

Moolarben Coal Project Stage I Optimisation Modification



Environmental Assessment

Prepared for Moolarben Coal Operations Pty Limited | May 2013

Volume 2 – Supporting Appendices



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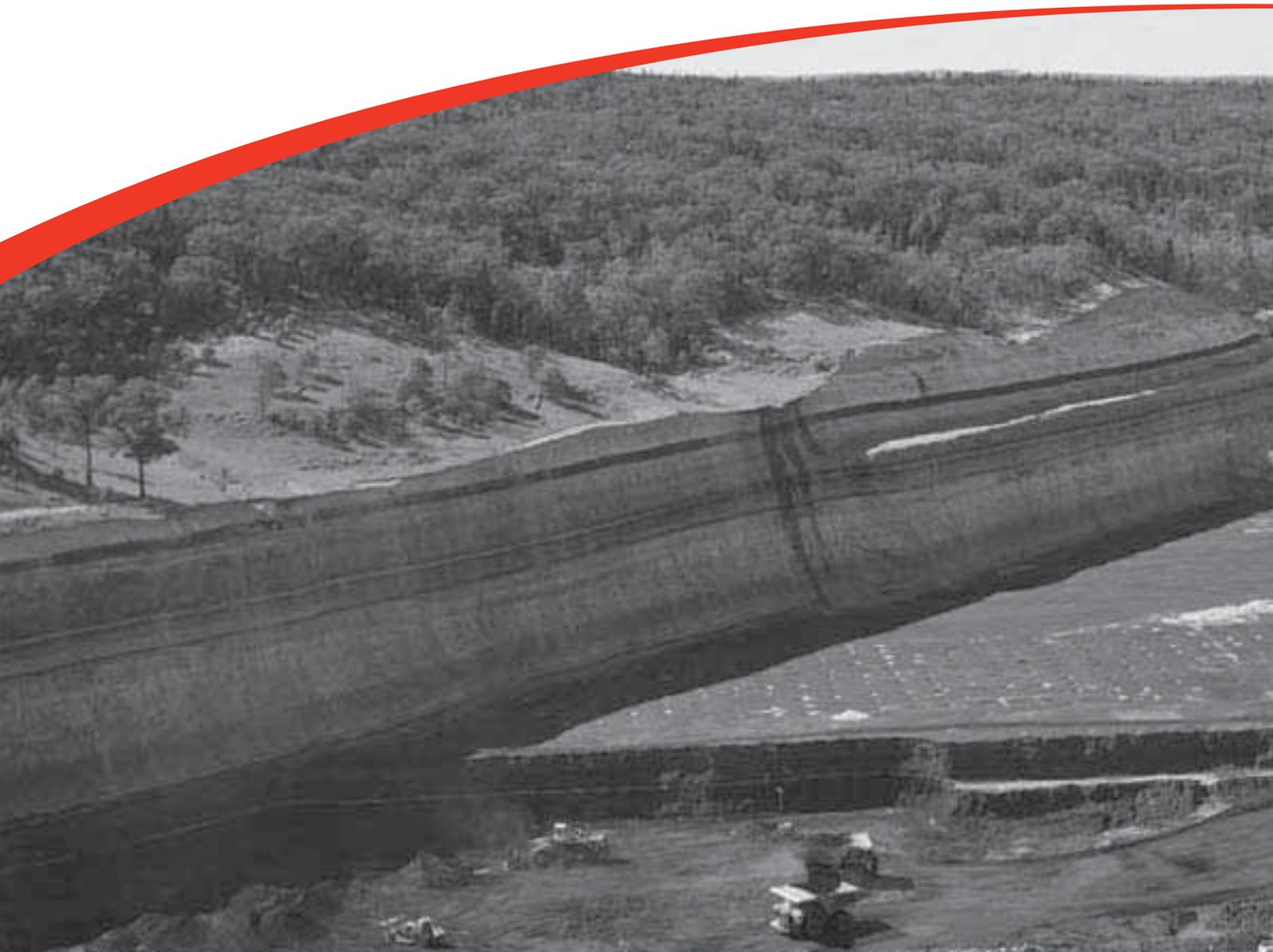
Appendix A – Project Approval MP 05_0117

Appendix B – Study team

Appendix C – Noise and vibration impact assessment

Appendix D – Air quality and greenhouse gas impact assessment

Appendix E – Ecological impact assessment



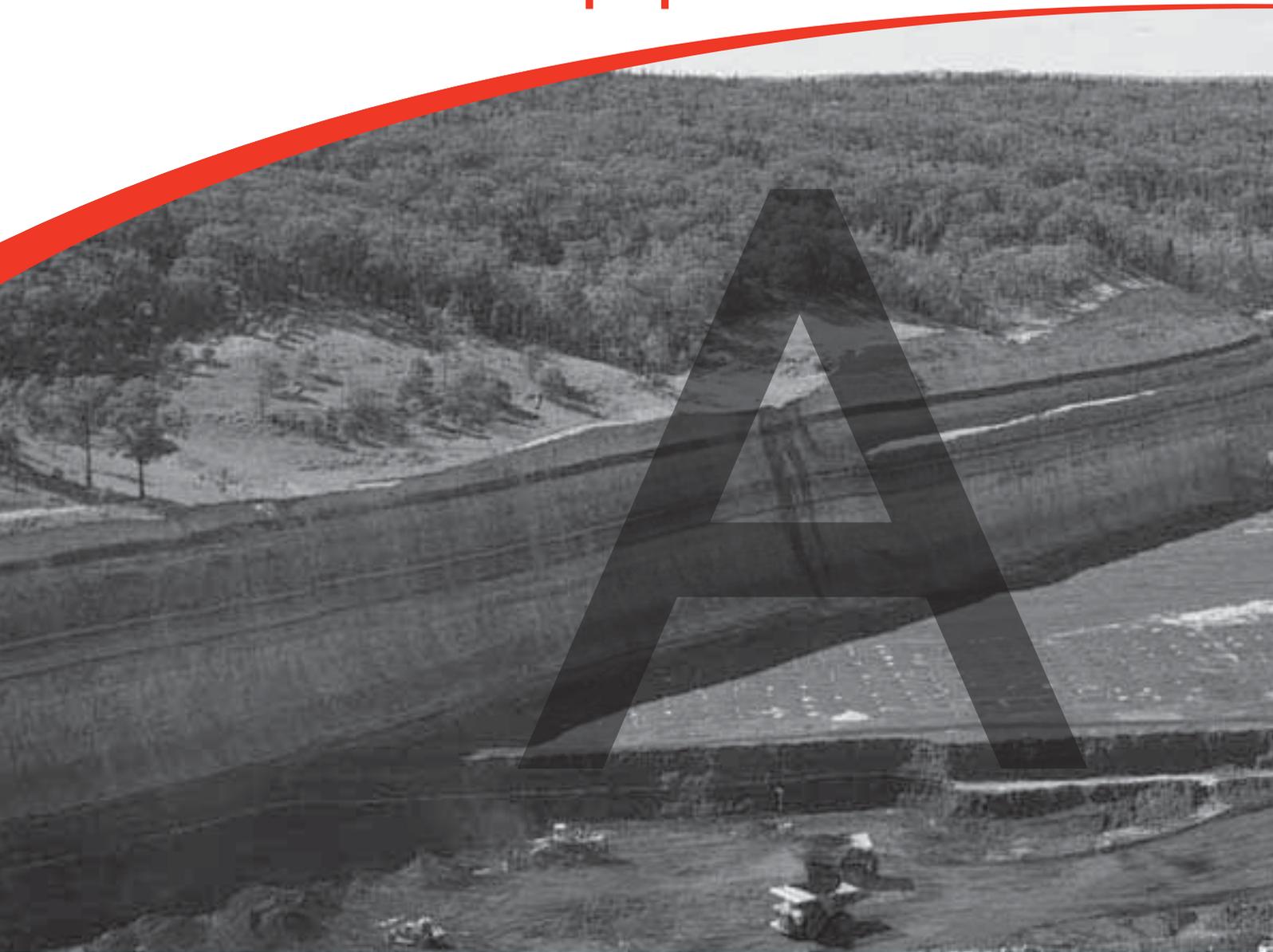
Moolarben Coal Project Stage 1 Optimisation Modification, Environmental Assessment – May 2013

Volume 2 – Supporting Appendices



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Appendix A



Project Approval MP 05_0117 (as modified)

Moolarben Coal Project Stage 1 Optimisation Modification, Environmental Assessment – May 2013



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Project Approval

Section 75J of the *Environmental Planning and Assessment Act 1979*

I approve the project application referred to in schedule 1, subject to the conditions in schedules 2 to 5.

These conditions are required to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the ongoing environmental management of the project.

Red type represents the November 2008 modification

Blue type represents the December 2008 modification

Green type represents the June 2009 modification

Purple type represents the October 2009 modification

Orange type represents the January 2010 modification

Pink type represents the May 2010 modification

Frank Sartor MP
Minister for Planning

Sydney

2007

SCHEDULE 1

Application Number:	05_0117
Proponent:	Moolarben Coal Mines Pty Limited
Approval Authority:	Minister for Planning
Land:	See Appendix 1
Project:	Moolarben Coal Project

TABLE OF CONTENTS

DEFINITIONS	3
ADMINISTRATIVE CONDITIONS	4
Obligation to Minimise to the Environment	4
Terms of Approval	4
Limits of Approval	4
Staged Submission of Management Plans/Monitoring Programs	4
Structural Adequacy	4
Demolition	4
Operation of Plant and Equipment	5
Planning Agreement	5
SPECIFIC ENVIRONMENTAL CONDITIONS	
Acquisition of Affected Properties	6
Noise	7
Blasting and Vibration	9
Air Quality	11
Meteorological Monitoring	12
Subsidence	12
Water	13
Landscape Management	15
Heritage	17
Transport	17
Lighting Impacts	19
Greenhouse Gas	19
Waste	19
ADDITIONAL PROCEDURES FOR AIR QUALITY & NOISE MANAGEMENT	20
Notification of Landowners	20
Independent Review	20
Land Acquisition	21
ENVIRONMENTAL MANAGEMENT, MONITORING, REPORTING & AUDITING	23
Environmental Management Strategy	23
Environmental Monitoring Program	23
Reporting	23
Independent Environmental Audit	24
Community Consultative Committee	24
Access to Information	24
APPENDIX 1: SCHEDULE OF LAND	25
APPENDIX 2: GENERAL LAYOUT OF PROJECT	30
APPENDIX 3: STATEMENT OF COMMITMENTS	33
APPENDIX 4: GENERAL TERMS OF THE VOLUNTARY PLANNING AGREEMENT	35
APPENDIX 5: PROPERTY NUMBERS	36
APPENDIX 6: ULAN VILLAGE	38
APPENDIX 7: UNDERGROUND MINE LAYOUT & LOCATION OF SENSITIVE NATURAL FEATURES	39
APPENDIX 8: REHABILITATION AND OFFSET STRATEGY	40
APPENDIX 9: ABORIGINAL HERITAGE	41
APPENDIX 10: NON-ABORIGINAL HERITAGE	48
APPENDIX 11: INDEPENDENT DISPUTE RESOLUTION PROCESS	50

DEFINITIONS

Acquisition Zone	The privately owned land listed in table 1 to schedule 3 where there are no negotiated agreements in place between the Proponent and the applicable landowner
AEMR	Annual Environmental Management Report
ARTC	Australian Rail Track Corporation Ltd
BCA	Building Code of Australia
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
Construction	The demolition of buildings or works, carrying out of work and erection of buildings covered by this approval.
Council	Mid-Western Regional Council
Day	The period from 7am to 6pm on Monday to Saturday, and 8am to 6pm on Sundays and Public Holidays
DECCW	Department of Environment, Climate Change and Water
Department	Department of Planning
DII	Department of Industry and Investment
Director-General	Director-General of Department of Planning, or delegate
Dirty Water	Water from the project's dirty water management system as described in the EA
DTI	Department of Transport and Infrastructure
EA	The report titled <i>Moolarben Coal Project Environmental Assessment, Volumes 1-5</i> , dated September 2006, as modified by the Preferred Project Report submitted to the Department in December 2006 and the response to submissions.
EA (MOD 1)	The <i>Application to Make Modifications to the Project Approval for the Moolarben Coal Project</i> , prepared by Wells Environmental Services and dated August 2008.
EA (MOD 2)	The <i>Environmental Assessment - Section 75W Modification Application</i> , prepared by Coffey Natural Systems and dated December 2008.
EA (MOD 4)	The <i>Documentation in Support of the Balloon Loop Modification</i> , prepared by Wells Environmental Services and dated April 2009.
EA (MOD 5)	The <i>Environmental Assessment - Section 75W Modification Application</i> , prepared by Coffey Natural Systems and dated July 2009, associated response to submissions dated August 2009, and supplementary information dated September 2009.
EA (MOD 6)	The <i>Environmental Assessment - Section 75W Modification Application</i> , prepared by Coffey Natural Systems and dated December 2009.
EA (MOD 8)	The <i>Environmental Assessment - Section 75W Modification Application</i> , prepared by Moolarben Coal Operations Pty Ltd and dated April 2010.
EEC	Endangered Ecological Community as defined under the NSW <i>Threatened Species Conservation Act 1995</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
EPL	Environment Protection Licence
Evening	Evening is defined as the period from 6pm to 10pm
Land	Land means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Mine Water	Water that accumulates within active mining areas, coal rejects emplacement areas, tailings dams and infrastructure areas, synonymous with dirty water
Mining Operations	Includes all coal extraction, processing, and transportation activities carried out on site
Minister	Minister for Planning, or delegate
Mtpa	Million tonnes per annum
Night	The period from 10pm to 7am on Monday to Saturday, and 10pm to 8am on Sundays and Public Holidays
NOW	NSW Office of Water
Offset Strategy	The conservation and enhancement program described in the EA and Response to Submissions
Panel	Independent Hearing and Assessment Panel for the Project
Privately owned land	Land that is not owned by a public agency, or a mining company (or its subsidiary)
Project	The development as described in the EA
Proponent	Moolarben Coal Mines Pty Limited, or its successors
Response to Submissions	The Proponent's response to issues raised in submissions, submitted to the Department in December 2006, and subsequent submissions on groundwater dated April 2007 and July 2007.
ROM	Run of Mine
Site	The land referred to in Schedule 1

Statement of Commitments
VPA

The Proponent's commitments in Appendix 3
Voluntary planning agreement under the EP&A Act

SCHEDULE 2 ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Proponent shall implement all practicable measures to prevent and/or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

Terms of Approval

2. The Proponent shall carry out the project generally in accordance with the:
 - (a) EA;
 - (b) statement of commitments;
 - (c) EA (MOD 1);
 - (d) EA (MOD 2);
 - (e) EA (MOD 4);
 - (f) EA (MOD 5);
 - (g) EA (MOD 6);
 - (h) EA (MOD 8); and
 - (i) conditions of this approval.

Notes:

- *The general layout of the project is shown in Appendix 2.*
- *The statement of commitments is reproduced in Appendix 3 (excluding the commitments which are directly reflected in, or inconsistent with, the conditions of this approval).*

3. *If there is any inconsistency between the above documents, the most recent document shall prevail to the extent of the inconsistency. However, the conditions of this approval shall prevail to the extent of any inconsistency.*

Note:

- *To remove doubt, modifications made to the statement of commitments (eg via MOD 5) prevail over all EAs submitted prior to that modification.*

4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
 - (a) any reports, plans, programs, strategies or correspondence that are submitted in accordance with this approval; and
 - (b) the implementation of any actions or measures contained in these reports, plans, programs, strategies or correspondence.

Limits on Approval

5. Mining operations may take place for 21 years from the grant of the mining lease for the project.

Note: Under this approval, the Proponent is required to rehabilitate the site and provide offsets to the satisfaction of the Director-General. Consequently, this approval will continue to apply in all other respects other than the right to conduct mining operations until the site has been rehabilitated and the offset provided to a satisfactory standard.

6. The Proponent shall not:
 - (a) produce more than 10 million tonnes of coal a year; or
 - (b) extract more than 8 million tonnes of ROM coal a year from the open-cut mining operations, and 4 million tonnes of ROM coal a year from the underground mining operations.
7. The Proponent shall only transport coal from the site by rail.

Staged Submission of Management Plans/Monitoring Programs

8. With the approval of the Director-General, the Proponent may submit any management plan or monitoring program required by this approval on a progressive basis.
- 8A. *Within 3 months of any modifications to this approval, the Proponent shall review and if necessary revise all strategies/plans/programs required under this approval which are relevant to the modification to the satisfaction of the Director-General.*

Structural Adequacy

9. The Proponent shall ensure that all new buildings and structures, and any alterations or additions to existing buildings and structures, are constructed in accordance with the relevant requirements of the BCA.

Notes:

- *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for the proposed building works.*
- *Part 8 of the EP&A Regulation sets out the requirements for the certification of the project.*

Demolition

10. The Proponent shall ensure that all demolition work is carried out in accordance with *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version.

Operation of Plant and Equipment

11. The Proponent shall ensure that all plant and equipment used at the site is:
- (a) maintained in a proper and efficient condition; and
 - (b) operated in a proper and efficient manner.

Planning Agreement

12. Within 12 months of this approval, the Proponent shall enter into a planning agreement with Council in accordance with:
- (a) Division 6 of Part 4 of the EP&A Act; and
 - (b) the terms of the Proponent's offer to the Minister on 4 September 2007, which includes the matters set out in Appendix 4.
-

SCHEDULE 3 SPECIFIC ENVIRONMENTAL CONDITIONS

ACQUISITION OF AFFECTED PROPERTIES

Acquisition Upon Request

1. Upon receiving a written request for acquisition from the owner of the land listed in Table 1, the Proponent shall acquire the land in accordance with the procedures in conditions 10-12 of Schedule 4.

Table 1: Land subject to acquisition upon request

4 – M. Swords	5 – M & P Swords
6 – Thompson	15 – Green
20 – Williamson	25 – Tuck-Lee
29a – E. Mayberry	29b – E. Mayberry
29 – E. Mayberry	33 – K. & R. Mayberry
36 – Rayner	50 – C. Mayberry
134 – M.J. & H. Swords	163 – C.M. & J.J. Key
164 – J.J. Key	166 – C.M. Key

Note: For information on the numbering and identification of properties used in this approval, see Appendix 5.

NOISE

Noise Impact Assessment Criteria

2. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 2 at any residence on privately-owned land, or on more than 25% of any privately-owned land.

Table 2: Noise impact assessment criteria dB(A)

Land Number	Day	Evening	Night	
	$L_{Aeq}(15min)$	$L_{Aeq}(15min)$	$L_{Aeq}(15min)$	$L_{A1}(1min)$
26, 49	38	38	38	45
22, 23, 41A, 63, 64, 170, 171, 172	38	38	37	45
169, 173	37	37	37	45
All other privately owned land (outside the village of Ulan)	35	35	35	45
Ulan Primary School	35 (internal) when in use and under all weather conditions			-
Ulan Anglican Church Ulan Catholic Church	35 (internal) when in use and under all weather conditions			-
Goulburn River National Park Munghorn Gap Nature Reserve	50			-

However, the Proponent may exceed the noise limits in Table 2 if it has:

- (a) a written negotiated noise agreement with any landowner for higher noise limits, and a copy of this agreement has been forwarded to the Department and DECCW; or
- (b) an approved Construction Noise Management Plan (see condition 7 below) for the project, which sets higher noise limits for a specified period.

Notes:

- To determine compliance with the $L_{Aeq}(15\text{ minute})$ noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct

measurement of noise from the project is impractical, the **DECCW** may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.

- To determine compliance with the $L_{A1(1\text{ minute})}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the **DECCW** may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level ; or
 - temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

Land Acquisition Criteria

3. If the noise generated by the project exceeds the relevant criteria in Table 3 at any residence on privately-owned land or on more than 25% of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 10-12 of Schedule 4.

Table 3: Land acquisition criteria dB(A)

Day/Evening/Night $L_{Aeq(15min)}$	Land Number
43 / 43 / 43	26, 49
43 / 43 / 42	22, 23, 41A, 63, 64, 170, 171, 172,
42 / 42 / 42	169, 173
40 / 40 / 40	All other private land owners not listed in Table 1

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 2.

Cumulative Noise Criteria

4. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately owned land, or on more than 25% of any privately owned land, excluding the land listed in Table 1, to the satisfaction of the Director-General:
 - $L_{Aeq(11\text{ hour})}$ 50 dB(A) - Day;
 - $L_{Aeq(4\text{ hour})}$ 45 dB(A) - Evening;
 - $L_{Aeq(9\text{ hour})}$ 40 dB(A) – Night.
5. If the cumulative noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned land, or on more than 25% of privately owned land, excluding the land listed in Table 1, then upon receiving a written request from the landowner, the Proponent shall take all reasonable and feasible measures to acquire the land on as equitable basis as possible with the relevant mines, in accordance with the procedures in conditions 10-12 of schedule 4, to the satisfaction of the Director-General:
 - $L_{Aeq(11\text{ hour})}$ 53 dB(A) - Day;
 - $L_{Aeq(4\text{ hour})}$ 48 dB(A) - Evening;
 - $L_{Aeq(9\text{ hour})}$ 43 dB(A) – Night.

Notes:

- For the purpose of this condition, the expression "Proponent" in conditions 10-12 of schedule 4 should be interpreted as the Proponent and any other relevant mine owners.
- The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

Traffic Noise Impact Assessment Criteria

6. The Proponent shall take all reasonable and feasible measures to ensure that the traffic noise generated by the project combined with the traffic noise generated by other mines does not exceed the traffic noise impact assessment criteria in Table 4.

Table 4: Traffic noise criteria dB(A)

Road	Day/Evening	Night
	$L_{Aeq(1\text{ hour})}$	$L_{Aeq(1\text{ hour})}$
Ulan Road	60	55

Note: Traffic noise generated by the project is to be measured in accordance with the relevant procedures in the DECCW's Environmental Criteria for Road Traffic Noise.

Construction Noise Management

7. The Proponent shall prepare and implement a Construction Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:
- be prepared in consultation with the DECCW by a suitably qualified expert whose appointment has been approved by the Director-General;
 - be submitted to the Director-General for approval prior to carrying out any construction on site;
 - contain noise goals for the construction period;
 - specify the type and location of night-time construction activities;
 - describe what measures would be implemented to minimise the construction noise impacts of the project during the construction period, with particular emphasis on minimising the impacts on Ulan School and its pupils;
 - describe how the effectiveness of these measures would be monitored;
 - document the procedures that would be followed if an exceedance of the construction noise goals are detected.

Additional Noise Mitigation Measures

8. Upon receiving a written request from a landowner:
- of the land listed in Table 1 (unless the landowner has requested acquisition); or
 - of the following land: 26, 49, 22, 23, 41A, 63, 64, 170, 171, 172; or
 - of any residence on privately owned land outside the Ulan Village where subsequent noise monitoring shows the noise generated by the project is greater than or equal to $L_{Aeq(15 \text{ min})}$ 38 dB(A) (except where a negotiated noise agreement is in place)
- the Proponent shall implement additional noise mitigation measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the landowner.

Note: For the purposes of this approval Ulan Village is defined by the area coloured pink on the map in Appendix 6.

These additional mitigation measures must be reasonable and feasible.

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

Within 3 months of this approval, the Proponent shall notify all applicable landowners that they are entitled to receive additional noise mitigation measures.

Continuous Improvement

9. The Proponent shall:
- include in each Annual Environmental Management Report (AEMR) required by Condition 5 (Schedule 5) a review of best practice noise mitigation measures that could be reasonably and feasibly applied to the ongoing operation of the mine;
 - where there is a clear public benefit in the application of such measures, implement these measures to the satisfaction of the Director-General; and
 - ensure that any additional measures implemented as part of this condition are considered in all future AEMR's and Independent Environmental Audit's required under Condition 6 (Schedule).

Monitoring

10. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General. This program must:
- be prepared in consultation with DECCW;
 - be submitted to the Director-General for approval prior to carrying out any construction on site; and
 - include:
 - a combination of real-time and supplementary attended monitoring measures; and
 - noise monitoring protocol for evaluating compliance with the noise impact assessment and land acquisition criteria in this approval.

Note: This program must expressly monitor the modifying factors referred to in the NSW Industrial Noise Policy (such as intermittency, tonality and low frequency).

BLASTING AND VIBRATION

Airblast Overpressure Impact Assessment Criteria

11. The Proponent shall ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 5 at any residence on privately owned land.

Table 5: Airblast overpressure impact assessment criteria

Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
115	5% of the total number of blasts over a period of 12 months
120	0%

Ground Vibration Impact Assessment Criteria

12. The Proponent shall ensure that the ground vibration level from blasting at the project does not exceed the criteria in Table 6.

Table 6: Ground vibration impact assessment criteria

Receiver	Peak particle velocity (mm/s)	Allowable exceedance
Residence on privately owned land	5	5% of the total number of blasts over a period of 12 months
	10	0%
330kV transmission line	50	0%
Aboriginal rock shelters	40	0%

Note: The impact assessment criteria for Aboriginal rock shelters applies unless the Proponent develops site specific impact assessment criteria to the satisfaction of the Director-General.

Blasting Hours

13. The Proponent shall only carry out blasting at the project between 9am and 5pm Monday to Saturday inclusive. No blasting is allowed on Sundays, public holidays, or at any other time without the written approval of DECCW.

Blasting Frequency

14. The Proponent may carry out:
- 2 blasts a day;
 - 9 blasts a week, averaged over any 12 month period, including
 - a maximum of 4 blasts a week, averaged over any 12 month period, with a maximum instantaneous charge (MIC) of greater than 650kg.

Operating Conditions

15. During mining operations, the Proponent shall:
- implement best blasting practice to:
 - protect the safety of people and livestock in the area surrounding blasting operations;
 - protect public or private infrastructure/property in the area surrounding blasting operations from blasting damage; and
 - minimise the dust and fume emissions from blasting at the project; and
 - co-ordinate blasting on site with the blasting at the adjoining Ulan and Wilpinjong coal mines to minimise the potential cumulative blasting impacts of the three mines, to the satisfaction of the Director-General.
16. The Proponent shall not undertake blasting within 500 metres of:
- the Ulan-Wollar Road without the approval of Council;
 - the Ulan Road without the approval of the DTI;
 - the Gulgong-Sandy Hollow Railway Line without the approval of the ARTC;
 - the Wollar-Wellington 330kV Transmission Line without the approval of Transgrid; and

- (e) any privately-owned land or adjoining mine-owned land, unless suitable arrangements have been made with the landowner and any tenants to minimise the risk of flyrock-related impact to the property to the satisfaction of the Director-General.

Public Notice

17. During mining operations, the Proponent shall:
- (a) notify the landowner/occupier of any residence within 2 kilometres of the open cut mining operations who registers an interest in being notified about the blasting schedule at the mine;
 - (b) operate a Blasting Hotline, or alternate system agreed to by the Director-General, to enable the public to get up-to-date information on the blasting schedule at the project;
 - (c) advertise the blasting hotline number in a local newspaper at least 4 times each year; and
 - (d) publicise an updated blasting schedule on its website, to the satisfaction of the Director-General .

Property Inspections

18. Prior to starting mining operations, the Proponent shall:
- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to prepare a report of the condition and structural integrity of:
 - Ulan Public School;
 - Ulan Catholic Church;
 - Ulan Anglican Church;
 - the historic heritage items with moderate to exceptional heritage significance identified in Appendix 6; and
 - any building or structure on privately owned land within 2 kilometres of open cuts 1, 2 or 3, and
 - (b) give the relevant land owner a copy of this report.

Notes:

- *The preparation of this report may be delayed with the agreement of the relevant land owner.*
- *The Proponent is not required to prepare a report on any building or structure on privately owned land within 2 kilometres of open cuts 1, 2 or 3 if the relevant land owner does not want such a report to be prepared.*

Property Investigations

19. If the landowner of privately owned land within 2 km of an open cut area claims that buildings and/or structures on his/her land have been damaged as a result of blasting at the project, the Proponent shall within 3 months of receiving this claim:
- (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Director-General, to investigate the claim; and
 - (b) give the landowner a copy of the property investigation report.

If this independent property investigation confirms the landowner's claim, and both parties agree with these findings, then the Proponent shall repair the damages to the satisfaction of the Director-General.

If the Proponent or landowner disagrees with the findings of the independent property investigation, then either party may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 8).

Blast Monitoring Program

20. The Proponent shall prepare and implement a Blast Monitoring Program for the project to the satisfaction of the Director-General. This program must:
- (a) be prepared in consultation with the DECCW;
 - (b) be submitted to the Director General for approval prior to carrying out any blasting on site; and
 - (c) include a protocol for evaluating blasting impacts and demonstrating compliance with the blasting criteria in this approval.

AIR QUALITY

Impact Assessment Criteria

21. The Proponent shall ensure that the dust emissions generated by the project do not cause additional exceedances of the air quality impact assessment criteria in Tables 7, 8, and 9 at any residence on privately owned land, or on more than 25 percent of any privately owned land (excluding the properties listed in Table 1).

Table 7: Long term impact assessment criteria for particulate matter

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³

Table 8: Short term impact assessment criteria for particulate matter

Pollutant	Averaging period	Criterion
Particulate matter < 10 µm (PM ₁₀)	24 hour	50 µg/m ³

Table 9: Long term impact assessment criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2 g/m ² /month	4 g/m ² /month

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

Land Acquisition Criteria

22. If the dust emissions generated by the project exceed the criteria in Tables 10, 11 and 12 at any residence on privately owned land, or on more than 25 percent of any privately owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 10-12 of schedule 4.

Table 10: Long term land acquisition criteria for particulate matter

Pollutant	Averaging period	Criterion
Total suspended particulate (TSP) matter	Annual	90 µg/m ³
Particulate matter < 10 µm (PM ₁₀)	Annual	30 µg/m ³

Table 11: Short term land acquisition criteria for particulate matter

Pollutant	Averaging Period	Criterion	Percentile ¹	Basis
Particulate matter < 10 µm (PM ₁₀)	24 hour	150 µg/m ³	99 ²	Total ³
Particulate matter < 10 pm (PM ₁₀)	24 hour	50 µg/m ³	98.6	Increment ⁴

Notes: ¹Based on the number of block 24 hour averages in an annual period.

²Excludes extraordinary events such as bush fires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with the DECCW.

³Background PM₁₀ concentrations due to all other sources plus the incremental increase in PM₁₀ concentrations due to the mine alone.

⁴Incremental increase in PM₁₀ concentrations due to the mine alone.

Table 12: Long term land acquisition criteria for deposited dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust	Annual	2/g/m ² /month	4 g/m ² /month

Note: Deposited dust is assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.

Operating Conditions

23. The Proponent shall:
- regularly assess the real time air quality and meteorological monitoring data;
 - relocate, modify and/or stop mining operations in adverse meteorological conditions to minimise the short term air quality impacts of the project on privately-owned land, and in particular on properties 8, 22, 23, 26, 30, 31, 32, 41A, 49, 63, 64, 169, 170, 172 during open cut mining operations;
 - implement all reasonable and feasible measures to minimise the off-site odour and fume emissions generated by any spontaneous combustion on site, to the satisfaction of the Director-General.

Monitoring

24. The Proponent shall prepare and implement an Air Quality Monitoring Program for the project to the satisfaction of the Director-General. This program must:
- be prepared in consultation with DECCW;
 - be submitted to the Director-General for approval prior to carrying out any construction on site; and
 - include:
 - a combination of real-time monitors, high volume samplers and dust deposition gauges to monitor the air quality emissions of the project; and
 - an air quality monitoring protocol for evaluating compliance with the air quality impact assessment and land acquisition criteria in this approval

METEOROLOGICAL MONITORING

25. The Proponent shall ensure the project has a suitable meteorological station in the vicinity of the site that complies with the requirements in *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline.

SUBSIDENCE

Subsidence – Natural Features

26. The Proponent shall:
- ensure that the Drip, Goulburn River Gorge and bed of the Goulburn River (see Appendix 7) remain outside the zone of recorded subsidence damage for longwall mining in NSW;
 - minimise subsidence damage to Cliff Line 3 (see Appendix 7); and
 - reduce the likelihood of subsidence damage to:
 - Aboriginal sites 264, 282, 283, 286, 287 (see Appendix 7) to low; and
 - Aboriginal site 280 (see Appendix 7) to moderate.

Note: The mine layout and design will be reviewed during the assessment of each subsidence management plan (see below), which will be informed by both the end-of panel reports (see condition 28 below) and each independent environmental audit (see condition 6 of Schedule 5). Consequently, the final mine plan may differ in minor respects from the mine plan shown in Appendix 7. However, the revised mine plan would need to comply with the performance criteria specified in this condition.

Subsidence Management Plan

27. The Proponent shall prepare and implement a Subsidence Management Plan (SMP) for the project to the satisfaction of the Director-General of DII. This plan must:
- be prepared in accordance with the latest version (or subsequent replacement) of the:
 - New Approval Process for Management of Coal Mining Subsidence - Policy*; and
 - Guideline for Applications for Subsidence Management Approvals*;
 - be approved prior to the carrying out any underground mining operations that could cause subsidence;
 - include a detailed program to monitor:

- the height of fracturing above the goaf of the longwall panels;
 - surface subsidence above the longwall panels, including all near and far field components of subsidence;
 - the impact of surface subsidence on surface features, including flora and fauna, threatened species, and any surface water quality and/or flows; and
 - the effectiveness of any subsidence mitigation measures; and
- (d) a program to validate the subsidence prediction methodology for the project, and calibrate it to sit specific conditions.

End-of-Panel Report

28. Prior to completion of each longwall panel, the Proponent shall:
- (a) prepare an end-of-panel report analysing the subsidence, surface water, and groundwater impacts of the panel, and the cumulative impacts of this panel combined with any other longwall panels;
 - (b) commission suitably qualified subsidence and groundwater experts whose appointment has been approved by the Director-General to review the end-of-panel report, and if necessary recommend changes to the monitoring programs and/or mine plan for subsequent panels; and
 - (c) submit a copy of the end-of-panel report and expert review to the Department, **DII** and any other relevant agencies.

WATER

Water Supply

29. The Proponent must ensure that it has sufficient water for all stages of the project, and if necessary, adjust the scale of mining operations to match its water supply.

Note: The Proponent is required to obtain the necessary water licences for the project under the Water Act 1912 and/or Water Management Act 2000.

Surface Water Discharges

30. The Proponent shall ensure that all surface water discharges from the site:
- (a) meet the relevant ANZECC water quality objectives for the protection of aquatic ecosystems and the water quality of existing receiving waters; and
 - (b) comply with the discharge limits (both volume and quality) set for the project in any EPL.

Offsets

31. The Proponent shall:
- (a) offset any loss to the base flow of the Goulburn River and associated creeks caused by the project; and
 - (b) provide suitable compensation or compensatory measures to the owners of any privately owned land whose water supply is adversely affected by the project, to the satisfaction of the Director-General.

Permeability of Water Storages

32. The Proponent shall ensure that the tailings dam, mine infrastructure dams, groundwater storage and treatment dams, and the Ulan Seam sub-crop line of the most northerly final void are suitably lined to comply with a permeability standard of $< 1 \times 10^{-9}$ m/s.

Regional Water Supply/Monitoring Investigation

33. Prior to the commencement of mining operations, unless the Director-General agrees otherwise, the Proponent shall carry out a Regional Water Supply/Monitoring Investigation to the satisfaction of the Director-General. This investigation must:
- (a) be conducted by suitably qualified and independent expert/s whose appointment has been approved by the Director-General;
 - (b) be carried out in consultation with the **DECCW**, **DII**, **NOW** and owners of the Ulan and Wilpinjong coal mines;
 - (c) assess the feasibility and potential environmental benefits of increased water sharing between the three mining operations in the region;
 - (d) consider the potential for developing regional surface and ground water monitoring programs to:
 - rationalise the surface and ground water monitoring programs of the three mining operations in the region; and

- improve the monitoring of the individual and cumulative surface and ground water impacts of these mining operations; and
- (e) recommend measures to reduce the surface and ground water impacts of mining in the region, and any potential changes to existing licences and/or approvals that could facilitate the implementation of these measures.

Water Management Plan

34. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with DECCW, DII and NOW by suitably qualified expert/s whose appointment/s have been approved by the Director-General;
 - (b) be submitted to the Director-General for approval prior to carrying out any construction on site; and
 - (c) include:
 - a Site Water Balance;
 - an Erosion and Sediment Control Plan;
 - a Surface Water Monitoring Plan;
 - a Groundwater Monitoring Plan; and
 - a Surface and Ground Water Response Plan.

Site Water Balance

35. The Site Water Balance must:
- (a) include details of:
 - sources and security of water supply;
 - water use on site;
 - water management on site;
 - off-site water transfers;
 - reporting procedures, and
 - (b) investigate and describe measures to minimise water use by the project.

Erosion and Sediment Control

36. The Erosion and Sediment Control Plan must:
- (a) be consistent with the requirements of the *Managing Urban Stormwater: Soils and Construction Manual* (Landcom 2004, or its latest version);
 - (b) identify activities that could cause soil erosion and generate sediment;
 - (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;
 - (d) describe the location, function, and capacity of erosion and sediment control structures; and
 - (e) describe what measures would be implemented to maintain the structures over time.

Surface Water Monitoring

37. The Surface Water Monitoring Plan must include:
- (a) detailed baseline data on surface water flows and quality in creeks and other waterbodies that could be affected by the project (including the Goulburn River, Bora Creek and Moolarben Creek);
 - (b) surface water quality and stream health assessment criteria, including trigger levels for investigating any potentially adverse surface water impacts; and
 - (c) a program to monitor:
 - surface water flows, quality, and impacts on water users;
 - stream health; and
 - channel stability
 in the Goulburn River, Bora Creek, and Moolarben Creek.

Groundwater Monitoring

38. The Groundwater Monitoring Plan must include:
- (a) detailed baseline data of groundwater levels, yield and quality in the region, and particularly any groundwater bores, springs and seeps (including spring and seep fed dams) that may be affected by mining operations on site;
 - (b) a program to augment the baseline data over the life of the project;
 - (c) groundwater assessment criteria, including trigger levels for investigating any potentially adverse groundwater impacts;
 - (d) a program to monitor:
 - groundwater inflows to the open cut and underground mining operations;

- the impacts of the project on:
 - the alluvial, Triassic, coal seam and interburden aquifers;
 - base flows to the Goulburn River and associated creeks;
 - any groundwater bores, springs and seeps (including spring and seep fed farm dams) on privately-owned land;
 - any groundwater dependent ecosystems, such as the Drip, and riparian vegetation along the Goulburn River and associated creeks; and
 - the seepage/leachate from any tailings dams, water storages or backfilled voids on site; and
- (e) a program to validate the groundwater model for the project, and calibrate it to site specific conditions.

Surface and Ground Water Response Plan

39. The Surface and Ground Water Response Plan must describe what measures and/or procedures would be implemented to:
- (a) respond to any exceedances of the surface water, stream health, and groundwater assessment criteria;
 - (b) offset the loss of any base flow to the Goulburn River and/or associated creeks caused by the project;
 - (c) compensate landowners of privately-owned land whose water supply is adversely affected by the project; and
 - (d) mitigate and/or offset any adverse impacts on groundwater dependent ecosystems or riparian vegetation.

LANDSCAPE MANAGEMENT

Rehabilitation

40. The Proponent shall progressively rehabilitate the site to the satisfaction of the DII, in general accordance with the proposed rehabilitation and offset strategy shown in Appendix 8.

Endangered Ecological Community Offset

41. Within 12 months of this approval, the Proponent shall make suitable arrangements to:
- (a) transfer at least 135 hectares of the White Box Yellow Box Blakely's Red Gum Woodland endangered ecological community to the Minister for Climate Change, Environment and Water to offset, on a "like for like" basis, the 65 hectares that would be cleared by the project at an offset ratio of 2:1; and
 - (b) provide DECCW with funds (which at the discretion of DECCW may include an in-kind contribution) to cover any reasonable costs associated with the transfer and ongoing management of this land.
- 41A. By the end of December 2010, the Proponent shall make suitable arrangement to:
- (a) conserve at least 4 hectares of existing White Box Yellow Box Blakely's Red Gum Woodland endangered ecological community on Property 24;
 - (b) conserve and enhance at least 2.6 hectares of regenerating White Box Yellow Box Blakely's Red Gum Woodland endangered ecological community on Property 24;
 - (c) revegetate two cleared areas on Property 46 with at least 10 hectares of endangered ecological community; and
 - (d) make suitable arrangements to protect and manage these offset areas in the long-term, to the satisfaction of the Director-General and DECCW.

Vegetation Offsets

42. The Proponent shall:
- (a) revegetate at least 38 hectares of disturbed land on the "Red Hills" property (see property R14 in Appendices 5 and 8) with White Box Yellow Box Blakely's Red Gum vegetation;
 - (b) revegetate at least 153 hectares of cleared land on the "Red Hills" property (see property R14 in Appendices 5 and 8) and adjoining lands (see properties R12, R13, R15, R16, R17, R18 and R19 in Appendices 5 and 8) with suitable native vegetation to improve wildlife corridor linkages;
 - (c) conserve and enhance at least 1262 hectares of existing native vegetation onsite; and
 - (d) make suitable arrangements to protect these offset areas from development in the long term, to the satisfaction of the Director-General and DECCW.

Landscaping – Environmental Bunds

43. The Proponent shall progressively landscape the environmental bunds on site.

Landscape Management Plan

44. The Proponent shall prepare and implement a detailed Landscape Management Plan for the project to the satisfaction of DII and Director-General. This Plan must:
- (a) be prepared in consultation with DECCW and NOW by suitably qualified expert/s whose appointment/s have been approved by the Director-General;
 - (b) be submitted to the Director-General for approval prior to starting mining operations on site; and
 - (c) include a:
 - Rehabilitation and Offset Management Plan;
 - Final Void Management Plan; and
 - Mine Closure Plan.

Rehabilitation and Offset Management Plan

45. The Rehabilitation and Offset Management Plan must include:
- (a) the rehabilitation objectives for the site, vegetation offsets and landscaping;
 - (b) a description of the short, medium, and long term measures that would be implemented to:
 - rehabilitate the site;
 - implement the vegetation offsets; and
 - landscape the environmental bunds;
 - (c) performance and completion criteria for the rehabilitation of the site, implementation of the vegetation offsets, and landscaping of the environmental bunds;
 - (d) a detailed description of the measures that would be implemented over the next 3 years including the procedures to be implemented for:
 - progressively rehabilitating areas disturbed by mining;
 - implementing vegetation offsets;
 - reducing the visual impacts of the project;
 - protecting areas outside the disturbance areas;
 - rehabilitating creeks and drainage lines on the site (including Moolarben Creek) to ensure no net loss of stream length and aquatic habitat;
 - undertaking pre-clearance surveys;
 - managing impacts on fauna;
 - landscaping the site to minimise visual impacts;
 - conserving and reusing topsoil;
 - collecting and propagating seed for rehabilitation works;
 - salvaging and reusing material from the site for habitat enhancement;
 - controlling weeds and feral pests;
 - controlling access;
 - bushfire management; and
 - managing any potential conflicts between the offsite offset areas and Aboriginal cultural heritage,
 - (e) a program to monitor the effectiveness of these measures, and progress against the performance and completion criteria (see (c) above);
 - (f) a description of the potential risks to successful rehabilitation and/or revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and
 - (g) details of who would be responsible for monitoring, reviewing, and implementing the plan.

Note: Reference to "rehabilitation" in this approval includes all works associated with the rehabilitation and restoration of the site as described in the EA, and applies to all areas within the Mining Lease and Offsets Strategy.

Final Void Management

46. The Final Void Management Plan must:
- (a) justify the planned final location and future use of the final void/s;
 - (b) incorporate design criteria and specifications for the final void/s based on verified groundwater modelling predictions and a re-assessment of post-mining groundwater equilibration;
 - (c) assess the potential interactions between creeks on the site and the final void/s; and
 - (d) describe what actions and measures would be implemented to:
 - minimise any potential adverse impacts associated with the final void; and
 - manage and monitor the potential impacts of the final void until the mining lease for the project is relinquished.

Mine Closure Plan

47. The Mine Closure Plan must:

- (a) define the objectives and criteria for mine closure;
- (b) investigate options for the future use of the site, including any final void/s;
- (c) describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and
- (d) describe how the performance of these measures would be monitored over time.

Vegetation Offset Bond

48. Within 3 months of the approval of the Landscape Management Plan, the Proponent shall lodge a bond with the Department to ensure that the vegetation offsets are implemented in accordance with the performance and completion criteria of the Landscape Management Plan. The sum of the bond shall be determined by calculating the full cost of implementing the vegetation offsets, and verified by suitably qualified quantity surveyor, to the satisfaction of the Director-General.

Notes:

- *If the vegetation offset is completed to the satisfaction of the Director-General, the Director-General will release the conservation bond.*
- *If the vegetation offset is not completed to the satisfaction of the Director-General, the Director-General will call in all or part of the conservation bond, and arrange for the satisfactory completion of the relevant works.*
- *If amendments to the Mining Act 1992 allow the Minister for Mineral Resources to require rehabilitation securities under a Mining Lease which apply to the implementation of rehabilitation works outside the boundary of a Mining Lease, the Proponent may transfer the vegetation offset bond required under this approval to the Minister of Mineral Resources provided the Director-General and the DII agree to the transfer.*

HERITAGE

Aboriginal Heritage Plan

49. The Proponent shall prepare and implement an Aboriginal Heritage Plan for the project to the satisfaction of the Director-General. The plan must:
- (a) be prepared in consultation with DECCW and the Aboriginal community;
 - (b) be submitted to the Director-General for approval prior to carrying out any development on site; and
 - (c) include a:
 - program for the test excavations, intensive recording, salvage, and surface collection of the sites identified in Appendix 9, which includes a suitable lithic analysis of all material collected as part of the salvage operations;
 - program for the conservation of the site outside the surface disturbance area (see Appendix 9), including measures that would be implemented to secure, analyse and record the sites at risk of subsidence;
 - program to further assess and document the Aboriginal heritage values of the area;
 - description of the measures that would be implemented if any Aboriginal skeletal remains are discovered during the project; and
 - protocol for the ongoing consultation and involvement of the Aboriginal community in the conservation and management of the Aboriginal heritage on the site.

Non-Aboriginal Heritage Plan

50. The Proponent shall prepare and implement a Heritage Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with the Council;
 - (b) be submitted to the Director-General for approval prior to carrying out any development on site; and
 - (c) include a:
 - program for the archival recording of the sites identified in Appendix 10, in accordance with the relevant NSW Heritage Office guidelines; and
 - description of the measures that would be implemented to conserve and/or maintain public access to the sites identified in Appendix 10.

TRANSPORT

Road Works

51. Prior to carrying out any construction on site, unless otherwise authorised by the Director-General, the Proponent shall:
- (a) construct the new intersection between the Ulan-Cassilis Road (MR 214) and the proposed mine access road for the coal handling preparation plant and coal stockpile infrastructure areas; and
 - (b) upgrade the existing intersection between the Ulan-Cassilis Road (MR 214) and Ulan-Wollar Road in conjunction with the owner of the Wilpinjong coal mine,

to the satisfaction of the DTI.

52. Prior to carrying out any construction on site to the south of the Ulan-Wollar Road, the Proponent shall construct the new intersection between the Ulan-Wollar Road and the proposed mine access road for the open cut operations to the satisfaction of Council.
53. Within 3 years of this approval, the Proponent shall construct the proposed diversion of the Ulan-Wollar Road to the satisfaction of Council.
54. Prior to the commencement of mining operations in open cut 2, the Proponent shall divert Carrs Gap Road to the satisfaction of Council.
55. Prior to the commencement of mining operations in open cut 3, the Proponent shall divert Moolarben Road to the satisfaction of Council.

Note: These road works must be constructed in accordance with the relevant DTI or Austroads standards, and signposted and lit in accordance AS 1742 – Manual of Uniform Traffic Control Devices and AS/NZS 1158: 2005 – Lighting for Roads and Public Spaces.

Upgrade of Ulan Road (MR 208/214), Cope Road (MR 598) and Ulan-Wollar Road

56. Within 6 months of this approval, the Proponent shall prepare a detailed program for the staged upgrade of Ulan Road, Cope Road and Ulan-Wollar Road to the satisfaction of the Director-General. This program must:
 - (a) be prepared by a suitably qualified expert/s whose appointment has been approved by the Director-General;
 - (b) be prepared in consultation with the DTI, Council, and the owner of the Wilpinjong coal mine;
 - (c) identify the road works that are required to improve the safety of these roads;
 - (d) include a detailed program to progressively implement these works; and
 - (e) allocate the available funding in any relevant VPA or statement of commitments to these works.

Note: The Proponent is only responsible for upgrading the Ulan-Wollar Road from the existing intersection between Ulan-Cassilis Road (MR 214) and Ulan-Wollar Road and the new intersection between the Ulan-Wollar Road and the proposed mine access road for the open cut mining operations (see Conditions 51(b) and 52 of Schedule 3).

57. Following the approval of this program, the Proponent shall implement the program in consultation with the DTI, Council, and owner of the Wilpinjong coal mine.

Traffic Management

58. The Proponent shall:
 - (a) schedule the shift changes on site to occur outside the school bus hours; and
 - (b) co-ordinate the shift changes on site with the shift changes of the adjoining Ulan and Wilpinjong coal mines to minimise the potential cumulative traffic impacts of the shift changes of the three mines;

Rail Transport – West

59. The Proponent shall not transport any coal west of the site through Gulgong and Mudgee without the written approval of the Director-General. In seeking this approval, the Proponent shall submit a report to the Director-General that:
 - (a) has been prepared in consultation with Council;
 - (b) demonstrates that the railway line has been suitably upgraded to accommodate the proposed coal train traffic;
 - (c) describes:
 - the expected tonnages, train size, number, and rail scheduling of the proposed coal train movements (both laden and unladen);
 - the measures that would be implemented to minimise, mitigate and/or manage the ongoing environmental effects of these coal train movements; and
 - how the performance of these measures would be monitored.

Monitoring of Coal Transport

60. The Proponent shall monitor the:
 - (a) amount of coal transported from the site each year; and
 - (b) date and time of each train movement generated by the project.

LIGHTING IMPACTS

61. The Proponent shall:
- (a) take all practicable measures to further mitigate off-site lighting impacts from the project; and
 - (b) ensure that all external lighting associated with the project complies with *Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting*, to the satisfaction of the Director-General.

GREENHOUSE GAS

Energy Savings Action Plan

62. The Proponent shall prepare and implement an Energy Savings Action Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be prepared in consultation with **NOW**;
 - (b) be prepared in accordance with the *Guidelines for Energy Savings Action Plans* (DEUS 2005, or its latest version);
 - (c) be submitted to the Director-General for approval prior to carrying out any construction on site; and
 - (d) include a program to monitor the effectiveness of measures to reduce energy use on site.

Gas Drainage

63. The Proponent shall implement all reasonable and feasible measures to minimise the greenhouse gas emissions from the underground mining operations to the satisfaction of the Director-General.
64. Prior to carrying out underground mining operations, the Proponent shall submit a Greenhouse Gas Minimisation Plan to the Director-General. This plan must:
- (a) identify options for minimising greenhouse gas emissions from underground mining operations, with a particular focus on capturing and/or using these emissions;
 - (b) investigate the feasibility of implementing each option;
 - (c) propose the measures that would be implemented in the short to medium term on site; and
 - (d) include a research program to inform the continuous improvement of the greenhouse gas minimisation measures on site.

WASTE

65. The Proponent shall prepare and implement a Waste Management Plan for the project to the satisfaction of the Director-General. This plan must:
- (a) be submitted to the Director-General for approval prior to commencing construction;
 - (b) identify the various waste streams of the project;
 - (c) describe what measures would be implemented to reuse, recycle, or minimise the waste generated by the project; and
 - (d) include a program to monitor the effectiveness of these measures.

Note: This plan is not required to cover the disposal of tailings or the management of overburden.

SCHEDULE 4 ADDITIONAL PROCEDURES FOR AIR QUALITY AND NOISE MANAGEMENT

NOTIFICATION OF LANDOWNERS

1. Within 1 month of this approval, the Proponent shall notify the landowners of the land listed in Table 1 in writing that they have the right to require the Proponent to acquire their land at any stage during the project.
2. If the results of monitoring required in Schedule 3 identify that the impacts generated by the project are greater than the relevant impact assessment criteria in Schedule 3, except where this is predicted in the EA, and except where a negotiated agreement has been entered into in relation to that impact, then the Proponent shall notify the Director-General and the affected landowners and/or existing or future tenants (including tenants of mine owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the criteria in Schedule 3.
3. Prior to carrying out any construction on site, the Proponent shall:
 - (a) prepare a brochure to advise landowners and tenants (including tenants of mine owned properties) of the possible health and amenity impacts associated with exposure to particulate matter, in consultation with NSW Health, and to the satisfaction of the Director-General;
 - (b) provide a copy of the approved brochure to the landowners and tenants (including tenants of mine owned properties) of properties where the predictions in the EA identify that the dust emissions generated by the project are likely to be greater than the air quality land acquisition criteria in Schedule 3.

INDEPENDENT REVIEW

4. If a landowner considers the project to be exceeding the impact assessment criteria in Schedule 3, except where this is predicted in the EA, then he/she may ask the Director-General in writing for an independent review of the impacts of the project on his/her land.

If the Director-General is satisfied that an independent review is warranted, the Proponent shall within 3 months of the Director-General advising that an independent review is warranted:

- (a) consult with the landowner to determine his/her concerns;
 - (b) commission a suitably qualified, experienced and independent person whose appointment has been approved by the Director-General, to conduct monitoring on the land, determine whether the project is complying with the relevant impact assessment criteria in Schedule 3, identify the source(s) and scale of any impact on the land, and the project's contribution to this impact;
 - (c) give the Director-General and landowner a copy of the independent review.
5. If the independent review determines that the project is complying with the relevant impact assessment criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.
 6. If the independent review determines that the project is not complying with the relevant impact assessment criteria in Schedule 3, and that the project is primarily responsible for this non-compliance, then the Proponent shall:
 - (a) take all reasonable and feasible measures, in consultation with the landowner, to ensure that the project complies with the relevant criteria; and
 - (b) conduct further monitoring to determine whether these measures ensure compliance; or
 - (c) secure a written agreement with the landowner to allow exceedances of the criteria in Schedule 3, to the satisfaction of the Director-General.

If the additional monitoring referred to above subsequently determines that the project is complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the Proponent is unable to finalise an agreement with the landowner, then the Proponent or landowner may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 11).

If the measures referred to in (a) do not achieve compliance with the relevant land acquisition criteria in Schedule 3, and the Proponent cannot secure a written agreement with the landowner to allow these exceedances within 3 months, then, upon receiving a written request from the landowner, the Proponent shall acquire the landowner's land in accordance with the procedures in Conditions 10-12 below.

7. If the independent review determines that the relevant criteria in Schedule 3 are being exceeded, but that more than one mine is responsible for this non-compliance, then the Proponent shall, together with the relevant mine/s:
- (a) take all reasonable and feasible measures, in consultation with the landowner, to ensure that the relevant criteria are complied with; and
 - (b) conduct further monitoring to determine whether these measures ensure compliance; or
 - (c) secure a written agreement with the landowner and other relevant mines to allow exceedances of the criteria in Schedule 3,
- to the satisfaction of the Director-General.

If the additional monitoring referred to above subsequently determines that the project is complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

If the Proponent is unable to finalise an agreement with the landowner and/or other mine/s, then the Proponent or landowner may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process (see Appendix 11).

If the measures referred to in (a) do not achieve compliance with the relevant land acquisition criteria in Schedule 3, and the Proponent together with the relevant mine/s cannot secure a written agreement with the landowner to allow these exceedances within 3 months, then, upon receiving a written request from the landowner, the Proponent shall acquire all or part of the landowner's land on as equitable basis as possible with the relevant mine/s, in accordance with the procedures in Conditions 10-12 below.

8. If the landowner disputes the results of the independent review, either the Proponent or the landowner may refer the matter to the Director-General for resolution.

If the matter cannot be resolved within 21 days, the Director-General shall refer the matter to an Independent Dispute Resolution Process.

9. If, following the Independent Dispute Resolution Process, the Director-General decides that the Proponent shall acquire all or part of the landowner's land, then the Proponent shall acquire this land in accordance with the procedures in conditions 10-12 below.

LAND ACQUISITION

10. Within 3 months of receiving a written request from a landowner with acquisition rights, the Proponent shall make a binding written offer to the landowner based on:
- (a) the current market value of the landowner's interest in the property at the date of this written request, as if the property was unaffected by the project the subject of the project application, having regard to the:
 - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
 - presence of improvements on the property and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of Condition 8 of Schedule 3;
 - (b) the reasonable costs associated with:
 - relocating within the Mid Western Regional Council local government area, or to any other local government area determined by the Director-General;
 - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and
 - (c) reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Proponent and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Director-General for resolution (see Appendix 8).

Upon receiving such a request, the Director-General shall request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer or Fellow of the Institute, to consider submissions from both parties, and determine a fair and reasonable acquisition price for the land, and/or terms upon which the land is to be acquired.

Within 14 days of receiving the independent valuer's determination, the Proponent shall make a written offer to purchase the land at a price not less than the independent valuer's determination.

If the landowner refuses to accept this offer within 6 months of the date of the Proponent's offer, the Proponent's obligations to acquire the land shall cease, unless otherwise agreed by the Director- General.

11. The Proponent shall bear the costs of any valuation or survey assessment requested by the independent valuer, or the Director-General and the costs of determination referred above.
 12. If the Proponent and landowner agree that only part of the land shall be acquired, then the Proponent shall pay all reasonable costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of the plan at the Office of the Registrar-General.
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SCHEDULE 5 ENVIRONMENTAL MANAGEMENT, MONITORING, AUDITING AND REPORTING

ENVIRONMENTAL MANAGEMENT STRATEGY

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must be submitted to the Director-General prior to carrying out any development on site, and:
 - (a) provide the strategic context for environmental management of the project;
 - (b) identify the statutory requirements that apply to the project;
 - (c) describe in general how the environmental performance of the project would be monitored and managed;
 - (d) describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the project;
 - receive, handle, respond to, and record complaints;
 - resolve any disputes that may arise during the course of the project;
 - respond to any non-compliance;
 - manage cumulative impacts; and
 - respond to emergencies; and
 - (e) describe the role, responsibility, authority, and accountability of all the key personnel involved in environmental management of the project.

ENVIRONMENTAL MONITORING PROGRAM

2. The Proponent shall prepare and implement an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program must consolidate the various monitoring requirements of this approval into a single document, and be submitted to the Director-General with the submission of the relevant monitoring programs.

REPORTING

Incident Reporting

3. Within 24 hours of detecting an exceedance of the limits/performance criteria in this approval or the occurrence of an incident that causes (or may cause) harm to the environment, the Proponent shall notify the Department and other relevant agencies of the exceedance/incident.
4. Within 6 days of notifying the Department and other relevant agencies of an exceedance/incident, the Proponent shall provide the Department and these agencies with a written report that:
 - (a) describes the date, time, and nature of the exceedance/incident;
 - (b) identifies the cause (or likely cause) of the exceedance/incident;
 - (c) describes what action has been taken to date; and
 - (d) describes the proposed measures to address the exceedance/incident.

Annual Reporting

5. Within 12 months of this approval, and annually thereafter, the Proponent shall submit an AEMR to the Director-General and relevant agencies. This report must:
 - (a) identify the standards and performance measures that apply to the project;
 - (b) describe the works carried out in the last 12 months;
 - (c) describe the works that will be carried out in the next 12 months;
 - (d) include a summary of the complaints received during the past year, and compare this to the complaints received in previous years;
 - (e) include a summary of the monitoring results for the project during the past year;
 - (f) include an analysis of these monitoring results against the relevant:
 - impact assessment criteria/limits;
 - monitoring results from previous years; and
 - predictions in the EA;
 - (g) identify any trends in the monitoring results over the life of the project;
 - (h) identify any non-compliance during the previous year; and
 - (i) describe what actions were, or are being, taken to ensure compliance.

INDEPENDENT ENVIRONMENTAL AUDIT

6. Within 2 years of this approval, and every 3 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
- (a) be conducted by a suitably qualified, experienced, and independent team of experts whose appointment has been endorsed by the Director-General;
 - (b) include consultation with the relevant agencies;
 - (c) assess the environmental performance of the project and whether it is complying with the relevant requirements in this approval and any relevant mining lease and environment protection licence (including any strategy, plan or program under these approvals);
 - (d) review the adequacy of strategies, plans and/or programs required under these approvals; and, if necessary,
 - (e) recommend measures or actions to improve the environmental performance of the project, and/or any strategy, plan or program required under these approvals, including changes to the mine plan.

Note:

- *Notwithstanding the timing referred to above, audits must be carried out prior to the completion of longwall panels 4 and 8. The Proponent must liaise with the Department to determine the precise date of these audits.*
 - *This audit team should be led by a suitably qualified auditor, and include experts in the field of subsidence, surface water and groundwater management, noise, ecology and mine rehabilitation.*
7. Within 6 weeks of completing this audit, or as otherwise agreed by the Director-General, the Proponent shall submit a copy of the audit report to the Director-General with a response to any recommendations contained in the audit report.
8. Within 3 months of submitting the audit report to the Director-General, the Proponent shall review and if necessary revise the strategies/plans/programs required under this approval, to the satisfaction of the Director-General.

COMMUNITY CONSULTATIVE COMMITTEE

9. The Proponent shall establish a Community Consultative Committee (CCC) for the project to the satisfaction of the Director-General, in general accordance with the *Guideline for Establishing and Operating Community Consultative Committees for Mining Projects*. This committee must be established within 3 months of this approval.

ACCESS TO INFORMATION

10. Within 3 months of the approval of any strategy/plan/program required under this approval (or any subsequent revision of these strategies/plans/programs), or the completion of the audits or AEMRs, required under this approval, the Proponent shall:
- (a) provide a copy of the relevant document/s to the relevant agencies and CCC;
 - (b) put a copy of the document/s on its website.
11. During the project, the Proponent shall:
- (a) make a summary of monitoring results required under this approval publicly available on its website; and
 - (b) update these results on a regular basis (at least every 3 months).
-

**APPENDIX 1
SCHEDULE OF LAND**

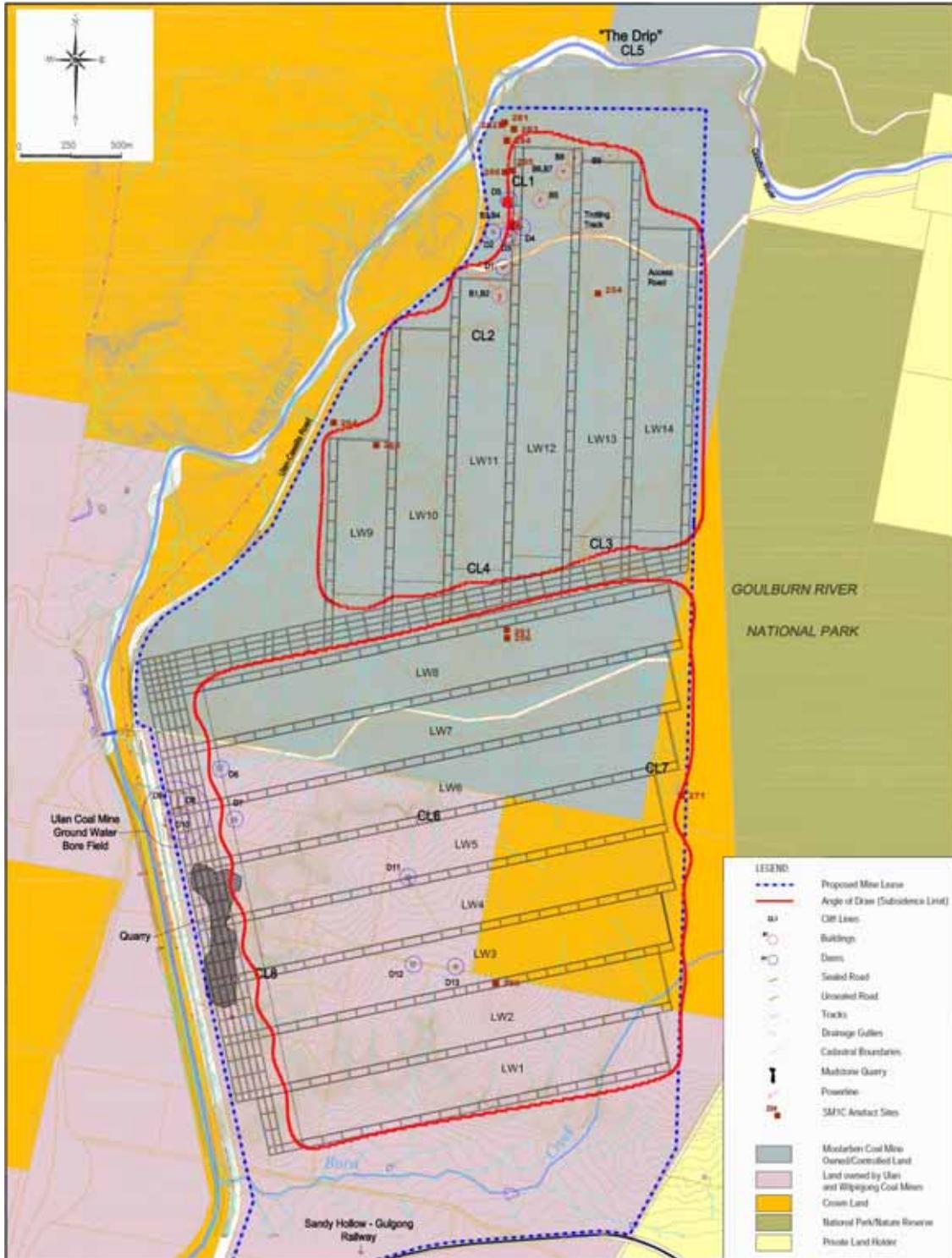
Owner	Description	DP	Parish	County
Council of the Shire of Mudgee	Lot 1	DP 817487	Lennox	Phillip
C Mayberry	Pt. Lot 102	DP 755442	Moolarben	Phillip
C Mayberry	Pt. Lot 157	DP 755442	Moolarben	Phillip
C Mayberry	Pt. Lot 6	DP 115031	Moolarben	Phillip
DJ & JG Stokes	Pt. Lot 208	DP 755442	Moolarben	Phillip
DJ & JG Stokes	Pt. Lot 4	DP 575167	Moolarben	Phillip
DJ & JG Stokes	Pt. Lot 65	DP 755442	Moolarben	Phillip
DJ & JG Stokes	Pt. Lot 88	DP 755442	Moolarben	Phillip
DJ & Y Raynor	Lot 1	DP 115031	Moolarben	Phillip
DJ & Y Raynor	Lot 2	DP 115031	Moolarben	Phillip
DJ & Y Raynor	Lot 89	DP 755442	Moolarben	Phillip
DJ & Y Raynor	Lot 98	DP 755442	Moolarben	Phillip
DJ & Y Raynor	Pt. Lot 140	DP 755442	Moolarben	Phillip
DJ & Y Raynor	Pt. Lot 218	DP 755442	Moolarben	Phillip
DJ & Y Raynor	Pt. Lot 238	DP 755442	Moolarben	Phillip
DJ & Y Raynor	Pt. Lot 260	DP 755442	Moolarben	Phillip
DJ & Y Raynor	Pt. Lot 261	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 107	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 108	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 145	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 16	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 17	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 18	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 19	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 248	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 40	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 45	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 50	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 51	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 53	DP 755442	Moolarben	Phillip
EC Mayberry	Lot 64	DP 755442	Moolarben	Phillip

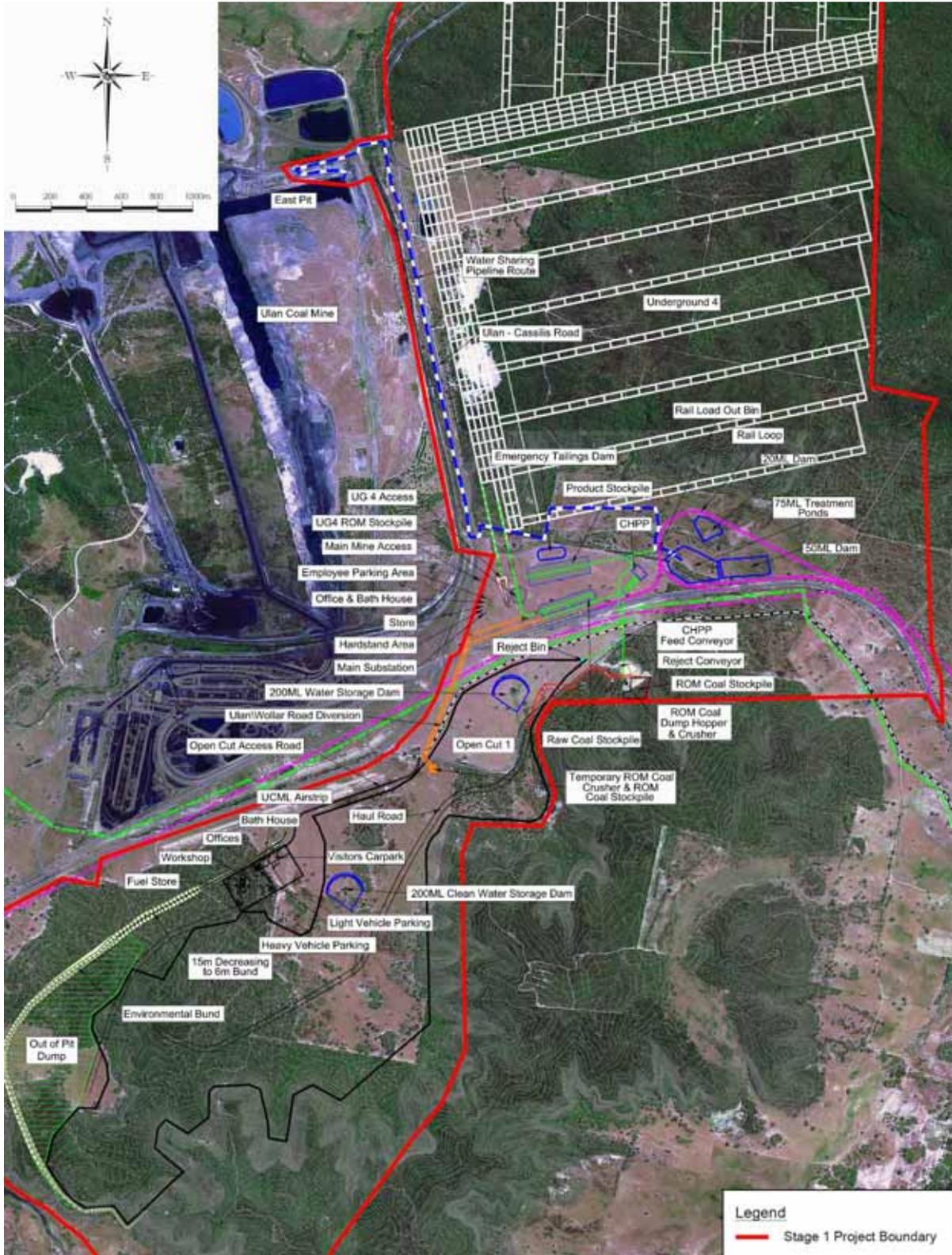
Owner	Description	Parish	County
EC Mayberry	Pt. Lot 167 DP 755442	Moolarben	Phillip
EC Mayberry	Pt. Lot 170 DP 755442	Moolarben	Phillip
EC Mayberry	Pt. Lot 172 DP 755442	Moolarben	Phillip
EC Mayberry	Pt. Lot 183 DP 755442	Moolarben	Phillip
K & RE Mayberry	Lot 146 DP 755442	Moolarben	Phillip
K & RE Mayberry	Lot 52 DP 755442	Moolarben	Phillip
K & RE Mayberry	Lot 63 DP 755442	Moolarben	Phillip
K & RE Mayberry	Lot 99 DP 755442	Moolarben	Phillip
K & RE Mayberry	Pt. Lot 205 DP 755442	Moolarben	Phillip
K & RE Mayberry	Pt. Lot 289 DP 704098	Moolarben	Phillip
MJ & H Swords	Pt. Lot 93 DP 755442	Moolarben	Phillip
MJ & H Swords	Pt. Lot 93 DP 755454	Wilpinjong	Phillip
MJ & PM Swords	Lot 119 DP 755442	Moolarben	Phillip
MJ & PM Swords	Lot 44 DP 755442	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 1 DP 803204	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 192 DP 755442	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 193 DP 755442	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 37 DP 755442	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 60 DP 755442	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 61 DP 755442	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 62 DP 755442	Moolarben	Phillip
MJ & PM Swords	Pt. Lot 95 DP 755442	Moolarben	Phillip
MJ Swords	Lot 109 DP 755442	Moolarben	Phillip
MJ Swords	Lot 110 DP 755442	Moolarben	Phillip
MJ Swords	Lot 223 DP 755442	Moolarben	Phillip
MJ Swords	Lot 234 DP 755442	Moolarben	Phillip
MJ Swords	Pt. Lot 112 DP 755454	Wilpinjong	Phillip
MJ Swords	Pt. Lot 113 DP 755454	Wilpinjong	Phillip
MJ Swords	Pt. Lot 228 DP 755442	Moolarben	Phillip
MJ Swords	Pt. Lot 229 DP 755442	Moolarben	Phillip
MJ Swords	Pt. Lot 96 DP 755454	Wilpinjong	Phillip
RB Cox	Pt. Lot 125 DP 755442	Moolarben	Phillip
Moolarben Coal Mines Pty Limited	Pt. Lot 1 DP 878678	Wilpinjong	Phillip

Owner	Description	Parish	County
Moolarben Coal Mines Pty Limited	Pt. Lot 2 DP 878678	Wilpinjong	Phillip
Moolarben Coal Mines Pty Limited	Pt. Lot 262 DP 755442	Moolarben	Phillip
Moolarben Coal Mines Pty Limited	Pt. Lot 30 DP 755439	Lennox	Phillip
Moolarben Coal Mines Pty Limited	Pt. Lot 7 DP 878678	Wilpinjong	Phillip
Moolarben Coal Mines Pty Limited	Pt. Lot 97 DP 755454	Wilpinjong	Phillip
Moolarben Coal Mines Pty Limited	Pt. Lot 6 DP 878678	Wilpinjong	Phillip
Ulan Coal Mines Ltd.	Lot 1 DP 722881	Moolarben	Phillip
Ulan Coal Mines Ltd.	Lot 178 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Lot 179 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Lot 2 DP 722882	Lennox	Phillip
Ulan Coal Mines Ltd.	Lot 241 DP 1111238	Lennox	Phillip
Ulan Coal Mines Ltd.	Lot 272 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Lot 277 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Lot 3 DP 722882	Lennox	Phillip
Ulan Coal Mines Ltd.	Lot 4 DP 722882	Lennox	Phillip
Ulan Coal Mines Ltd.	Lot 45 DP 736630	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 1 DP 1089166	Moolarben	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 1 DP 1099037	Moolarben	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 1 DP 720332	Ulan	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 14 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 2 DP 817487	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 20 DP 755439	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 242 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 253 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 44 DP 736630	Lennox/Ulan	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 46 DP 736630	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 47 DP 736630	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 48 DP 736630	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 50 DP 736630	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 51 DP 736630	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 53 DP 736630	Lennox	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 54 DP 736630	Lennox	Phillip

Owner	Description	Parish	County
Ulan Coal Mines Ltd.	Pt. Lot 75 DP 750773	Ulan	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 91 DP 755442	Moolarben	Phillip
Ulan Coal Mines Ltd.	Pt. Lot 92 DP 755442	Moolarben	Phillip
Crown	Carrs Gap Road	Moolarben	Phillip
Crown	Moolarben Road	Moolarben	Phillip
Crown	Saddlers Creek Road		
Crown	Ulan Road		
Crown	Ulan–Wollar Road		
Crown	Lot 152 DP 755442 Reserve for Public School	Moolarben	Phillip
Crown	Lot 176 DP 755442 Reserve for future public requirements R65457	Moolarben	Phillip
Crown	Pt. Lot 204 DP 755442 Reserve for future public requirements R65457	Moolarben	Phillip
Crown	Pt. Lot 290 DP 704098 Reserve for Access	Moolarben	Phillip
Crown	Pt. Lot 7009 DP 1025321 Vacant Crown Land	Moolarben	Phillip
Crown	Pt. Lot 31 DP 755439 Vacant Crown Land	Lennox	Phillip
Crown	Pt. Lot 7010 DP 1025345 Vacant Crown Land	Moolarben	Phillip
Crown	Reserve for Resting Place R.82539	Lennox	Phillip
Crown	Lot 33 DP 755439	Lennox	Phillip
Crown	Lot 34 DP 755439	Lennox	Phillip
Crown	Lot 55 DP 722794	Lennox	Phillip
Crown	Lot 56 DP 722795	Lennox	Phillip
Crown	Pt. Lot 43 DP 736630	Lennox/Ulan	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 10 0857C)	Moolarben	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 11 0857C)	Wilpinjong	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 12 0857C)	Moolarben	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 13 0857C)	Wilpinjong	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 14 0857C)	Moolarben	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 15 0857C)	Moolarben	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 16 0857C)	Moolarben	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 17 0857C)	Moolarben	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 18 0857C)	Moolarben	Phillip
Crown	Unidentified Crown Road (Refer Plan - No 19 0857C)	Moolarben	Phillip

Owner	Description	Parish	County
Crown	Unidentified Crown Road - No 20 (Refer 0857C) Plan	Moolarben	Phillip
Crown	Unidentified Crown Road - No 21 (Refer 0857C) Plan	Moolarben	Phillip
Crown	Unidentified Crown Road - No 22 (Refer 0857C) Plan	Moolarben	Phillip
Crown	Unidentified Crown Road - No 6 (Refer 0857C) Plan	Lennox	Phillip
Crown	Unidentified Crown Road - No 7 (Refer 0857C) Plan	Lennox	Phillip
Crown	Unidentified Crown Road - No 8 (Refer 0857C) Plan	Lennox	Phillip
Crown	Unidentified Crown Road - No 9 (Refer 0857C) Plan	Moolarben	Phillip
Crown	Vacant Crown Land - No 1 (Refer 0857C) Plan	Lennox	Phillip
Crown	Vacant Crown Land - No 2 (Refer 0857C) Plan	Lennox	Phillip
Crown	Vacant Crown Land - No 3 (Refer 0857C) Plan	Lennox	Phillip
Crown	Vacant Crown Land - No 4 (Refer 0857C) Plan	Lennox	Phillip
Crown	Vacant Crown Land - No 5 (Refer 0857C) Plan	Lennox	Phillip
State Rail Authority	Sandy Hollow–Gulgong Railway		





APPENDIX 3 STATEMENT OF COMMITMENTS

- (1) **Protect The Drip and Goulburn River Corner Gorge**
The Drip and the Goulburn River Corner Gorge are shown on the plan titled "Moolarben Coal Mine – Preferred Mine Plan General Layout" contained in Appendix A9 to the "Moolarben Coal Project Response to Submissions".
Moolarben will conduct its underground mining operations consistent with the Preferred Project Underground No. 4 layout to protect the Goulburn River features known as the Drip, the Goulburn River Corner Gorge and associated cliffs so that there is no damage whilst seeking to maximise recovery of coal resources and as may be required by any conditions of project approval for the Moolarben Coal Project.
- (2) **Shift Change**
Moolarben undertakes to schedule its major employee shift changes to times outside the hours of 8.15 to 9.00 am and 3.15 to 4.00 pm Monday to Friday to seek to reduce overlap of employee traffic and school transport and as may be required by any conditions of project approval for the Moolarben Coal Project.
- (3) **Replace Water**
Moolarben will compensate or replace waters (similar quality and quantity) lost by a private landholder as a consequence of the Moolarben Coal Project in accordance with the adopted protocols and procedures contained in the Moolarben Coal Project Environmental Management System and as may be required by any conditions of project approval for the Moolarben Coal Project.
- (4) **Environmental Management System**
Moolarben will prepare and implement an Environmental Management System containing Environmental Management Plans, and Mine Operating Plan for the life of the Moolarben Coal Project consistent with the Environmental Assessment Report, the Response to Submissions Report, the Preferred Project Report and as may be required by any conditions of project approval for the Moolarben Coal Project.
- (5) **Noise in School Rooms**
Moolarben in consultation with the Ulan Public School and the Department of Education will undertake agreed works to ameliorate potential noise and dust impacts associated with the Moolarben Coal Project upon classrooms and general school operations.
OR
Moolarben will, should the Department of Education request, on a reasonable basis relating to the effect of noise and dust from the Moolarben Coal Project, negotiate to contribute to or meet reasonable costs toward relocating the school.
- (6) **Land Purchase Commitment**
Moolarben will accept an obligation to purchase (if so required by any affected private landholder) any land affected by operations of the Moolarben Coal Project in accordance with any requirement to do so as provided in any project approval for the Moolarben Coal Project.
- (7) **Mine Water Sharing Plan**
Moolarben will seek to enter into a mine water sharing plan in respect of mining operations of the Ulan Coal Mine and Wilpinjong Coal Mine under the auspices of the Director General of the Department of Planning and as may be required by any conditions of project approval for the Moolarben Coal Project.
- (8) **Voluntary Planning Agreement**
Moolarben will enter into a Voluntary Planning Agreement with Mid Western Regional Council and the Minister for Planning incorporating the principles contained in the offer by Moolarben to the Minister for Planning on 4 September 2007 to enter into the Voluntary Planning Agreement.
- (9) **Employ Local People**
Moolarben will, wherever possible and feasible, employ appropriately qualified persons residing within the local area.
- (10) **Traineeships**
Moolarben will provide traineeships for the youth of the local community.
- (11) **Dronvisa Quarry**
Moolarben will seek to enter into an operational agreement with Dronvisa Quarry with regard to the safe continuation of its operations in conjunction with underground mining.
- (12) **Ecology**

Moolarben will enter into such arrangements as may be required by the Director-General to provide for ecological offsets as proposed in the Environmental Assessment and Preferred Project Report and as may be required by any conditions of project approval for the Moolarben Coal Project.

(13) **Flows in the Goulburn River – Co-operative Monitoring Program**

Moolarben will use its reasonable endeavours to agree and implement a monitoring program in cooperation with the Ulan and Wilpinjong mines (and to the reasonable requirement of the Director General who will consult with the DNR) to identify any potential for any change in the water flows in the Goulburn River due to mining at the Moolarben, Ulan and Wilpinjong mines and as may be required by any conditions of project approval for the Moolarben Coal Project.

(14) **Mine Water Management and Salinity – Sharing with Ulan and Wilpinjong**

Moolarben will use its reasonable endeavours to agree and implement a co-operative arrangement with and enter into a life of mine agreement between the Ulan and Wilpinjong mines (the “Mines”) to establish, implement and operate water sharing and use plans and procedures with the objective of minimising the removal by the Mines of water from the environment and the discharge of minewaters by the Mines to the environment and which shall address the ability of the Mines to utilise mine water produced by the Mines between the Mines and as may be required by any conditions of project approval for the Moolarben Coal Project.

(15) **Salinity Off Sets**

– Bobadeen Irrigation Scheme (“BIS”) - Salinity Offset Management Plan (“SOMP”)

In the event that the Moolarben Coal Project reduces the capacity for the removal of salt from the Salinity Offset Management Plan area operated by Ulan Mine in conjunction with the Bobadeen Irrigation Scheme under Environment Protection Licence 394, then Moolarben will, at its election, either:

- take from Ulan that volume of water that would otherwise have been used in the BIS; OR
- provide an area of land with equivalent salt removal capacity; AND
- any disputed issue will be determined by an appropriately qualified expert agreed between Moolarben and Ulan and in default appointed by the Director General of Planning.
-

(16) **Haulage of Coal to the West by Rail**

Prior to the haulage of coal by rail to the west of the Moolarben Coal Project, Moolarben shall notify the Director-General with details of expected tonnages, train size and rail scheduling and where practicable schedule rail haulage during daylight hours only through the town of Mudgee as may otherwise be required by any conditions of project approval for the Moolarben Coal Project.

(17) **Traffic Management – Mid Western Regional Council**

Moolarben acknowledges the need for it to contribute to the upgrade and maintenance of aspects of the local road system affected by the operation of the Moolarben Coal Project and commits to implement the Voluntary Planning Agreement in satisfaction of the principles of that agreement.

(18) **Additional Management and Mitigation**

– Modification of Stage 1

Moolarben commits to implementing the following management and mitigation measures to ensure that impacts associated with modifications to the infrastructure layout of the Moolarben Coal Project are minimised.

Environmental Aspect	Management and Mitigation Commitments
Air quality	<ul style="list-style-type: none"> • 240 t haul trucks (rather than 170 t) will be used on the internal haul road in OC1. • Dust control measures will be used on internal haul roads. • Raw coal transfer and rejects conveyors will be partially enclosed. • Dust sprays will be fitted to the dump hopper. • Dust sprays will be fitted to the temporary ROM coal crusher
Noise	<ul style="list-style-type: none"> • 240 t haul trucks will be fitted with noise attenuation equipment to meet sound power levels assumed in the Stage 1 EA noise Impact assessment. • Raw coal transfer and rejects conveyors will be partially enclosed. • Night time construction activities will be restricted to the main infrastructure area. • Night time construction activities will be restricted to civil works, such as concrete finishing, formwork and steel tying and mechanical and electrical works on the CHPP only. There will be no night time concrete pours or metal fabrication works involving rattle guns. • Night time construction activities will only apply until the mine is commissioned and first product coal is transported from the site. • Vehicles required for night time construction activities will be fitted with non-tonal (quacker) reversing alarms, or smart alarms. • Night time construction noise will comply with the approved operational night time noise impact assessment criteria. • Attended monitoring will be undertaken at the nearest privately-owned residence, during the period of night time construction. • Acoustic barriers will be installed around the temporary ROM coal crushing facility.
Biodiversity	<ul style="list-style-type: none"> • Where possible, construction works in areas of known and potential threatened woodland species habitat will be avoided during their breeding cycle. • Pre-clearing fauna surveys will be undertaken and arboreal fauna and nesting sites will be recovered and relocated. • One of two hollow bearing trees within the rail loop alignment will be retained (where possible). • Tree hollows will be salvaged for use as compensatory habitat, including tree hollow(s) from the second hollow bearing tree within the rail loop alignment. • The loss of 6 ha of native vegetation and grasslands associated with construction of the rail loop will be offset by: <ul style="list-style-type: none"> - Revegetating a further 6.0 ha of cleared land on properties R12, R13, R14, R15, R16, R17, R18 and R19 (condition 42(b) of schedule 3 of the Stage 1 Approval) with suitable native vegetation. • The loss of 10.33 ha of intact native vegetation associated with boundary fence line clearing and disturbance from the ROM facilities, including 1.3 ha of EEC, will be offset by: <ul style="list-style-type: none"> - Conserving 4 ha of existing EEC on property 24. - Enhancing 2.6 ha of naturally regenerating EEC on property 24. - Rehabilitating 10 ha of land to the west and southwest of OC1 within mining lease 1606 (ML 1606) with EEC (see EA 05_0117 MOD 5 Plan 2). - Revegetating a further 4.0 ha of cleared land on properties R12, R13, R14, R15, R16, R17, R18 and R19 (condition 42(b) of schedule 3 of the Stage 1 Approval) with suitable native vegetation. • The cleared area along the mining lease boundary will be rehabilitated and revegetated to enable cleared EEC to re-establish. • Feral animals, weeds and pests will be controlled.

Environmental Aspect	Management and Mitigation Commitments
<i>Cultural heritage</i>	<ul style="list-style-type: none"> • <i>Cultural heritage sites S1MC 306-309 within the footprint of the rail loop will be salvaged and stored in the Keeping Place.</i> • <i>Cultural heritage site S1MC 308 within the footprint of the rail loop will be subject to sub surface testing initially using a mechanical device.</i> • <i>If additional cultural heritage sites or objects are identified as result of the salvage assessment for S1MC 308 and cannot be avoided, further archaeological assessment will be undertaken in accordance with the approved Aboriginal Heritage Management Plan.</i> • <i>Cultural heritage sites S1MC 310, S1MC 311 and S1MC 312 within the footprint of the water pipeline route will be salvaged and stored in the Keeping Place.</i> • <i>Construction activities for the water sharing pipeline on MCM' mining leases will be confined within a fenced off corridor.</i> • <i>The area immediately west of the ROM dump hopper site will be monitored for cultural heritage prior to construction taking place.</i> • <i>Cultural heritage monitoring and salvage will be undertaken by a qualified archaeologist and members of the Aboriginal Stakeholder community groups (Mudgee Local Aboriginal Land Council based in Mudgee; North-East Wiradjuri Pty Ltd, based in Ulan; Murong Gialinga Aboriginal and Torres Strait Islander Corporation, based in Mudgee; and Warrabinga Native Title Claimants Aboriginal Corporation, based in Kandos).</i> • <i>Where additional cultural heritage sites are identified, further archaeological assessment will be carried out prior to continuing with construction.</i> • <i>Local Aboriginal community representatives will be involved in monitoring ground disturbance activities; and in the recording, salvaging and storing of cultural heritage objects impacted by site works.</i>
<i>Soil and water</i>	<ul style="list-style-type: none"> • <i>Soils will be stockpiled and used to rehabilitate areas not required for ongoing operations.</i> • <i>Erosion and sediment control measures detailed in the approved ESCP will be implemented.</i> • <i>Water pressure will be monitored at the inlet and outlet of the water sharing pipeline and the entire length of pipeline will be inspected regularly.</i> • <i>In the event that a leak or loss of pressure is detected in the water sharing pipeline, pumping will cease and the resultant cause investigated and remediated.</i>
<i>Traffic</i>	<ul style="list-style-type: none"> • <i>Night time construction workers will be required to car pool to minimise the addition of night time traffic to the local road network.</i>

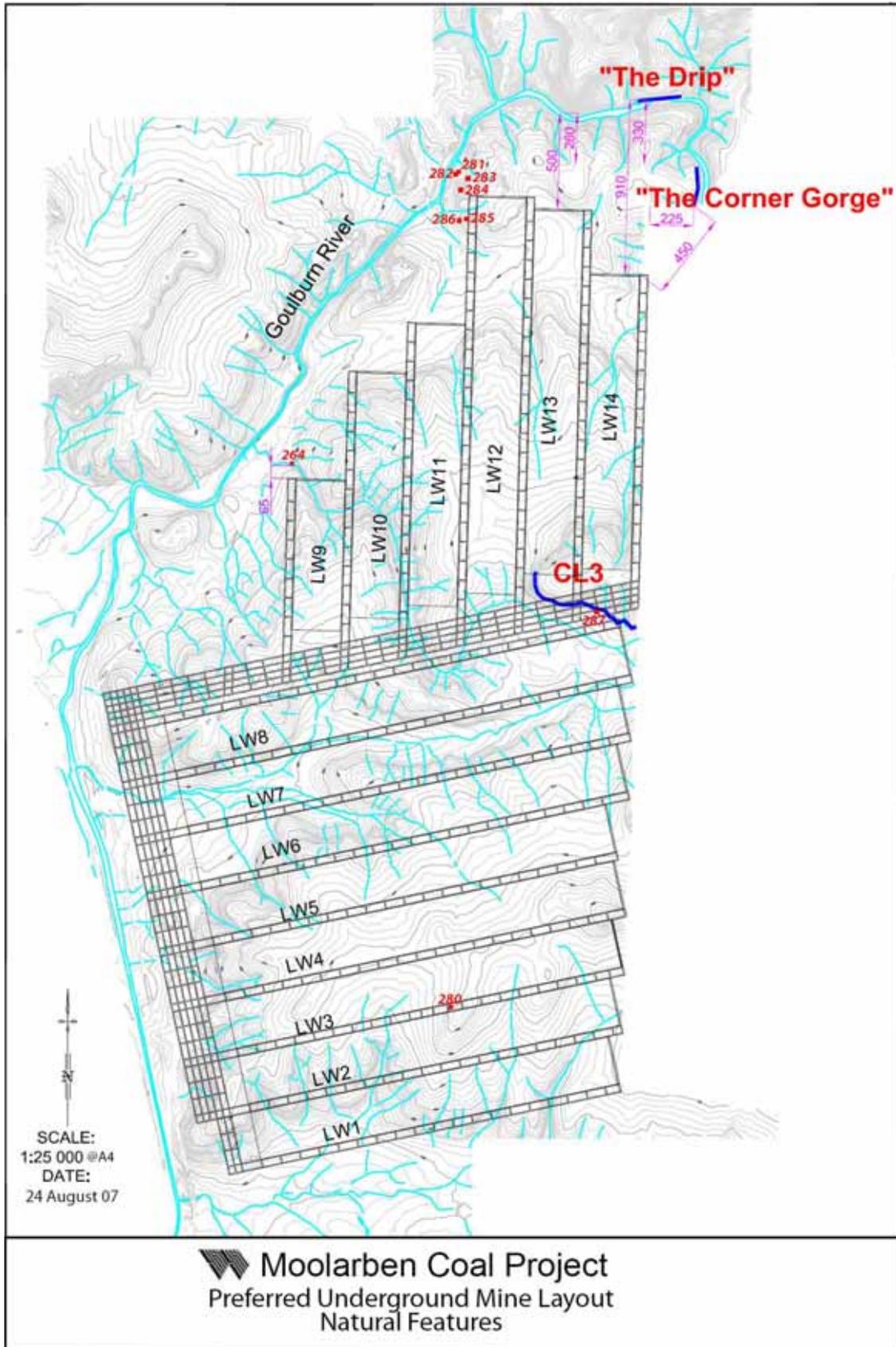
**APPENDIX 4
GENERAL TERMS OF THE VOLUNTARY PLANNING AGREEMENT**

Funding Area	Minimum Proponent Contribution	Funding Time Frame
Monetary Contribution – open cut product coal	\$1,000,000	Three equal instalments to be paid over a three year period, with the first annual instalment to be paid within seven days of the first loading and dispatch of coal produced from the open cut operations from the Project.
Monetary Contribution – underground product coal	\$300,000	One instalment to be paid within seven days of the first loading and dispatch of coal produced from the underground operations of the Project.
Road Maintenance Contribution – Cope Road and Ulan Road	\$1,000,000	Three equal instalments to be paid over a three year period, with the first instalment to be paid within seven days of the commencement of construction
Road Maintenance Contribution – General	\$1,250,000	\$62,500 each year for a period of 20 years with the first instalment to be paid on the first anniversary of the first loading and dispatch of coal produced from the operations of the Project.
Community Infrastructure Contribution	\$1,000,000	\$100,000 each year for a period of 10 years with the first instalment to be paid on the first anniversary of the first loading and dispatch of coal produced from the operations of the Project.

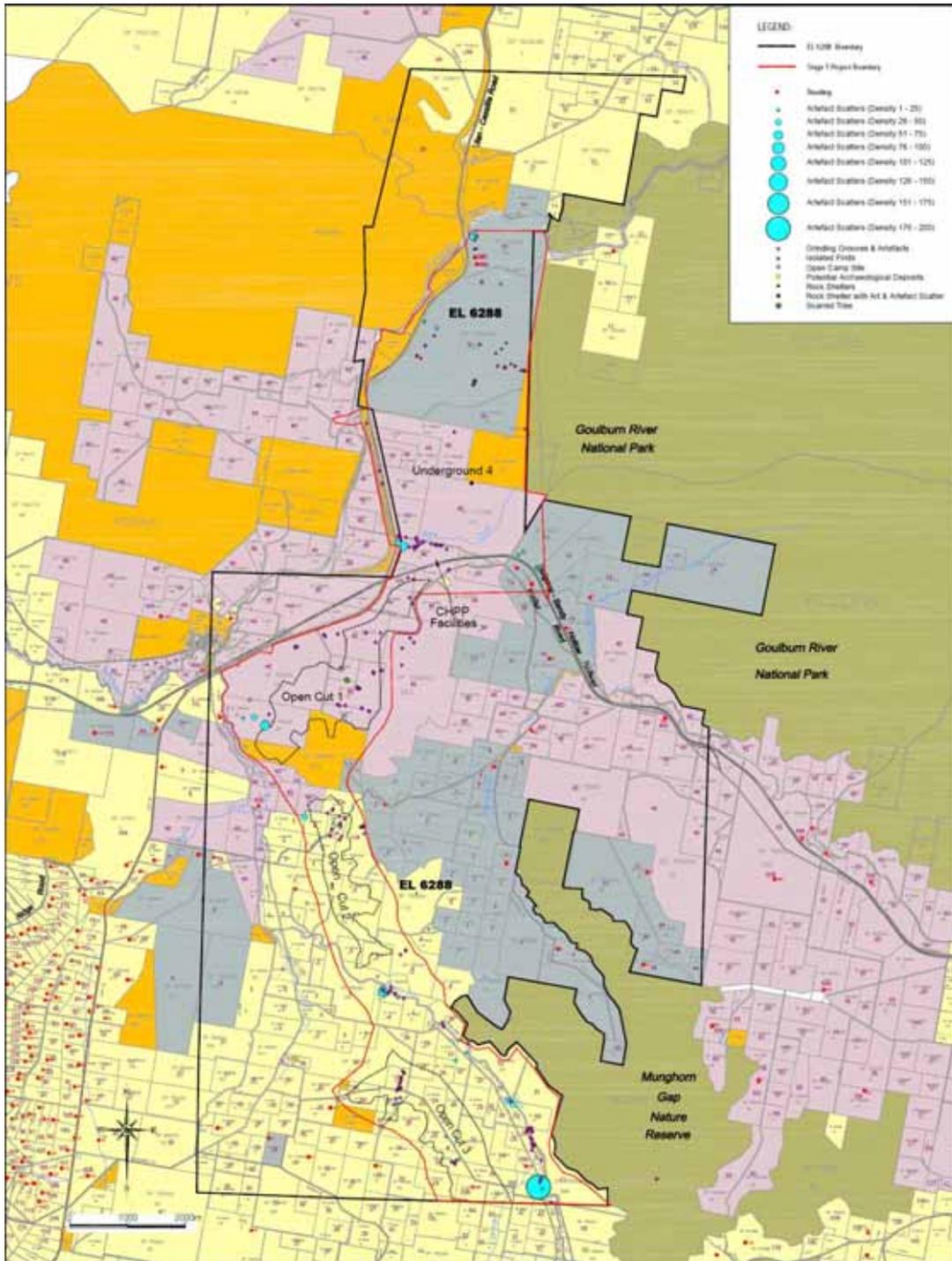
Note: The "Road Maintenance Contribution – General" and "Community Infrastructure Contribution" must be reviewed and adjusted to take into account any increase in the CPI over time.

No.	NAME	No.	NAME	No.	NAME
1	Moatben Coal Mine Owned/Controlled Land	82	M & C Feinberg	163	Moatben Coal Mine Owned/Controlled Land
2	Moatben Coal Mine Owned/Controlled Land	83	C F & C R Ball	164	Moatben Coal Mine Owned/Controlled Land
3	Moatben Coal Mine Owned/Controlled Land	84	D S Bewick	165	Moatben Coal Mine Owned/Controlled Land
4	M. Smith	85	J & Z. Kozlovic	166	Moatben Coal Mine Owned/Controlled Land
5	M & P. Smith	86	A. Spence	167	Moatben Coal Mine Owned/Controlled Land
6	Moatben Coal Mine Owned/Controlled Land	87	S J & K. Howe	168	Anglian Property Trust
7	Moatben Coal Mine Owned/Controlled Land	88	G D & R A. Watts	169	E H & R J. Teak
8	Moatben Coal Mine Owned/Controlled Land	89	M V & H W. Oliver & E B J. Tomlinson	170	W & T. Roberts
9	I.C.I. Australia Operations	90	S.A. Powell	171	J.M. McDougall
10a	Moatben Coal Mine Owned/Controlled Land	91	H.M. Graham	172	A.J. & T.M. Kinkead
11	J. Muller & C. Hine	92	V.A. Pukolis, J. Bekins, S. Bennett & G. Bennett	173	Moatben Coal Mine Owned/Controlled Land
12	Moatben Coal Mine Owned/Controlled Land	93	F & M. Farach	174	W. Taylor
13	Moatben Coal Mine Owned/Controlled Land	94	L.K. Whitlamyer	175	M. Vale
14	Moatben Coal Mine Owned/Controlled Land	95	S.J. Bridgman	176	V. Skarabell
15	Moatben Coal Mine Owned/Controlled Land	96	D. Laidon	177	P.C. Middle
16	Moatben Coal Mine Owned/Controlled Land	97	D.J. & M.D. Smith	178	P. Stone
17	Moatben Coal Mine Owned/Controlled Land	98	J.P. & M.S. Piper	179	G. Jordan & N. Mahang
18	Moatben Coal Mine Owned/Controlled Land	99	B.S. & H.W. Innes	180	C & L. Bennett
19	Moatben Coal Mine Owned/Controlled Land	100	D.S.A. Rogers	181	R. Pinner
20	A.J. & W.M. Williamson	101	N.D. & D.M.F. Hall	182	J. Hutchinson
21	Moatben Coal Mine Owned/Controlled Land	102	J. & H. Sedgwick	183	R. & E. Stevens
22	A. Allen	103	S.R. Burnett & S.L. Grant	184	L. Stevenson
23	A. & E. Woodhead	104	R.A. & L.A. Dethlefs	185	L. Stevenson
24	Moatben Coal Mine Owned/Controlled Land	105	J. & M. Smith	186	R. J. Adamson
25	G.D. Tech-Lab & H.H. Systems	106	T.R. & J.H. Reid	187	R. & A. Farney
26	Fully North Pty Limited	107	Z.J. & M. S.A.A. Rees, S. Pridmore	188	K.A.T. Farney
27	Moatben Coal Mine Owned/Controlled Land	108	R. Varga	189	M.M.D. & A. Stogin & J.P. & R. Hoyle
28	Moatben Coal Mine Owned/Controlled Land	109	D.A. & V.M. Evans	190	T. L. Johnson
29a	S. Matheny	110	S.R. & S.A. Bennett	191	R. & T. Lyttam
30	R. Cox	111	S.J. & K.J. Williams	192	R. J. Williams
31	M. Cox	112	J.H. Radford	193	R. & C. Holland
32	D. & J. Stokes	113	S.J. & L.G. Merrinckley	194	P. & K. Potts
33	K. & R. Matheny	114	T.F. & K. Holland	195	R. Colton
34	J. Aschman	115	J.B. Corbett	196	P. Barberg & P. West
35	P. Johnson, M. & G. Thompson, P. & P. Delaney	116	D.J. & S.M. Reid	197	P. Gunn & I. Neilson
36	D. & V. Raine	117	F. & S. Miles	198	P. Gunn & I. Neilson
37	J. Szpakowski	118	A. Swift	199	P. Gunn & I. Neilson
38	State of NSW	119	G.M. & H.J. Piretti	200	L. & K. Dean
39	R. & D. Spinks	120	F.S. & D.R. Cox	201	K. & G. Traverson
40	J. Daniels	121	Frank Thomas	202	H. & V. Baker
41a,b,c	P. Lewis	122	W.P. West	203	G. Miller
42	C. & L. Schmitt	123	N.D. Sullivan	204	R. & J. Duncan
43	Moatben Coal Mine Owned/Controlled Land	124	N.J. & H.E. Bailey	205	D. Spence
44	Moatben Coal Mine Owned/Controlled Land	125	D.B. Middle	206	C. Marshall & K. Vella
45	W&A Elm, Truss, Auth	126	J. McInnes	207	A. & D. Smith
46a,b,c,d,e	Star Coal Mines Ltd	127	D.E. & P. Dickinson	208	R. & C. Hayward
46e	North Eastern Woodlark Whipping Community Fund Limited	128	A. Sims	209	F. Mason
47	S.F. & M.R. Andrew	129	M. Vella	210	J. & A. Taitout
48	Moatben Coal Mine Owned/Controlled Land	130	G. McEwen	211	L. McDwyer & W. Gray
49	Moatben Coal Mine Owned/Controlled Land	131	S.R. & R.A. King	212	E. M. Linn
50	C. Mackery	132	N. Wilson	213	D. & J. Pennington
51	Moatben Coal Mine Owned/Controlled Land	133	J.M. & T.E. Fyfe	214	R. & E. O'Hall
52	J. Williams	134	M.J. & A.H. Saville	215	R. & P. Owen
53	W.D. & M.S. Bryant	135	D.T. Worsley	216	G. Holland & P. Handcock
54	M. & S. C. Harris	136	S.J. & J.R. Robinson	217	M. & L. Power
55	W.J. Bundy	137	R.C. & V.M. Langshaw	218	R. & D. Stodd
56	M.J. & V. Condy	138	W.C. & V.M. Langshaw	219	T. & S. Roper
57	M.J. Condy	139	Ulan Coal Mines Ltd	220	S. Roper & N. Sizer
58	M. J. & J. L. Bewick	140	Ulan Coal Mines Ltd	221	State of NSW
59	G. & D. M. Szpakowski	141	Whipping Coal Pty. Limited	222	R. Pickett
60	B.D. & D.M. Rayner	142	Ulan Coal Mines Ltd	223	E. Palmer & J. Stewart
61	M.A. Miles	143	R. & M.E. Kuttles	224	R. & P. Dawson
62	K. C. Worsley	144	J.T. & Y.R. Jones	225	P. & R. Mulvaney
63	B. F. & B. Whitlock	145	J.R. & B.M. Evans	226	L. & P. Muzat
64	J. W. Graham & T. L. Beard	146	R.W. & D.G. Langshaw	227	R. & J. Hughes
65	Carlisle Land Pty Ltd	147	R.M. Rowing	228	P. Lillis
66	L. Byrne	148	Moatben Coal Mine Owned/Controlled Land	229	J. & S. Linn
68	S.C. & E.M. Kelly	149	Nerreea Council	230	D. Wainman & D. Hoyle
69	R. H. Ewart	150	Moatben Coal Mine Owned/Controlled Land	231	T. Wainman & S. Barry
70	D. J. & A. Cooney	151	A. J. Cunningham	232	L. & J. Hoaring
71	Council of the Shire of Mulgah	152	Moatben Coal Mine Owned/Controlled Land	233	G. Simons
72	Ulan District	153	Moatben Coal Mine Owned/Controlled Land	234	B. Upton & B. Stammers
73	R.L. Pickett	154	Moatben Coal Mine Owned/Controlled Land	235	L. & R. Wilson
74	J.E. Simpson	155	Moatben Coal Mine Owned/Controlled Land	236	R. & C. Donohue
75	P. Bar	156	Moatben Coal Mine Owned/Controlled Land	237	A. Pridmore
76	B.G. Jackson	157	Moatben Coal Mine Owned/Controlled Land	238	R. Power
77	D.H. & S.E. Fletcher	158	Moatben Coal Mine Owned/Controlled Land	239	J. Dalrymple
78	B. & P. Power	159	Moatben Coal Mine Owned/Controlled Land	240	N. & J. Neale
79	P. J. & S.E. Nudge	160a	Minister of Education	241	H. & D. Darnley
80	W. & G. T. Sebald	161	Moatben Coal Mine Owned/Controlled Land		
81	K.J. & B.J. Gordon	162	D.M. Hamilton		

APPENDIX 7
UNDERGROUND MINE LAYOUT AND LOCATION OF SENSITIVE NATURAL FEATURES



APPENDIX 9 ABORIGINAL HERITAGE



Site Name	Site Type	X Centre	Y Centre	Artefact Density	Management Recommendation
S1MC1	Scarred Tree	760670	6424444	1	Left insitu
S1MC2	Artefact Scatter	760840	6424339	14	Surface Collection
S1MC3	Isolated Find	760846	6424309	1	Surface Collection
S1MC4	Isolated Find	760866	6424307	1	Surface Collection
S1MC5	Artefact Scatter	760867	6424306	3	Surface Collection
S1MC6	Isolated Find	760890	6424301	1	Surface Collection
S1MC7	Isolated Find	760867	6424294	1	Surface Collection
S1MC8	Isolated Find	760548	6424002	1	Surface Collection
S1MC9	Isolated Find	760508	6424018	1	Surface Collection
S1MC10	Isolated Find	760645	6424004	1	Surface Collection
S1MC11	Artefact Scatter	760924	6423968	3	Surface Collection
S1MC12	Isolated Find	760933	6423948	1	Surface Collection
S1MC13	Isolated Find	761054	6423910	1	Surface Collection
S1MC14	Isolated Find	761050	6423907	1	Surface Collection
S1MC15	Isolated Find	761252	6425269	1	Surface Collection
S1MC16	Isolated Find	761168	6425107	1	Surface Collection
S1MC17	Isolated Find	760997	6425271	1	Surface Collection
S1MC18	Isolated Find	759777	6425026	1	Conservation
S1MC19	Isolated Find	759786	6425012	1	Conservation
S1MC20	Isolated Find	759816	6425028	1	Conservation
S1MC21	Isolated Find	760296	6425214	1	Conservation
S1MC 22	Isolated Find	760297	6425216	1	Conservation
S1MC 23	Isolated Find	760269	6425239	1	Conservation
S1MC24	Isolated Find	760514	6425250	1	Surface Collection
S1MC25	Isolated Find	761802	6425783	1	Surface Collection
S1MC26	Isolated Find	761766	6425183	1	Conservation
S1MC27	Isolated Find	761828	6425100	1	Conservation
S1MC28	Isolated Find	761627	6425002	1	Conservation
S1MC29	Isolated Find	761619	6424707	1	Conservation
S1MC30	Isolated Find	761135	6424559	1	Surface Collection
S1MC31	Isolated Find	761132	6424567	1	Surface Collection
S1MC32	Isolated Find	761124	6424585	1	Surface Collection
S1MC33	Isolated Find	761125	6424584	1	Surface Collection
S1MC34	Isolated Find	761128	6424583	1	Surface Collection
S1MC35	Isolated Find	761125	6424584	1	Surface Collection
S1MC36	Isolated Find	761255	6424616	1	Conservation
S1MC37	Isolated Find	761255	6424616	1	Conservation
S1MC38	Isolated Find	761279	6424617	1	Conservation
S1MC39	Isolated Find	761279	6424617	1	Conservation
PAD 1	Pad 1	761452	6424581	N/A	Conservation
PAD 2	Pad 2	761265	6423464	N/A	Conservation
PAD 3	Pad 3	761265	6423392	N/A	Conservation
S1MC40	Artefact Scatter	760441	6421958	12	Test Excavations and Salvage
S1MC41	Isolated Find	760384	6421732	1	Test Excavations and Salvage
S1MC42	Isolated Find	760408	6421838	1	Test Excavations and Salvage
S1MC43	Artefact Scatter	760558	6421874	9	Test Excavations and Salvage
S1MC44	Isolated Find	760550	6421657	1	Test Excavations and Salvage
S1MC45	Isolated Find	760582	6421721	1	Test Excavations and Salvage

Site Name	Site Type	X Centre	Y Centre	Artefact Density	Management Recommendation
S1MC46	Isolated Find	760547	6421941	1	Test Excavations and Salvage
S1MC47	Isolated Find	760637	6422033	1	Test Excavations and Salvage
S1MC48	Isolated Find	760569	6421916	1	Test Excavations and Salvage
S1MC49	Isolated Find	760543	6422069	1	Test Excavations and Salvage
S1MC50	Isolated Find	760340	6422126	1	Test Excavations and Salvage
S1MC51	Isolated Find	760434	6422195	1	Test Excavations and Salvage
S1MC52	Isolated Find	760422	6422175	1	Test Excavations and Salvage
S1MC53	Artefact Scatter	759942	6422062	39	Conservation
S1MC54	Artefact Scatter	760966	6421764	3	Conservation
S1MC55	Rockshelter & Artefacts	760964	6421902	8	Conservation
S1MC56	Rockshelter & Artefacts	760936	6421882	1	Conservation
S1MC57	Artefact Scatter	760906	6421882	16	Conservation
S1MC58	Artefact Scatter	761241	6419040	10	Conservation
S1MC59	Artefact Scatter	761274	6419089	8	Conservation
S1MC60	Artefact Scatter	761555	6418906	12	Conservation
S1MC61	Isolated Find	761650	6418891	1	Conservation
S1MC62	Isolated Find	761503	6418958	1	Conservation
S1MC63	Isolated Find	761502	6418979	1	Conservation
S1MC64	Isolated Find	761502	6418979	1	Conservation
S1MC65	Isolated Find	761382	6418984	1	Conservation
S1MC66	Artefact Scatter	761345	6418974	24	Conservation
S1MC67	Artefact Scatter	761298	6418996	52	Conservation
S1MC68	Isolated Find	761300	6419026	1	Conservation
S1MC69	Isolated Find	761300	6419031	1	Conservation
S1MC70	Isolated Find	761427	6419023	1	Conservation
S1MC71	Isolated Find	761427	6419023	1	Conservation
S1MC72	Isolated Find	761421	6419023	1	Conservation
S1MC73	Isolated Find	761429	6419089	1	Conservation
S1MC74	Isolated Find	761687	6419730	1	Conservation
S1MC75	Isolated Find	761683	6419722	1	Conservation
S1MC76	Isolated Find	761683	6419722	1	Conservation
S1MC77	Isolated Find	761597	6419653	1	Conservation
PAD 4	Pad 4	761685	6419735	N/A	Conservation
PAD 5	Pad 5	761685	6419735	N/A	Conservation
PAD 6	Pad 6	761341	6420748	N/A	Conservation
36-3-0222	Artefact Scatter	760420	6420820	6	Intensive Recording and Salvage
36-3-0223	Isolated Find	760420	6420880	1	Intensive Recording and Salvage
S1MC78	Artefact Scatter	761628	6417183	12	Test Excavations and Salvage
S1MC79	Isolated Find	761592	6417154	1	Test Excavations and Salvage
S1MC80	Isolated Find	761535	6417281	1	Surface Collection
S1MC81	Isolated Find	761547	6417308	1	Surface Collection
S1MC82	Isolated Find	761563	6417309	1	Surface Collection
S1MC83	Isolated Find	761557	6417330	1	Surface Collection
S1MC84	Artefact Scatter	761580	6417360	6	Surface Collection
S1MC85	Isolated Find	761613	6417323	1	Surface Collection
S1MC86	Isolated Find	761612	6417508	1	Surface Collection
S1MC87	Isolated Find	761615	6417500	1	Surface Collection

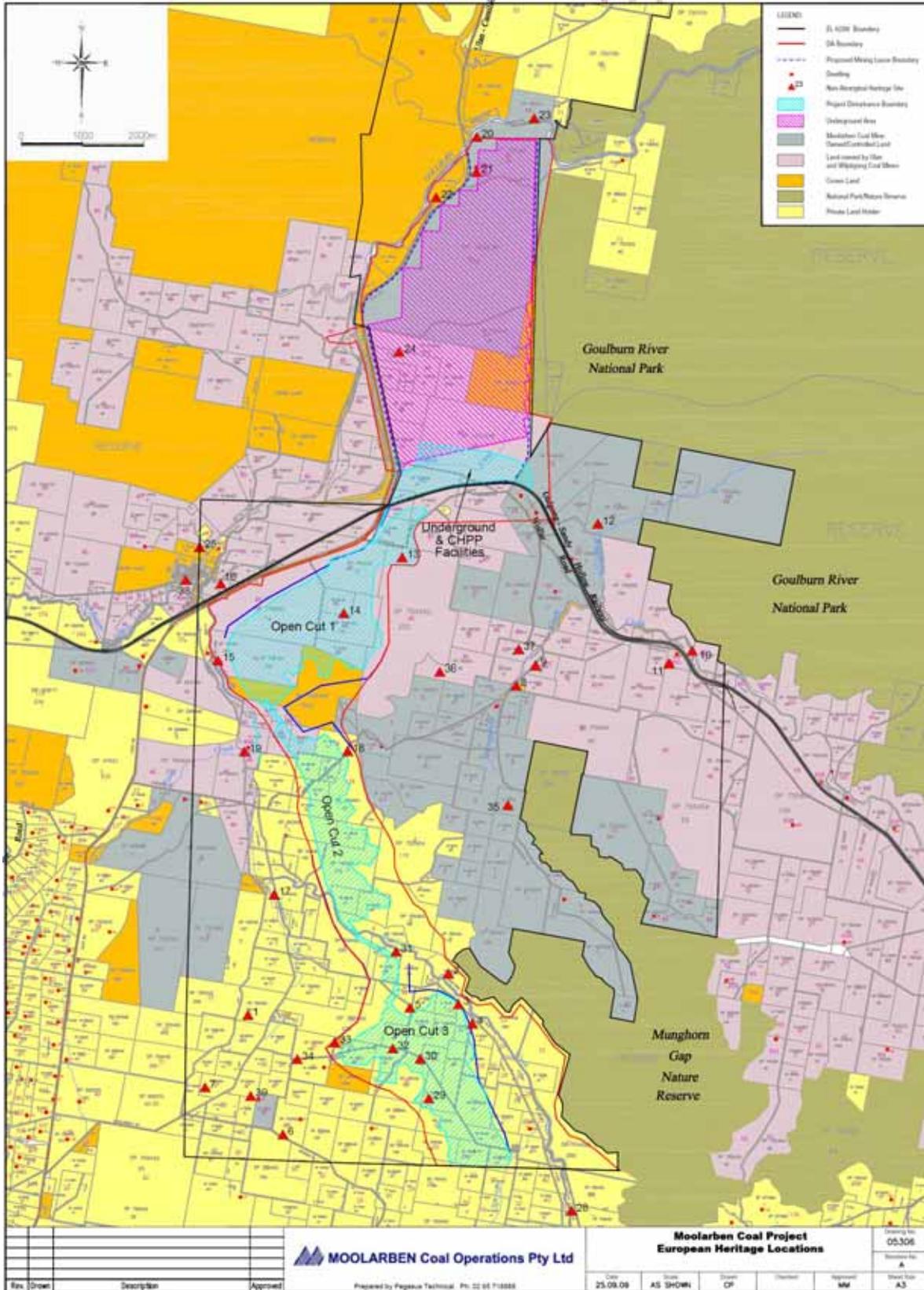
Site Name	Site Type	X Centre	Y Centre	Artefact Density	Management Recommendation
S1MC88	Isolated Find	761608	6417465	1	Surface Collection
S1MC89	Isolated Find	761591	6417421	1	Surface Collection
S1MC90	Isolated Find	761579	6417403	1	Surface Collection
S1MC91	Isolated Find	761631	6417624	1	Surface Collection
S1MC92	Isolated Find	761659	6417596	1	Surface Collection
S1MC93	Isolated Find	761659	6417588	1	Surface Collection
S1MC94	Artefact Scatter	761638	6417728	3	Surface Collection
S1MC95	Isolated Find	762537	6415994	1	Surface Collection
S1MC96	Isolated Find	762530	6416009	1	Surface Collection
S1MC97	Isolated Find	762523	6416029	1	Surface Collection
S1MC98	Isolated Find	762475	6416038	1	Surface Collection
S1MC99	Isolated Find	762553	6416059	1	Surface Collection
S1MC100	Isolated Find	762414	6416282	1	Surface Collection
S1MC101	Isolated Find	762415	6416282	1	Surface Collection
S1MC102	Artefact Scatter	762379	6416477	3	Surface Collection
S1MC103 a	Artefact Scatter	762693	6416081	2	Surface Collection
S1MC103	Artefact Scatter	763978	6415601	184	Conservation
S1MC104	Artefact Scatter	764042	6415564	4	Conservation
S1MC105	Isolated Find	763996	6415683	1	Conservation
S1MC106	Isolated Find	764013	6415735	1	Conservation
S1MC107	Isolated Find	766017	6415739	1	Conservation
S1MC108	Isolated Find	764026	6415756	1	Conservation
S1MC109	Isolated Find	764023	6416068	1	Conservation
S1MC110	Isolated Find	764118	6416246	1	Conservation
S1MC111	Isolated Find	764135	6416310	1	Conservation
S1MC112	Isolated Find	764136	6416312	1	Conservation
S1MC113	Isolated Find	764140	6416326	1	Conservation
S1MC114	Isolated Find	764148	6416337	1	Conservation
S1MC115	Isolated Find	764124	6416425	1	Conservation
S1MC116	Isolated Find	764114	6416357	1	Conservation
S1MC117	Isolated Find	764095	6416462	1	Conservation
S1MC118	Isolated Find	764026	6416575	1	Conservation
S1MC119	Isolated Find	764027	6416566	1	Conservation
S1MC120	Isolated Find	764095	6416601	1	Conservation
S1MC121	Isolated Find	764111	6416632	1	Conservation
S1MC122	Isolated Find	764066	6416619	1	Conservation
S1MC123	Isolated Find	764064	6416622	1	Conservation
S1MC124	Isolated Find	764070	6416630	1	Conservation
S1MC125	Isolated Find	764058	6416612	1	Conservation
S1MC126	Isolated Find	764056	6416612	1	Conservation
S1MC127	Isolated Find	764121	6416573	1	Conservation
S1MC128	Isolated Find	764161	6416333	1	Conservation
S1MC129	Isolated Find	764118	6416557	1	Conservation
S1MC130	Artefact Scatter	762600	6418163	23	Conservation
S1MC131	Isolated Find	762763	6418104	1	Conservation
S1MC132	Artefact Scatter	763451	6417107	33	Conservation
S1MC133	Artefact Scatter	763477	6417119	7	Conservation
S1MC134	Isolated Find	763507	6417086	1	Conservation

Site Name	Site Type	X Centre	Y Centre	Artefact Density	Management Recommendation
S1MC135	Artefact Scatter	763535	6417042	32	Conservation
S1MC136	Artefact Scatter	762737	6417948	5	Conservation
S1MC137	Isolated Find	762338	6418398	1	Conservation
S1MC138	Isolated Find	762315	6418451	1	Conservation
S1MC139	Artefact Scatter	762549	6417807	23	Test Excavations and Salvage
S1MC140	Artefact Scatter	761278	6416654	4	Conservation
S1MC141	Isolated Find	761409	6416796	1	Test Excavations and Salvage
S1MC142	Isolated Find	761479	6417036	2	Test Excavations and Salvage
S1MC143	Artefact Scatter	761535	6417066	3	Test Excavations and Salvage
S1MC144	Isolated Find	761519	6417142	1	Test Excavations and Salvage
PAD 8	Pad 8	761478	6421053	0	Conservation
PAD 9	Pad 9	761552	6421040	0	Conservation
PAD 10	Pad 10	761551	6421051	0	Conservation
PAD 11	Pad 11	761426	6420964	0	Conservation
PAD 12	Pad 12	761318	6420832	0	Conservation
S1MC225	Isolated Find	761752	6425887	1	Conservation
S1MC226	Isolated Find	761726	6426232	1	Conservation
S1MC227	Isolated Find	761825	6426206	1	Conservation
S1MC228	Artefact Scatter	762428	6426370	13	Conservation
S1MC229	Isolated Find	762430	6426375	1	Conservation
S1MC230	Artefact Scatter	761640	6426786	69	Test Excavations and Salvage
S1MC231	Isolated Find	761907	6426804	1	Test Excavations and Salvage
S1MC232	Isolated Find	761926	6426825	1	Test Excavations and Salvage
S1MC233	Artefact Scatter	761954	6426840	2	Test Excavations and Salvage
S1MC234	Isolated Find	761990	6426858	1	Test Excavations and Salvage
S1MC235	Isolated Find	762126	6426823	1	Test Excavations and Salvage
S1MC236	Artefact Scatter	762199	6426811	14	Test Excavations and Salvage
S1MC237	Isolated Find	762202	6426805	1	Test Excavations and Salvage
S1MC238	Isolated Find	762211	6426803	1	Test Excavations and Salvage
S1MC239	Isolated Find	762220	6426805	1	Test Excavations and Salvage
S1MC240	Artefact Scatter	762231	6426802	7	Test Excavations and Salvage
S1MC241	Artefact Scatter	762272	6426800	10	Test Excavations and Salvage
S1MC242	Isolated Find	762291	6426800	1	Test Excavations and Salvage
S1MC243	Isolated Find	762310	6426800	1	Test Excavations and Salvage
S1MC244	Artefact Scatter	761552	6426828	30	Conservation
S1MC245	Isolated Find	761747	6426767	1	Test Excavations and Salvage
S1MC246	Isolated Find	761820	6426775	1	Test Excavations and Salvage
S1MC247	Isolated Find	761831	6426745	1	Test Excavations and Salvage
S1MC248	Isolated Find	761863	6426758	1	Test Excavations and Salvage
S1MC249	Isolated Find	761863	6426771	1	Test Excavations and Salvage
S1MC250	Isolated Find	761860	6426773	1	Test Excavations and Salvage
S1MC252	Isolated Find	761867	6426779	1	Test Excavations and Salvage
S1MC253	Isolated Find	761870	6426772	1	Test Excavations and Salvage
S1MC254	Artefact Scatter	763332	6431357	2	Conservation
S1MC255	Isolated Find	763332	6431357	1	Conservation
S1MC256	Artefact Scatter	762878	6429620	23	Monitor subsidence
S1MC257	Artefact Scatter	762850	6429600	4	Conservation
S1MC258	Artefact Scatter	762865	6429652	2	Conservation

Site Name	Site Type	X Centre	Y Centre	Artefact Density	Management Recommendation
S1MC259	Isolated Find	762889	6429671	1	Conservation
S1MC260	Isolated Find	762849	6429605	1	Conservation
S1MC261	Rockshelter & Artefact	762876	6429660	2	Conservation
S1MC262	Isolated Find	762876	6429676	1	Conservation
S1MC263	Isolated Find	762177	6430458	1	Conservation
S1MC264	Grinding Grooves & Artefacts	762010	6430705	78	Monitor subsidence: Intensive recording.
S1MC265	Artefact Scatter	762224	6430592	3	Conservation
S1MC266	Isolated Find	763000	6431393	1	Conservation
S1MC267	Rockshelter & Artefact	761945	6430063	10	Monitor subsidence
S1MC268	Isolated Find	761875	6430102	1	Conservation
S1MC269	Isolated Find	761882	6430110	1	Conservation
S1MC270	Isolated Find	762024	6430287	1	Monitor subsidence
S1MC271	Rockshelter & Artefacts	763749	6428829	8	Monitor subsidence
S1MC272	Artefact Scatter	763827	6428747	2	Conservation
S1MC273	Isolated Find	762660	642864	1	Conservation
S1MC274	Isolated Find	761580	6426932	1	Conservation
S1MC275	Isolated Find	761878	6426869	1	Conservation
S1MC276	Isolated Find	761877	6426917	1	Conservation
S1MC277	Isolated Find	761862	6426931	1	Conservation
S1MC278	Isolated Find	761688	6426940	1	Conservation
S1MC279	Isolated Find	761551	6426963	1	Conservation
S1MC280	Rockshelter & Artefacts	762822	6427883	45	Monitor subsidence: Intensive recording.
S1MC281	Artefact Scatter	762865	6432219	11	Monitor subsidence
S1MC282	Artefact Scatter	762851	6432207	65	Monitor subsidence
S1MC283	Rockshelter & Artefacts	762912	6432185	6	Monitor subsidence
S1MC284	Rockshelter & Artefacts	762877	6432127	8	Monitor subsidence
S1MC285	Rockshelter & Artefacts	762905	6431976	2	Monitor subsidence
S1MC286	Rockshelter & Artefacts	762868	6431969	28	Monitor subsidence
S1MC287	Rockshelter & Artefacts	763240	6430143	28	Monitor subsidence: Intensive recording.
S1MC288	Rockshelter & Artefacts	763336	6430223	1	Monitor subsidence: Intensive recording.
S1MC289	Rockshelter & Artefacts	763795	6429838	9	Monitor subsidence: Intensive recording.
S1MC290	Rockshelter & Artefacts	763739	6429835	5	Monitor subsidence: Intensive recording.
S1MC291	Isolated Find	763726	6429853	1	Monitor subsidence: Intensive recording.
S1MC292	Isolated Find	763406	6429904	1	Monitor subsidence: Intensive recording.
S1MC293	Isolated Find	763385	6429901	1	Monitor subsidence: Intensive recording.
S1MC294	Rockshelter & Artefacts	763673	6429849	2	Monitor subsidence: Intensive recording.
S1MC295	Isolated Find	763273	6429928	1	Monitor subsidence: Intensive recording.
S1MC296	Rockshelter & Artefacts	763503	6429961	12	Monitor subsidence: Intensive recording.
S1MC297	Rockshelter & Artefacts	763420	6430329	5	Monitor subsidence: Intensive recording.
PAD 7	Pad 7	763846	6428750	0	Conservation

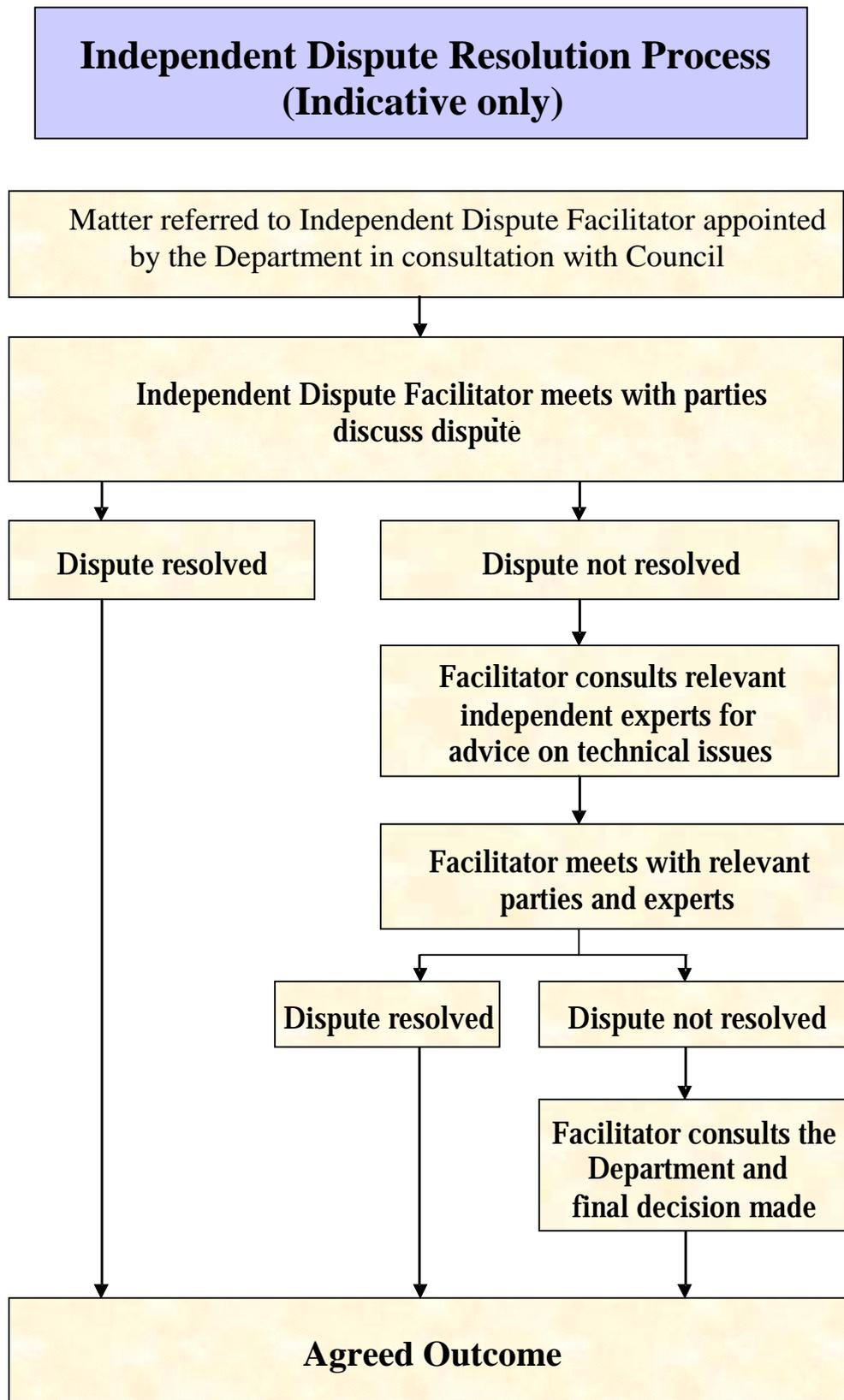
Site Name	Site Type	X Centre	Y Centre	Artefact Density	Management Recommendation
S1MC298	Artefact Scatter	759258	6423654	75	Test Excavation & Salvage
S1MC299	Isolated Find	759331	6423850	1	Surface Collection
S1MC300	Artefact Scatter	759071	6423798	41	Intensive Recording & Surface Collection
S1MC301	Artefact Scatter	758997	6424100	10	Surface Collection
S1MC302	Artefact Scatter	758881	6423779	20	Surface Collection
S1MC306	Isolated Find	763630	6426632	1	Surface Collection
S1MC307	Isolated Find	763714	6426587	1	Surface Collection
S1MC308	Artefact Scatter	763945	6426408	2 + PAD	Test Excavation & Salvage
S1MC309	Isolated Find	763991	6426357	1	Surface Collection
S1MC310	Isolated Find	761014	6428930	1	Surface Collection
S1MC311	Isolated Find	761232	6428099	1	Surface Collection
S1MC312	Isolated Find	761279	6427873	1	Surface Collection

APPENDIX 10 NON-ABORIGINAL HERITAGE



No	Place Name	Impact Status	Significance	Summary Recommendation
2	Farm site. Portion 218. Ph Moolarben	No impact	Local – moderate	No further action required In situ conservation.
3	Burial site, Roberts family. Portion 146, Ph Moolarben	Impact by Open Cut 3 development	Local – high	Exhumation. Discussion to be held with related families.
4	House & burial site. Portion 63, Ph Moolarben	Impact by Open Cut 3 development	Local – moderate	Exhumation. Discussion to be held with related families.
14	House site. Portion 178 Ph Moolarben	Impact by Open Cut 1 development	Local – moderate	Archival recording
15	Moolarben Dam	No impact	Local – moderate	In situ conservation
18	Carr's Gap Road. Portion 30. Ph Moolarben	Impact by Open Cut 2 development likely	Local – moderate	Archival recording In situ conservation. If impacted recovery works to be recommended
19	Farm site. 'Glen Moor', Portion 203 Ph Moolarben	No impact	Local –exceptional	Archival recording. In situ conservation.
20	Grave & memorial garden. Portion 30 Ph Lennox	No impact	Local - high	Area to be maintained.
22	Stock yards. Portion 34 Ph Lennox	No impact	Local – moderate	Archival recording. In situ conservation.
23	Natural environment. 'The Drip'	No impact	Local – high	Ensure public access is maintained
29	House site. Portion 45 Ph Moolarben	Impact by Open Cut 3 development	Local – moderate	Archival recording.
30	School site. Portion 176 Ph Moolarben	Impact by Open Cut 3 development	Local – moderate	Archival recording.
31	House site, Portion 228, Ph Moolarben	No impact	Local – moderate	Archival recording. In situ conservation.
32	House site. Portion 89 Ph Moolarben	Impact by Open Cut 3 development	Local – moderate	Archival recording.
33	Recreation Ground. Portion 204. Ph Moolarben	No impact	Local – moderate	Archival recording. In situ conservation.

APPENDIX 11
INDEPENDENT DISPUTE RESOLUTION PROCESS



Appendix B

B

Study team

Moolarben Coal Project Stage 1 Optimisation Modification, Environmental Assessment – May 2013





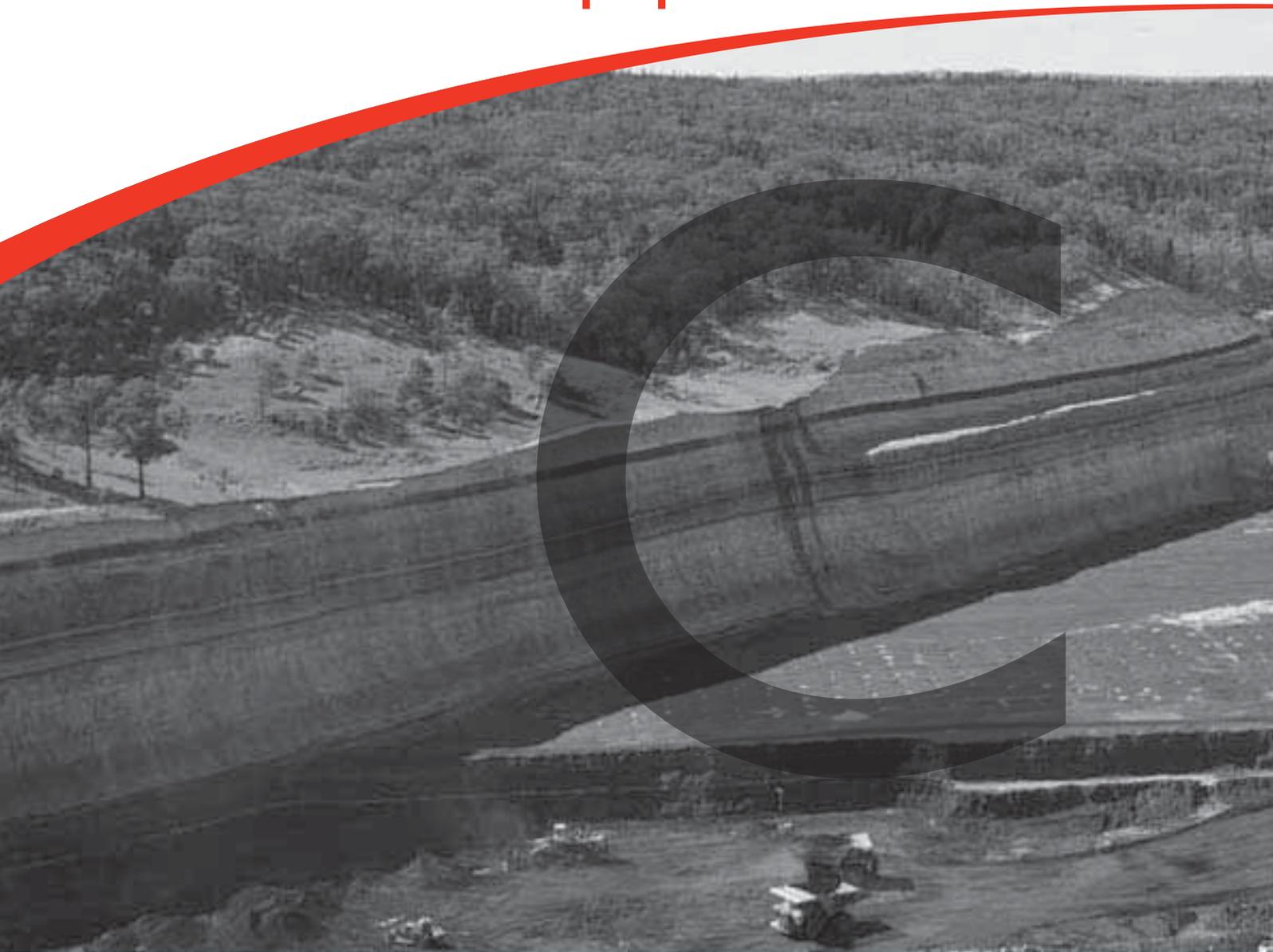
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This EA was prepared by EMM with the assistance of a number of external specialists. Members of the study team and their roles and qualifications are listed in Table B.1 below.

Table B.1 Study team

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Appendix C



Noise and vibration impact assessment

Moolarben Coal Project Stage 1 Optimisation Modification, Environmental Assessment – May 2013



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Noise and Vibration Impact Assessment

Moolarben Coal Project
Stage 1 Optimisation Modification

Prepared for Moolarben Coal Operations Pty Limited | 6 May 2013

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Moolarben Coal Project Stage 1 Optimisation Modification

Final

Report J12090RP1 | Prepared for Moolarben Coal Operations Pty Limited | 6 May 2013

Prepared by	Daniel Weston	Approved by	Najah Ishac
Position	Senior Acoustic Engineer	Position	Director
Signature		Signature	
Date	6/5/2013	Date	6/5/2013

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Document Control

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V1	28/3/2013	D.Weston	N.Ishac / L.Stewart
V2	4/4/2013	D.Weston	N.Ishac
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V5	6/5/2013	D.Weston	N.Ishac / L.Stewart



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Executive Summary

ES1 Introduction

The Moolarben Coal Project (MCP) is an approved open cut and underground coal mine in the Western Coalfields of NSW, approximately 40 km north-east of Mudgee. EMGA Mitchell McLennan Pty Limited was engaged by Moolarben Coal Operations Pty Limited to undertake a noise and vibration impact assessment for the Moolarben Coal Project – Stage 1 Optimisation Modification.

The elements of the proposed modification to MP05_0117 comprise:

- the extension of mining within Open Cuts 1 and 2;
- the construction and operation of additional water management infrastructure; and
- a minor change to the rehabilitation sequencing and final landform.

The project approval period will be extended to accommodate the proposed modification.

A Major Project Application for Stage 2 of the MCP, MP 08_0135, is currently being assessed by the Department of Planning and Infrastructure. If approved, Stage 2 will consist of one open cut pit, Open Cut 4, and two underground mines, Undergrounds 1 and 2, and associated additional infrastructure. This noise and vibration impact assessment is based on the assumption that Stage 2 of the MCP will be approved, enabling possible worst case impacts to be assessed.

The noise and vibration assessment has been carried out with reference to the following studies, standards, guidelines and policies:

- Spectrum Acoustics, August 2006, *Noise and Vibration Impact Assessment, Proposed Moolarben Coal Mine, Ulan NSW*;
- Global Acoustics, January 2012, *Stage 2 Noise Modelling, Environmental Noise Assessment*;
- Environment Protection Authority (EPA) 2000, *NSW Industrial Noise Policy (INP)*;
- NSW EPA 2011, *Road Noise Policy (RNP)*;
- EPA and Department of Planning and Infrastructure (DP&I) joint document 2007, *The Interim Guideline for Assessment of Noise from Rail Infrastructure Projects (IGANRIP)*;
- EPA February 2006, *Assessing Vibration: A Technical Guideline*;
- Australian and New Zealand Environment Conservation Council (ANZECC) 1990; *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration*; and
- DECC 2009, *Interim Construction Noise Guideline (ICNG)*.

ES1.1 Overview of noise and blasting impact assessment

A risk assessment prepared during the scope development for the proposed modification identified noise as a potential high risk issue requiring detailed assessment. Accordingly, EMM worked together with MCO mine planning engineers to develop an operational strategy that achieved its production objectives whilst minimising the potential for environmental noise impacts. This was generally achieved by revising the sequence of mine activity in all approved and proposed open cut mining areas to reduce the intensity of mining activity (ie in comparison to previous assessments) at nearest assessment locations over the mine life.

The noise and vibration impact assessment presented herein considered the current approved Stage 1 operations, Open Cut 1 and Open Cut 2 extension areas and the proposed Stage 2 operations. Noise criteria as contained in the existing Project Approval (MP05_0117) were adopted in the assessment.

A technical peer review of the noise and vibration impact assessment was carried out by Dr Rob Bullen, Wilkinson Murray, which is provided in Appendix F. Comments have been incorporated in this document where applicable.

ES1.1.1 Operations

The operational noise assessment found that during adverse weather conditions for all assessment periods and all stages of the mine life with all reasonable and feasible mitigation in place, six assessment locations are predicted to experience noise levels above the MP05_0117 noise criteria which place these assessment locations in a potential noise management zone. Five of these assessment locations (31, 58, 63, 70 and 75) are predicted to receive a marginal noise level exceedance (1 to 2 dB(A)), and one assessment location (30) is predicted to receive a moderate noise level exceedance (3-5 dB(A)). One of these, assessment location 63, is currently listed in the additional noise mitigation section (condition 8) of the MP05_0117, and has entered into a noise agreement with MCO that will take affect when Stage 2 is approved. No assessment locations are predicted to experience noise levels that would place them in a potential noise acquisition zone.

The assessment found that no private landholders are predicted to experience noise levels of greater than 40 dB(A), on more than 25 % of their total land area. However, within two privately owned properties, six individual lots listed in Table 6.4, are predicted to experience noise levels of greater than 40 dB(A), on more than 25 % of the individual lot land area.

A low frequency noise impact assessment was prepared to determine if modifying factor adjustments as defined in the INP were applicable to MCP. The low frequency noise assessment demonstrates that both the INP's 15 dB threshold for dB(C) to dB(A) and more contemporary criteria (Broner 60dB(C)) will be satisfied at all assessment locations during worst case meteorological conditions.

ES1.1.2 Sleep disturbance

Potential sleep disturbance impacts from operational maximum noise level events have been assessed and are expected to be below the Project Approval sleep disturbance noise criteria for all private residence assessment locations during worst case meteorological conditions.

ES1.1.3 Cumulative noise

The site is located in an area with surrounding established mine sites, including Ulan Coal Mine and Wilpinjong Coal Mine. The cumulative noise impact assessment of the MCP and each of these mining operations predicted noise levels below Project Approval cumulative noise limits which are based on the INP amenity noise criteria.

ES1.1.4 Road and rail traffic

The proposed modification does not seek to increase employee numbers or road and rail traffic movements. Previous studies have addressed road and rail traffic noise levels and given there is no change to road and rail emission generating activities under the proposed modification, road and rail traffic noise has not been assessed herein.

ES1.1.5 Blasting

The blasting noise overpressure and ground vibration will be within levels previously assessed and approved under MP05_0117.

Table of Contents

Executive Summary	E.1
Glossary of Terms	v
Chapter 1 Introduction	1
1.1 Background	1
1.2 Common noise levels	3
Chapter 2 Modification description	5
2.1 Overview of proposed modification	5
2.2 Relationship to other projects	5
2.3 Technical peer review	5
Chapter 3 Existing environment	7
3.1 Overview	7
3.2 Background noise monitoring	7
3.3 Noise monitoring network	7
Chapter 4 Assessment criteria	9
4.1 Project approval limits	9
4.1.1 Noise	9
4.1.2 Blasting	11
4.2 Low frequency noise	12
4.3 Zones of impact	12
4.3.1 Noise management zone	12
4.3.2 Noise affectation zone	13
Chapter 5 Methodology	15
5.1 Assessment locations	15
5.2 Noise modelling	18
5.3 Meteorology	18
5.3.1 Winds	18
5.3.2 Temperature inversions	19
5.3.3 Meteorological conditions considered in modelling	19
5.4 Operational noise modelling scenarios	20
5.4.1 Plant and equipment noise levels	22
Chapter 6 Impact assessment	23
6.1 Operational noise modelling results	23
6.1.1 Assessment of drainage flow winds	31
6.2 Privately owned land assessment	32

Table of Contents *(Cont'd)*

6.3	Low frequency noise assessment	34
6.4	Sleep disturbance assessment	34
6.5	Cumulative noise	36
6.6	Traffic noise	37
6.7	Blasting	37
Chapter 7	Management and monitoring	39
7.1	Noise	39
7.2	Blasting	40
Chapter 8	Conclusion	43

Appendices

A	Assessment locations
B	INP wind analysis
C	Location of plant and equipment used in the noise model
D	Plant and equipment sound power levels
E	Noise contours - $L_{Aeq,15min}$
F	Technical peer review

Tables

1.1	Perceived change in noise	3
5.1	Relevant site-specific meteorological parameters	19
5.2	Indicative plant and equipment quantities and sound power levels	22
6.1	Predicted operational noise levels - dB(A), $L_{eq(15-min)}$	25
6.2	Assessment locations within management zone during adverse weather conditions	31
6.3	Drainage flow wind noise level predictions, dB(A)	31
6.4	Privately owned land identified to be within the affectation zone	32
6.5	Predicted operational low frequency noise levels, $L_{eq,15min}$	34
6.6	Maximum noise from intermittent sources	35
6.7	Maximum noise from intermittent sources at privately owned residences, dB(A)	35
6.8	Cumulative noise level predictions, dB(A)	36
A.1	Assessment locations	A.1

Tables

B.1	Day percentage of wind speed (vector at 22.5° intervals)	B.1
B.2	Evening percentage of wind speed (vector at 22.5° intervals)	B.1
B.3	Night percentage of wind speed (vector at 22.5° intervals)	B.2
D.1	Plant and equipment sound power levels	D.1

Figures

1.1	Site location plan	2
1.2	Common noise levels	3
2.1	Project layout plan	6
5.1a	Assessment locations	16
5.2b	Assessment locations	17
6.1	Predicted noise levels on privately owned land parcels	33
7.1	Duratrax	40

Glossary of Terms

Abbreviation or term	Definition
ABL	The assessment background level (ABL) is defined in the INP as a single figure background level for each assessment period (day, evening and night). It is the tenth percentile of the measured L90 statistical noise levels.
Amenity criteria	The amenity criteria relate to existing industrial noise. Where industrial noise approaches base amenity criteria, then noise levels from new industries need demonstrate that they will not be an additional contributor to existing industrial noise.
ANZECC	Australian and New Zealand Environment Conservation Council
MCO	Moolarben Coal Operations Pty Limited
Day period ¹	Monday–Saturday: 7.00 am to 6.00 pm, on Sundays and public holidays: 8.00 am to 6.00 pm.
dB(A)	Noise is measured in units called decibels (dB). There are several scales for describing noise, the most common being the 'A-weighted' scale. This attempts to closely approximate the frequency response of the human ear.
DP&I	Department of Planning and Infrastructure
EA	Environmental assessment
EMM	EMGA Mitchell McLennan Pty Limited
EP&A Act	<i>Environmental and Planning Assessment Act 1979 (NSW)</i>
Evening period ¹	Monday–Saturday: 6.00 pm to 10.00 pm, on Sundays and public holidays: 6.00 pm to 10.00 pm.
IGANRIP	Interim Guideline for Assessment of Noise from Rail Infrastructure Projects
INP	<i>Industrial Noise Policy, Environment Protection Authority 2000</i>
Intrusive criteria	The intrusive criteria refers to noise that intrudes above the background level by more than 5 dB.
L ₁	The noise level exceeded for 1% of the time.
L ₁₀	The noise level which is exceeded 10% of the time. It is roughly equivalent to the average of maximum noise level.
L ₉₀	The noise level that is exceeded 90% of the time. Commonly referred to as the background noise level.
L _{eq}	The energy average noise from a source. This is the equivalent continuous sound pressure level over a given period. The L _{eq(15min)} descriptor refers to an L _{eq} noise level measured over a 15-minute period.
Linear peak	The peak level of an event is normally measured using a microphone in the same manner as linear noise (ie unweighted), at frequencies both in and below the audible range.
L _{max}	The maximum sound pressure level received during a measuring interval.
Night period ¹	Monday–Saturday: 10.00 pm to 7.00 am, on Sundays and public holidays: 10.00 pm to 8.00 am.
NMP	Noise management plan
EPA	The NSW Environmental Protection Authority (formerly the Environment Protection Authority and the Department of Environment, Climate Change and Water).
PSNL	The project-specific noise levels (PSNL) are criteria for a particular industrial noise source or industry. The PSNL is the lower of either the intrusive criteria or amenity criteria.
RBL	The rating background level (RBL) is an overall single value background level representing each assessment period over the whole monitoring period. The RBL is used to determine the intrusiveness criteria for noise assessment purposes and is the median of the average background levels.
RNP	<i>Road Noise Policy, Environment Protection Authority 2000</i>
Sound power level (L _w)	A measure of the total power radiated by a source. The sound power of a source is a fundamental property of the source and is independent of the surrounding environment.

Glossary of Terms

Abbreviation or term	Definition
Temperature inversion	A meteorological condition where the atmospheric temperature increases with altitude.
Moolarben Coal Project – Stage 1 Optimisation Modification	Proposed modification
UCM	Ulan Coal Mine
WCM	Wilpinjong Coal Mine
Vibration	A motion that can be measured in terms of its displacement, velocity or acceleration. The common unit for velocity is millimetres per second (mm/s).

Note: 1. Excludes road traffic noise where Day: 07.00 am to 10.00 pm; Night: 10.00 pm to 07.00 am.

1 Introduction

1.1 Background

The Moolarben Coal Project (MCP) is an approved open cut and underground coal mine in the Western Coalfields of NSW, approximately 40 km north-east of Mudgee (Figure 1.1). EMGA Mitchell McLennan Pty Limited was engaged by Moolarben Coal Operations Pty Limited (MCO) to undertake a noise and vibration impact assessment for the Moolarben Coal Project – Stage 1 Optimisation Modification (proposed modification).

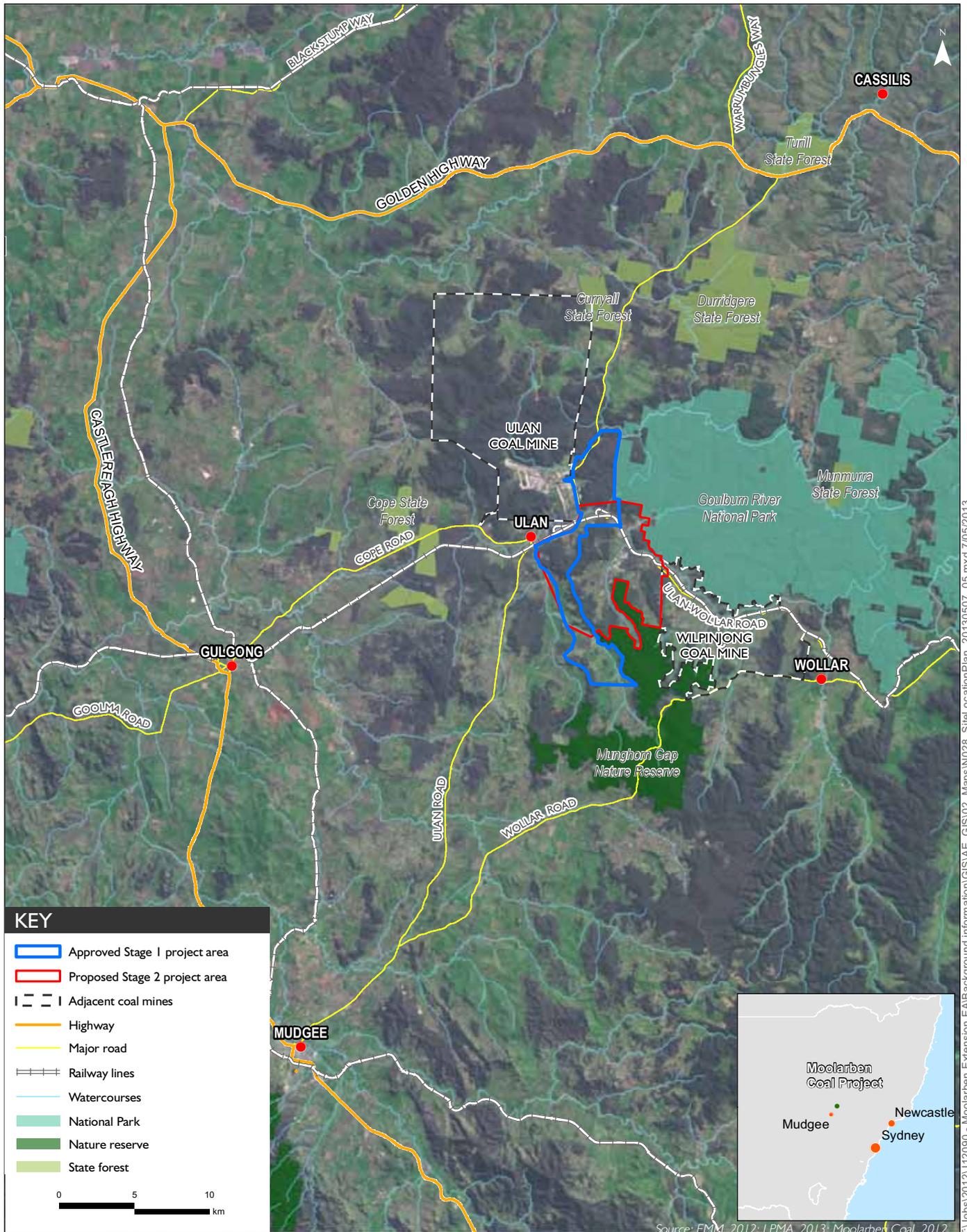
The MCP Stage 1 Major Project approval 05_0117 (MP 05_0117) was approved under Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) in 2007. Since gaining approval, MP 05_0117 has been modified on seven occasions to make administrative changes, changes to infrastructure and allow the construction of a borefield. The main components of the MCP Stage 1, as modified, comprise:

- three open cut pits, referred to as Open Cuts 1, 2 and 3, which have an approved combined maximum extraction rate of 8 million tonnes per annum (Mtpa) of run of mine (ROM) coal;
- one underground mine, referred to as Underground 4, which has an approved maximum extraction rate of 4 Mtpa of ROM coal;
- coal handling, processing, rail loop, load-out and water management infrastructure; and
- associated facilities including offices, bathhouses, workshops and fuel storages.

To date, mining has occurred within Open Cut 1 only, commencing at the south-western perimeter and progressing in a north-easterly direction.

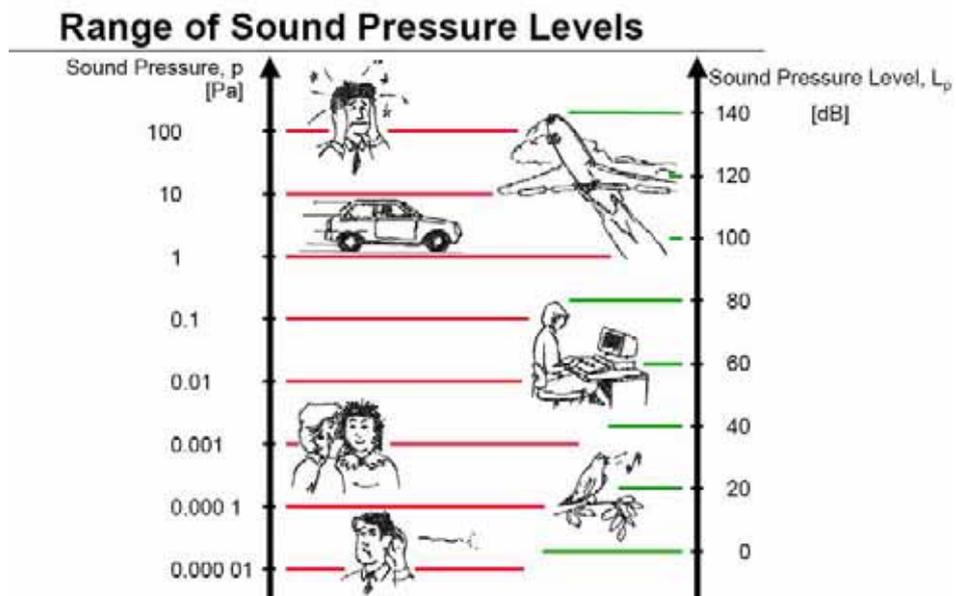
The current disturbance limit granted under MP 05_0117 is restricting the extraction of large quantities of the deposit which are economically viable in today's market. The proposed modification will extend the disturbance boundary enabling increased resource utilisation, a longer life for Open Cuts 1 and 2 and promote the continuity of Stage 1 operations. All of the elements of the proposed modification are listed in Section 2.1.

The MCP is bordered by the Goulburn River to the north-west; privately owned grazing land to the north; Goulburn River National Park, Wilpinjong Coal Mine and Munghorn Gap Nature Reserve to the east; privately-owned grazing land to the south; and privately-owned grazing land, Ulan settlement and Ulan Coal Mine to the west.



1.2 Common noise levels

To assist with gaining a perspective on different noise levels, examples of common noise levels encountered on a daily basis are provided in Figure 1.2.



Source: Basic concepts of sound (Brüel and Kjær 1998)

Figure 1.2 Common noise levels

It is useful to have an appreciation of decibels, the unit of noise measurement. Table 1.1 gives some practical indication of what an average person perceives about changes in noise levels.

Table 1.1 Perceived change in noise

Change in sound level (dB)	Perceived change in noise
3	just perceptible
5	noticeable difference
10	twice (or half) as loud
15	large change
20	four times as loud (or quarter) as loud

2 Modification description

2.1 Overview of proposed modification

The elements of the proposed modification to MP05_0117 comprise:

- the extension of mining within Open Cuts 1 and 2;
- the construction and operation of additional water management infrastructure; and
- a minor change to the rehabilitation sequencing and final landform.

The project approval period will be extended to accommodate the proposed modification.

No other changes are proposed under the modification: there will be no change to the maximum annual rate of coal production, mining methods, equipment, manning levels, coal handling and processing, external coal transport or operating hours.

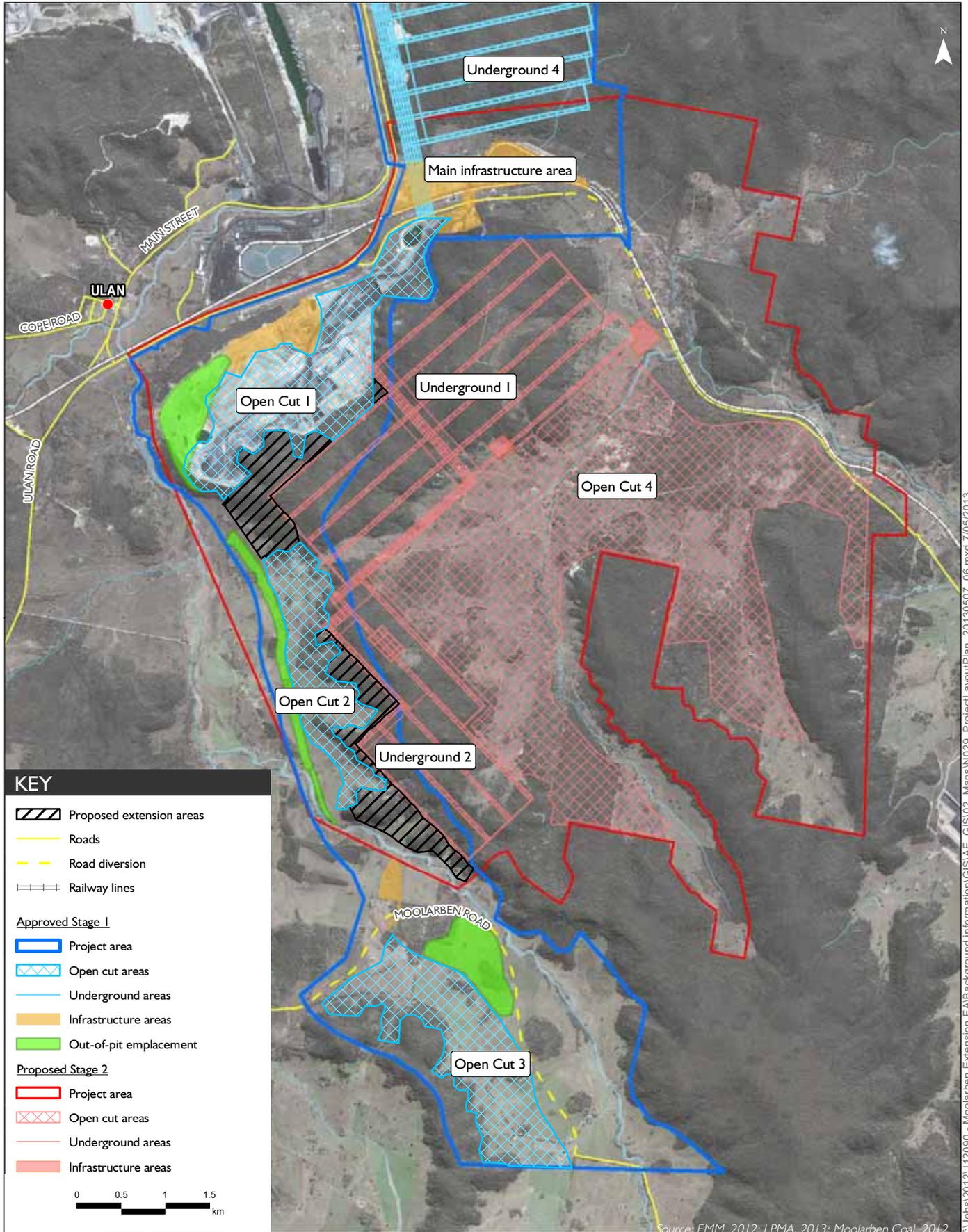
The proposed modification elements are shown in Figure 2.1. They are all within the Stage 1 project approval boundary, which forms the 'project area' for the proposed modification. Within the project area, Open Cut 1 and 2 extension areas are referred to collectively as the 'proposed extension areas'. It is noted that proposed extension areas include a disturbance buffer of up to 50 m that will enable the development of a services road and infrastructure if required, such as water pipelines. This ensures that all potential impacts associated with the proposed extension to mining have been assessed.

2.2 Relationship to other projects

A Major Project Application for Stage 2 of the MCP, MP 08_0135, is currently being assessed by the Department of Planning and Infrastructure (DP&I). If approved, Stage 2 will consist of one open cut pit, Open Cut 4, and two underground mines, Undergrounds 1 and 2, and associated additional infrastructure. This noise and vibration impacts assessment is based on the assumption that Stage 2 of the MCP will be approved, enabling potential worst case impacts to be assessed.

2.3 Technical peer review

The noise and vibration impact assessment was technically peer reviewed by Dr Rob Bullen, Wilkinson Murray. Comments have been addressed as applicable throughout this report and a copy of the technical peer review is provided in Appendix F.



3 Existing environment

3.1 Overview

The existing acoustic environment at surrounding properties is typical of rural residential settings influenced by existing mining noise at times being audible and at times inaudible based on compliance monitoring reports reviewed by EMM and on anecdotal information obtained during consultation.

For properties to the west or north-west, mining from Ulan Coal Mine (UCM) and the MCP were identified as audible at times, while properties to the south-west are experiencing audible noise from the MCP at times of north-easterly winds, and at other times mining noise is inaudible. The Wilpinjong Coal Mine (WCM) is located to the east of the project area. Historically, noise from the WCM has been indiscernible at assessment locations which are generally located to the west of the MCP, however recent site observations note an increasing noise contribution in areas to the south and south west of the MCP. Other sources of noise in the area include Ulan Road traffic as well as agricultural equipment and machinery typical of rural locations. Noise from rail activity was noted at locations near to the local rail network.

The topography surrounding the site consists of small ridges and valleys associated with the Goulburn River, Moolarben and Wilpinjong Creeks and their associated minor tributaries. Land surface elevation varies from about 600 m AHD on the ridges to about 370 m AHD in the Goulburn River Valley. The local topography provides acoustic shielding to a number of assessment locations from approved operations.

3.2 Background noise monitoring

Baseline noise monitoring was carried out during the Stage 1 assessment process at six locations and this data was used to establish project specific noise levels (PSNLs) in accordance with Industrial Noise Policy (INP) (EPA 2000) methods. The PSNLs now represent operational noise criteria listed in MP05_0117.

Ambient L_{Aeq} noise levels were generally between 43 to 55 dB(A) during the day, 37 to 53 dB(A) during the evening and 37 to 51 dB(A) during the night. Background (L_{90}) noise levels were generally between 27 dB(A) to 42 dB(A) during the day, 24 dB(A) to 31 dB(A) during the evening and 23 dB(A) to 40 dB(A) during the night. Background and ambient noise levels were typical of rural and rural residential areas and were generally elevated in areas close to Ulan settlement and main road and rail lines.

No additional noise monitoring was carried out for the Stage 2 assessment process.

3.3 Noise monitoring network

There is an established noise monitoring network around MCP which currently consists of three permanent real time noise monitors and several attended noise monitoring locations. The real time noise monitors are located at Ulan Primary School, an MCO owned property (assessment location 6) and Gaw (assessment location 234). The monitors provide constant feedback to site personnel and assist with noise management at site.

Quarterly noise monitoring reports are produced for each real time noise monitor. The reports are submitted to regulators, published on the MCO website and accessible to community. Results of attended noise surveys are presented in Annual Environmental Management Reports (AEMR). The most recent

report (2011 to 2012) notes that noise emission from the MCP were found to comply with MP05_0117 noise limits at all attended monitoring locations.

4 Assessment criteria

4.1 Project approval limits

4.1.1 Noise

Noise limits and conditions that apply to this assessment are provided in MP05_0117, as modified, and are reproduced below.

It is worth noting that all properties listed in Table 1 of MP5_0117 have been acquired by MCO.

Acquisition Upon Request

1. Upon receiving written request for acquisition from the owner of the land listed in Table 1, the Proponent shall acquire the land in accordance with the procedures in conditions 10-12 of Schedule 4.

Table 1: Land subject to acquisition upon request

4 – M. Swords	5 – M & P Swords
6 – Thompson	15 – Green
20 – Williamson	25 – Tuck-Lee
29a – E. Mayberry	29b – E. Mayberry
29 – E. Mayberry	33 – K. & R. Mayberry
36 – Rayner	50 – C. Mayberry
134 – M.J. & H. Swords	163 – C.M. & J.J. Key
164 – J.J. Key	166 – C.M. Key

Notes: For information on the numbering and identification of properties used in this approval, see Appendix 5

Noise Impact Assessment Criteria

2. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 2 at any residence on privately-owned land, or on more than 25% of any privately-owned land. However, the Proponent may exceed the noise limits in Table 2 if it has:

(a) a written negotiated noise agreement with any landowner for higher noise limits, and a copy of this agreement has been forwarded to the Department and DECCW; or

(b) an approved Construction Noise Management Plan (see condition 7 below) for the project, which sets higher noise limits for a specified period.

Table 2: Noise impact assessment criteria dB(A)

Land number	Day, $L_{Aeq(15min)}$	Evening, $L_{Aeq(15min)}$	Night	
			$L_{Aeq(15min)}$	$L_{A1(1min)}$
26, 49	38	38	38	45
22, 23, 41A, 63, 64, 170, 171, 172	38	38	37	45
169, 173	37	37	37	45
All other privately owned land (outside the village of Ulan)	35	35	35	45

Land number	Day, $L_{Aeq(15min)}$	Evening, $L_{Aeq(15min)}$	Night	
			$L_{Aeq(15min)}$	$L_{A1(1min)}$
Ulan Primary School		35 (internal) when in use and under all weather conditions		-
Ulan Anglican Church		35 (internal)		-
Ulan Catholic Church		when in use and under all weather conditions		
Goulburn River National Park		50		-
Munghorn Gap Nature Reserve		50		-

Notes:

- To determine compliance with the $L_{Aeq(15\text{ minute})}$ noise limits, noise from the project is to be measured at the most affected point within the residential boundary, or at the most affected point within 30 metres of a dwelling (rural situations) where the dwelling is more than 30 metres from the boundary. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy). The modification factors in Section 4 of the NSW Industrial Noise Policy shall also be applied to the measured noise levels where applicable.
- To determine compliance with the $L_{A1(1\text{ minute})}$ noise limits, noise from the project is to be measured at 1 metre from the dwelling façade. Where it can be demonstrated that direct measurement of noise from the project is impractical, the DECCW may accept alternative means of determining compliance (see Chapter 11 of the NSW Industrial Noise Policy).
- The noise emission limits identified in the above table apply under meteorological conditions of:
 - wind speeds of up to 3 m/s at 10 metres above ground level ; or
 - temperature inversion conditions of up to 3°C/100m, and wind speeds of up to 2 m/s at 10 metres above ground level.

Land Acquisition Criteria

3. If the noise generated by the project exceeds the relevant criteria in Table 3 at any residence on privately owned land or on more than 25% of any privately-owned land, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 10-12 of Schedule 4.

Table 3: Land acquisition criteria dB(A)

Day/Evening/Night $L_{Aeq(15min)}$	Land Number
43 / 43 / 43	26, 49
43 / 43 / 42	22, 23, 41A, 63, 64, 170, 171, 172,
42 / 42 / 42	169, 173
40 / 40 / 40	All other private land owners not listed in Table 1

Notes: Noise generated by the project is to be measured in accordance with the notes presented below Table 2.

Cumulative Noise Criteria

4. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on privately owned land, or on more than 25% of any privately owned land, excluding the land listed in Table 1, to the satisfaction of the Director-General:

- $L_{Aeq(11\text{ hour})}$ 50 dB(A) - Day;
- $L_{Aeq(4\text{ hour})}$ 45 dB(A) - Evening;
- $L_{Aeq(9\text{ hour})}$ 40 dB(A) - Night.

5. If the cumulative noise generated by the project combined with the noise generated by other mines exceeds the following amenity criteria at any residence on privately owned land, or on more than 25% of privately owned land, excluding the land listed in Table 1, then upon receiving a written request from the landowner, the Proponent shall take all reasonable and feasible measures to acquire the land on as equitable basis as possible with the relevant mines, in accordance with the procedures in conditions 10-12 of schedule 4, to the satisfaction of the Director-General:

- $L_{Aeq(11 \text{ hour})}$ 53 dB(A) - Day;
- $L_{Aeq(4 \text{ hour})}$ 48 dB(A) - Evening;
- $L_{Aeq(9 \text{ hour})}$ 43 dB(A) – Night.

Notes:

- For the purpose of this condition, the expression “Proponent” in conditions 10-12 of schedule 4 should be interpreted as the Proponent and any other relevant mine owners.
- The cumulative noise generated by the project combined with the noise generated by other mines is to be measured in accordance with the relevant procedures in the NSW Industrial Noise Policy.

Traffic Noise Impact Assessment Criteria

6. The Proponent shall take all reasonable and feasible measures to ensure that the traffic noise generated by the project combined with the traffic noise generated by other mines does not exceed the traffic noise impact assessment criteria in Table 4.

Table 4: Traffic noise criteria dB(A)

Road	Day/Evening	Night
	$L_{Aeq(1hour)}$	$L_{Aeq(1hour)}$
Ulan Road	60	55

Note: Traffic noise generated by the project is to be measured in accordance with the relevant procedures in the DECCW’s Environmental Criteria for Road Traffic Noise...

4.1.2 Blasting

Blasting and vibration limits and conditions that apply to this assessment are provided in MP05_0117, as modified, and are reproduced below.

Airblast Overpressure Impact Assessment Criteria

11. The Proponent shall ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 5 at any residence on privately owned land.

Table 5: Airblast overpressure impact assessment criteria

Airblast overpressure level (dB(Lin Peak))	Allowable exceedance
115	5% of the total number of blasts over a period of 12 months
120	0%

Ground Vibration Impact Assessment Criteria

12. The Proponent shall ensure that the ground vibration level from blasting at the project does not exceed the criteria in Table 6.

Table 6: Ground vibration impact assessment criteria

Receiver	Peak particle velocity (mm/s)	Allowable exceedance
Residence on privately owned land	5	5% of the total number of blasts over a period of 12 months
	10	0%
330 kV transmission line	50	0%
Aboriginal rock shelters	40	0%

Note: The impact assessment criteria for Aboriginal rock shelters applies unless the Proponent develops site specific impact assessment criteria to the satisfaction of the Director-General...

4.2 Low frequency noise

As well as noise and blasting criteria contained within MP05_0117, low frequency noise from the proposed modification has also been assessed. Section 4 of the INP (EPA, 2000:28) provides guidelines for applying 'modifying factor' adjustments to account for low frequency noise emissions. The INP states that where there is a difference of 15 dB or more between 'C' weighted and 'A' weighted levels, then a correction factor of 5 dB is applicable. Section 6.3 of this report provides an assessment of low frequency noise for the proposed modification.

Furthermore, industry accepted practice suggests that low frequency noise is not likely to result in impacts unless received levels are above 60 dB(C) (for the night time period). Therefore, this study has also considered 60 dB(C) for the assessment of low frequency noise.

4.3 Zones of impact

Section 1.4.8 of the INP describes zones of impact. The common approach to zones of impact accepted by the DP&I and EPA, is that after all reasonable and feasible mitigation has been applied, a noise management zone or noise acquisition zone may be stipulated if noise limits cannot be met. These zones are explained in more detail in the following sections.

It is noted that these zones are not explicitly stipulated in MP 05_0117.

4.3.1 Noise management zone

The noise management zone is where modelled noise levels are above and within 5 dB of the noise impact assessment criteria, after all reasonable and feasible mitigation has been applied. Within the management zone, assessment locations may experience noise levels up to 5 dB(A) above the noise impact assessment criteria. Depending on the degree of exceedance (1–5 dB), noise impacts in the noise management zone could range from minor (1–2 dB) to moderate (3–5 dB). DP&I recommended management procedures to implement in this zone, include:

- prompt response where issues of concern are raised by community;
- noise monitoring onsite and within the adjacent community;
- that mine operations planning considers on-site noise mitigation measures and plant maintenance procedures and where appropriate includes sound suppression components and preventative maintenance;

- investigation of, and where practical and cost-effective, acoustical treatment/mitigation at assessment locations where levels are 3 - 5 dB above noise limit; and
- consideration of negotiated agreements with property owners who are situated above the noise limits. This process is initiated when the:
 - regulatory authority is satisfied that no further reduction in noise levels can be made through a viable mitigation strategy; and
 - proponent demonstrates that even when using its best economically viable, reasonable and feasible strategies it cannot achieve the noise limits.

This negotiation is designed to be available to those whose acoustic amenity is potentially affected by the MCP, where predicted worst case noise levels are within 1 to 5 dB(A) above the PSNLs. While negotiations of an agreed noise limit can occur at this time, further negotiations will be triggered when site noise exceeds the recommended noise limits.

Current assessment locations in a noise management zone are listed in Condition 8, Schedule 3 (Additional Noise Mitigation Measures) of MP 05_0117.

4.3.2 Noise affectation zone

The noise affectation zone is where modelled noise levels are more than 5 dB over the PSNL, after all reasonable and feasible mitigation has been applied. Implementation of the following measures may be required:

- discussions with relevant property owners to assess concerns and provide solutions;
- implementation of acoustical mitigation at assessment locations; and
- negotiated agreements with property owners, or acquisition of the property by the project proponent.

Acquisition noise criteria are contained within Condition 3, Schedule 3 of MP 05_0117 and have been applied in this assessment (refer Section 4.1.1). Furthermore all properties identified in a noise acquisition zone in previous assessments (ie properties listed in Condition 1, Schedule 3 of MP 05_0117) have been acquired by MCO.

5 Methodology

The noise study has been carried out with reference to the following studies, standards, guidelines and policies:

- Spectrum Acoustics, August 2006, *Noise and Vibration Impact Assessment, Proposed Moolarben Coal Mine, Ulan NSW*;
- Global Acoustics, January 2012, *Stage 2 Noise Modelling, Environmental Noise Assessment*;
- Environment Protection Authority (EPA) 2000, *NSW Industrial Noise Policy*;
- NSW EPA 2011, *Road Noise Policy (RNP)*;
- EPA and Department of Planning and Infrastructure (DP&I) joint document 2007, *The Interim Guideline for Assessment of Noise from Rail Infrastructure Projects (IGANRIP)*;
- EPA February 2006, *Assessing Vibration: A Technical Guideline*;
- Australian and New Zealand Environment Conservation Council (ANZECC) 1990; *Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration*; and
- DECC 2009, *Interim Construction Noise Guideline (ICNG)*.

The methods adopted for this assessment are provided in the following sections.

5.1 Assessment locations

Assessment locations considered in the noise and vibration impact assessment include private residences, commercial, school and church properties and are presented in Appendix A and shown in Figure 5.1a and 5.1b. All mine owned properties have been excluded from the assessment.

KEY

Assessment locations

- Commercial
- Private residence
- School / Church

Property ownership

- Freehold Land
- Crown Land
- Moolarben Coal Operations
- National Parks
- Ulan Coal Mines
- Wilpinjong Coal Mines

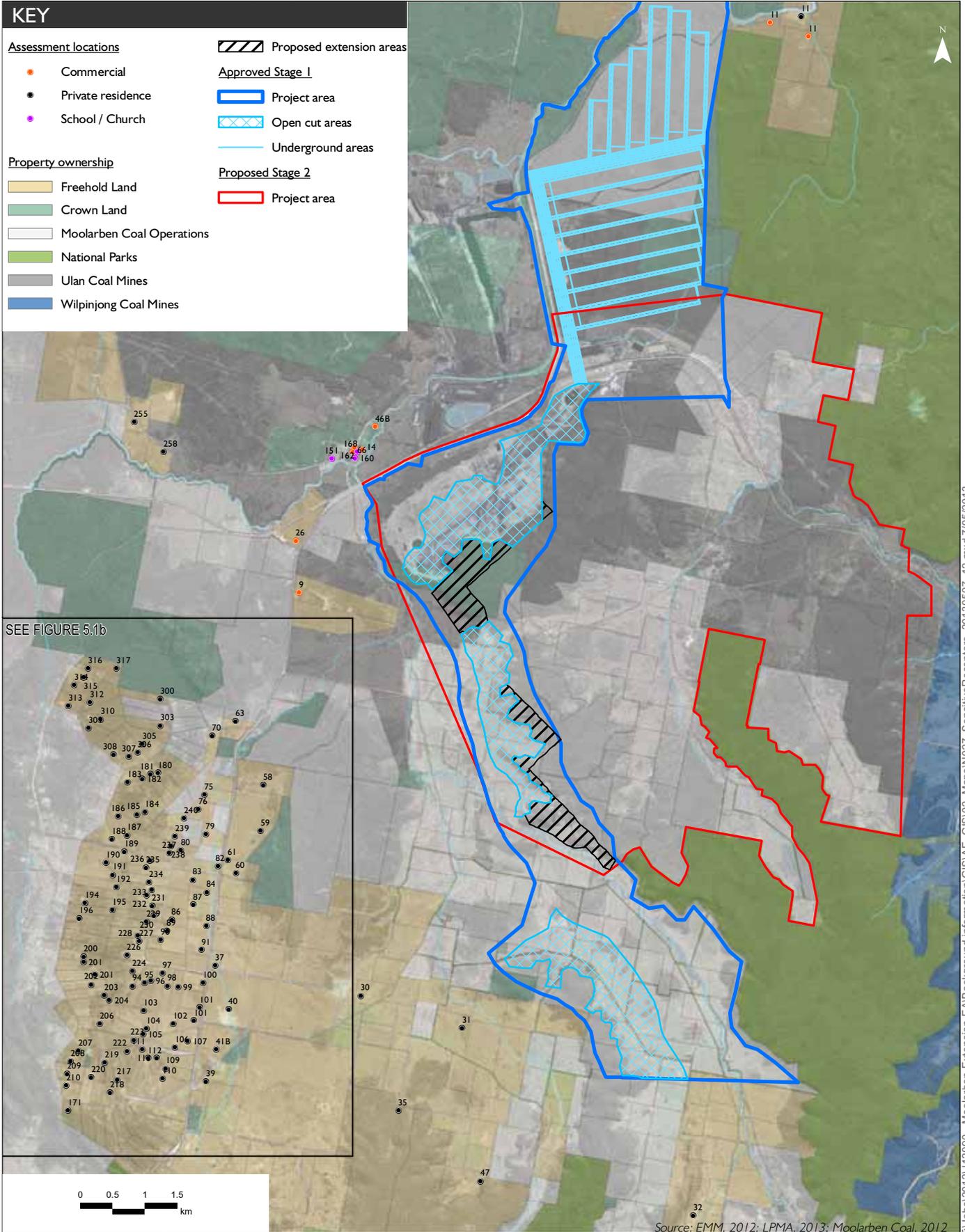
Proposed extension areas

Approved Stage 1

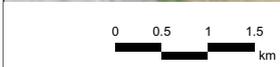
- Project area
- Open cut areas
- Underground areas

Proposed Stage 2

- Project area



SEE FIGURE 5.1b

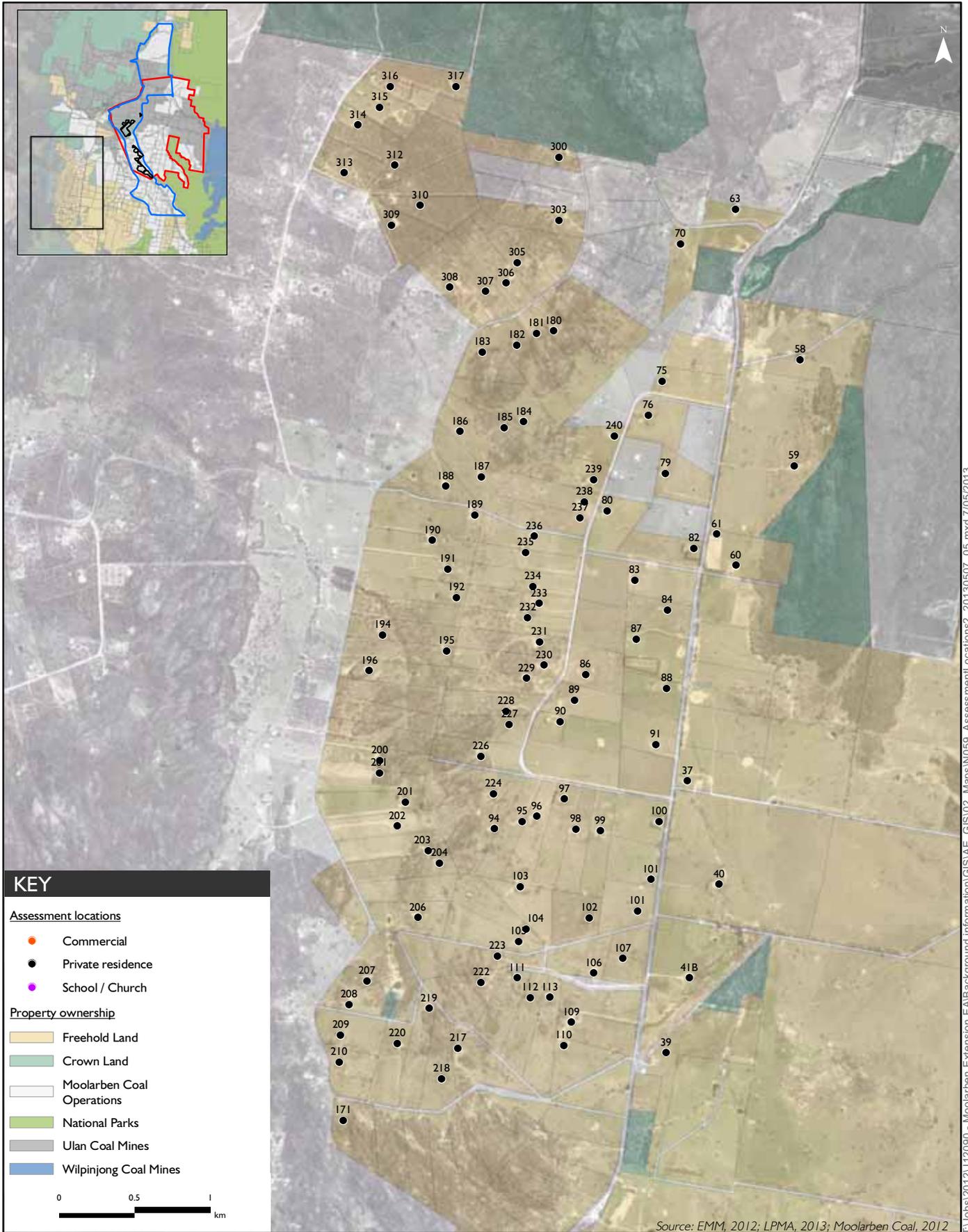


Source: EMM, 2012; LPMA, 2013; Moolarben Coal, 2012



Assessment locations
Moolarben Coal Project - Stage 1 Optimisation Modification
Noise and vibration impact assessment

Figure 5.1a



F:\Jobs\2012\12090 - Moolarben Extension EA\Background Information\GIS\02_Maps\N059_AssessmentLocations2_20130507_05.mxd 7/05/2013

5.2 Noise modelling

A risk assessment prepared during the scope development for the proposed modification identified noise as a potential high risk issue requiring detailed assessment. Accordingly, EMM worked together with MCO mine planning engineers to develop an operational strategy that achieved its production objectives whilst minimising the potential for environmental noise impacts. This was generally achieved by revising the sequence of mine activity in all open cut mining operations, comprising the current approved Stage 1 operations (Open Cut 1, 2 and 3), the proposed Stage 1 modification (Open Cut 1 and 2 extension areas) and the proposed Stage 2 operation (Open Cut 4). This process involved a detailed review of the past noise impact assessments, mine plans and plant and equipment operating schedules for each assessed stage of mining, in consultation with MCO mine planning engineers.

The MCP currently employs a range of noise mitigation measures such as extensive environmental bunding and plant and equipment fitted with noise suppression, all of which were included in the noise model.

Noise modelling was based on three-dimensional digitised ground contours for the surrounding land and conceptual mine plans, including layouts for mine pits and overburden emplacement areas for five stages, Years 2, 6, 11, 16 and 21. The mine plans represent a snapshot of mining activity, with equipment placed at various locations and heights, representing worst case operating conditions for each of these stages under the proposed modification.

Noise predictions were carried out using Brüel and Kjær Predictor software. 'Predictor' calculates total noise levels at assessment locations from the concurrent operation of multiple noise sources. The model considers factors such as the lateral and vertical location of plant, source-to-receptor distances, ground effects, atmospheric absorption, topography of the mine and surrounding area and applicable meteorological conditions.

5.3 Meteorology

The INP provides procedures for identifying and combining prevailing meteorological conditions at a site (referred to as a 'feature' of the area) and assessing the noise levels against the relevant criteria.

The noise model was used to predict noise levels under various combinations of wind speed and direction and vertical temperature gradient. Hence, the proportion of time during which certain noise levels will be experienced can be inferred from the percentage occurrence of the various combinations of wind speed, wind direction and stability class.

The effect of a representative set of meteorological conditions on the level of noise received at assessment locations is presented in this study.

Site specific weather data during 2011 was provided from a weather station located at the Rayner residence, located approximately 2 to 3 km to the south of the project area. This data was analysed to determine the presence of 'noise enhancing' prevailing winds and temperature inversions. Data from the weather station at UCM was also analysed, however prevailing weather conditions identified using data from the Rayner residence weather station was found to be worst case from a noise perspective and was, therefore, adopted for the noise study to ensure a conservative assessment.

5.3.1 Winds

During certain wind conditions, noise levels at residences may increase or decrease compared with noise during calm conditions. This is due to refraction caused by the varying speed of sound with increasing

height above ground. The received noise level increases when the wind blows from the source to the receiver, and conversely, decreases when the wind blows from the receiver to the source.

Winds of up to 3 m/s must be considered in noise predictions when they occur for greater than 30% of the time during day, evening or night periods. Winds were analysed to determine the percentage occurrence. The analysis of meteorological data identified 16 different weather scenarios with wind speeds of up to 3m/s and occurrence of greater than 30%. For the purpose of modelling, the worst case wind speed was selected for a 'feature' wind direction. The results of a detailed analysis of wind speed and directions are provided in Appendix B.

5.3.2 Temperature inversions

Temperature inversions (ie where atmospheric temperature increases with altitude) typically occur during the night-time period in the winter months and can increase (ie focus) mine noise levels at surrounding residences. Temperature inversions (ie stability class 'F') are to be assessed when they are found to occur for 30% of the time or greater during the winter months.

Drainage flow winds (ie localised cold air travelling in a direction of decreasing altitude) can occur during temperature inversion conditions. The increase of noise levels caused by a drainage flow wind needs consideration if a development (ie noise source) is at a higher altitude to surrounding residences, and where there is no intervening topography. Given the complex topography at and around the MCP and the likely location of plant and equipment at elevated positions, increased noise levels due to drainage flow winds have been assessed to applicable receivers.

5.3.3 Meteorological conditions considered in modelling

A summary of calm and worst case identified prevailing weather conditions considered typical of the area that were used in the noise modelling are provided in Table 5.1. These were determined in accordance with INP guidelines.

It is noted that a number of prevailing winds greater than 30% were also identified during the evening period, however wind speeds were found to be either less than those identified during the day and/ or night periods (ie from the same direction), or are winds that would reduce noise levels for receivers (ie wind direction being receivers-to-source). Further, the 4-hour evening period is not as statistically relevant as the other periods. The assessment of day and night prevailing winds is therefore considered representative of worst case noise impacts from the MCP.

Many of the wind directions greater than 30% were found to occur during both day and night. Where this was the case, it was generally found that the day wind speed was greater than the night, and therefore only the day was assessed as a worst case, covering all night directions as well.

Table 5.1 Relevant site-specific meteorological parameters

Assessment condition	Period	Temperature	Wind speed (m/s)/ direction ²	Relative humidity	Temperature gradient
Calm	D/E/N	20°C/10°C	nil	90%	nil
Prevailing winds	Day	20°C	2.5 / NNE (22.5°)	70%	nil
			2.7 / NE (45°)		
			2.7 / ENE (67.5°)		
			2.6 / E (90)		

			2.2 / ESE (112.5°)		
			2.1 / N (0°)		
	Night	10°C	1.7 / NNE (22.5°)	90°C	nil
			1.9 / NE (45°)		
			2.1 / ENE (67.5°)		
			2.2 / E (90°)		
			2.1 / ESE (112.5°)		
			1.8 / SE (135°)		
			1.6 / SSE (157.5°)		
			1.5 / S (180°)		
'F class' temperature inversion	Night	10°C	-	90%	3.9°/100m
Drainage wind ¹	Night	10°C	2 / ENE (67.5°)	90%	3°/100m

Notes: 1. A drainage flow wind has been applied to noise model predictions where sources are elevated in relation to assessment locations and where a drainage flow from the ENE would be supported by local topography
2. Wind direction is based on a vector component for the stated direction. Wind speed is based on the upper 10th percentile wind speed occurrence at or below 3m/s. All wind speeds less the 0.5 m/s and greater than 3 m/s were excluded from the analysis in accordance with INP methods.

5.4 Operational noise modelling scenarios

Five scenarios have been modelled which take into account the staged operation of the MCP and are summarised below. The staged operation encompasses the approved Stage 1 operation, the proposed Stage 1 extension areas and the proposed Stage 2 Preferred Project. This modelling and assessment approach (ie considering all approved and proposed project components) was adopted due to request by DP&I.

The location of mining operations and plant positions for all modelled scenarios are shown graphically in Appendix C. Note that haul trucks as per the quantities provided in Table 5.2 have been modelled as a moving point source on the haul roads as indicated in Appendix C.

i Indicative year 2

All fixed plant and equipment such as the coal handling and processing facilities have been assumed to be operating continuously in any 15 minute period, 24 hours a day. Key mobile plant activities have been modelled as follows:

- two excavators loading coal and waste rock in the northern and southern areas of Open Cut 1. Coal haulage from Open Cut 1 coal loading locations to the ROM coal stockpile. Waste rock haulage and emplacement behind the active mining areas;
- excavators loading waste rock in Open Cut 4. Waste rock haulage and emplacement behind the active mining areas;
- dozers operating at all excavator, emplacement and Open Cut 4 rehabilitation locations;
- drills operating on the advancing upper bench in Open Cuts 1 and 4;
- graders and water carts working continuously on haul roads; and
- coal loading at the rail load out bin.

ii Indicative year 6

All fixed plant and equipment such as the coal handling and processing facilities have been assumed to be operating continuously in any 15 minute period, 24 hours a day. Key mobile plant activities have been modelled as follows:

- one excavator loading coal in Open Cut 1, with coal haulage from the Open Cut 1 load location to the ROM coal stockpile;
- two excavators loading coal and waste rock in Open Cut 4. Coal haulage from the Open Cut 4 coal loading locations to the ROM coal stockpile. Waste rock haulage and emplacement behind the active mining areas;
- dozers operating at all excavator, dump and rehabilitation locations;
- drills operating on the advancing upper bench in Open Cuts 1 and 4;
- graders and water carts working continuously on haul roads; and
- coal loading at the rail load out bin.

iii Indicative year 11

All fixed plant and equipment such as the coal handling and process facilities and ventilation fans have been assumed to be operating continuously in any 15 minute period, 24 hours a day. Key mobile plant activities have been modelled as follows:

- one excavator loading coal in Open Cut 1. Coal haulage from the Open Cut 1 load location to the ROM coal stockpile;
- two excavators loading coal and waste rock in Open Cut 4. Coal haulage from Open Cut 4 coal loading locations to the ROM stockpile. Waste rock haulage and emplacement behind the active mining areas;
- dozers operating at all excavator, emplacement and rehabilitation locations;
- drills operating on the advancing upper bench in Open Cuts 1 and 4 ;
- graders and water carts working continuously on haul roads; and
- coal loading at the rail load out bin.

iv Indicative year 16

All fixed plant and equipment such as the coal handling and process facilities and ventilation fans have been assumed to be operating continuously in any 15 minute period, 24 hours a day. Key mobile plant activities have been modelled as follows:

- one excavator loading coal in Open Cut 2. Coal haulage from the Open Cut 2 load location to the ROM coal stockpile;

- two excavators loading coal and waste rock in Open Cut 4. Coal haulage from the Open Cut 4 coal loading locations to the ROM coal stockpile. Waste rock haulage and emplacement behind the active mining areas;
- dozers operating at all excavator, emplacement and rehabilitation locations;
- drills operating on the advancing upper bench in Open Cuts 1 and 4;
- graders and water carts working continuously on haul roads; and
- coal loading at the rail load out bin.

v Indicative year 21

All fixed plant and equipment such as the coal handling and process facilities have been assumed to be operating continuously in any 15 minute period, 24 hours a day. Key mobile plant activities have been modelled as follows:

- one excavator loading coal in Open Cut 3. Coal haulage from the Open Cut 3 load location to the ROM coal stockpile;
- two excavators loading coal and waste rock in Open Cut 4. Coal haulage from the Open Cut 4 coal loading locations to the ROM coal stockpile. Waste rock haulage and emplacement behind the active mining areas;
- dozers operating at all excavator, dump and rehabilitation locations;
- drills operating on the advancing upper bench in Open Cuts 3 and 4;
- graders and water carts working continuously on haul roads; and
- coal loading at the rail load out bin.

5.4.1 Plant and equipment noise levels

Table 5.2 describes the main noise sources, their quantities by year of operation and representative sound power levels of plant items assessed for the proposed modification. Octave band sound power level data is provided in Appendix C. This data is understood to be based on measurements at the site or from similar operations.

Table 5.2 Indicative plant and equipment quantities and sound power levels

Item	Lw, L _{eq(15-min)} , dB(A)	Quantity (Day, evening and night operation)				
		Year 2	Year 6	Year 11	Year 16	Year 21
Haul trucks	115	19	19	19	21	22
Excavator	118	5	5	5	5	6
Dozer	114	13	15	15	15	15
Grader	112	4	3	3	3	3
Water truck	114	4	3	3	3	3
Front End Loader	120	1	1	1	1	1

Table 5.2 Indicative plant and equipment quantities and sound power levels

Item	Lw, L _{eq(15-min)} , dB(A)	Quantity (Day, evening and night operation)				
		Year 2	Year 6	Year 11	Year 16	Year 21
Haul truck (Rejects)	115	3	2	2	2	3
Drill	120	2	3	3	3	3
CHPP module 1(SW Facade)	116	1	1	1	1	1
CHPP building 2	108	1	1	1	1	1
CHPP building 3	90	1	1	1	1	1
Sizing station	114	1	1	1	1	1
ROM crusher	113	1	1	1	1	1
Overland conveyor	81 ¹	10	10	10	10	10
Conveyor drive	102-107	6	6	6	6	6
Ventilation fans	112	0	0	2	1	0
Locomotive	108	3	3	3	3	3

Notes: 1. Sound power level per linear metre - 10 separate conveyors of varying lengths used in all stages.
 2. Sound power level data for plant and equipment were extracted from a recent noise report, "Stage 2 Noise Modelling Environmental Noise Assessment" by Global Acoustics.

6 Impact assessment

6.1 Operational noise modelling results

The predicted noise levels for each meteorological condition during all assessed mining stages are provided in Table 6.1 for privately owned residential, commercial, school and church assessment locations with all mine owned properties excluded. The predictions are for assessable meteorology being calm and prevailing (winds or inversion) conditions as relevant. Note, assessment locations shown in Table 6.1 with predicted noise levels less than 30 dB(A) for all years for all assessed meteorological conditions are not shown to simplify the tabulated results.

An assessment of drainage flow winds for applicable assessment locations is provided in Section 6.1.1.

For school and church assessment locations, a facade reduction of 8 dB(A) has been applied to predicted external noise levels to provide direct comparison with internal noise criteria nominated in MP05_0117. This 8 dB(A) reduction is considered conservative, as generally a facade with windows open will provide 10 dB of noise reduction.

The shading indicates assessment locations where noise predictions fall into a noise management zone (ie predicted noise levels are between 1 and 5 dB(A) above the PSNLs). The predicted noise levels are below the MP05_0117 acquisition limits at all assessment locations.

Noise contours have been prepared for Years 2, 6, 11, 16 and 21 for calm and prevailing meteorological conditions and provide a visual guide of potential operational noise levels in relation to the noise limits. The contours represent the indicative maximum of day and night noise levels for each of the stages assessed. These are provided as Appendix E1 to Appendix E5.

Table 6.1 Predicted operational noise levels - dB(A), $L_{eq(15-min)}$

ID	Criteria D/E/N ¹	Year 2			Year 6			Year 11			Year 16			Year 21		
		Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²
		D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N
9	65/65/65	<30	38	39	36	43	44	<30	41	42	<30	39	40	<30	40	41
26	65/65/65	<30	38	39	30	39	40	<30	36	37	<30	35	37	<30	36	37
30	35/35/35	<30	<30	<30	<30	31	32	<30	32	32	<30	35	35	<30	39	39
31	35/35/35	<30	<30	<30	<30	31	32	<30	30	30	<30	34	33	<30	36	34
35	35/35/35	<30	<30	<30	<30	30	30	<30	30	30	<30	32	32	<30	32	32
37	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30	<30	30	30
39	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	<30	31	32
40	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
41B	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30	<30	32	32
46B	65/65/65	38	44	45	35	43	44	34	42	43	35	41	42	34	41	42
47	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	33	32
58	35/35/35	<30	35	34	<30	36	36	<30	37	37	<30	36	37	<30	36	36
59	35/35/35	<30	33	33	<30	32	32	<30	32	33	<30	34	35	<30	33	33
60	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	30	<30	31	31	<30	30	<30
61	35/35/35	<30	<30	<30	<30	30	<30	<30	30	31	<30	31	32	<30	31	30
63 ⁴	38/38/37	<30	35	35	<30	37	38	<30	38	39	<30	37	37	<30	36	37
66	65/65/65	34	43	44	34	43	44	31	41	42	32	40	41	34	41	42
70	35/35/35	<30	34	35	<30	36	37	<30	37	37	<30	36	36	<30	35	36
78	35/35/35	<30	32	32	<30	33	33	<30	34	35	<30	33	33	<30	33	33
75	35/35/35	<30	33	33	<30	35	35	<30	35	36	<30	35	35	<30	34	35
76	35/35/35	<30	33	33	<30	34	34	<30	35	35	<30	34	35	<30	34	34
79	35/35/35	<30	32	33	<30	33	34	<30	33	34	<30	33	34	<30	33	33

Table 6.1 Predicted operational noise levels - dB(A), $L_{eq(15-min)}$

ID	Criteria D/E/N ¹	Year 2			Year 6			Year 11			Year 16			Year 21		
		Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²
		D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N
80	35/35/35	<30	31	32	<30	33	33	<30	33	33	<30	32	33	<30	32	33
82	35/35/35	<30	31	31	<30	30	30	<30	30	31	<30	31	32	<30	31	32
83	35/35/35	<30	31	31	<30	32	32	<30	31	31	<30	31	32	<30	31	32
84	35/35/35	<30	30	31	<30	<30	<30	<30	<30	<30	<30	30	31	<30	30	31
86	35/35/35	<30	<30	30	<30	31	31	<30	30	30	<30	30	30	<30	31	31
87	35/35/35	<30	30	30	<30	30	30	<30	30	30	<30	30	30	<30	31	31
88	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30	<30	31	31
89	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	30	30	<30	31	31
90	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	30	30	<30	31	31
91	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30	<30	<30	30
94	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
95	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
96	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
97	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
98	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
99	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
100	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
101	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	31
101A	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	32	33
102	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
103	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	31
104	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30

Table 6.1 Predicted operational noise levels - dB(A), $L_{eq(15-min)}$

ID	Criteria D/E/N ¹	Year 2			Year 6			Year 11			Year 16			Year 21		
		Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²
		D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N
105	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
106	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	31
107	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	<30	31	31
109	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	31
110	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	31
111	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
149	65/65/65	35	44	45	34	42	43	31	41	42	32	40	41	35	41	42
151 ³	35/35/-	<30	34	-	<30	34	-	<30	31	-	<30	31	-	<30	32	-
160 ³	35/-/-	<30	35	-	<30	35	-	<30	33	-	<30	32	-	<30	33	-
162	65/65/65	35	43	44	34	42	43	31	41	42	32	40	41	34	41	42
168 ³	35/35/-	<30	35	-	<30	34	-	<30	32	-	<30	32	-	<30	33	-
180	35/35/35	<30	32	33	<30	34	34	<30	34	35	<30	33	34	<30	33	34
181	35/35/35	<30	31	31	<30	32	33	<30	33	34	<30	33	33	<30	32	33
182	35/35/35	<30	32	32	<30	33	34	<30	33	34	<30	33	34	<30	33	33
183	35/35/35	<30	31	32	<30	32	32	<30	31	32	<30	31	32	<30	31	31
184	35/35/35	<30	31	32	<30	33	33	<30	33	34	<30	33	33	<30	33	33
185	35/35/35	<30	31	32	<30	32	33	<30	33	33	<30	32	33	<30	32	33
186	35/35/35	<30	31	31	<30	31	32	<30	31	32	<30	31	32	<30	31	31
187	35/35/35	<30	30	31	<30	31	31	<30	32	32	<30	32	32	<30	31	32
189	35/35/35	<30	31	31	<30	31	32	<30	32	32	<30	32	32	<30	31	32
191	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	<30	<30	<30
192	35/35/35	<30	30	30	<30	31	31	<30	31	32	<30	31	31	<30	31	31

Table 6.1 Predicted operational noise levels - dB(A), $L_{eq(15-min)}$

ID	Criteria D/E/N ¹	Year 2			Year 6			Year 11			Year 16			Year 21		
		Calm	Prevailing ²		Calm	Prevailing ²		Calm	Prevailing ²		Calm	Prevailing ²		Calm	Prevailing ²	
		D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N
195	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30	<30	<30	<30
204	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30
223	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30
224	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
226	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	30
227	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	<30	30	<30	30	31
228	35/35/35	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	30	<30	31	<30
229	35/35/35	<30	<30	<30	<30	30	30	<30	30	31	<30	30	30	<30	31	31
230	35/35/35	<30	<30	30	<30	30	31	<30	31	31	<30	30	31	<30	31	31
231	35/35/35	<30	30	30	<30	30	31	<30	31	31	<30	31	31	<30	31	31
232	35/35/35	<30	30	30	<30	31	31	<30	31	31	<30	31	31	<30	31	31
233	35/35/35	<30	30	30	<30	31	31	<30	31	32	<30	31	31	<30	31	32
234	35/35/35	<30	30	30	<30	31	32	<30	31	32	<30	31	32	<30	31	32
235	35/35/35	<30	30	31	<30	32	32	<30	32	32	<30	32	32	<30	31	32
236	35/35/35	<30	31	31	<30	32	32	<30	32	33	<30	32	33	<30	32	32
237	35/35/35	<30	31	32	<30	32	33	<30	33	33	<30	32	33	<30	32	33
238	35/35/35	<30	31	32	<30	33	33	<30	33	33	<30	33	33	<30	32	33
239	35/35/35	<30	32	32	<30	33	33	<30	33	34	<30	33	33	<30	32	33
240	35/35/35	<30	32	33	<30	33	34	<30	34	35	<30	33	34	<30	33	34
255	35/35/35	<30	32	33	<30	31	32	<30	30	31	<30	30	31	<30	30	31
258	35/35/35	<30	34	35	<30	34	35	<30	33	34	<30	32	33	<30	32	33
300	35/35/35	<30	<30	30	<30	32	32	<30	31	31	<30	32	33	<30	30	31

Table 6.1 Predicted operational noise levels - dB(A), $L_{eq(15-min)}$

ID	Criteria D/E/N ¹	Year 2			Year 6			Year 11			Year 16			Year 21		
		Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²	Calm		Prevailing ²
		D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N	D/E/N	D	N
303	35/35/35	<30	32	33	<30	33	34	<30	32	32	<30	32	33	<30	31	31
305	35/35/35	<30	<30	<30	<30	31	31	<30	30	31	<30	31	31	<30	30	31
306	35/35/35	<30	<30	<30	<30	31	32	<30	31	32	<30	31	32	<30	31	31
307	35/35/35	<30	<30	<30	<30	31	31	<30	31	31	<30	31	31	<30	30	31
308	35/35/35	<30	<30	<30	<30	30	30	<30	<30	30	<30	30	30	<30	<30	30
309	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	<30	30	<30	<30	<30
310	35/35/35	<30	<30	<30	<30	30	31	<30	<30	30	<30	30	30	<30	<30	<30
312	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	<30	<30	<30	<30	<30
313	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	<30	<30	<30	<30	<30
314	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	<30	<30	<30	<30	<30
315	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	<30	<30	<30	<30	<30
316	35/35/35	<30	<30	<30	<30	30	30	<30	<30	<30	<30	<30	<30	<30	<30	<30
317	35/35/35	<30	<30	<30	<30	30	31	<30	<30	<30	<30	<30	30	<30	<30	<30

- Notes:
1. D/E/N = Day / Evening / Night
 2. The value shown is the maximum predicted noise level from all assessed wind and temperature inversion conditions.
 3. An 8 dB(A) reduction has been applied to provide a conservative internal noise level prediction for direct comparison to MP05_0117 noise criteria.
 4. MCO currently has a noise agreement with this property owner that will take affect when Stage 2 is approved.

The noise model predictions have been assessed by comparing the higher of the calm and prevailing (winds and temperature inversion) results to the MP05_0117 criteria.

Assessment locations predicted to be within the potential noise management zone, during adverse weather conditions are presented in Table 6.2. The predictions demonstrate that during adverse weather conditions for all assessment periods, for all stages of the mining life, six assessment locations are predicted to experience noise levels above the operational limits and are, therefore, potentially located in a noise management zone. One of these, assessment location 63, is currently listed in the additional noise mitigation section of the MP05_0117 (condition 8), and has entered into a noise agreement with MCO that will take affect when Stage 2 is approved.

No assessment locations have been predicted in a potential noise acquisition zone. This is mainly attributed to less intensive mine activity in Open Cuts 1 and 2 with the proposed modification (ie activity nearest to assessment locations), in comparison to that assessed for the Stage 2 Preferred Project (Global Acoustics 2012) and MCO fulfilling MP 05_0117 property acquisition commitments.

It is noted that previous studies part of the Stage 2 application (*Stage 2 Noise Modelling, Environmental Noise Assessment, Global Acoustics 2012*) do identify potential property acquisition and these results remain relevant if Stage 2 is approved. Equivalent impacts were not identified in the proposed modification due to the difference in plant and equipment locations modelled in Open Cut 3 in the Stage 2 and proposed modification assessments. Similarly, where previous studies have identified moderate impacts, noise mitigation rights afforded to such properties should continue to apply.

Table 6.2 Assessment locations within management zone during adverse weather conditions

ID	Level above MP05_0117 (ie PSNL)	Year
30	moderate exceedance, 3-5 dB	21
31	minor exceedance, 1-2 dB	21
58	minor exceedance, 1-2 dB	6, 11, 16, 21
63	minor exceedance, 1-2 dB	6, 11
70	minor exceedance, 1-2 dB	6, 11, 16, 21
75	minor exceedance, 1-2 dB	11

6.1.1 Assessment of drainage flow winds

The potential for drainage flow winds was identified in the meteorological data analysis and has been assessed for selected assessment locations where this condition may be relevant. These assessment locations include commercial properties only. These properties are located in relatively low lying areas as compared to the site and sources, making them susceptible to drainage winds. The results of this assessment are provided in Table 6.3.

Table 6.3 Drainage flow wind noise level predictions, dB(A)

Assessment location ID	Criterion ¹	Modelled night time noise levels during drainage flow wind conditions, $L_{eq,15min}$				
		Year 2	Year 6	Year 11	Year 16	Year 21
9	65	42	46	44	42	44

Table 6.3 Drainage flow wind noise level predictions, dB(A)

Assessment location ID	Criterion ¹	Modelled night time noise levels during drainage flow wind conditions, $L_{eq,15min}$				
		Year 2	Year 6	Year 11	Year 16	Year 21
26	65	41	42	39	39	39
46B	65	47	46	45	44	44
66	65	46	45	43	43	43
149	65	47	45	44	43	44
162	65	46	45	43	43	43

Notes: 1. The 65 dB(A) criteria is referenced from Table 2.1 in the INP and applies to commercial assessment locations, when in use.

All noise levels predictions are below the relevant noise criteria at all assessment locations. Therefore, increased noise levels due to potential drainage flow winds are not predicted to cause adverse noise impacts.

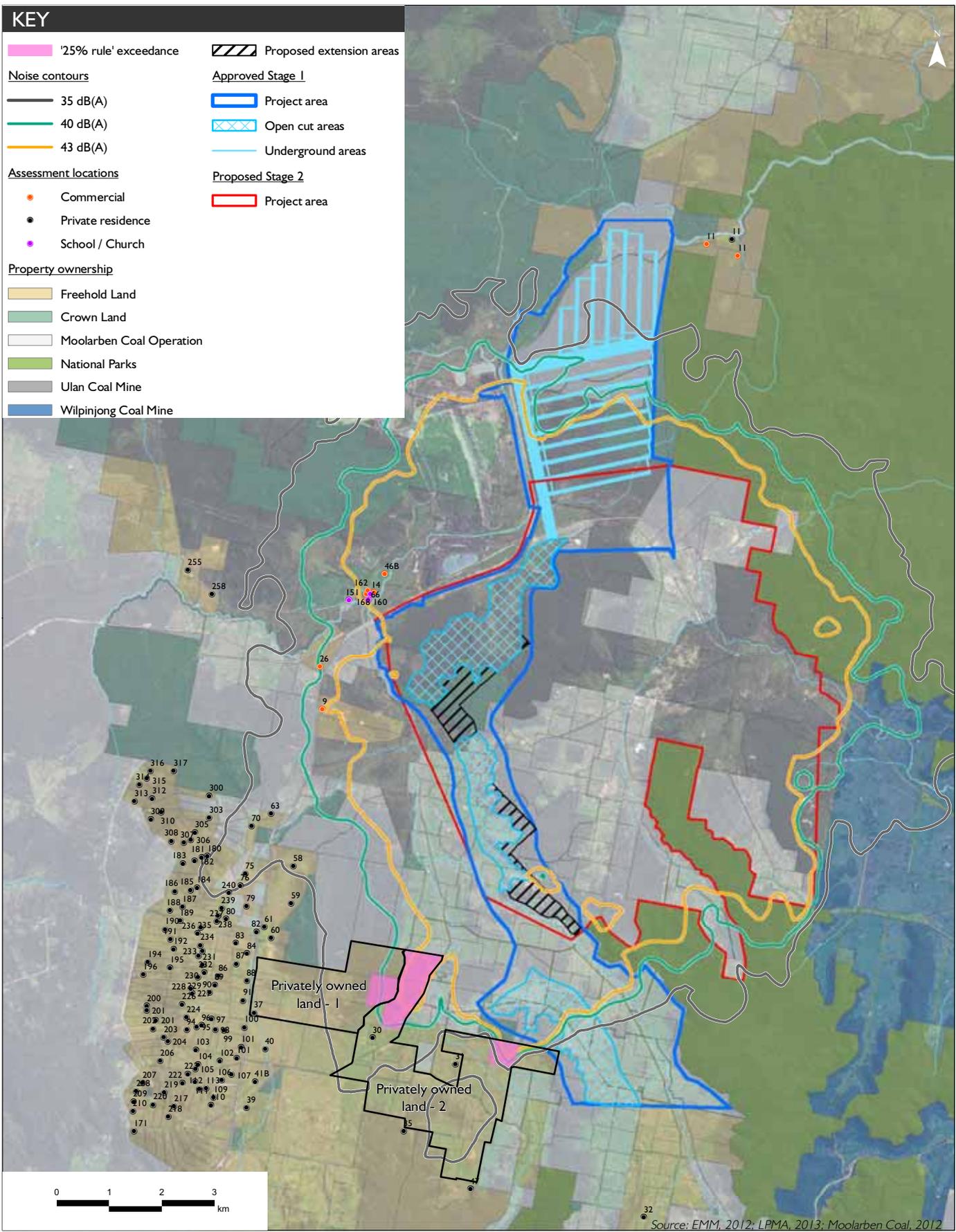
6.2 Privately owned land assessment

The $L_{eq(15-min)}$ noise contours derived from all five indicative operational stages for adverse weather conditions are presented in Figure 6.1.

The assessment found that no private landholders are predicted to experience noise levels of greater than 40 dB(A), on more than 25 % of their total land area. However, within two privately owned properties, six individual lots, listed in Table 6.4, are predicted to experience noise levels of greater than 40 dB(A), on more than 25 % of the individual lot land area. These six lots are owned by two land owners as shown in Figure 6.1.

Table 6.4 Privately owned land identified to be within the affectation zone

ID	Lot//DP Number
Privately owned land – 1	224//755442
	7//115031
	112//755442
Privately owned land - 2	114//755442
	124//755442
	111//755442



Predicted noise levels on privately owned land parcels
 (worst case meteorological conditions, all years, $L_{eq(15-min)}$ dB(A))
 Moolarben Coal Project - Stage I Optimisation Modification
 Noise and vibration assessment
 Figure 6.1

6.3 Low frequency noise assessment

The INP suggests some noise sources may cause greater annoyance than others due to certain audible characteristics, such as low frequency noise. An assessment has therefore been prepared to quantify potential low frequency noise impacts. The C-weighted noise levels at assessment locations have been calculated by applying the octave band C-weightings to the predicted octave band noise levels.

Noise levels have been predicted for prevailing winds, temperature inversions and drainage flow winds (where relevant) and the maximum noise level from these meteorological scenarios were used in the low frequency assessment. Predictions have been provided for select worst case locations in terms of proximity to the site and, therefore, levels at all other locations would be equal to or less than the representative locations presented. The results are provided in Table 6.5.

Table 6.5 Predicted operational low frequency noise levels, $L_{eq,15min}$

Assessment location	Year 2			Year 6			Year 11			Year 16			Year 21		
	dBA	dB(C)	C-A	dBA	dB(C)	C-A	dBA	dB(C)	C-A	dBA	dB(C)	C-A	dBA	dB(C)	C-A
9 ¹	43	51	8	43	51	8	42	51	9	40	50	10	39	49	10
26 ¹	47	54	7	43	52	8	42	51	9	41	51	9	40	50	10
30	<30	n/a	n/a	32	46	14	32	46	13	35	48	12	39	48	9
31	<30	n/a	n/a	32	45	14	30	44	13	33	46	12	34	45	12
35	<30	n/a	n/a	30	45	15	30	45	15	32	46	14	31	45	14
40	<30	n/a	n/a	<30	n/a	n/a	<30	n/a	n/a	<30	n/a	n/a	<30	n/a	n/a
46	38	49	11	48	54	7	47	54	7	43	51	8	41	50	9
47	<30	n/a	n/a	<30	n/a	n/a	<30	n/a	n/a	<30	n/a	n/a	32	45	13
58	35	48	14	36	48	12	37	49	11	35	47	12	35	47	12
59	34	48	14	32	45	13	33	45	12	35	46	12	32	44	12
60	<30	n/a	n/a	<30	n/a	n/a	30	42	12	31	42	11	<30	n/a	n/a
63	36	48	12	37	49	12	39	50	11	37	49	12	36	48	12
66 ¹	42	48	6	40	47	7	37	46	9	37	46	9	36	44	9
149 ¹	37	48	11	34	47	12	34	46	13	33	46	13	32	46	13
151	42	49	7	42	51	9	39	48	9	39	49	10	40	50	10
160	43	50	7	43	51	8	41	50	9	40	50	10	41	51	10
162 ¹	46	53	7	42	51	9	41	50	9	40	50	10	39	49	10
258	35	47	12	34	47	12	34	46	13	33	46	13	32	46	13

Notes: n/a denotes predicted dB(A) noise levels below 30 where a low frequency adjustment would not cause a penalty corrected noise level over the criteria for all assessment locations.

1. Drainage flow prediction is worst case for these assessment locations

Results show that low frequency noise levels (dB(C)) for all privately owned assessment locations are predicted to be below the recommended 60 dB(C) night time criteria. Results also show the difference between dB(A) and dB(C) noise levels are less than the recommended INP 15 dB difference for all assessment locations during worst case meteorological conditions. The potential for low frequency noise impacts are, therefore, not expected from the proposed modification.

6.4 Sleep disturbance assessment

Intermittent noises, such as bulldozer track plates, reversing alarms, or truck pass-by or loading activity should be assessed against sleep disturbance criteria. Typical noise levels from the loudest of these events

are presented in Table 6.6 which has been obtained from measurements undertaken on similar coal mining projects in NSW.

Table 6.6 Maximum noise from intermittent sources

Noise source	Measured L _{max} noise level, dB(A)
Haul truck	125
Reverse alarm	105–115 (with maximum modifying factor adjustment)
Bulldozer with reversing alarm	115
Bulldozer tracks	122

Table 6.6 indicates the highest maximum noise levels expected at homes would likely result from haul trucks. The maximum (at source) sound power level of unmitigated haul trucks has previously been measured to be typically 125 dB(A)L_{max}. Maximum noise levels at each privately owned residential assessment location were calculated under adverse meteorological conditions.

Predicted L_{max} noise levels from trucks at assessment locations were based on the typical equipment positions used for mining operations. Predictions were based on a single event, rather than the simultaneous operation of a number of plant items, because of the low probability of more than one maximum noise event occurring concurrently. Maximum noise levels have been assessed against MP05_0117 noise limits.

Predicted maximum noise levels for the night-time period during calm and adverse meteorological conditions are provided in Table 6.7 for privately owned residential assessment locations only. Predictions shown are for selected assessment locations which are representative of the potentially most affected of all locations surrounding the site.

Table 6.7 Maximum noise from intermittent sources at privately owned residences, dB(A)

Assessment location ID	L ₁ criterion	Modelled L _{max} night time noise level during prevailing weather conditions				
		Year 2	Year 6	Year 11	Year 16	Year 21
30	45	<30	<30	<30	32	37
31	45	<30	<30	30	33	35
35	45	<30	<30	<30	<30	37
40	45	<30	<30	<30	<30	34
47	45	<30	<30	<30	<30	<30
58	45	30	33	36	34	34
59	45	<30	30	<30	<30	33
60	45	<30	<30	<30	<30	<30
63	45	31	35	36	35	35
258	45	32	31	34	31	31

Predictions in Table 6.7 show that maximum noise levels from the site are expected to be below the 45 dB(A) noise criterion at all assessment locations during calm and adverse weather conditions.

Noise levels at the remaining assessment locations are expected to be similar to or below those shown in Table 6.7, and hence will also satisfy criteria.

6.5 Cumulative noise

Cumulative noise from more than one industrial or mining operation is assessed using the INP amenity criteria.

There are two mining operations adjacent to the MCP: UCM, located to the north-west; and WCM, located to the east. For some assessment locations, there is potential for noise levels from each of these mining operations to 'add' with MCP operational noise levels. However, given the location of UCM and WCM in relation to the MCP, it is unlikely that noise levels from all three operations would add at any one assessment location. An assessment has been prepared in two parts to address cumulative noise impacts from: UCM with the MCP; and WCM with the MCP.

Representative assessment locations were selected based on their proximity to the MCP, UCM and WCM operations, which are listed in Table 6.8.

Worst case predicted noise levels from UCM were obtained for identified assessment locations using results provided in the *Ulan Coal – Continued Operations Noise and Vibration Impact Assessment* (Wilkinson Murray 2009). This was supplemented by data contained in the *MCP Stage 2 Noise Modelling, Environmental Noise Assessment* (Global Acoustics 2012).

Worst case predicted noise levels from WCM were estimated for identified assessment locations using results provided in the *Wilpinjong Coal Mine - 75W Modification Noise Impact Assessment* (Heggies 2010).

The levels chosen for the assessment represent the highest predicted noise level from all assessed meteorological conditions for all assessed stages of mining from UCM and WCM sites. These noise levels were logarithmically added to the highest noise levels from all assessed meteorological conditions for all assessed mining years from the MCP. A minus 3 dB(A) correction has been applied to convert the presented $L_{Aeq,15\text{minute}}$ to $L_{Aeq,period}$ noise levels as per EMM's experience and industry practice. This correction adjusts a worst case 15 minute operation as assessed, to represent typical operating noise levels over the entire day, evening or night period, which in practice would be less in comparison.

For residential assessment locations, the night criterion is most stringent and has been assessed only. School and church assessment locations have been assessed against the 35 dB(A) internal noise level.

It is highly unlikely that worst case impacts from each mine would occur during the same meteorological condition, during the same stage of mine life. For this reason the assessment is considered highly conservative. Results of the cumulative noise impact assessment are provided in Table 6.8.

Table 6.8 Cumulative noise level predictions, dB(A)

Assessment Location ID	Cumulative noise criteria, $L_{Aeq,period}$	Highest $L_{eq,15\text{ min}}$, all years, all assess meteorological conditions			Predicted cumulative noise level, $L_{Aeq(period)}$ ($L_{eq,15\text{ min}}$ minus 3 dB(A))
		MCP	UCM	WCM	
MP05_0117					
30	40	39	n/a	34	37
31	40	36	n/a	34	35
35	40	32	n/a	34	33

Table 6.8 Cumulative noise level predictions, dB(A)

Assessment Location ID MP05_0117	Cumulative noise criteria, $L_{Aeq,period}$	Highest $L_{eq,15 min}$, all years, all assess meteorological conditions			Predicted cumulative noise level, $L_{Aeq(period)}$ ($L_{eq,15min}$ minus 3 dB(A))
		MCP	UCM	WCM	
40	40	30	n/a	34	32
41B	40	32	n/a	34	33
47	40	33	n/a	34	34
58	40	37	<30	n/a	35
59	40	35	<30	n/a	33
63	40	39	31	n/a	37
70	40	37	31	n/a	35
75	40	36	31	n/a	34
151 ¹	35	34	34	n/a	34
160 ¹	35	35	34	n/a	35
255	40	33	35	n/a	34
258	40	35	35	n/a	35
300	40	33	<30	n/a	32
303	40	34	<30	n/a	32
316	40	30	<30	n/a	30
317	40	31	<30	n/a	31

Notes: 1. A facade noise level reduction of 8 dBA has been added to convert external noise levels to internal noise levels.
2. n/a denotes negligible noise levels that would not add to the cumulative noise level contribution.

Cumulative noise levels at selected representative assessment locations comply with criteria provided in MP05_0117.

6.6 Traffic noise

The proposed modification does not seek to increase employee numbers or road and rail traffic movements. Previous studies have addressed road and rail traffic noise levels and changes where relevant and, therefore, road traffic noise has not been assessed herein.

6.7 Blasting

The blasting noise overpressure and ground vibration for all mining areas approved under MP 05_0117 and proposed under Stage 2 have been previously assessed. The proposed distances from the Open Cut 1 and Open Cut 2 extension areas to assessment locations are representative of distances considered in past assessments. Increased blast elevation in extension areas is also unlikely to increase vibration and overpressure levels, as elevated areas are typically set-back from the site boundary nearest to assessment locations. The criteria and impacts identified previously are, therefore, likely to be unchanged as a result of the proposed modification.

7 Management and monitoring

7.1 Noise

Noise management and monitoring at the site is carried in accordance with MCO's Noise Management Plan (NMP) which was prepared in consultation with the NSW EPA. Objectives of the NMP are to:

- minimise operational and construction noise impacts from the MCP;
- maintain compliance with conditions of approval, environmental protection licences and legislation relating to noise;
- provide a protocol for monitoring and evaluation of noise impacts on surrounding private residences and sensitive receivers; and
- communicate with the local community and regulators regarding MCO's activities.

MCO currently implement the following operational and engineering controls to manage noise emissions from the site which will continue under the proposed modification:

- separate day and night emplacement areas when deemed necessary at night;
- use of shielded areas in adverse weather conditions;
- use of real-time noise monitoring data to assist operational personnel in proactive management of noise impacts;
- regular maintenance of equipment, including sound attenuation components;
- sound power testing of mobile and stationary equipment;
- use of dedicated production assistants to monitor and support real time noise mitigation strategies;
- enclosure of high risk stationary equipment at the CHPP such as conveyors, crushers and reject bins;
- attenuation of mobile equipment such as haul trucks, shovels and excavators, dozers and drills;
- commitment to maintain an awareness of best practice noise mitigation technologies and alternative operating methodologies; and
- continued community consultation to help identify and manage operational noise impacts in the surrounding district.

MCO has also been involved in the research and development of Duratray which has been fitted to several of their operating rear dump trucks. Duratray is an impact resistant rubber tray lining which has been proven to reduce loading associated impact noise significantly. A rear dump truck with Duratray fitted is shown in Figure 7.1.



Figure 7.1 Duratrax

The NMP also commits to the ongoing implementation and review of the noise monitoring program to best manage dynamic operating noise levels.

No additional management or monitoring of noise is required as a result of this noise and vibration impact assessment.

7.2 Blasting

Blasting management and monitoring at the site is carried out in accordance with MCO's Blast Management Plan which was prepared in consultation with the NSW EPA. Objectives of the blast management plan are:

- to minimise off-site disturbance during blasting events;
- to maintain compliance with conditions of approval, environmental protection licences and legislation relating to airblast and ground vibration;
- to provide a protocol for monitoring and evaluation of blast impacts on surrounding private residences, infrastructure and sensitive receivers; and
- to communicate with the local community and regulators regarding MCO's blasting activities.

MCO currently implement the following controls to manage blast emissions from the site which will continue under the proposed modification:

- no open cut blasting will be conducted on Sundays or public holidays, or outside of the approved hours of 9:00 am to 5:00 pm Monday to Saturday without written authority from the EPA;

- blasting onsite will be coordinated with blasting at the adjoining Ulan Coal Mine and Wilpingjong Coal Mine to minimise the potential cumulative blasting impacts;
- notification of blasting times to the local community and blast exclusion zones will be maintained;
- current blast controls will be continued such as training all relevant personnel on environmental obligations and explosives management;
- use of appropriate initiation and detonation systems and adherence to blast loading and initiation designs;
- designing all blasts to ensure that vibration and airblast limits are complied with;
- monitoring of all blasts reflective of the nearest privately owned residential receiver, sensitive infrastructure, and Aboriginal rock shelters;
- calibration of site models, using monitored data from initial blasting, to enable refinement and assessment of ongoing impacts;
- development of a blast record system which captures sufficient information to allow appropriate categorisation and comparison of blasts; and
- periodic review of blasting procedures to evaluate performance.

No additional management or monitoring of blasting is required as a result of this noise and vibration impact assessment.

8 Conclusion

A risk assessment prepared during the scope development for the proposed modification identified noise as a potential high risk issue requiring detailed assessment. Accordingly, EMM worked together with MCO mine planning engineers to develop an operational strategy that achieved its production objectives whilst minimising the potential for environmental noise impacts. This was generally achieved by revising the sequence of mine activity in all approved and proposed open cut mining areas to reduce the intensity of mining activity (ie in comparison to previous assessments) at nearest assessment locations over the mine life.

The noise and vibration impact assessment presented herein considered the current approved Stage 1 operations, Open Cut 1 and Open Cut 2 extension areas and the proposed Stage 2 operations. Noise criteria as contained in the existing Project Approval (MP05_0117) were adopted in the assessment.

A technical peer review of the noise and vibration impact assessment was carried out by Dr Rob Bullen, Wilkinson Murray, which is provided in Appendix F. Comments have been incorporated in this document where applicable.

The operational noise assessment found that during adverse weather conditions for all assessment periods and all indicative stages of the mine life with all reasonable and feasible noise mitigation in place, six assessment locations are predicted to experience noise levels between 1 and 5 dB(A) above the MP05_0117 noise criteria which place these assessment locations in a potential noise management zone. Five of these assessment locations (31, 58, 63, 70 and 75) are predicted to receive a marginal noise level exceedance (1 to 2 dB(A)), one assessment location (30) is predicted to receive a moderate noise level exceedance (3-5 dB(A)). Assessment location 63, is currently listed in the additional noise mitigation section of MP05_0117 (condition 8), and has entered into a noise agreement with MCO that will take affect when Stage 2 is approved. No assessment locations are predicted to experience noise levels above a potential acquisition noise criteria.

The assessment found that no private landholders are predicted to experience noise levels of greater than 40 dB(A), on more than 25 % of their total land area. However, within two privately owned properties, six individual lots, listed in Table 6.4, are predicted to experience noise levels of greater than 40 dB(A), on more than 25 % of the individual lot land area.

A low frequency noise impact assessment was prepared to determine if modifying factor adjustments as defined in the INP were applicable to the MCP. The low frequency noise assessment demonstrates that both the INP's 15dB threshold for dB(C) to dB(A) and more contemporary criteria (Broner 60dB(C)) will be satisfied at all assessment locations during worst case meteorological conditions.

Potential sleep disturbance impacts from operational maximum noise level events have been assessed and are expected to satisfy MP05_0117 criteria for all private residence assessment locations during worst case meteorological conditions.

The site is located in an area with surrounding established mine sites, including UCM and WCM. The cumulative noise impact assessment of the MCP and each of these mining operations predicted noise levels below cumulative noise limits which are based on the INP amenity noise criteria.

The proposed modification does not seek to increase employee numbers or road and rail traffic movements. Previous studies have addressed road and rail traffic noise levels and changes where relevant and, therefore, noise levels are not predicted to increase as a result of the proposed modification.

The blasting noise overpressure and ground vibration will be within levels previously assessed and approved under MP05_0117.

Appendix A

Assessment locations

Table A.1 Assessment locations

ID	Lot number	Classification	Easting (m)	Northing (m)
9	5	Commercial	757478.02	6422930.08
11	21	Commercial	765376.00	6431621.95
11	1	Private residence	765265.02	6431931.08
11	26	Commercial	764784.42	6431838.86
26	276	Commercial	757429.53	6423741.41
30	9	Private residence	758435.02	6416631.08
31	122	Private residence	760008.02	6416123.08
32	104	Private residence	763590.02	6413194.08
35	263	Private residence	759020.93	6414840.07
37	194	Private residence	756179.21	6417106.53
39	255	Private residence	756037.75	6415288.25
40	190	Private residence	756389.04	6416414.39
41B	273	Private residence	756194.02	6415791.08
46B	31	Commercial	758663.00	6425526.00
47	138	Private residence	760293.02	6413734.08
58	235	Private residence	756926.02	6419919.08
59	217	Private residence	756885.93	6419210.11
60	B	Private residence	756500.19	6418545.85
61	A	Private residence	756374.53	6418754.87
63	6	Private residence	756497.48	6420922.54
66	11	Commercial	758310.00	6425130.00
70	59	Private residence	756132.49	6420691.66
75	31	Private residence	756012.10	6419777.38
76	36	Private residence	755920.05	6419546.44
79	34	Private residence	756034.31	6419159.31
80	30	Private residence	755648.77	6418908.39
82	32	Private residence	756223.23	6418658.81
83	23	Private residence	755831.73	6418444.08
84	22	Private residence	756047.34	6418248.22
86	26	Private residence	755505.64	6417817.78
87	21	Private residence	755840.70	6418051.09
88	20	Private residence	756042.62	6417723.53
89	27	Private residence	755430.60	6417644.75
90	28	Private residence	755337.35	6417501.34
91	19	Private residence	755969.31	6417348.10
94	15	Private residence	754900.49	6416785.30
95	14	Private residence	755085.22	6416833.78
96	13	Private residence	755182.57	6416867.32
97	12	Private residence	755363.90	6416985.34
98	11	Private residence	755439.74	6416782.77
99	10	Private residence	755603.11	6416770.05
100	9	Private residence	755992.38	6416832.19
101	7	Private residence	755849.76	6416237.34

Table A.1 Assessment locations

ID	Lot number	Classification	Easting (m)	Northing (m)
101A	8	Private residence	755937.38	6416447.24
102	6	Private residence	755529.77	6416188.88
103	5	Private residence	755071.61	6416398.56
104	4	Private residence	755111.84	6416116.32
105	3	Private residence	755061.48	6416032.72
106	2	Private residence	755558.02	6415823.08
107	1	Private residence	755752.08	6415919.17
109	25	Private residence	755409.62	6415494.06
110	27	Private residence	755360.90	6415339.26
111	30	Private residence	755051.87	6415789.48
112	29	Private residence	755138.06	6415655.26
113	28	Private residence	755269.13	6415660.51
149	7	Commercial	758456.86	6425165.47
151	8	Catholic church	757983.98	6425024.62
160	1	School	758350.31	6425029.22
162	A	Commercial	758341.73	6425198.76
168	4	Catholic church	758385.55	6425136.25
171	49	Private residence	753898.02	6414840.08
180	67	Private residence	755292.34	6420111.27
181	68	Private residence	755178.09	6420091.87
182	69	Private residence	755048.63	6420016.24
183	70	Private residence	754821.64	6419968.80
184	71	Private residence	755092.54	6419503.96
185	72	Private residence	754967.44	6419464.24
186	73	Private residence	754673.76	6419437.36
187	74	Private residence	754816.11	6419137.02
188	75	Private residence	754576.65	6419072.75
189	132	Private residence	754771.72	6418880.87
190	133	Private residence	754488.24	6418711.37
191	134	Private residence	754591.98	6418520.08
192	135	Private residence	754649.17	6418328.26
194	137	Private residence	754160.38	6418079.92
195	138	Private residence	754583.33	6417973.19
196	139	Private residence	754072.48	6417840.32
200	143	Private residence	754140.93	6417240.93
201	144	Private residence	754137.97	6417157.83
201	145	Private residence	754311.37	6416962.25
202	146	Private residence	754258.27	6416804.11
203	147	Private residence	754461.73	6416639.49
204	148	Private residence	754537.18	6416556.99
206	150	Private residence	754393.56	6416191.95
207	34	Private residence	754057.23	6415768.34
208	33	Private residence	753937.85	6415611.89

Table A.1 Assessment locations

ID	Lot number	Classification	Easting (m)	Northing (m)
209	37	Private residence	753882.71	6415406.67
210	38	Private residence	753872.99	6415226.03
217	42	Private residence	754659.21	6415319.33
218	41	Private residence	754549.87	6415117.20
219	40	Private residence	754467.85	6415586.50
220	39	Private residence	754257.74	6415350.91
222	31	Private residence	754813.39	6415761.22
223	32	Private residence	754921.17	6415935.11
224	16	Private residence	754895.26	6417021.22
226	37	Private residence	754811.97	6417270.27
227	38	Private residence	754999.97	6417481.59
228	39	Private residence	754978.23	6417571.52
229	40	Private residence	755114.64	6417790.82
230	41	Private residence	755228.88	6417878.82
231	42	Private residence	755200.07	6418033.90
232	43	Private residence	755121.49	6418197.11
233	2	Private residence	755196.23	6418290.40
234	1	Private residence	755156.90	6418404.60
235	46	Private residence	755107.50	6418631.39
236	47	Private residence	755165.35	6418737.98
237	48	Private residence	755468.37	6418862.37
238	49	Private residence	755496.92	6418968.84
239	50	Private residence	755557.59	6419118.24
240	51	Private residence	755694.20	6419408.08
255	30	Private residence	754921.92	6425601.92
258	24	Private residence	755375.27	6425131.69
300	76	Private residence	755327.37	6421268.29
303	79	Private residence	755327.37	6420849.62
305	81	Private residence	755052.22	6420566.39
306	82	Private residence	754978.30	6420430.94
307	83	Private residence	754842.79	6420373.48
308	84	Private residence	754604.60	6420402.21
309	104	Private residence	754218.58	6420816.78
310	105	Private residence	754407.48	6420948.13
312	107	Private residence	754239.11	6421214.93
313	108	Private residence	753906.47	6421165.68
314	109	Private residence	753996.82	6421485.84
315	110	Private residence	754140.55	6421604.88
316	111	Private residence	754210.36	6421744.44
317	112	Private residence	754645.67	6421744.44

Appendix B

INP wind analysis

Table B.1 Day percentage of wind speed (vector at 22.5° intervals)

Direction	Winter	Autumn	Spring	Summer
22.5°	25	39.4	35.3	44.9
45°	26.5	37.7	34	42.8
67.5°	26.1	37	30.6	41.9
90°	26.5	34.6	28.3	40.3
112.5°	24.7	30.2	22.5	37
135°	23	25.1	15.9	24.9
157.5°	23.4	19.2	12.5	15.3
180°	20	13.8	11.2	8.8
202.5°	17.5	14.3	14	9.6
225°	16.9	15.7	15.3	11.6
247.5°	17.9	16.7	16.6	14
270°	19	17.9	18.8	15.8
292.5°	19.2	18.1	18.9	15.2
315°	19.5	20.1	22.6	17.5
337.5°	19.8	26.6	27.3	29.5
360°	21.2	31.7	31.5	37.9

Notes: 1. Bold highlight denotes occurrence of 30 % and greater.

Table B.2 Evening percentage of wind speed (vector at 22.5° intervals)

Direction	Winter	Autumn	Spring	Summer
22.5°	62	75.8	57.1	60.6
45°	58.4	74.7	54.9	60.2
67.5°	53.5	63.6	50.6	59.7
90°	46.8	60	49.4	57.1
112.5°	42.5	57.5	46.8	53
135°	41.1	48.8	39.8	49.2
157.5°	35.3	39.7	33.7	37.8
180°	30.4	31.5	29.6	23.7
202.5°	29.3	23.9	25.2	14.6
225°	23.4	19.1	22.4	9.2
247.5°	18.7	12.5	20.3	8.9
270°	14.2	11.1	17.4	7.5
292.5°	9.5	6.2	13.2	5.9
315°	7.1	2.4	10.4	3.6
337.5°	6.5	2.2	7.9	2.5
360°	4.6	0.8	7.1	2.5

Notes: 1. Bold highlight denotes occurrence of 30 % and greater.

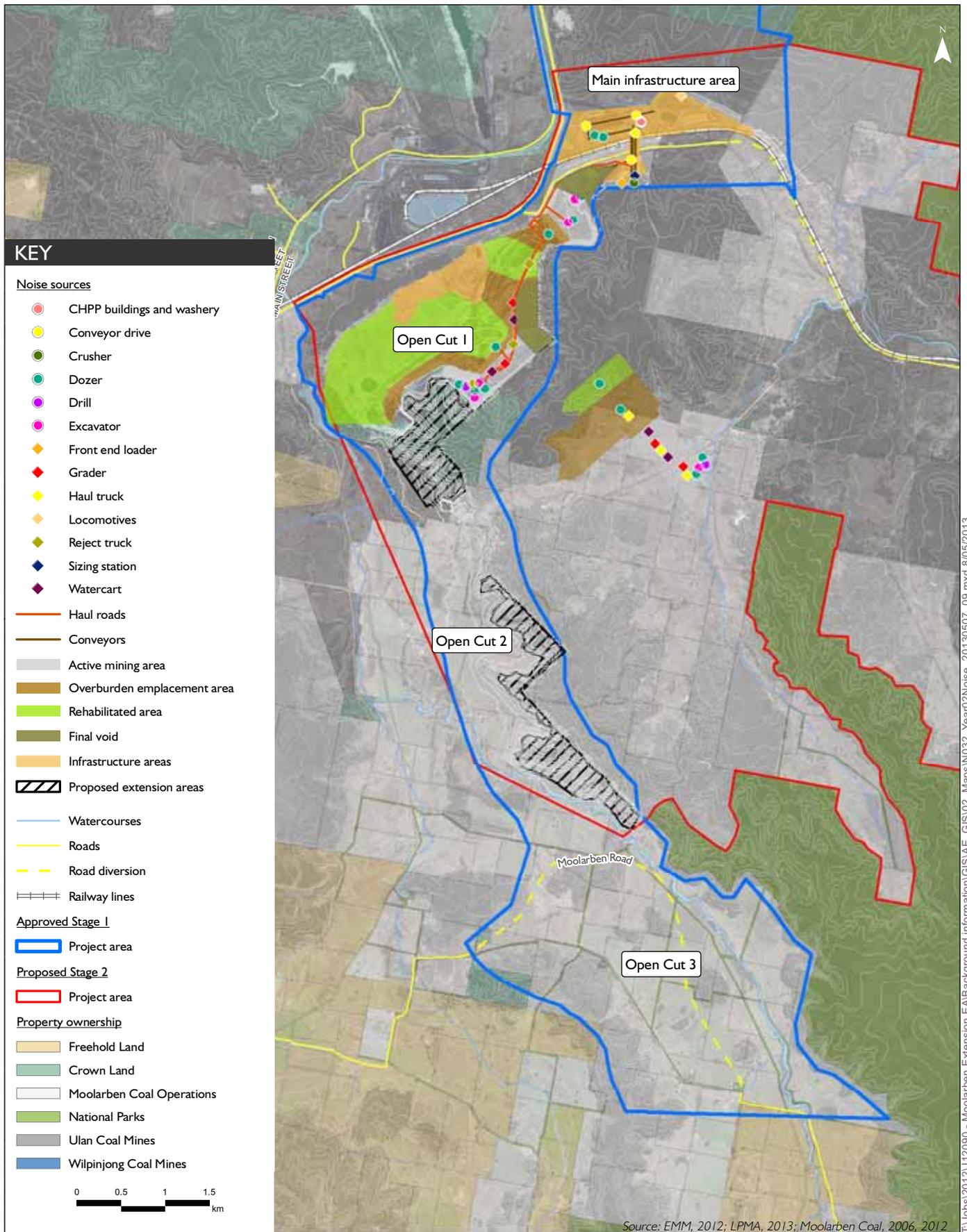
Table B.3 Night percentage of wind speed (vector at 22.5° intervals)

Direction	Winter	Autumn	Spring	Summer
22.5°	44.4	50.7	48	57.1
45°	40.8	48.5	45.9	55.6
67.5°	40.5	47.1	43.3	54.9
90°	34.9	44.7	39.9	50
112.5°	31.7	40.8	36.6	49.2
135°	29	39.6	35.7	40.3
157.5°	22.4	31	31.8	37.4
180°	22.4	21.5	22.8	17.7
202.5°	17.5	13.7	20.2	15.7
225°	15.8	13.2	13.6	8.8
247.5°	14.8	10.8	12.5	8.4
270°	11.1	8	8.6	4.6
292.5°	9.3	7.9	6.1	3.3
315°	8.6	5.2	6	2.8
337.5°	7.8	4.8	4.9	1.2
360°	7.3	3.7	4.3	1

Notes: 1. Bold highlight denotes occurrence of 30 % and greater.

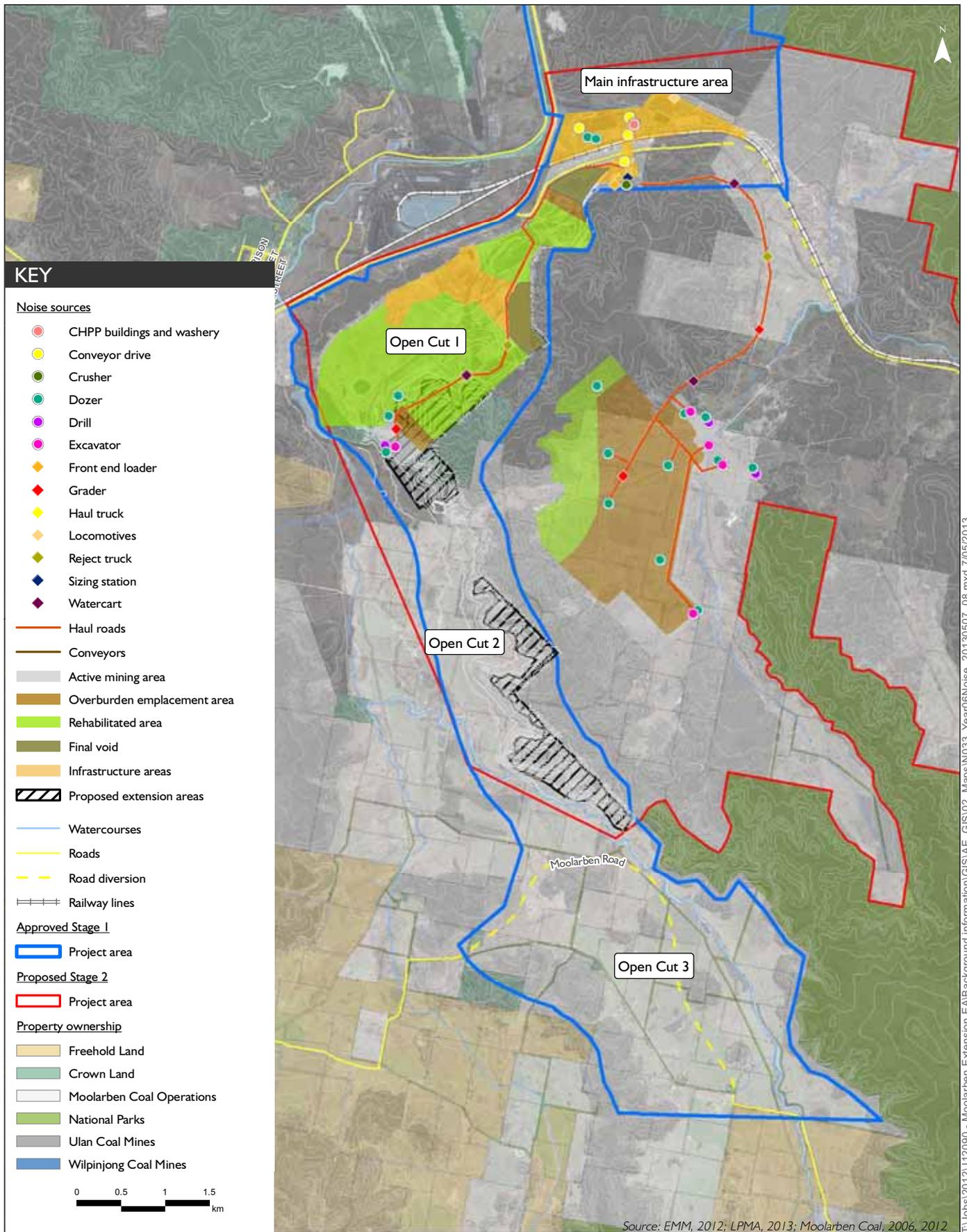
Appendix C

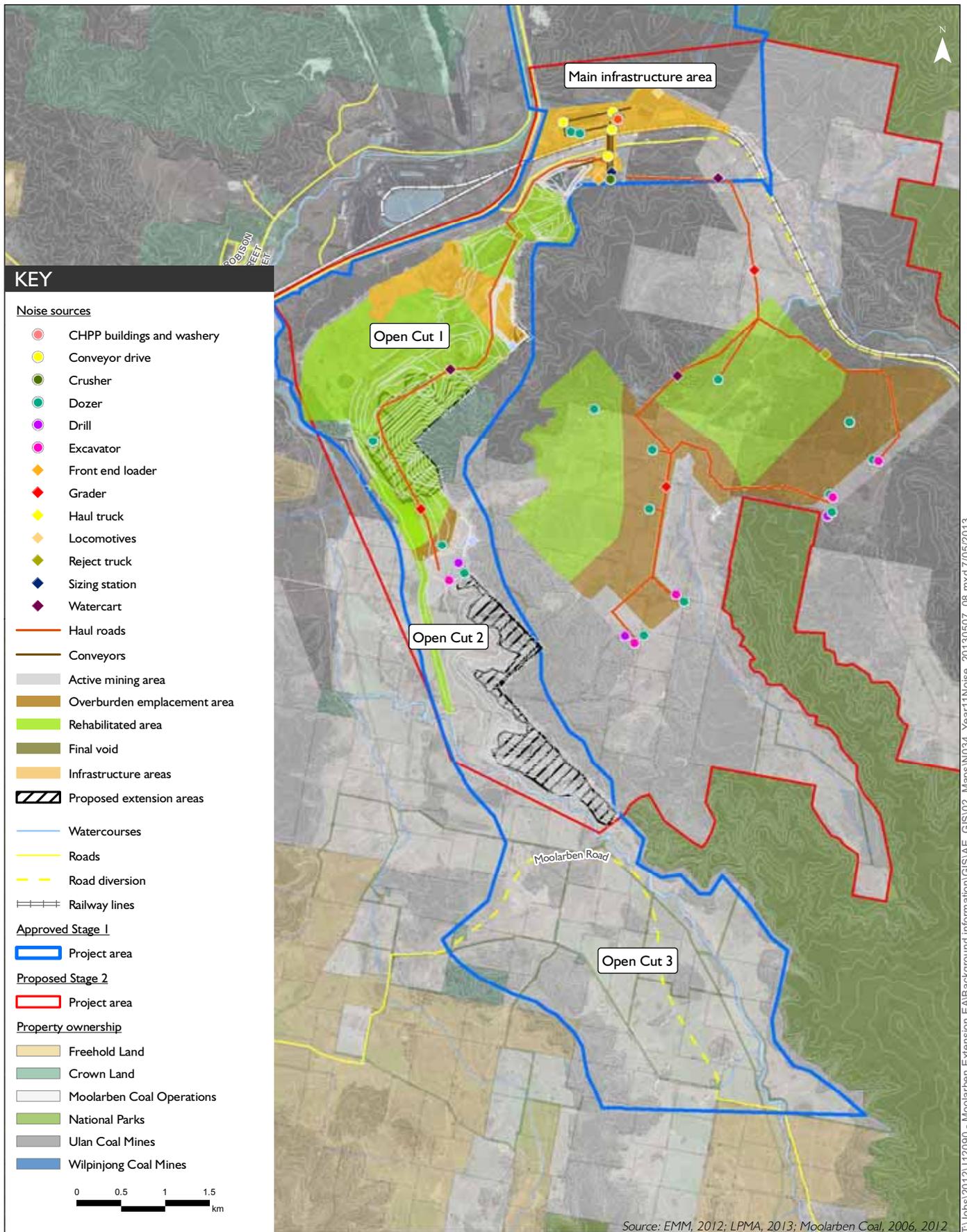
Location of plant and equipment used in the noise model



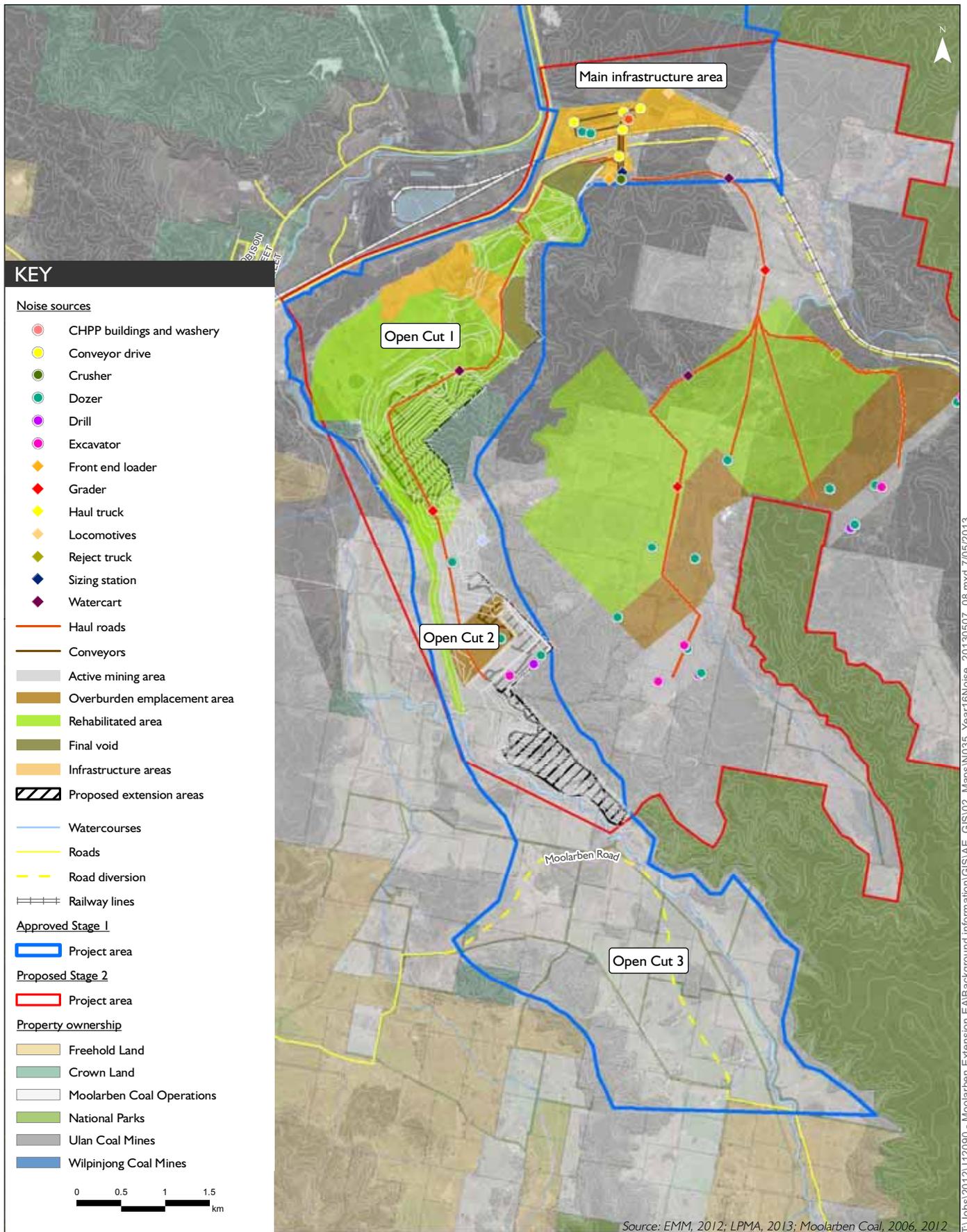
Year 2 - Modelled noise source locations
Moolarben Coal Project - Stage 1 Optimisation Modification
Noise and vibration impact assessment

Figure C I

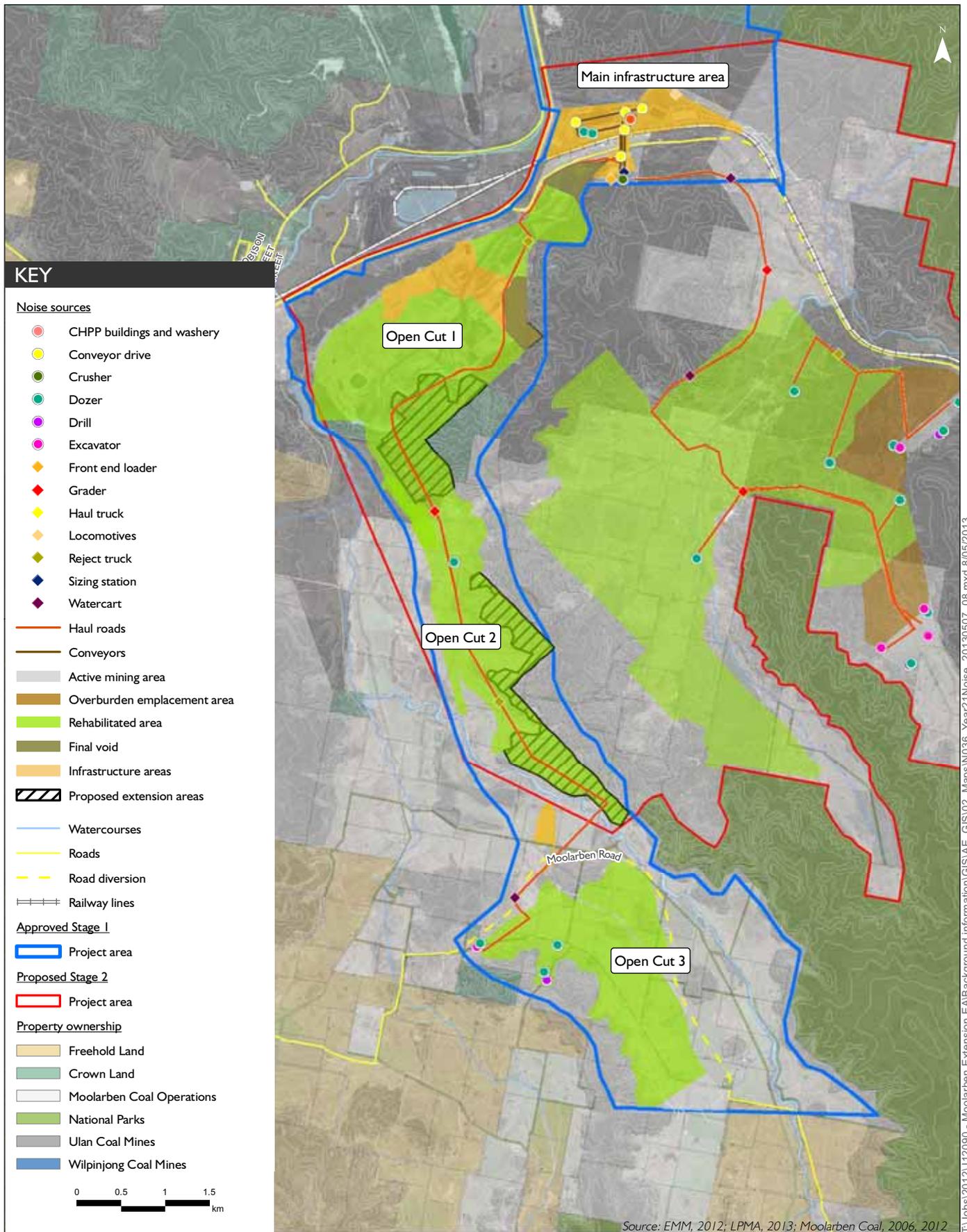




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Year 21 - Modelled noise source locations
 Moolarben Coal Project - Stage I Optimisation Modification
 Noise and vibration impact assessment

Figure C5

Appendix D

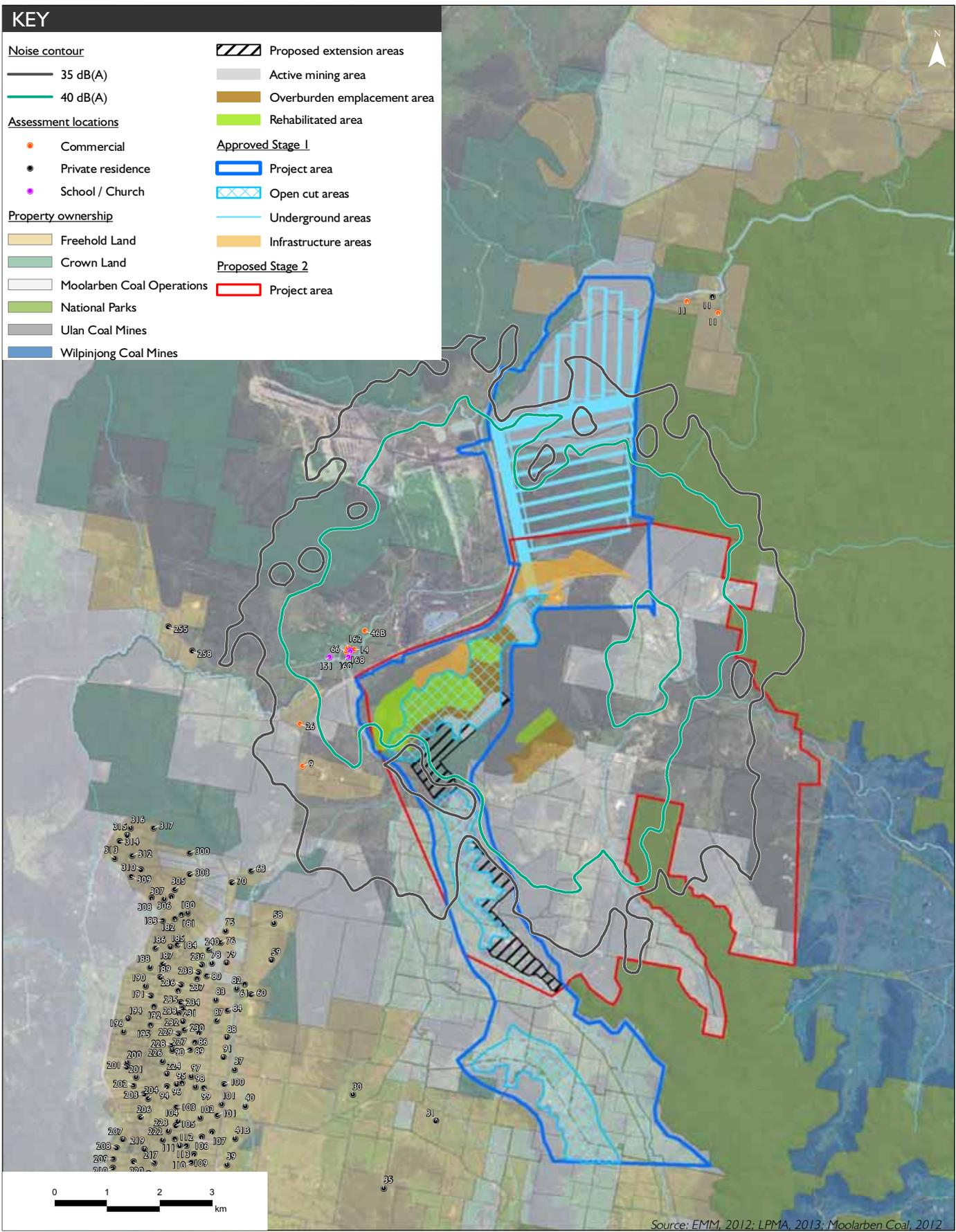
Plant and equipment sound power levels

Table D.1 Plant and equipment sound power levels

Item	Octave band centre frequency, dB								Overall, dB	Overall, dB(A)
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz		
Haul trucks	115	116	111	113	109	104	100	107	121	115
Excavator	113	117	119	115	112	112	106	98	123	118
Dozer	113	115	112	113	108	104	97	96	120	114
Grader	105	114	109	105	109	105	99	93	117	112
Water truck	111	120	119	110	108	105	102	96	123	114
Front End Loader	116	118	117	116	115	113	107	102	124	120
Haul truck (Rejects)	115	116	111	113	109	104	100	107	121	115
Drill	110	118	114	114	113	114	113	113	123	120
CHPP module 1(SW Facade)	121	117	115	113	110	107	103	96	125	116
CHPP building 2	114	108	105	105	105	98	91	82	116	108
CHPP building 3	95	90	89	88	85	82	79	72	98	90
Sizing station	112	111	109	110	109	107	101	91	118	114
ROM crusher	117	113	109	110	108	104	103	92	120	113
Overland conveyor per meter	84	85	81	79	76	72	67	61	89	81
Conveyor drive	102	102	101	107	102	96	90	87	111	107
Ventilation fans	115	114	110	113	102	98	94	83	122	112
Locomotive	87	99	102	102	104	102	97	90	110	108

Appendix E

Noise contours - $L_{Aeq,15min}$

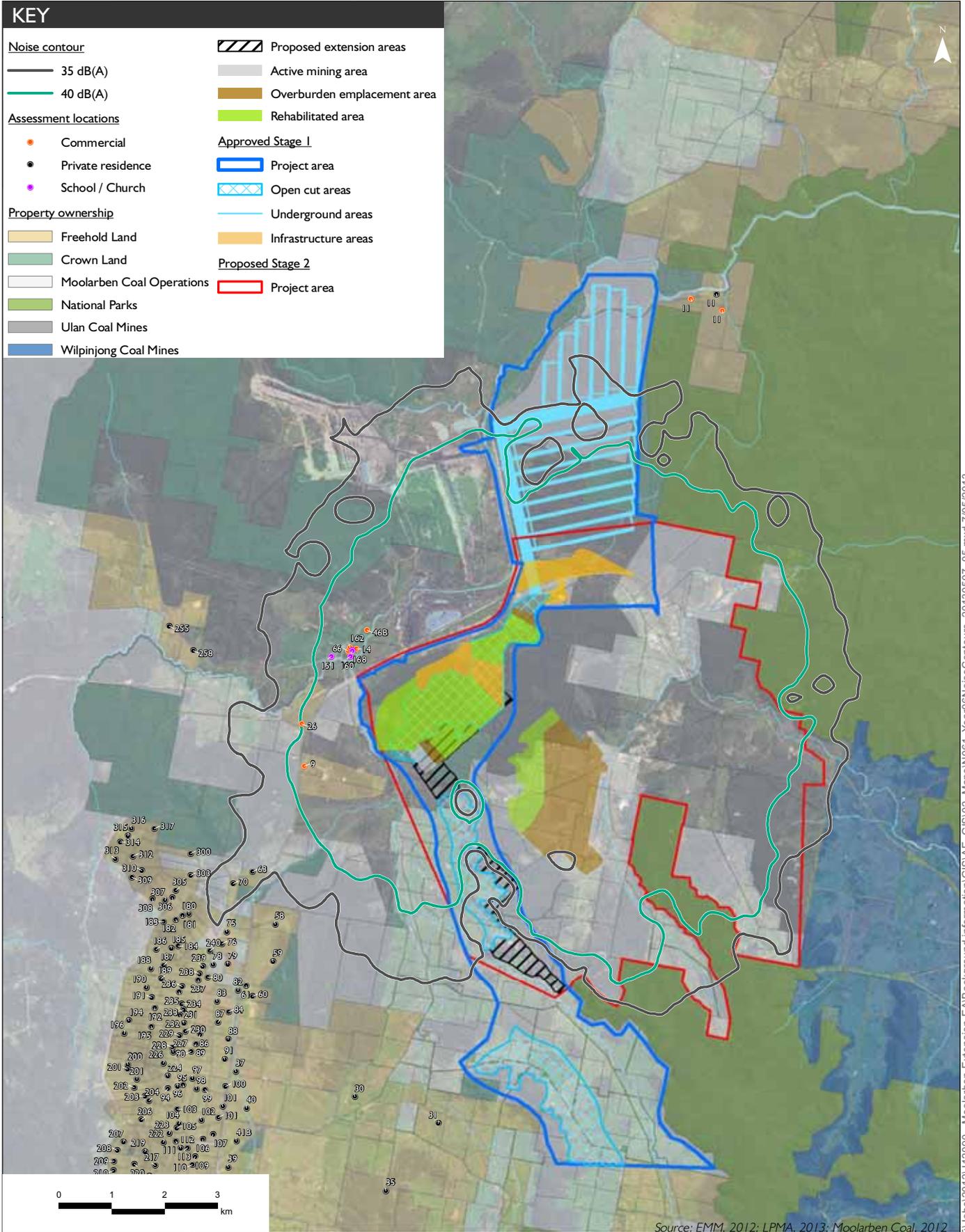


Year 2 operational noise levels, worst case meteorological conditions, $L_{eq(15-min)}$ dB(A)
 Moolarben Coal Project - Stage 1 Optimisation Modification
 Noise and vibration impact assessment
 Figure E1



KEY

- | | |
|-----------------------------|-----------------------------|
| Noise contour | Proposed extension areas |
| 35 dB(A) | Active mining area |
| 40 dB(A) | Overburden emplacement area |
| Assessment locations | Rehabilitated area |
| Commercial | Approved Stage 1 |
| Private residence | Project area |
| School / Church | Open cut areas |
| Property ownership | Underground areas |
| Freehold Land | Infrastructure areas |
| Crown Land | Proposed Stage 2 |
| Moolarben Coal Operations | Project area |
| National Parks | |
| Ulan Coal Mines | |
| Wilpinjong Coal Mines | |



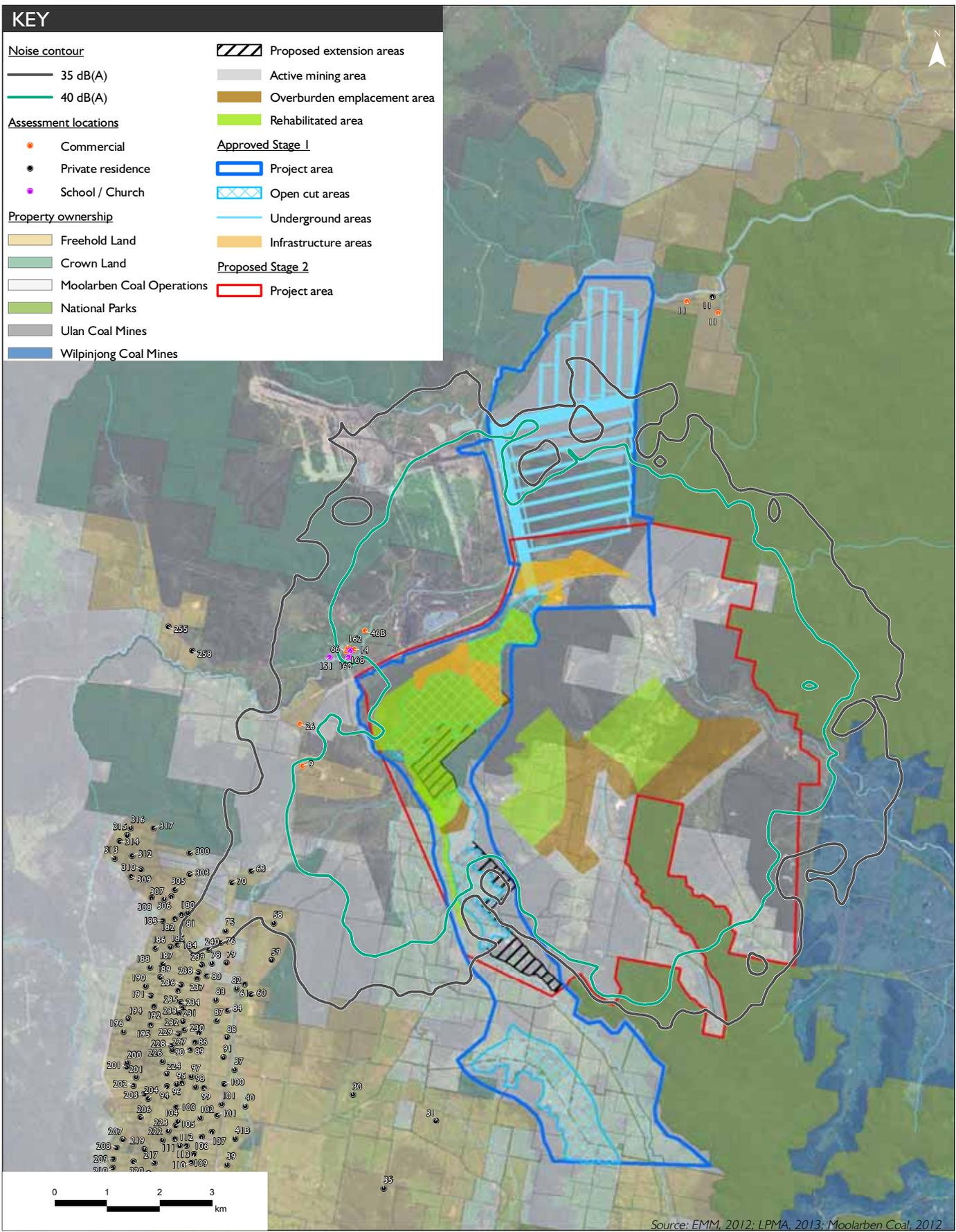
Source: EMM, 2012; LPMA, 2013; Moolarben Coal, 2012

T:\Jobs\2012\12090 - Moolarben Extension EIA\Background Information\GIS\02_Maps\N061_Year06NoiseContours_20130507_05.mxd 7/05/2013

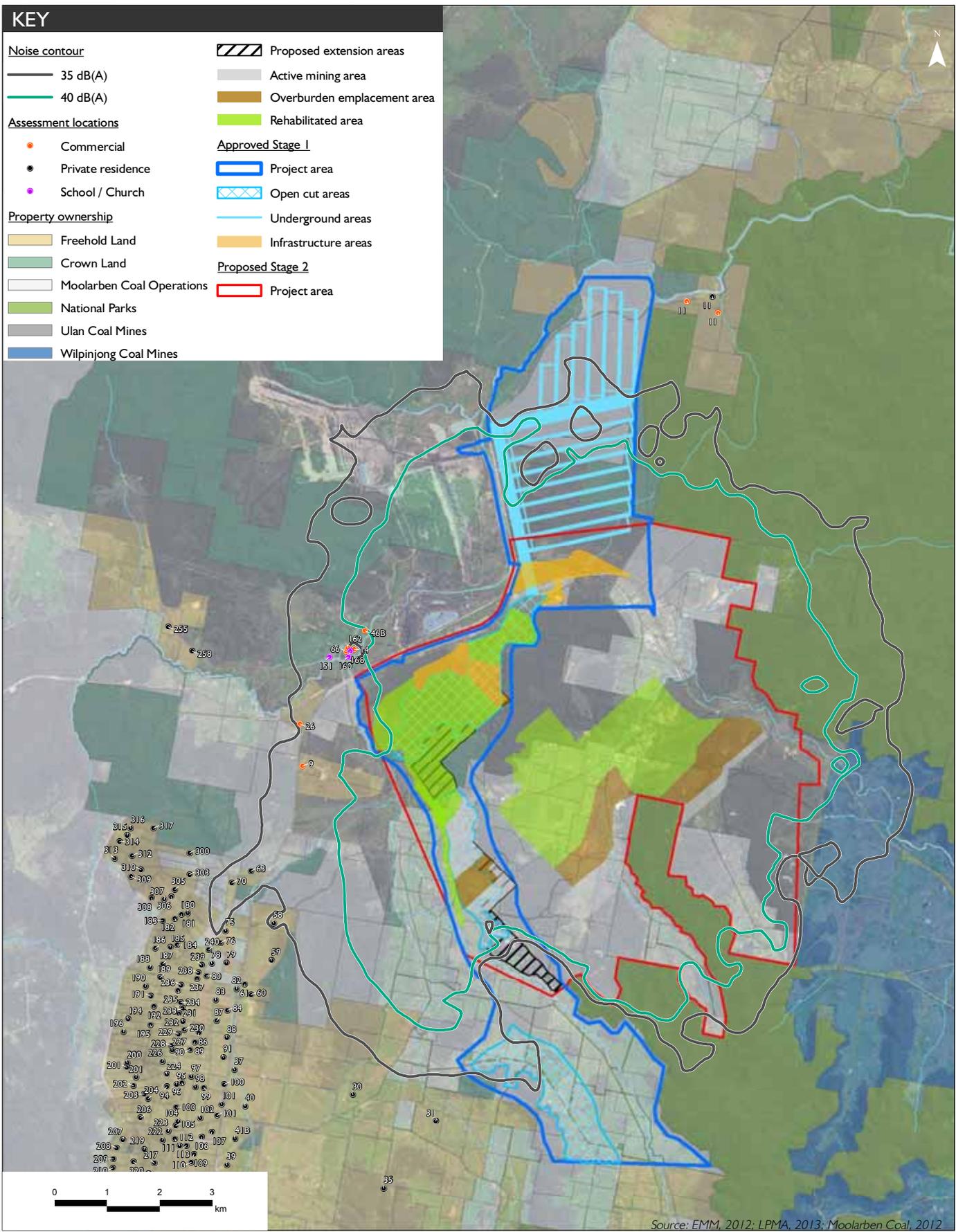


Year 6 operational noise levels, worst case meteorological conditions, $L_{eq(15-min)}$ dB(A)
 Moolarben Coal Project - Stage 1 Optimisation Modification
 Noise and vibration impact assessment

Figure E2

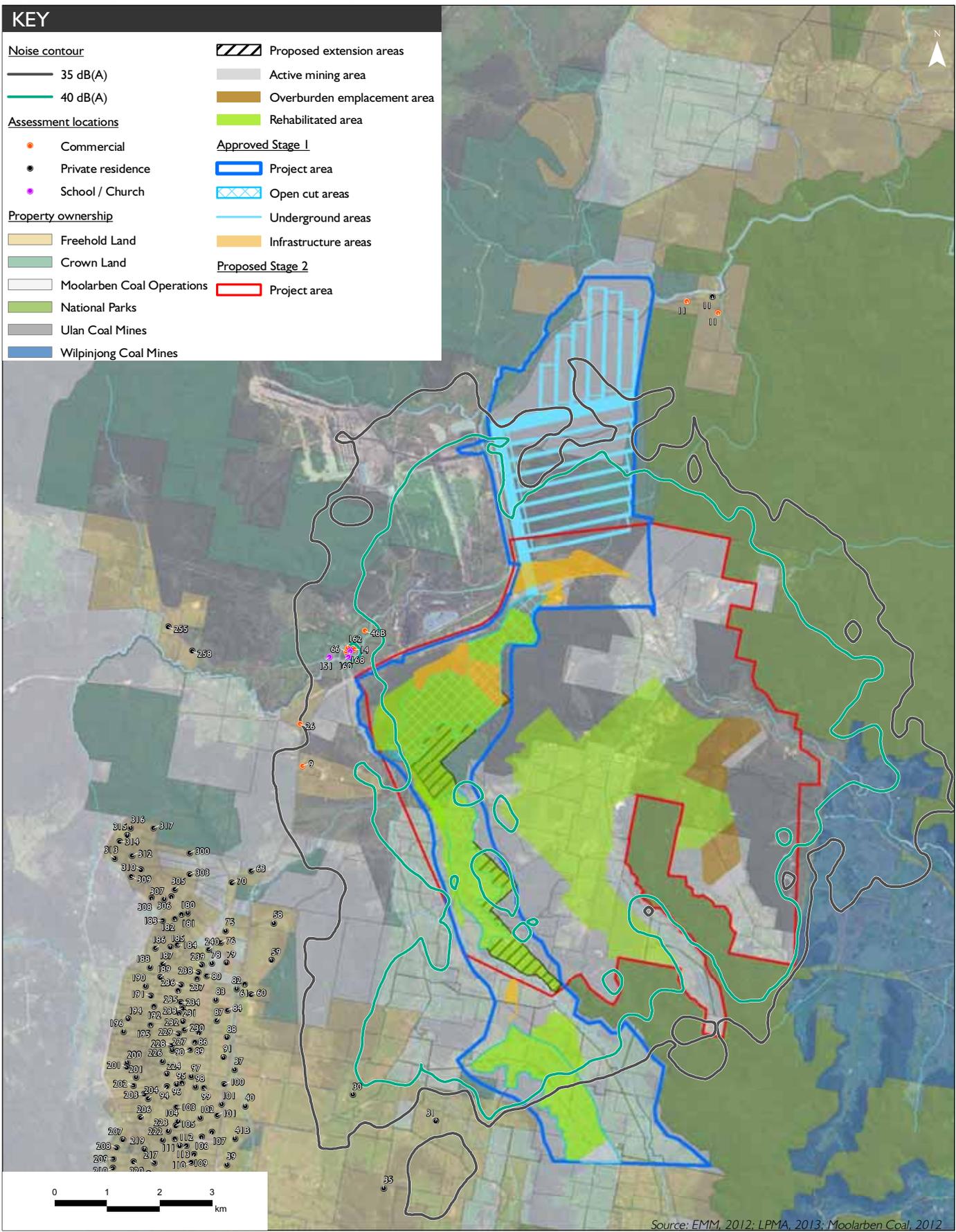


Year II operational noise levels, worst case meteorological conditions, $L_{eq(15-min)}$ dB(A)
 Moolarben Coal Project - Stage I Optimisation Modification
 Noise and vibration impact assessment
 Figure E3



Year 16 operational noise levels, worst case meteorological conditions, $L_{eq(15-min)}$ dB(A)
 Moolarben Coal Project - Stage 1 Optimisation Modification
 Noise and vibration impact assessment
 Figure E4





Year 21 operational noise levels, worst case meteorological conditions, $L_{eq(15-min)}$ dB(A)
 Moolarben Coal Project - Stage 1 Optimisation Modification
 Noise and vibration impact assessment
 Figure E5



Appendix F

Technical peer review

14 May 2013

WM Project Number: 13127
Our Ref: 140513EMM RB Report
Email: nishac@emgamm.com

Najah Ishac
EMGA Mitchell McLennan
Suite 01, 20 Chandos St
ST LEONARDS NSW 2065

Dear Najah,

Re: Moolarben Coal Project Stage 1 Optimisation Modification: Peer Review of Noise Assessment

Wilkinson Murray was requested to provide a peer review of the methodology adopted in the assessment of noise impacts from the proposed Moolarben Coal Project Stage 1 Optimisation Modification, and the conclusions of that assessment.

Preliminary comments were based on the report "Noise and Vibration Assessment: Moolarben Coal Project Stage 1 Optimisation Modification", version V2, and were provided on 26 April, 2013. Version V5 of that report was then produced and received on 6 May 2013, incorporating modifications based on our preliminary comments, among other changes.

The modifications in Version V5 of the report, together with subsequent clarifications in discussion with EMGA Mitchell McLennan, have addressed all the potential issues raised in our preliminary comments. Although there remain points at which there may be disagreement about technical details of the modelling, I am satisfied that none of these would have any significant influence on predicted noise levels at any noise-sensitive receiver.

Hence I am satisfied that Version V5 of the above report presents a thorough and comprehensive assessment of potential noise impacts from the project, and the methodology used is consistent with standard best practice for assessment of such noise impacts.

Yours faithfully

WILKINSON MURRAY



Robert Bullen
Principal

Table F-16: PM02 - Year 16

PM ₁₀ 24-hour average (µg/m ³)							
Date	Background	Predicted increment	Total	Date	Background	Highest predicted increment	Total
16/11/2011	30.0	7.8	37.8	26/10/2011	ND	42.6	42.6
23/10/2011	23.6	-0.3	23.3	27/10/2011	ND	36.9	36.9
26/01/2011	21.8	1.5	23.3	24/11/2011	ND	34.5	34.5
23/09/2011	19.3	0.2	19.5	10/01/2011	ND	33.2	33.2
1/02/2011	17.5	0.1	17.6	11/01/2011	ND	33.1	33.1
4/12/2011	17.4	12.0	29.4	25/11/2011	ND	29.9	29.9
20/01/2011	16.8	22.0	38.8	4/01/2011	ND	29.8	29.8
17/10/2011	16.0	6.7	22.7	14/10/2011	ND	28.0	28.0
7/02/2011	15.8	22.9	38.7	8/01/2011	13.3	27.8	41.1
2/04/2011	15.2	8.4	23.6	16/07/2011	ND	27.7	27.7

ND - No data