2b	n/a	40	42	n/a[1]
2c	n/a	38	39	n/a[1]
2d	n/a	38	39	n/a[1]
2e	n/a	45	50	n/a[1]
2f	n/a	48	58	n/a[1]
2i	n/a	42	44	n/a[1]
2t	n/a	33	32	n/a[1]
2u	n/a	35	34	n/a[1]
2v	n/a	36	35	n/a[1]
2x	n/a	38	40	n/a[1]
2y	n/a	38	41	n/a[1]
2z	n/a	38	41	n/a[1]
5	9	35	36	n/a[1]
5aa	n/a	34	35	n/a[1]
5ab	n/a	33	34	n/a[1]
5ac	n/a	34	35	n/a[1]
5ad	n/a	34	35	n/a[1]
5ae	n/a	37	39	n/a[1]
5f	n/a	38	40	n/a[1]
5g	n/a	38	39	n/a[1]
5r	n/a	33	33	n/a[1]
5s	n/a	34	34	n/a[1]
5t	n/a	34	34	n/a[1]

Receiver ID	NAG	L_{Amax} Noise Level (dBA)		$L_{A1,1min}$ Consent Criterion
		Train Load Out Bin	Benching / Stretching	
5u	n/a	34	35	n/a[1]
5y	n/a	34	35	n/a[1]
5z	n/a	34	35	n/a[1]
7	8	37	39	n/a[1]
101	7	35	37	n/a[1]
107	7	35	37	n/a[1]
211	9	34	36	n/a[1]
231	7	37	37	n/a[1]

Note:

1. Consent noise criteria do not apply to mine-owned residences.

APPENDIX F

CONSTRUCTION IN VICINITY OF MOUNT PLEASANT OPERATION - NOISE PREDICTIONS

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)	
		P10	Day Consent Noise Criteria
Privately-Owned Residential Receivers			
4	9	33	39
19	8	37	41
20	8	36	41
21	8	36	41
23	8	40	40
35	8	39	42
35b	8	39	41
67	7	40	Acquisition
68	7	40	43
74	7	39	43
77	7	39	42
79	7	38	41
80	7	38	41
82	8	37	41
83	7	37	40
84	8	37	40
86	7	39	42
96	7	42	Acquisition
102	7	42	Acquisition
108	7	43	Acquisition
112	7	40	Acquisition
118	7	42	Acquisition
120	7	42	Acquisition
120c	7	42	Acquisition
121	7	42	Acquisition
206	8	37	41
207	8	38	41
207b	8	36	41
212	8	35	41
212b	8	35	41
213	8	36	41
214	8	36	41
215	8	36	41
216	8	36	41
217	8	37	41
218	8	36	41
219	8	37	41
220	8	37	41
221	8	37	41
222	8	37	41
223	8	37	41
224	8	37	41
225	8	37	41

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)	
		P10	Day Consent Noise Criteria
283	9	35	39
288	8	36	41
288b	8	36	41
289	8	39	41
526	7	38	40
527	8	38	41
528	8	38	41
529	8	38	41
530	8	38	41
531	8	38	41
532	8	38	41
533	8	38	41
534	8	38	41
535	8	38	41
536	8	38	41
537	8	38	41
538	8	37	41
539	8	37	41
541	8	36	41
542	8	36	41
543	8	36	41
544	8	36	41
545	8	36	41
Mine-Owned Residential Receivers[1]			
1ac	n/a	40	n/a[1]
1ae	n/a	43	n/a[1]
1af	n/a	40	n/a[1]
1ag	n/a	40	n/a[1]
1ah	n/a	40	n/a[1]
1ai	n/a	40	n/a[1]
1aj	n/a	40	n/a[1]
1ak	n/a	40	n/a[1]
1al	n/a	39	n/a[1]
1am	n/a	39	n/a[1]
1an	n/a	41	n/a[1]
1ao	n/a	40	n/a[1]
1ap	n/a	41	n/a[1]
1aq	n/a	41	n/a[1]
1ar	n/a	41	n/a[1]
1as	n/a	41	n/a[1]
1at	n/a	41	n/a[1]
1au	n/a	41	n/a[1]
1av	n/a	42	n/a[1]
1aw	n/a	42	n/a[1]

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)	
		P10	Day Consent Noise Criteria
1ax	n/a	42	n/a[1]
1ay	n/a	42	n/a[1]
1az	n/a	42	n/a[1]
1ba	n/a	42	n/a[1]
1h	n/a	42	n/a[1]
1i	n/a	43	n/a[1]
1j	n/a	43	n/a[1]
1k	n/a	43	n/a[1]
1l	n/a	43	n/a[1]
1m	n/a	36	n/a[1]
1n	n/a	44	n/a[1]
1p	n/a	41	n/a[1]
2aa	n/a	37	n/a[1]
2ab	n/a	37	n/a[1]
2ac	n/a	30	n/a[1]
2ad	n/a	37	n/a[1]
2ae	n/a	28	n/a[1]
2af	n/a	38	n/a[1]
2ah	n/a	37	n/a[1]
2ai	n/a	36	n/a[1]
2aj	n/a	39	n/a[1]
2ak	n/a	37	n/a[1]
2al	n/a	36	n/a[1]
2b	n/a	39	n/a[1]
2c	n/a	37	n/a[1]
2d	n/a	38	n/a[1]
2e	n/a	47	n/a[1]
2f	n/a	54	n/a[1]
2i	n/a	41	n/a[1]
2t	n/a	31	n/a[1]
2u	n/a	33	n/a[1]
2v	n/a	34	n/a[1]
2x	n/a	37	n/a[1]
2y	n/a	37	n/a[1]
2z	n/a	37	n/a[1]
5	9	34	n/a[1]
5aa	n/a	33	n/a[1]
5ab	n/a	32	n/a[1]
5ac	n/a	33	n/a[1]
5ad	n/a	33	n/a[1]
5ae	n/a	36	n/a[1]
5f	n/a	36	n/a[1]
5g	n/a	36	n/a[1]
5r	n/a	31	n/a[1]

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)	
		P10	Day Consent Noise Criteria
5s	n/a	32	n/a[1]
5t	n/a	32	n/a[1]
5u	n/a	32	n/a[1]
5y	n/a	33	n/a[1]
5z	n/a	33	n/a[1]
7	8	36	n/a[1]
101	7	42	n/a[1]
107	7	43	n/a[1]
211	9	35	n/a[1]
231	7	38	n/a[1]

Note:

1. Consent noise criteria do not apply to mine-owned residences.

APPENDIX G

CONSTRUCTION OF RAIL SPUR (OUTSIDE MINING LEASES) - NOISE PREDICTIONS

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)		
		P10	*ICNG* Day Management Level Within Recommended Standard Hours	*ICNG* Day Management Level Outside Recommended Standard Hours
Privately-Owned Residential Receivers				
4	9	35	44	39
19	8	51	46	41
20	8	51	46	41
21	8	51	46	41
23	8	69	46	41
35	8	34	46	41
35b	8	34	46	41
67	7	34	45	40
68	7	33	45	40
74	7	33	45	40
77	7	31	45	40
79	7	30	45	40
80	7	30	45	40
82	8	31	46	41
83	7	30	45	40
84	8	30	46	41
86	7	30	45	40
96	7	30	45	40
102	7	29	45	40
108	7	29	45	40
112	7	21	45	40
118	7	19	45	40
120	7	20	45	40
120c	7	21	45	40
121	7	22	45	40
206	8	48	46	41
207	8	51	46	41
207b	8	46	46	41
212	8	41	46	41
212b	8	41	46	41
213	8	46	46	41
214	8	46	46	41
215	8	47	46	41
216	8	47	46	41
217	8	48	46	41
218	8	47	46	41
219	8	47	46	41
220	8	48	46	41
221	8	48	46	41
222	8	49	46	41
223	8	49	46	41

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)		
		P10	*ICNG* Day Management Level Within Recommended Standard Hours	*ICNG* Day Management Level Outside Recommended Standard Hours
224	8	50	46	41
225	8	48	46	41
283	9	38	44	39
288	8	40	46	41
288b	8	38	46	41
289	8	33	46	41
526	7	30	45	40
527	8	38	46	41
528	8	37	46	41
529	8	37	46	41
530	8	35	46	41
531	8	37	46	41
532	8	37	46	41
533	8	37	46	41
534	8	35	46	41
535	8	37	46	41
536	8	37	46	41
537	8	35	46	41
538	8	42	46	41
539	8	39	46	41
541	8	39	46	41
542	8	39	46	41
543	8	39	46	41
544	8	40	46	41
545	8	40	46	41
Mine-Owned Residential Receivers[1]				
1ac	n/a	63	n/a[1]	n/a[1]
1ae	n/a	42	n/a[1]	n/a[1]
1af	n/a	36	n/a[1]	n/a[1]
1ag	n/a	36	n/a[1]	n/a[1]
1ah	n/a	33	n/a[1]	n/a[1]
1ai	n/a	33	n/a[1]	n/a[1]
1aj	n/a	33	n/a[1]	n/a[1]
1ak	n/a	33	n/a[1]	n/a[1]
1al	n/a	33	n/a[1]	n/a[1]
1am	n/a	31	n/a[1]	n/a[1]
1an	n/a	31	n/a[1]	n/a[1]
1ao	n/a	31	n/a[1]	n/a[1]
1ap	n/a	30	n/a[1]	n/a[1]
1aq	n/a	30	n/a[1]	n/a[1]
1ar	n/a	30	n/a[1]	n/a[1]
1as	n/a	30	n/a[1]	n/a[1]

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)		
		P10	*ICNG* Day Management Level Within Recommended Standard Hours	*ICNG* Day Management Level Outside Recommended Standard Hours
1at	n/a	30	n/a[1]	n/a[1]
1au	n/a	30	n/a[1]	n/a[1]
1av	n/a	30	n/a[1]	n/a[1]
1aw	n/a	29	n/a[1]	n/a[1]
1ax	n/a	29	n/a[1]	n/a[1]
1ay	n/a	28	n/a[1]	n/a[1]
1az	n/a	29	n/a[1]	n/a[1]
1ba	n/a	29	n/a[1]	n/a[1]
1h	n/a	29	n/a[1]	n/a[1]
1i	n/a	29	n/a[1]	n/a[1]
1j	n/a	29	n/a[1]	n/a[1]
1k	n/a	29	n/a[1]	n/a[1]
1l	n/a	29	n/a[1]	n/a[1]
1m	n/a	25	n/a[1]	n/a[1]
1n	n/a	24	n/a[1]	n/a[1]
1p	n/a	20	n/a[1]	n/a[1]
2aa	n/a	51	n/a[1]	n/a[1]
2ab	n/a	51	n/a[1]	n/a[1]
2ac	n/a	35	n/a[1]	n/a[1]
2ad	n/a	51	n/a[1]	n/a[1]
2ae	n/a	36	n/a[1]	n/a[1]
2af	n/a	51	n/a[1]	n/a[1]
2ah	n/a	52	n/a[1]	n/a[1]
2ai	n/a	53	n/a[1]	n/a[1]
2aj	n/a	67	n/a[1]	n/a[1]
2ak	n/a	51	n/a[1]	n/a[1]
2al	n/a	50	n/a[1]	n/a[1]
2b	n/a	50	n/a[1]	n/a[1]
2c	n/a	31	n/a[1]	n/a[1]
2d	n/a	34	n/a[1]	n/a[1]
2e	n/a	46	n/a[1]	n/a[1]
2f	n/a	55	n/a[1]	n/a[1]
2i	n/a	37	n/a[1]	n/a[1]
2t	n/a	17	n/a[1]	n/a[1]
2u	n/a	19	n/a[1]	n/a[1]
2v	n/a	22	n/a[1]	n/a[1]
2x	n/a	48	n/a[1]	n/a[1]
2y	n/a	50	n/a[1]	n/a[1]
2z	n/a	50	n/a[1]	n/a[1]
5	9	37	n/a[1]	n/a[1]
5aa	n/a	34	n/a[1]	n/a[1]
5ab	n/a	34	n/a[1]	n/a[1]

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)		
		P10	*ICNG* Day Management Level Within Recommended Standard Hours	*ICNG* Day Management Level Outside Recommended Standard Hours
5ac	n/a	35	n/a[1]	n/a[1]
5ad	n/a	35	n/a[1]	n/a[1]
5ae	n/a	44	n/a[1]	n/a[1]
5f	n/a	45	n/a[1]	n/a[1]
5g	n/a	47	n/a[1]	n/a[1]
5r	n/a	25	n/a[1]	n/a[1]
5s	n/a	28	n/a[1]	n/a[1]
5t	n/a	27	n/a[1]	n/a[1]
5u	n/a	32	n/a[1]	n/a[1]
5y	n/a	34	n/a[1]	n/a[1]
5z	n/a	34	n/a[1]	n/a[1]
7	8	45	n/a[1]	n/a[1]
101	7	29	n/a[1]	n/a[1]
107	7	29	n/a[1]	n/a[1]
211	9	39	n/a[1]	n/a[1]
231	7	30	n/a[1]	n/a[1]

Note:

1. *ICNG* management levels do not apply to mine-owned residences.

APPENDIX H

CONSTRUCTION OF HUNTER RIVER WATER SUPPLY PUMP STATION & ASSOCIATED WATER PIPELINE - NOISE PREDICTIONS

Construction of Water Pipeline – Noise Predictions

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)		
		P10	*ICNG* Day Management Level Within Recommended Standard Hours	*ICNG* Day Management Level Outside Recommended Standard Hours
Privately-Owned Residential Receivers				
67	7	47	45	40
68	7	57	45	40
289	8	51	46	41
527	8	56	46	41
528	8	56	46	41
529	8	54	46	41
530	8	50	46	41
531	8	49	46	41
532	8	48	46	41
533	8	48	46	41
534	8	46	46	41
535	8	45	46	41
536	8	43	46	41
537	8	42	46	41
Mine-Owned Residential Receivers[1]				
1ae	n/a	33	n/a[1]	n/a[1]
1af	n/a	42	n/a[1]	n/a[1]
1ag	n/a	49	n/a[1]	n/a[1]
2e	n/a	46	n/a[1]	n/a[1]
2i	n/a	45	n/a[1]	n/a[1]

Note: 1. *ICNG* management levels do not apply to mine-owned residences.

Construction of Hunter River Water Supply Pump Station – Noise Predictions

Receiver ID	NAG	$L_{Aeq,15min}$ Noise Level (dBA)		
		P10	*ICNG* Day Management Level Within Recommended Standard Hours	*ICNG* Day Management Level Outside Recommended Standard Hours
Privately-Owned Residential Receivers				
289	8	39	46	41
527	8	51	46	41
528	8	51	46	41
529	8	49	46	41
530	8	45	46	41
531	8	44	46	41
532	8	43	46	41
533	8	43	46	41
534	8	41	46	41
535	8	40	46	41
536	8	38	46	41
537	8	37	46	41

Note: 1. *ICNG* management levels do not apply to mine-owned residences.

APPENDIX I

PREDICTED NIGHT TIME RAIL SPUR NOISE PREDICTIONS

Receiver ID	Night Time $L_{Aeq,9hours}$	
	Low Wheel Defects	Medium Wheel Defects
Privately-Owned Residential Receivers		
19	40	43
20*	42	45
21*	42	45
23	53	56
206	37	40
207	40	43
207b	34	37
212	31	34
212b	30	33
213	36	39
214	36	39
215	36	39
216	37	40
217	37	40
218	36	39
219	37	40
220	37	40
221	38	41
222	38	41
223	39	42
224	39	42
225	37	41
283	29	32
Mine-Owned Residential Receivers		
1ac	48	51
1ae	36	40
1af	22	25
1ag	21	24
2aa	41	44
2ab	40	43
2ac	30	33
2ad	41	44
2ae	30	33
2af	42	45
2ah	43	46
2ai	41	44

Receiver ID	Night Time $L_{Aeq,9hours}$	
	Low Wheel Defects	Medium Wheel Defects
2aj	51	54
2ak	41	44
2al	40	44
2b	41	44
2c	18	21
2d	21	23
2e	36	39
2f	38	41
2g	39	42
2h	45	48
2i	23	26
2j	39	42
2k	41	44
2l	41	45
2x	38	42
2y	40	43
2z	40	43
5	28	32
5ae	35	38
5f	36	39
5g	37	40
7	35	39
211	29	32

Notes:

1. Predictions at façade.

* Receivers 20 and 21 already subject to acquisition rights from the Mt Arthur Mine.