



**NARRABRI MINE
ENVIRONMENTAL
MANAGEMENT SYSTEM**

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WHC_PLN_NAR_NOISE MANAGEMENT PLAN

NOISE MANAGEMENT PLAN

Edition	Rev.	Comments	Author	Authorised By	Date
1	1	Initial Stage 1 Noise Management Plan	D Young	C Burgess	3 December 2007
1	2	Update following approval of Stage 1, Modification 1	N Pennington	D Young	19 July 2010
1	3	Update for Stage 2	N Pennington	S Pegg	6 December 2011
1	4	3 Year Review	S Farrar	D Ellwood	26 May 2015
1	5	Update following Approval of Stage 2, Modification 5	S Farrar	D Ellwood	1 June 2018



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ACRONYMS USED THROUGHOUT THIS DOCUMENT

AR	-	Annual Review
AS	-	Australian Standard
CCC	-	Community Consultative Committee
CHPP	-	Coal Handling and Preparation Plant
dB	-	Decibel
dB(A)	-	A-weighted decibel
DP&E	-	Department of Planning and Environment
DRG	-	Division of Resources and Geoscience
EA	-	Environmental Assessment
EPA	-	Environment Protection Authority
EMS	-	Environmental Management Strategy
INP	-	Industrial Noise Policy
ISO	-	International Standards Organisation
NCOPL	-	Narrabri Coal Operations Pty Ltd
NM	-	Narrabri Mine
NMP	-	Noise Management Plan
NSC	-	Narrabri Shire Council
PA	-	Project Approval
RBL	-	Rating Background Level



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1 INTRODUCTION

1.1 Introduction

The Narrabri Mine ("the mine") is located approximately 30km south-southeast of Narrabri, and 10km north-northwest of Baan Baa (see Figure 1). The mine is operated by Narrabri Coal Operations Pty Ltd (NCOPL) as an underground mining operation.

The mine lies within a 5,298ha area covered by mining lease ML 1609 ("the mine site"), with an indicative mining area of approximately 3,630ha, and a surface facilities area of approximately 457ha.

The mine operates under Environment Protection Licence (EPL) 12789 and Project Approval (PA) 08_0144, which was granted by the Minister for Planning on the 26th July 2010, as modified, and incorporates:

- Underground longwall mining with an annual production rate of 11 Mtpa;
- Mine ventilation and gas drainage;
- Mine dewatering;
- Processing, stockpiling and loading of coal, which includes construction of a Coal Handling and Preparation Plant (CHPP);
- Placement of processing reject and storage of saline water;
- Construction and use of a water pipeline from the Namoi River;
- Transportation of the coal from the mine site to Port Newcastle via train;
- Final rehabilitation of surface disturbance following completion of the project; and
- All ancillary and related activities.

It is recognised that the operation of the mine has the potential to generate noise impacts within and beyond the boundaries of the mine site. In order to manage the potential for impacts on noise amenity, and in compliance with Schedule 4, Condition 4 of PA 08_0144, this Noise Management Plan (NMP) has been developed.

The initial NMP for the Stage 2 Longwall Project was prepared by Spectrum Acoustics in consultation with the EPA. This plan has been developed with reference to relevant legislation, approvals and guidelines, follows the management plan requirements specified in Schedule 6, Condition 2 of PA 08_0144, and is consistent with the commitments in the following documents:

- Stage 2 Longwall Project Environmental Assessment (EA) – specifically section 4B.7.
- Noise and Vibration Impact Assessment – included as Volume 2 (Part 6) of the Stage 2 Longwall Project Environmental Assessment Specialist Consultant Studies Compendium;
- Final Statement of Commitments – specifically Section 10; and



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- NM Modification 5 Environmental Assessment and the Modification 5 'Response to Submissions'.

The area surrounding the NM is utilised for agricultural or forestry purposes and prior to the development of the mine was not subjected to significant noise levels from transportation or industrial sources (i.e. present for a high proportion of time). Therefore the Rating Background Level (RBL) was determined to be at or below 30dB(A) (L90) at all receivers during day, evening and night periods.



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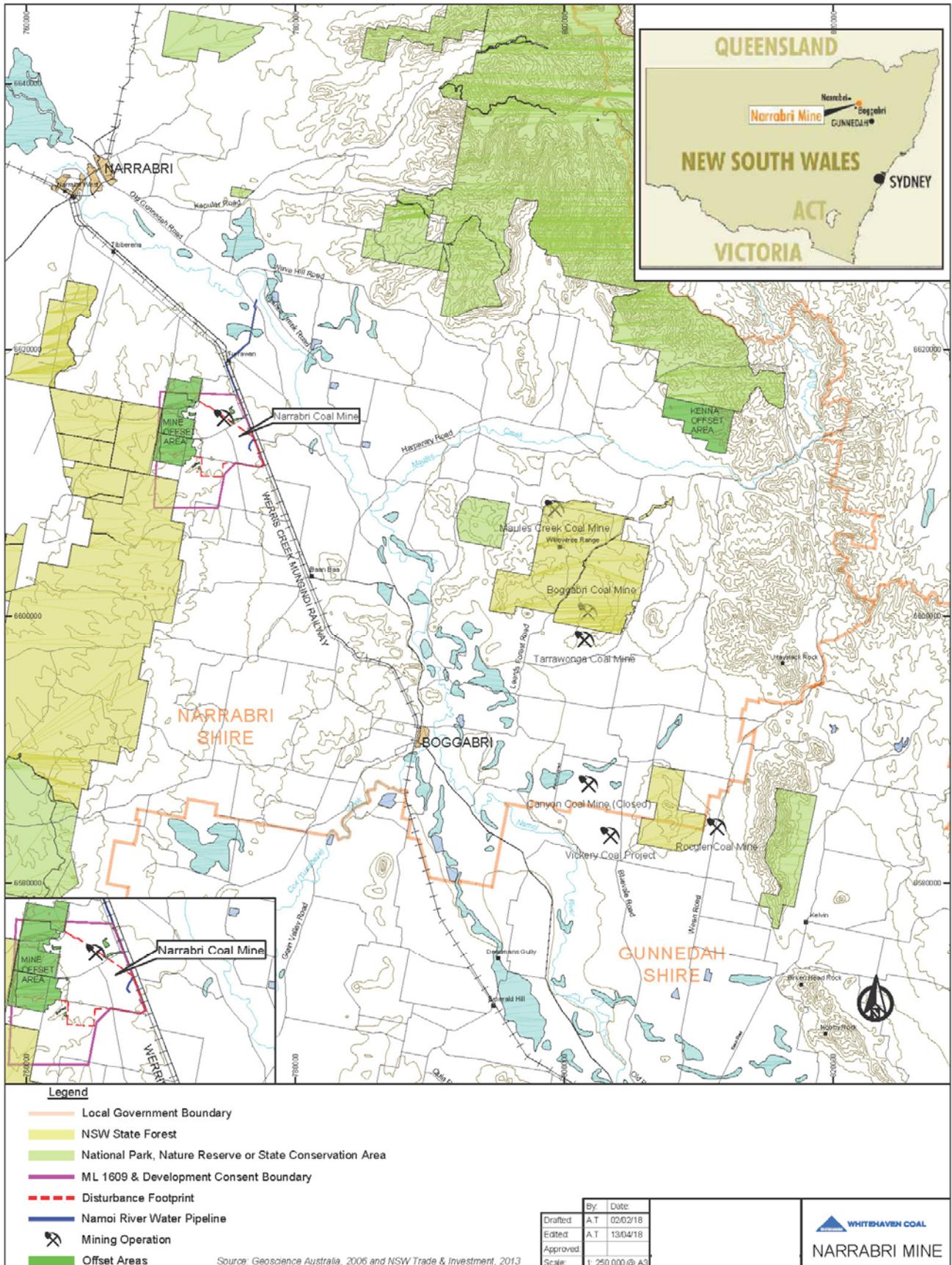


Figure 1: NM Location



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As outlined in the NSW Industrial Noise Policy (INP) (EPA, 2000) noise levels below 30dB(A) shall be taken as 30dB(A) for the purposes of assessing industrial noise. As such the 30dB(A) (L90) background level was adopted for all residential receivers in the Stage 2 Longwall Project EA. For further details on the baseline noise data refer to the Stage 2 Longwall Project EA and previous Annual Reviews (AR).

The NM Modification 5 Environmental Assessment (Resource Strategies, 2015) noise model predicted that two privately-owned properties would be subject to noise levels >35dB(A), based on worst case conditions that include temperature inversions. At the time of preparation of the EA, one of the properties had entered into a private agreement with the mine requiring additional mitigation measures and since this time the other property has been purchased by the mine.

The operational fleet that forms the basis of the modelling is presented in Table 1.

Table 1: Noise Source Sound Power Levels

Operational noise sources¹	Number	Sound Power Level (dB)
Conveyors	-	80db/m
Dozer at stockpile	2	117
	2	118
Crusher (attenuated)	1	103
CHPP (attenuated)	1	111
Bypass Crusher (attenuated)	1	107
Rail Load-out	1	102
Workshop	1	95
Ventilation fans (attenuated)	1	117
Goaf drainage fan	1	115
Personnel carrier	1	110
Locomotives idling on rail loop	1	102
Truck at rejects	1	107
Dozer at rejects	1	107
Water cart	1	105
Gas drainage pumps	>10	102
Drill	2	109
TOTAL sound power	-	125

Note 1: The sound power levels of the CHPP, bypass crusher, dozers and ventilation fans have been updated based on onsite sound power level measurements.

1.2 Noise Management

The noise impact assessment criteria as applicable under PA 08_0144 are presented in Section 2.3. In effect, the NMP:

- Identifies the noise impact assessment criteria for the mine;
- Identifies the measures that will be implemented to ensure compliance with noise limits and minimise noise impacts;
- Proposes noise monitoring programs, incorporating real time noise and continuous temperature inversion monitoring and attended monitoring, to assess and actively manage noise impacts and then report the levels of impact in relation to the mining and ancillary activities identified in Section 1.1, but limited to transport on private sections of road/rail; and



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- Provides a mechanism whereby any noise complaint can be dealt with quickly and effectively.

The NMP has been prepared with reference to relevant legislation and guidelines and is consistent with the commitments in the following documentation:

- Noise and Vibration Impact Assessment – included as Volume 2 (Part 6) of the Specialist Consultant Studies Compendium accompanying an Environmental Assessment for the Narrabri Coal Mine Stage 2 Project;
- Final Statement of Commitments for the Narrabri Coal Mine Stage 2 Project – specifically commitments 10.1-10.22; and
- The NM Modification 5 Environmental Assessment.

1.3 Purpose and Scope

The purpose of this NMP is to identify the standards and procedures necessary for the effective noise management at the mine and to assign responsibilities to personnel to undertake these tasks.

This plan applies to noise management associated with the surface components of the NM, which includes the underground ventilation infrastructure located on the surface.

1.4 NMP Revisions and Consultation

The Stage 2 Noise Management Plan was prepared by Spectrum Acoustics, approved as the experts to develop the plan by DP&E in May 2011, and approved on 6 December 2011. A revision to the NMP was approved by DP&E in May 2015. All versions of the NMP, including this revised version, have been supplied to the Environment Protection Authority (EPA) as required by PA 08_0144 and all correspondence to date has resulted in advice from the EPA that comments on management plans will not be provided.



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2 STATUTORY REQUIREMENTS

This NMP has been prepared to fulfil the requirements of relevant legislation, approved conditions, EA commitments and relevant standards and guidelines.

2.1 Relevant Legislation

The *Protection of the Environment Operations Act 1997* (POEO Act) is the principal piece of legislation governing noise emissions in NSW. The POEO Act requires an EPL be held for scheduled activities which include coal mining. NM holds EPL 12789.

2.2 Noise Management Plan Requirements

The requirements of PA 08_0144 with respect to this NMP are contained within Schedule 4, Conditions 4 and 5, and Schedule 6, Condition 2, refer to Table 2 below.

Table 2: Approval Conditions and Relevant NMP Sections

Project Approval Condition	Section of Document
<p>Noise Management Plan (Schedule 4, Condition 4) The Proponent shall revise the Noise Management Plan for the Stage 1 project to encompass all proposed mine activities and potential impacts associated with noise management (Stages 1 and 2) and subsequently implement the revised version of this Noise Management Plan to the satisfaction of the Secretary. This plan shall:</p>	This Document
(a) be prepared in consultation with EPA by a suitably qualified expert whose appointment has been approved by the Secretary;	1.4
(b) be submitted to the Secretary for approval by the 30 June 2011;	N/A
(c) include a noise monitoring program incorporating: <ul style="list-style-type: none"> • real time noise and temperature inversion monitoring; and • Attended noise monitoring to monitor the performance of the project;	5
(d) include reactive noise control measures to manage noise impacts for sensitive receivers; and	5.1.2
(e) include a protocol to establish whether the project is complying with the noise impact assessment criteria in Table 1.	3.8
<p>Continuous Improvement (Schedule 4, Condition 5) The Proponent shall:</p>	
(a) implement all reasonable and feasible best practice noise mitigation measures;	3
(b) investigate ways to reduce the noise generated by the project, including off-site road and rail noise and maximum noise levels which may result in sleep disturbance; and	6.2
(c) report on these investigations and the implementation and effectiveness of these measures in the Annual Review,	6.2
to the satisfaction of the Secretary.	



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Project Approval Condition	Section of Document
<p>Management Plan Requirements (Schedule 6, Condition 2)</p> <p>The Proponent shall ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:</p>	This Document
(a) detailed baseline data;	1.1
(b) a description of;	-
<ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); 	2
<ul style="list-style-type: none"> • any relevant limits or performance measures/criteria; 	2.3
<ul style="list-style-type: none"> • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; 	3, 5
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	3, 5
(d) a program to monitor and report on the;	-
<ul style="list-style-type: none"> • impacts and environmental performance of the project; 	5
<ul style="list-style-type: none"> • effectiveness of any management measures (see (c) above); 	6
(e) a contingency plan to manage any unpredicted impacts and their consequences;	4.3
(f) a program to investigate and implement ways to improve the environmental performance of the project over time;	6.2
(g) a protocol for managing and reporting any:	-
<ul style="list-style-type: none"> • incidents; 	5.5.1
<ul style="list-style-type: none"> • complaints; 	4.2
<ul style="list-style-type: none"> • non-compliances with statutory requirements; and 	4.1
<ul style="list-style-type: none"> • exceedances of the impact assessment criteria and/or performance criteria; and 	4
(h) a protocol for periodic review of the plan.	6.1.1

2.3 Noise Impact Assessment Criteria

Noise impact assessment criteria for the development were established in the Environmental Assessment using relevant guidelines identified in Section 2.7. These criteria have been incorporated in PA 08_0144 Schedule 4, Condition 1 which states:

- 1) *The Proponent shall ensure that the noise generated by the project does not exceed the levels set out in Table 1.*



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Table 1: Impact assessment criteria dB(A)

Location	Day LAeq(15 minute)	Evening LAeq(15 minute)	Night	
			LAeq(15 minute)	LA1(1 minute)
All Privately owned Residences	35	35	35	45

Notes:

- To determine compliance with the LA_{eq(15 minute)} limit, 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 EPA 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.
- These noise limits apply to applicable receivers under all meteorological conditions except for any one of the following:
 - wind speeds greater than 3m/s at 10 metres above ground level; or
 - stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
 - stability category G temperature inversion conditions.
- Except for wind speed at microphone height, the data to be used for determining meteorological conditions shall be that recorded by the meteorological station located in the vicinity of the site, or as otherwise agreed by the Secretary.
- To determine compliance with the LA1(1 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 EPA may accept alternative means of determining compliance (See Chapter 11 of the NSW Industrial Noise Policy).
- These limits do not apply if the Proponent has an agreement with the relevant owner/s of these residences to generate higher noise levels, and the Proponent has advised the Department in writing of the terms of this agreement.

- 2) If the noise generated by the project exceeds the Criteria in Table 2 at any residence on privately owned land then the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 5-7 of Schedule 7.

Table 2: Noise acquisition criteria dB(A).

Location	Day LAeq(15 minute)	Evening LAeq(15 minute)	Night
			LAeq(15 minute)
All Privately owned Residences	40	40	40

Note: Noise generated by the project is to be measured in accordance with the notes presented below in Table 1. For this condition to apply the exceedances of the criteria must be systemic.

- 3) If the noise generated by the project is equal to or exceeds the criteria in Table 3 at any residence on privately owned land, then the Proponent shall, upon receiving a written request from the landowner, implement reasonable and feasible noise mitigation measures (such as double glazing, insulation and/or air conditioning) at the residence in consultation with the landowner. 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 Secretary for resolution.



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Table 3: Additional noise mitigation criteria.

Location	Day LAeq(15 minute)	Evening LAeq(15 minute)	Night
			LAeq(15 minute)
All Privately owned Residences	38	38	38

Note: Noise generated by the project is to be measured in accordance with the notes presented below Table 1. For this condition to apply, the exceedances of the criteria must be systemic.

These noise criteria should be considered in conjunction with Conditions L3.1 to L3.6 of EPL 12789, which address monitoring requirements, prevailing meteorological conditions and contributing noise sources. The monitoring locations where the impact assessment criteria are to be assessed are specified in EPL 12789, as outlined in Section 5.1.

2.4 Notification Requirements

PA 08_0144 specifies the notification requirements relating to noise impacts and surrounding receivers. In particular Schedule 7, Condition 1 states:

- 1) *If the results of the monitoring required in schedule 4 identify that impacts generated by the project are greater than the relevant impact assessment criteria, except where a negotiated agreement has been entered into in relation to that impact, then the Proponent shall, within 2 weeks of obtaining the monitoring results, notify the Secretary, the affected landowners and 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 4.*

2.5 Temperature Inversion Conditions

PA 08_0144 prescribes the meteorological conditions for which the impact assessment criteria do not apply, refer to Section 2.3. The site's EPL 12789 also outlines meteorological conditions that the impact criteria for that licence do not apply, refer to Section L3.4 of EPL 12789. The method for determining temperature inversion conditions onsite is outlined in Section 5.2.

2.6 Continuous Improvement

Schedule 4, Condition 5 of PA 08_0144 outlines the requirements for continuous improvement as stated below:

- 5) *The Proponent shall:*
 - a) *implement all reasonable and feasible best practice noise mitigation measures;*
 - b) *investigate ways to reduce the noise generated by the project, including off-site road and rail noise and maximum noise levels which may result in sleep disturbance; and*
 - c) *report on these investigations and the implementation and effectiveness of these measures in the Annual Review,*
to the satisfaction of the Secretary.

2.7 Relevant Standards and Guidelines

Guidelines and standards applying to noise at the NM include:

- New South Wales *Industrial Noise Policy* (INP), Environment Protection Authority (EPA) 2000.



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- Australian Standard (AS) 1055:1997 – *Acoustics – Description and measurement of environmental noise.*
- AS 2702:1984 – *Acoustics – Methods for the Measurement of Road Traffic Noise.*
- AS IEC 61672.1:2004 – *Electroacoustics - Sound level meters – Specifications.*



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3 MANAGEMENT SAFEGUARDS AND AMELIORATIVE ACTIONS

The following actions or strategies will be implemented to minimise the potential for noise impacts at residential receivers. The receivers identified in the Stage 2 Longwall Project EA are shown in Table 3 and illustrated on Figure 2.

Table 3: Non-project Related Residences

Property Reference	Property Name	Monitoring Location
R2	“Ardmona”	Yes – added following Noise Model Validation “N3”
R4	“Oakleigh”	Yes – monitoring location “N5”
R5	“Pineview”	No – monitoring done at “Oakleigh”, located between the mine and “Pineview”
R6	“Matilda”	Yes – added following Noise Model Validation “N8”
R7	“Haylin View”	No – done at “Matilda”, owned by same person
R13	“Newhaven”	Yes – monitoring location “N6”, undertaken at boundary as approved in the 2011 EPL variation
R17	“Bungaree”	No
R18	“Merulana”	No

Note: Table 3 excludes the properties that have been acquired or where private agreements are in place. The properties listed for monitoring are the closest privately-owned residences to the mine.

3.1 Noise Controls

In order to minimise this potential for exceedance the following controls will or have been adopted:

- Prior to being brought onto site, or upon commissioning, all additional plant and equipment would be required to exhibit sound power levels consistent with those identified in the NM Modification 5 EA (Resource Strategies, 2015) (SoC 10.5);
- Sound power levels for key mobile site equipment, i.e. dozers and drill rigs, are to be reviewed annually. High frequency reversing alarms will not be permitted on key mobile equipment brought onto site or will be rectified as required. Rather, all reversing alarms will be of the broadband frequency type;
- Limit the use of a bulldozer at the Reject Emplacement Area during temperature inversion conditions (SoC 10.12);
- Limit the number of truck movements to the Reject Emplacement Area to 1 load per 15 minute period during temperature inversion conditions (SoC 10.13);



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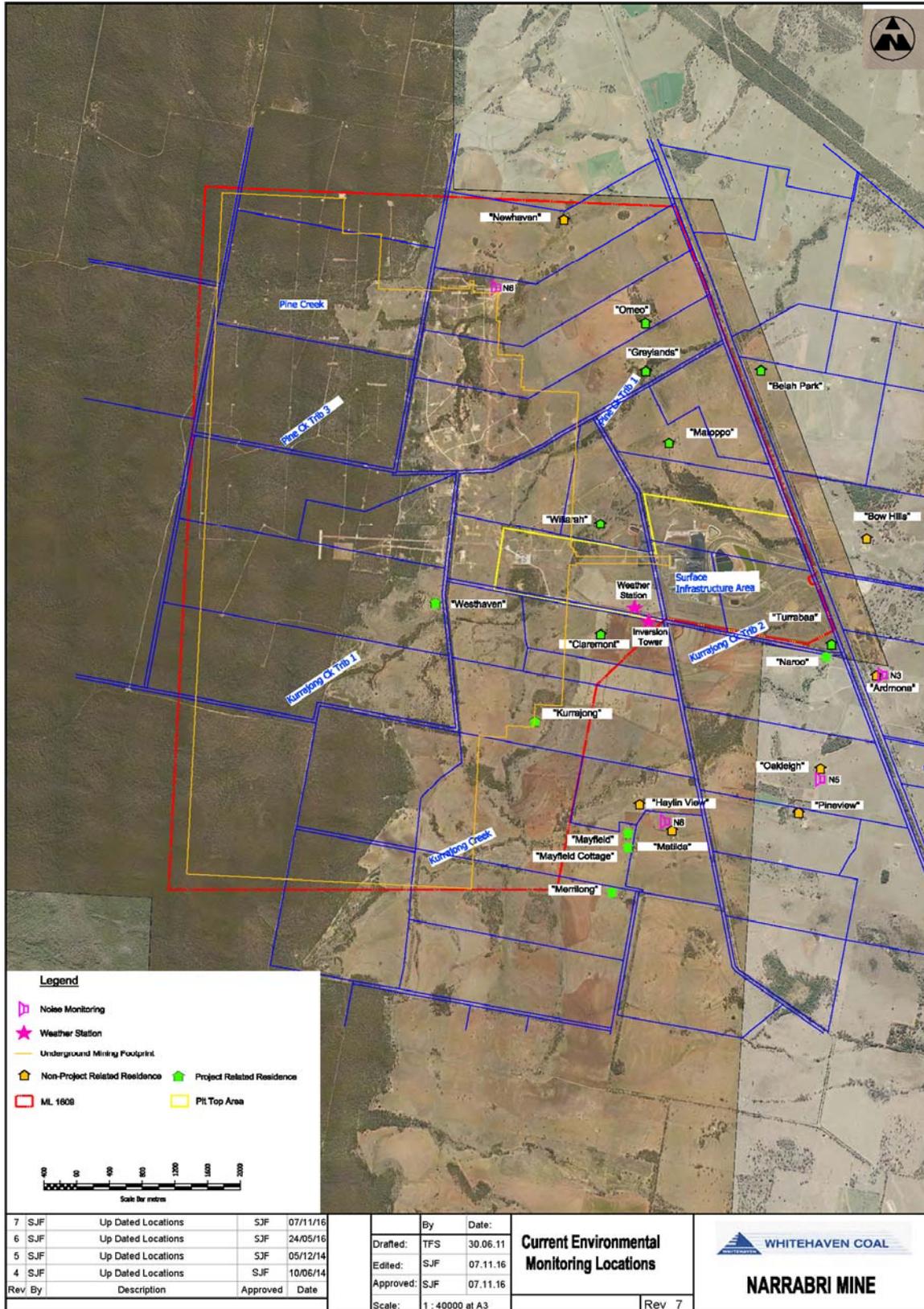


Figure 2: Noise Monitoring Locations¹

¹ Mobile noise unit locations are not included in Figure 2 as their locations may change to areas of greatest affectation however upon request from DP&E their locations will be provided.



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- Ensure specific noise attenuation is provided to surface drills when operating over LW118 to LW120 to achieve a sound power level of 109dB(A) (SoC 10.14);
- Utilise hard barriers to noise propagation paths where necessary during drilling operations. The type of barrier to be used will be based on site specific requirements, and may include the use of shipping containers placed strategically around the drilling rig;
- The approved hours of operation (SoC 2.1-2.10 of PA 08_0144) will be adhered to (refer to Table 4);

Table 4: Approved Hours of Operation

Activity	Hours / Days
Pit Bottom Area development	24 hours / 7 days
Underground mining	24 hours / 7 days
Gas drainage	24 hours / 7 days
Ventilation fan operation	24 hours / 7 days
Coal processing and handling	24 hours / 7 days
Rail loading and transportation	24 hours / 7 days
Surface maintenance	24 hours / 7 days
CHPP reject disposal	24 hours / 7 days ¹
Raw materials / supply delivery	7:00am to 10:00pm / 7 days
<small>Note: Reject disposal activities will generally be restricted to 7:00am to 10:00pm, 7 days per week. However, it is possible that the proportion of reject material generated by the CHPP may exceed the predicted average 5% level for short periods. To account for these periods of elevated reject production, contingent hours of operation will be 24 hours / 7 days (when inversion conditions do not prevail).</small>	

- NM will utilise the mobile noise units as outlined in Section 5.1.2; and
- Monitoring of emitted noise levels will be undertaken during mining operations to verify compliance with noise criteria and to assess the need, if any, for additional noise attenuation measures

3.2 Transport Noise Controls

- The site access road is sealed and regularly maintained (SoC 10.18);
- Strict adherence to the approved hours of operation for transport activities will be enforced by mine management (refer to Table 4) (SoC 10.16);
- All project employees and contractors will be instructed to enter and exit the mine site in a courteous manner and without undue traffic noise (SoC 10.17);
- All unsealed access roads will be regularly maintained to limit body noise from empty trucks, signposted and speed limited (40km/hr) to minimise transport noise (SoC 10.18); and
- The rail track within the rail loop is inspected monthly to monitor rail condition and highlight issues requiring rectification.



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3.3 Construction Noise Controls

While most construction activities are complete at the site, the following still applies to construction of the brine storage ponds:

- Prior to being brought onto site, or upon commissioning, all additional plant and equipment would be required to demonstrate sound power levels consistent with those identified in the NM Modification 5 EA (Resource Strategies, 2015) (SoC 10.5);
- Scraper operations will be restricted under temperature inversion conditions until noise compliance is identified (SoC 10.6); and
- The approved hours of operation (SoC 2.1-2.10 of PA 08_0144) will be adhered to, i.e. between the hours of 7:00am to 10:00pm, 7 days per week.

3.4 Other Noise Controls

- Equipment with lower sound power levels will be used in preference to more noisy equipment (SoC 10.2);
- NM will maintain dialogue with neighbours and the local community to ensure any concerns in relation to noise are addressed, mainly through the Community Consultative Committee (CCC) and complaints handling (refer section 4.2) (SoC 10.4); and
- Where noise exceedances systemic in nature are identified above the noise limits outlined in Section 2.3 at privately-owned residences, negotiated agreements should be sought or the process for property acquisition as outlined in PA 08_0144 followed.

3.5 Risk Management

- All personnel are required to identify, assess and eliminate or control noise management risks at the mine and report these to the Environmental Superintendent; and
- The Environmental Superintendent will update the NMP where appropriate to include control measures identified as a result of risk assessments undertaken as part of the operation of the mine.

3.6 Completed Controls

- Rotary breaker is fully enclosed (SoC 10.10); and
- CHPP is enclosed and 50% of the internal surface is lined with an acoustic insulation (SoC 10.11).

3.7 Noise Model Validation and Review

During 2013 NM commissioned a validation of the noise model (Spectrum Acoustics, 2013) in response to noise exceedances detected at nearby residences. The model validation was used to update the model developed for the Stage 2 Longwall Project EA, which was subsequently updated for Modification 5.



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The model validation identified dozer noise in second gear reverse as a contributing noise factor. However, given the mine is a dozer dependent operation, the limiting of reverse speeds would result in the purchase of additional dozers. The use of additional dozers would result in only a minor potential reduction in noise levels, and given the significant cost of additional dozers this is not considered by the mine to be a reasonable or feasible noise mitigation option.

Future noise model validations will be undertaken in response to sustained exceedances recorded at a privately-owned residence or as required for future modifications to PA 08_0144 where noise is identified as a key environmental issue.

3.8 Noise Management Protocol

A noise management protocol for the site has been developed as required by Schedule 4, Condition 4(e) of PA 08_0144, refer to Table 5.

Table 5: Noise Management Protocol

Control / Action	Timing / Trigger	Responsibility	Monitoring	Reporting
NM and all contractors will provide environmental training on noise control and awareness for all personnel and sub-contractors.	This training will take place before the commencement of work by any employee, contractor, or sub-contractor whose work is likely to create loud noise.	NM Manager / Individual Contractors.	This awareness training will be incorporated into site inductions.	The effectiveness of this control will be monitored by the Environmental Superintendent and will be reported annually in the AR.
Mining equipment will be required to satisfy maximum sound power levels as specified in Table 1 of this NMP.	Mining equipment used on site must be certified as compliant with the relevant noise standard and will be tested on site entry	Contract Coordinators / Environmental Superintendent.	Key mobile mining equipment noise levels will be reviewed annually.	Sound power levels of key mining equipment will be recorded.
Site equipment will be selected so as to have the lowest practical level of sound emission and will be maintained in good order.	This will be a continual process.	Contract Coordinators / Environmental Superintendent.	Noisy equipment is to be highlighted in regular mechanical inspections. Maintenance records are to be maintained and provided upon request.	The effectiveness of this control will be reported annually in the AR.
Due attention will be paid to adverse weather conditions, so that modifications can be made to the work program where necessary. A real time link between monitoring equipment and the site is in place advising of adverse meteorological conditions (e.g. temperature inversion conditions, windy conditions).	This will be a continual process.	NM Manager / Supervisors / Individual Contractors	On-site monitoring will highlight adverse conditions. The effectiveness of this will also be determined in the community consultation process.	The effectiveness of this control will be reported annually in the AR.



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Control / Action	Timing / Trigger	Responsibility	Monitoring	Reporting
All reversing alarms on key mobile equipment will be of the broadband type.	Before use of machinery on site.	Contract Coordinators / Individual Contractors.	General monitoring and observation by NM personnel.	The effectiveness of this control will be reported annually in the AR.
All complaints will be registered and responded to in accordance with the complaints procedure in the NMP.	Whenever a complaint is received.	Environmental Superintendent.	This control will be monitored in the complaints handling and follow-up process.	The effectiveness of this control will be reported annually in the AR.
Attended monitoring of emitted noise levels will be undertaken to verify compliance with noise criteria and to assess the need for additional noise attenuation measures.	On a quarterly basis for attended monitoring.	Environmental Superintendent.	By suitably qualified acoustical consultant.	Monitoring results and the effectiveness of any controls used will be reported in the relevant AR. Exceedances will be reported as outlined in Section 5.5.1.
Real time monitoring of emitted noise levels will be undertaken to assist in managing the operation and to assess the need for additional noise attenuation measures.	On a continuous basis by real time noise monitors.	Environmental Superintendent.	Trained NM employee.	Monitoring results and the effectiveness of any controls used will be reported in the relevant AR.
Temperature inversion incidence and strength will be monitored continuously.	On a continuous basis.	Environmental Superintendent.	Trained NM employee.	Monitoring results and the effectiveness of any controls used will be reported annually in the AR.



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4 MANAGEMENT OF EXCEEDANCES, COMPLAINTS AND NON-COMPLIANCE

The following management measures for exceedances and non-compliances do not relate to mine-owned residences or privately-owned residences where private agreements are in place and the DP&E have been advised in writing of the terms of the agreement. Should sustained exceedances/non-compliances at these locations be recorded then the mine will consider extending the monitoring program to the nearest privately owned residences to assess compliance.

4.1 Noise Impact Assessment Criteria Exceedances

If attended noise monitoring results exceed the levels outlined in Section 2 and taking into consideration Section 11.1.3 of the INP, i.e. measured noise levels must exceed the relevant criterion by 2 dB before the development is 'deemed to be in non-compliance', notifications will be made as outlined in Section 5.5.1 and advice will be sought to identify options to address noise related impacts. Such actions will include:

- Additional testing to confirm the elevated noise is sustained in nature. Further discussion will be undertaken with EPA and DP&E regarding additional monitoring requirements to determine whether a sustained exceedance constitutes a non-compliance;
- Consideration to changes to operational procedure or equipment type; and
- The installation of sound attenuation measures to plant and equipment, where necessary.

Where it is identified that the above options cannot achieve compliance with noise criteria, confirmed through attended noise monitoring, NM will undertake negotiations with the affected landowners with a view to entering into private agreements. Such negotiations would include options with regard to provision of insulation, double-glazing of windows, air-conditioning, or other measures designed to reduce noise impact at the affected property in accordance with conditional requirements.

Only attended noise monitoring will be utilised to determine compliance. Real time monitoring will be used for operational management purposes only.

4.1.1 Independent Review and Land Acquisition

If an owner of privately-owned land considers the mine to be exceeding noise compliance criteria, they may ask the Secretary in writing for an independent review of the impacts on their land. Conditions 3 and 4 of Schedule 7 of PA 08_0144 specify the independent review process.

Within 3 months of receiving a written request from a landholder with acquisition rights, NM shall make a binding written offer as detailed in Conditions 5-7, Schedule 7 of PA 08_0144. Noise acquisition criteria are specified in Schedule 4, Condition 2 while Schedule 7, Condition 6 requires NM to pay all reasonable costs associated with the land acquisition process.



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4.2 Complaints Handling

Any complaints received in relation to noise will be managed in accordance with the complaints management protocol described as follows:

- A publicly advertised telephone complaints line will be in place to receive complaints during operating hours and record complaints at other times.
- Each complaint received will be recorded on a Complaints Form, which will include the following details:
 - The date and time of complaint.
 - Any personal details the complainant wishes to provide or if no such details are provided a note to that effect.
 - The nature of the incident that led to the complaint, including its time and duration.
 - The action taken by the mine in relation to the complaint, including any follow-up contact with the complainant.
 - If no action was taken by the mine, the reason why no action was taken.
- The Environmental Superintendent will be responsible for ensuring that an initial response is provided within 24 hours of receipt of a complaint when received within normal business hours (except in the event of complaints recorded when the mine is not operational).
- Additional measures will be undertaken as required to address the complaint. This may include visiting the complainant, or inviting the complainant to the mine site.
- Once the identified measures are undertaken, the Environmental Superintendent will sign off on the relevant complaint within the Complaints Form.
- If necessary, follow-up monitoring comprising attended $L_{Aeq(15 \text{ minute})}$ measurements during the day, evening and night periods will be undertaken to confirm the source of the complaint is adequately mitigated.
- A summary of the complaints will be kept in a Complaints Register will be kept by the mine and made available to the NM Community Consultative Committee (CCC), the complainant (on request) and on the Whitehaven website. A summary of complaints received every 12 months will be provided to the DP&E, NSC, EPA, DRG and the CCC through the AR.

Based on the nature of individual complaints and the noise levels recorded, mitigation measures and/or acquisition rights could be triggered if the levels recorded are above those specified in Section 2.3 and are systemic in nature.

4.3 Contingency Measures

If noise levels at any residence exceed the levels outlined in Section 2.3, advice will be sought to identify options to address noise related impacts. Such actions will include:

- Additional testing to confirm the elevated noise is systemic in nature;



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- Additional testing to confirm the equipment has a sound power level that was identified in the EA;
- Implement any reasonable and feasible mitigation measures identified by the acoustic consultant;
- Consideration to changes to operational procedures or equipment types; and
- The installation of sound attenuation measures to plant and equipment, where necessary, to ensure that noise emissions comply with the relevant noise levels in Section 3.1.

Where it is identified that the above options cannot achieve compliance with noise criteria, NM will undertake negotiations with the affected landowners with a view to entering into private agreements. Such negotiations would include options with regard to provision of insulation, double-glazing of windows, air-conditioning, or other measures designed to reduce noise impact at the affected property. Should an agreement not be reached then the landowner could request acquisition as outlined in Section 4.1.1.



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5 MONITORING AND REPORTING

Periodic (attended) and real-time (continuous) monitoring of noise levels is required in accordance with Condition 4, Schedule 4 of PA 08_0144, which is reproduced in Section 2.3 of this NMP.

5.1 Noise Monitoring Programs

Noise monitoring includes attended monitoring at the residences identified on Figure 2 and Table 3 as well as real-time noise monitoring and temperature inversion monitoring. The real-time monitoring is used to assess the mines performance and the attended monitoring is used to determine compliance with the noise impact assessment criteria outlined in Section 2.3. Temperature inversion monitoring is undertaken to verify impact of temperature inversions on noise compliance.

5.1.1 Attended Noise Monitoring

The attended monitoring is undertaken on a quarterly basis over a period of three (3) consecutive days. In circumstances where the attended monitoring program does not provide conditions conducive to validation monitoring over the three days (i.e. wind speed and/or inversions outside the valid range of values in Condition 1, Schedule 4 of PA 08_0144) then within one (1) month an additional set of monitoring will be conducted at a time that covers those events.

In circumstances where noise complaints are made relating to operations at the mine site, additional targeted noise investigations may also be undertaken at those receivers in order to assess and/or validate the complaint, refer to Section 4.2.

Attended noise monitoring events target times when the mine is in full operation to ensure maximum potential affectation of low frequency noise is assessed, particularly during operations of the rail load out facility, and operation of the CHPP.

5.1.2 Real Time Noise Monitoring

In order to actively manage noise emissions onsite and to adequately comply with the requirement for proactive noise control measures, NM maintains a real time continuous noise management system. The key features of the monitoring system are as follows:-

- Real time access to monitoring information;
- Alarms generated based on certain parameters that include 15-minute noise levels approaching compliance limits;
- Universal user interface platform (web browser);
- Automatic daily reporting;
- Streaming audio to PC; and
- Continuous audio recording (.mp3 format).

Attended monitoring will be used to ensure calibration of the monitor and to assess inversion related impacts.

Real time noise monitoring occurs continuously with portable monitors enabling them to be relocated to areas of potential greatest impact during the life of operations. One



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monitor is located at the mine’s northern boundary and one located at the mine’s southern boundary. A third monitor is situated at one of the locations nominated in Table 3, but monitoring can also be extended to other residences in the event of noise related complaints or site activities that are identified as being of potential disturbance at other locations. The siting of the real time monitors will also give due regard to predominant wind direction (predominantly on a NW-SE gradient) at the time to ensure monitoring is undertaken in the quadrant of greatest impact at that time.

A Trigger Action Response Plan (TARP) has been developed based off alarms generated from the mobile noise units. The TARP requires actions to be implemented depending on the alarm type, i.e. initial or repeating, and recording actions taken and notifications made. Actions that can be implemented include: reviewing the live audio to determine source of alarm; limiting dozer reverse speeds; and relocating noisy equipment if identified as a noise source.

5.2 Temperature Inversion Monitoring

Temperature inversion monitoring is undertaken continuously by directly measuring temperature at two elevations 50m apart (10m & 60m from ground level). The differential over 50 meters is extrapolated to determine temperature lapse rate per °C/100 meters. This is done at the NM Temperature Inversion Tower, EPL 12789 monitoring location ‘W2’, in accordance with Appendix E of the INP. This method will provide an opportunity to assess inversion strength, the impact of the inversion on capacity to adhere to noise limits, and the capacity to adjust operations at surface during inversions if noise levels are identified above consent limits, i.e. during attended monitoring.

A Trigger Action Response Plan (TARP) has been developed based off alarms generated from the inversion tower. The TARP requires actions to be implemented depending on the alarm type and recording actions taken and notifications made. Actions that can be implemented include: limiting movements as required in Sections 3.1 & 3.3 for certain equipment; review operational tasks; and check for operational noise issues.

5.3 Noise Monitoring Frequency

The frequency of monitoring for the various noise monitoring programs is presented in Table 6.

Table 6: Noise Monitoring Summary

Type	Frequency	Responsibility	Comments
Operational Noise			
Attended noise surveys	Quarterly	Suitably Qualified Acoustical Consultant.	Noise monitoring methodology provided in Section 5 of NMP.
Temperature inversion monitoring	Continuous	NM or Suitably Qualified Acoustical Consultant.	Inversion monitoring methodology provided in Section 5.2.
Real-time	Continuous but portable	NM or Suitably Qualified Acoustical Consultant.	Noise monitoring methodology provided in Section 5 of NMP.
Mobile Mine Equipment Sound Power Levels			
Key Mobile Mine Equipment	Annually	Suitably Qualified Acoustical Consultant.	The sound power levels are to be recorded and compared against model inputs.



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5.4 Noise Monitoring Procedures

Attended noise surveys will be conducted in accordance with the: NSW Industrial Noise Policy, 2000 (INP); EPL 12789; Environmental Noise Control Manual; applicable Australian Standards; Stage 2 Longwall Project EA (R.W. Corkery, 2009); the NM Modification 5 EA (Resource Strategies, 2015); and the requirements of PA 08_0144, specifically Condition 1, Schedule 4, notes 1, 4 and 5.

5.5 Reporting

A summary of noise monitoring results will be reported to the CCC via the Environment Monitoring Report. EPL 12789 requires that monitoring results for nominated locations must be reported monthly and included on the company's website. These reports will be periodically uploaded onto the Whitehaven Coal website. Condition R4.1 of EPL12789 also requires the submission of a noise compliance assessment report within 30 days following the completion of quarterly noise monitoring.

Each year, the results of the noise monitoring program will be summarised in the AR together with reference to prevailing meteorological data and site activities during the measurement period(s), where relevant. Reporting will also include an analysis of the monitoring results against the exceedance criteria, previous monitoring results and predictions made in the EA. Where attenuation of plant is required and testing of attenuation and/or sound power level tests are completed, the results of these tests will also be summarised in the AR.

5.5.1 Incident Notification

The Environmental Superintendent will review the results of attended noise monitoring or following notification from the acoustic consultant, and in accordance with Condition 4, Schedule 6 of PA 08_0144, report any incident of exceedance in noise criteria as soon as practicable to the DP&E and EPA (for incidents involving properties listed in EPL 12789). Within 7 days of providing this notification, NM will provide a written report identifying the date, time and nature of the exceedance, identify the cause or likely cause of the exceedance, describe actions taken in relation to the exceedance, and identify any measures being undertaken to minimise the risk of future exceedance of noise criteria. Any exceedance in noise criteria will also be reported in the AR.

The extent of notification and reporting requirements depends on the severity of the issue, and whether the noise level is within modelled noise exceedance limits, but generally includes notification to DP&E and EPA (for incidents involving properties listed in EPL 12789) and/or the affected landholder as well as discussion in CCC Environment Monitoring Reports and the AR.



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6 SITE IMPLEMENTATION

6.1 Plan Monitoring and Corrective Action

6.1.1 Reviews

This document will be reviewed in accordance with the requirements of Schedule 6, Condition 3 of PA 08_0144.

6.1.2 Corrective Action

In the event that unpredicted or unforeseen noise impacts are identified, the following protocol (Table 7) will be adopted.

Table 7: Unpredicted Impact Protocol

Step	Procedure
1	Review the unpredicted impact including consideration of: <ul style="list-style-type: none">• Any relevant monitoring data; and• Current mine activities as well as activities in the vicinity of the issue.
2	Commission an investigation by an appropriate specialist into the unpredicted impact, if considered appropriate.
3	Develop appropriate ameliorative measures based on the results of the above investigations, in consultation with relevant government departments.
4	Implement additional monitoring, where relevant, to measure the effectiveness of the improvement measures.

6.2 Continuous Improvement

NM will investigate and implement ways to improve the environmental performance of the project over time as required by Schedule 4, Condition 5 of PA 08_0144. This will be achieved by keeping abreast of best practice in the industry for noise management and reporting on environmental performance annually in the AR. Examples of continuous improvement for the NM include, but are not limited to: ongoing liaison with Original Equipment Manufacturers (OEM) to investigate options for noise reducing technologies on plant and equipment; and ongoing review and implementation of the mine's mobile noise units TARP. Stakeholder feedback will form an integral part of assessing noise performance and assist in outlining measures for continuous improvement.



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7 REFERENCES

- Environmental Protection Authority (EPA) (2000), *Industrial Noise Policy*, NSW Government
- NM – Stage 2 Project Approval (PA) 08_0144 and Statement of Commitments
- R.W. Corkery and Co Pty Ltd (2009), *Narrabri Coal Mine Stage 2 Longwall Project: Environmental Assessment*, Prepared for Narrabri Coal Operations Pty Ltd
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