



**WERRIS CREEK COAL
ENVIRONMENTAL
MANAGEMENT SYSTEM**

Document Owner:	Environment
Revision Period:	3 Years
Issue:	Final
Last Revision Date:	16 April 2014
Date Printed:	16 April 2014

WHC_PLN_WC_NOISE MANAGEMENT PLAN

NOISE MANAGEMENT PLAN



Edition	Rev.	Comments	Author	Authorised By	Date
1	Rev D	First Draft for WCC Approval	Advitech	Andrew Wright	26 March 2012
2	Rev E	Draft for EPA Consultation	WCC	Andrew Wright	17 April 2012
3	Rev F	Draft for DoPI Approval	WCC	Danny Young	27 April 2012
4	Rev G	Draft for DoPI Approval	WCC	Peter Easey	28 June 2013
5	Rev H	Final for DoPI Approval	WCC	Andrew Wright	16 April 2014



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EXECUTIVE SUMMARY

This document has been prepared by Werris Creek Coal (WCC) for the NSW Department of Planning and Infrastructure (DoPI) with assistance from an external consultant.

WCC was granted Project Approval (PA 10_0059) on 25th October 2011 from DoP for the Life of Mine (LOM) extension project. Project Modification (PA 10_0059 MOD1) was granted on 30th August 2012. The Project involves a northerly extension of the current mine footprint, increasing the projected mine life by approximately 15 to 20 years. The Project Approval was modified (PA 10_0059 MOD1) on 30th August 2012 for augmentation of Void Water Dam 1 (VWD1) and minor modification to the Biodiversity Offset Area boundary.

To satisfy Condition 5, Schedule 3 of PA 10_0059, WCC are required to prepare and implement a Noise Management Plan (NMP) for the LOM project. The plan has also been prepared to meet the management plan requirements specified in Condition 2, Schedule 5 of the Project Approval.

The NMP summarises the results of the predictive noise impact assessment and outlines the control measures to be implemented as a part of the continued operations at the WCC mine to minimise the potential for noise impacts on the local community and the environment. The NMP also contains an updated Noise Monitoring Program, developed to quantify the noise impacts of the operation and to assess compliance against the revised noise criteria.



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ACRONYMS USED THROUGHOUT THIS DOCUMENT

AEMR	-	Annual Environmental Management Report
AS	-	Australian Standard
CCC	-	Community Consultative Committee
EPA	-	Environment Protection Authority
DoPI	-	Department of Planning & Infrastructure
EA	-	Environmental Assessment
EPL	-	Environment Protection Licence
I&I NSW	-	Industry & Investment NSW
ML	-	Mining Lease
NIA	-	Noise Impact Assessment
NMP	-	Noise Management Plan
NMZ	-	Noise Management Zone
WCC	-	Werris Creek Coal Pty Limited
WCCM	-	Werris Creek Coal Mine

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1 INTRODUCTION

The existing Werris Creek Coal No.2 Coal Mine (WCCM) is operated by Werris Creek Coal (WCC) and is located within the North West Slopes and Plains of New South Wales approximately 45km south west from Tamworth (Figure 1). The mine is currently located approximately 4km south of Werris Creek and 11km north-northwest of Quirindi (Figure 2).

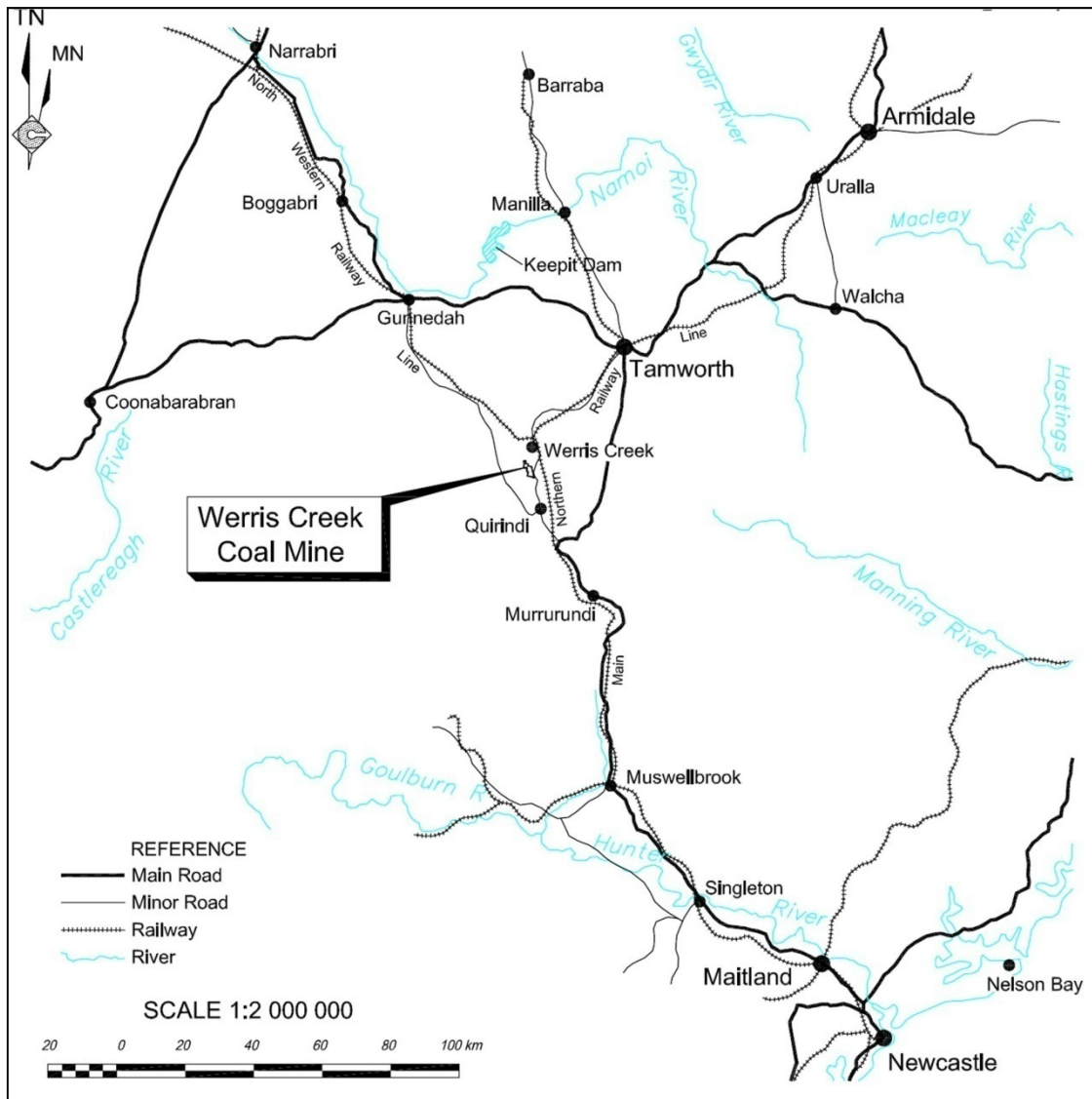


Figure 1: Regional Location (modified from Figure 1.1 R.W. Corkery & Co, 2010)

1.1 History of Operations

Underground mining at the former Werris Creek Colliery commenced commercially in 1925, closing in 1963 due to the cancellation of railway contracts for coal. The operation, owned by Preston Coal Company was small, employing a total of 13 people in 1928 (Pratt, 1996). The former Colliery was predominantly a board and pillar underground operation in which very few of the pillars have been removed (Pratt, 1996). The operation mined the lower 2.5m of what was referred to as the “Tunnel Seam” which corresponds to the E Seam in the current operations.

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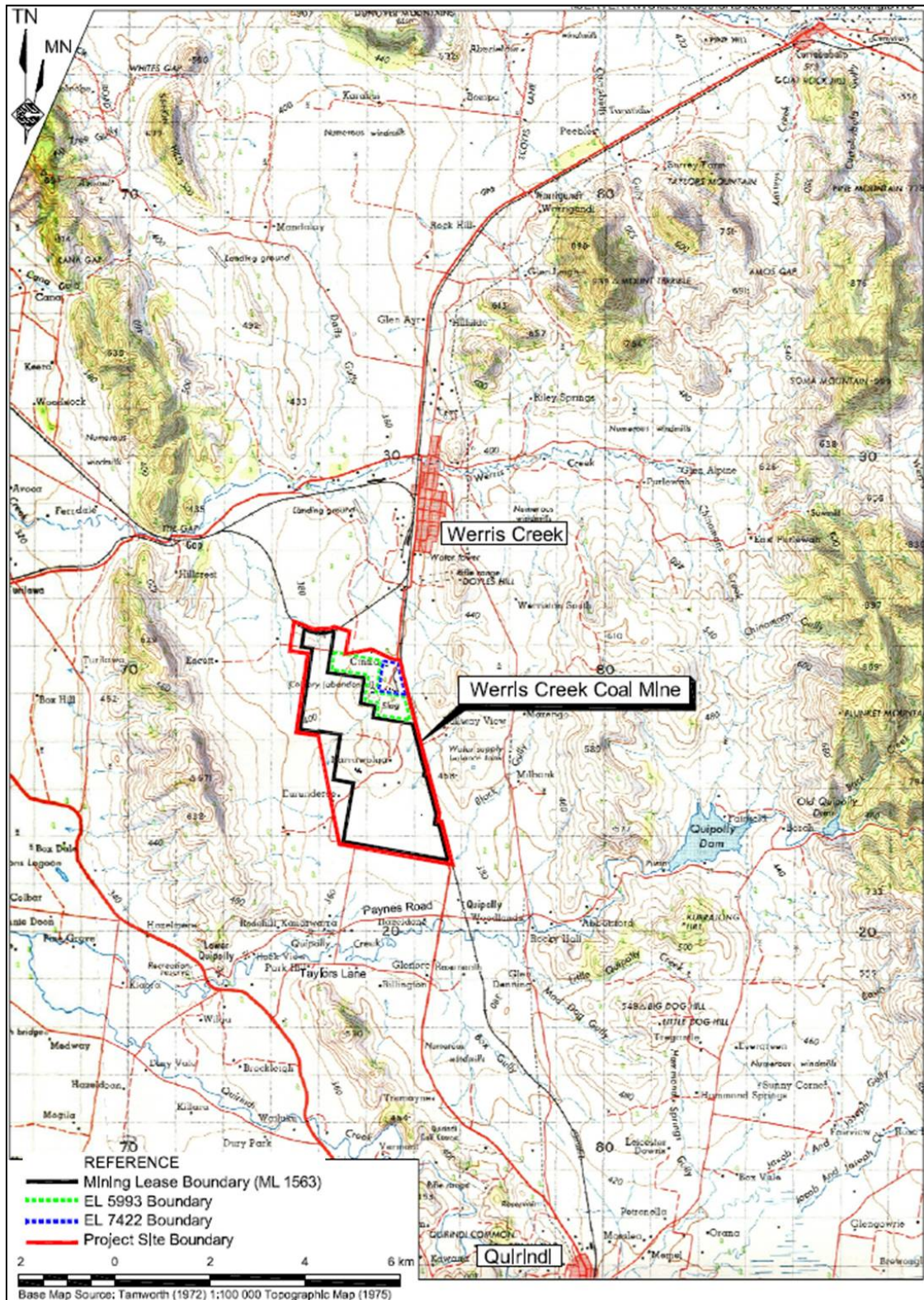


Figure 2: WCC Local Area (modified from Figure 1.1 R.W. Corkery & Co, 2011)

In 2002, Exploration License (EL) 5993 was granted to Creek Resources Pty Ltd and Betalpa Pty Ltd to undertake further exploration of the coal basin. Development Consent DA 172-7-2004 was approved on the 18th February 2005 and the Mining Lease (ML) 1563 was granted on 23rd March 2005. Construction for open cut operations commenced in April 2005. Whitehaven Coal Mining Pty



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Ltd purchased Creek Resources Pty Ltd in 2005 which owned 40% of WCC. Whitehaven Coal purchased the remaining 60% interest in WCC in late 2007 taking management control for the operation. The operating company is Werris Creek Coal Pty. Ltd, which is a wholly owned subsidiary of Whitehaven Coal Mining Pty Ltd.

1.2 Life Of Mine Project

The WCC Life Of Mine (LOM) Project covers an area of 910ha including ML1563, ML1672 (covering EL5993 and EL7422) and ML1671 for mining related purposes which covers the remaining areas within the project boundary not cover by a mining title (**Figure 2**). The LOM Project involves the following component activities and operations (**Figure 3**):

- Increase Void Water Dam 1 (VWD1) storage capacity to 250ML and modify the Biodiversity Offset Strategy to include “Greenslopes/Banool” property compensating for the increased disturbance for VWD1 and alternate LOM Explosive Magazine location in accordance with PA 10_0059(MOD1);
- Northerly continuation of the existing open cut mine to extract the entire Werris Creek outlier of the Greta Coal Measures;
- Extension of the out-of-pit overburden emplacement area to the west over the current footprint of the Coal Processing Area and Site Administration and Facilities Area (out-of-pit emplacement) and construct a “Acoustic and Visual Amenity Bund” that extends around the eastern and north eastern perimeter of the open cut, and extend northwards over the completed sections of the open cut (in-pit emplacement);
- Relocation of coal processing infrastructure (Coal Processing Area) and increase ROM coal stockpile (ROM Coal Pad) capacity to 200000t;
- Maintaining road transportation of coal to domestic markets at 50000tpa to meet the needs of local customers for low ash coal (R.W. Corkery & Co, 2011). Road transport must not go through local government areas of Muswellbrook, Singleton, Mid-Western Regional, Cessnock and Newcastle;
- Production of up to 2.5Mtpa of thermal and Pulverised Coal Injection (PCI) coal for the domestic and international markets;
- Increased storage capacity of the Product Coal Storage Area at the Rail Load-out Facility and extend the pad to the east to increase the capacity of the stockpile area to approximately 250000t;
- Increase in the approved hours of operation to 24 hours, 7 day per week for all activities excluding blasting and road transport of coal from the WCC;
- Relocation of the administration and workshop areas (Site Administration and Facilities Area);
- Construction of a new northern entrance to the WCC mine and subsequent upgrade of Escott Road for direct access to the relocated coal processing infrastructure, offices and facilities has not progressed at this time. As a cost saving due to market and economic constraints, WCC extended the existing southern access road around the western side of the overburden emplacement for access to the new northern Mine Infrastructure Area (MIA);
- Construction of a second feed point to the Rail Load-out Facility to allow for product separation and reduced inter-product contamination has not progressed at this time;
- Construction of a ‘turn-around’ rail loop which would take off from the Werris Creek Rail Siding to the immediate west of the Rail Load-out Facility;
- Continued dewatering the underground workings of the former Werris Creek Colliery (approved under DA 172-7-2004) to enable open cut mining through all of these workings;
- Construction of a Northern Void Water Dam for the storage of water which accumulates in the open cut;



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- Depending on economics, allows for the construction of a conveyor to transport coal from the Coal Processing Area to the Product Coal Storage Area potentially replacing internal coal haulage; and
- Rehabilitation and new Biodiversity Offset Strategy (BOS) focusing on restoring Grassy White Box Woodland.

1.3 Purpose

This Noise Management Plan (NMP - this document) describes the noise environment and predicted impact on community receptors from the WCC LOM Project. It provides details of the management measures implemented by WCC to mitigate noise generation from operational noise sources, and monitoring programs and reporting protocols to maintain compliance with the relevant noise criteria and respond to noise complaints.

The NMP has been prepared with regards to:

- the Life of Mine (LOM) Project Approval 10_0059 which was approved by the Department of Planning and Infrastructure (DoPI) on 25th October 2011 under delegation from the Minister for Planning and Infrastructure;
- the Project Modification (PA 10_0059 MOD1) which was approved by DoPI on 30th August 2012 under delegation from the Minister for Planning and Infrastructure;
- Environment Protection License (EPL 12290) issued by the NSW Environment Protection Authority (EPA);
- the final “Environmental Assessment for Werris Creek Coal Mine Life of Mine Project” (R.W Corkery & Co, 2010); and
- “Response to Submissions for the Environmental Assessment for Werris Creek Coal Mine Life of Mine Project” (R.W. Corkery & Co, 2011).

1.4 Scope

The NMP applies to all noise generating activities represented by Scenario 1 activities (LOM Project Environmental Assessment 2011 to 2015) that could potentially impact on noise levels by WCC as part of the LOM Project, within the areas defined as the Project Site Boundary (**Figure 3**).

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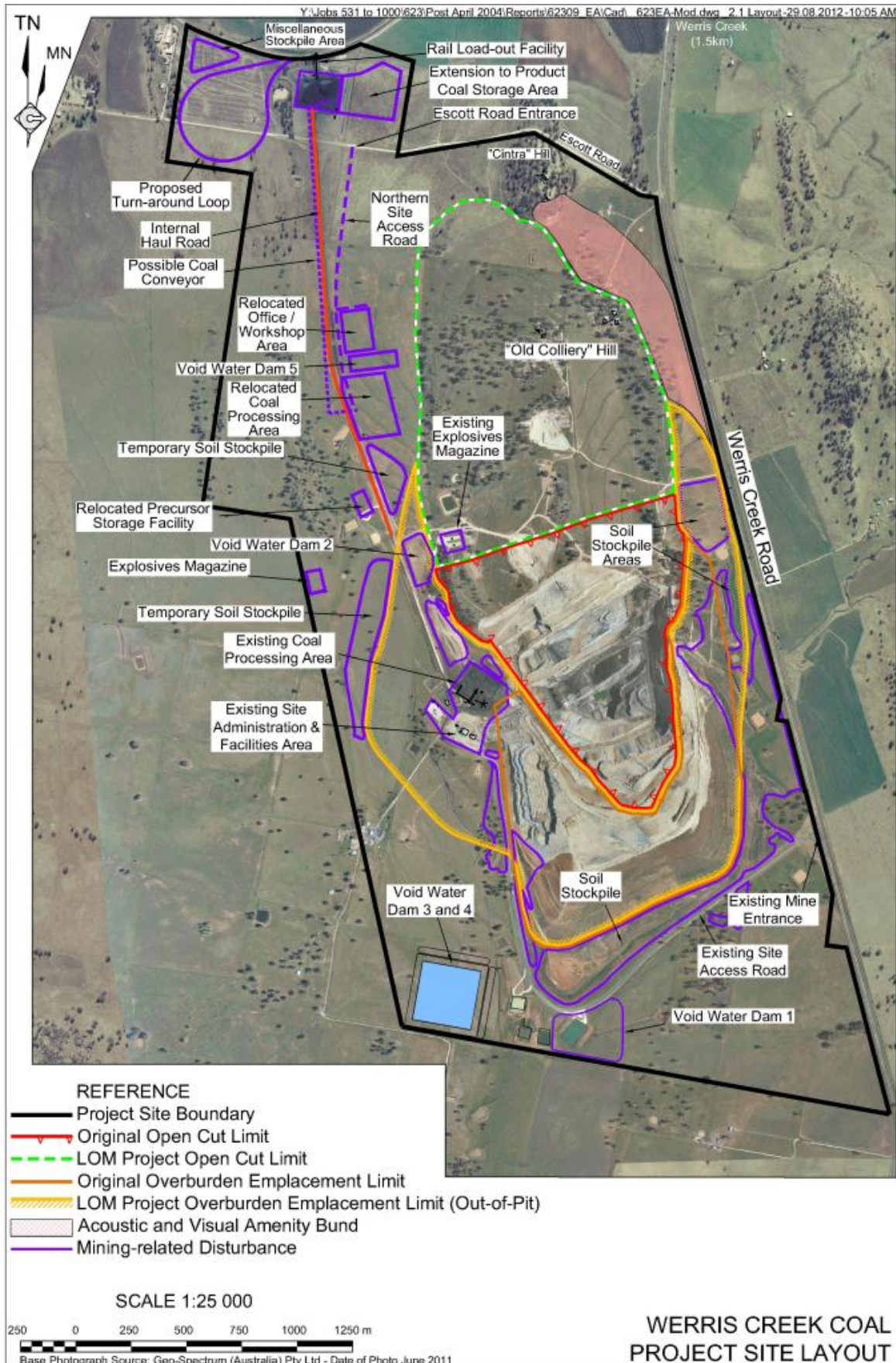


Figure 3: LOM WCC Layout (modified from Appendix 2 PA10_0059MOD1)



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2 RESPONSIBILITIES

The specific roles and responsibilities of WCC employees and contractors in relation to the NMP are outlined in **Table 1**.

Table 1: Roles and Responsibilities

Role	Responsibility
Environmental Manager / Operations Manager	<p>Approve appropriate resources for the implementation of this plan, including resources to support: the Noise Control Operator; ongoing attended and real time noise and meteorological monitoring.</p> <p>Ensure any potential or actual noise issue is reported in accordance with statutory obligations</p> <p>Authorise internal and external reporting requirements of this plan</p> <p>Approve subsequent revisions of this plan</p> <p>Ensure that risk of potential noise impacts associated with installation of new infrastructure or equipment, is appropriately assessed and managed</p>
Environmental Officer	<p>Implementation and Improvement of Plan</p> <p>Ensure the effective implementation of strategies designed to reduce noise impacts from the operation, and develop strategies in consultation with affected parties to minimise noise impacts, or manage risk associated with near misses</p> <p>Provide leadership in relation to noise management</p> <p>Coordinate in the ongoing review of this Plan</p> <p>Noise Monitoring</p> <p>Manage and maintain the noise monitoring programs in accordance with this plan</p> <p>Ensure that the results of monitoring are evaluated and reported to relevant personnel for consideration as part of ongoing mine planning</p> <p>Ensure monitoring equipment is operated in accordance with relevant industry standards and protocols</p> <p>Coordinate the collation and evaluation of monitoring data, and ensure that all monitoring records are maintained on site in accordance with the relevant internal protocols</p> <p>Reporting</p> <p>Manage reporting and publication of monitoring data</p> <p>Ensure all internal and external reporting requirements are met, including incident reporting in accordance with relevant protocols</p> <p>Coordinate incident investigation processes including associated reporting requirements, in accordance with relevant protocols</p> <p>Inspections</p> <p>Conduct periodic environmental inspections in accordance with relevant protocols</p> <p>Consultation</p> <p>Manage access and lease agreements for ongoing management of noise monitoring equipment</p> <p>Ensure effective management of and response to all community complaints and proactively engage government and community</p>



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Role	Responsibility
Operations Managers, Maintenance Managers, Coal Preparation Managers	<p>Ensure sufficient resources are made available to implement specific management measures, including:</p> <p>SWL testing and noise mitigation of mining fleet;</p> <p>Design and construct the relocated CHPP in accordance with the requirements of this plan;</p> <p>implementation of engineered noise controls, including CHPP noise barrier, acoustic and visual amenity bund, enclosure of conveyors and measures to address audibility or horns and alarms;</p> <p>additional noise mitigation at nominated properties, or property acquisitions;</p> <p>staff and contractor training to ensure effective implementation of operational controls;</p> <p>implementation of the Rail Spur Management Plan.</p> <p>Ensure that risk of potential noise impacts associated with installation of new infrastructure or equipment, is appropriately assessed and managed</p>
Operations Managers, Noise Control Operator, Open Cut Examiners, Mine Planning Engineers	<p>Implement strategies designed to reduce noise impacts from the project, including:</p> <p>Noise Control Operator procedures;</p> <p>Real Time Response Protocol;</p> <p>Daily Mine Noise Reduction Planning</p> <p>Ensure any potential or actual noise management issues are controlled in accordance with these procedures, and report any near miss or actual environmental incidents (including noise pollution), to the Environmental Officer</p> <p>Provide regular feedback via the data collection and reporting mechanisms in these procedures, to ensure improvements may be implemented, or constraints corrected</p> <p>Ensure sufficient resources are made available to implement specific management measures, including:</p> <p>SWL testing of mining fleet;</p> <p>managing inventories to promote the use of in-pit work locations during adverse conditions, including use of temporary ROM stockpiles;</p> <p>operation of mining plant (specifically haul trucks, diggers, dozers and drills) in accordance with requirements of this plan.</p> <p>Participate in risk assessment of activities that may generate noise impacts</p> <p>Provide leadership in relation to noise management</p> <p>Ensure personnel working at the operation are aware of the noise obligations</p>
All WCC Employees and Contractors	<p>Act in accordance with noise management procedures or protocols outlined in (or otherwise relevant to) this plan, including:</p> <p>WHC_PRO_Safe Operation of a Dozer;</p> <p>WHC_PRO_Safe Operation of a Dump Truck.</p> <p>Ensure any potential or actual noise management issues, including environmental incidents, are reported to the immediate supervisor</p> <p>Ensure equipment is maintained and operated in a proper and efficient manner</p>



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3 REQUIREMENTS

The regulatory requirements relating to noise management within the various approvals held by WCC are summarised in this section. The following tables provide a guide to where each approval condition is referenced and addressed in the NMP.

3.1 Project Approval 10_0059

The requirements for noise management outlined in WCC LOM Project Approval 10_0059 approved on 25th October 2011 and as modified in PA 10_0059(MOD1) approved on 30th August 2012 are summarised in **Table 2**, with identification of where these requirements are addressed within the NMP.

Table 2: WCC Project Approval 10_0059 and PA 10_0059 (MOD1) Conditions Relevant to Noise Management

Schedule (Condition)	Requirement	Response Detailed in Section																																																																																
3(1)	<p>Noise Criteria WCC shall ensure that noise generated by the project (including noise generated by the Werris Creek rail spur) does not exceed the criteria established in Table 1 of the approval.</p> <p>Table 1: Noise criteria</p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="2">L_{Aeq(15min)} dB(A)</th> <th>L_{A1(1min)} dB(A)</th> </tr> <tr> <th colspan="2">Location</th> <th>Day</th> <th>Evening & Night</th> <th>Night</th> </tr> </thead> <tbody> <tr> <td>R7</td> <td>83 Wadwells Lane</td> <td>37</td> <td>37</td> <td>45</td> </tr> <tr> <td>R8</td> <td>"Almawillee"*</td> <td>37</td> <td>37</td> <td>45</td> </tr> <tr> <td>R9</td> <td>"Gedhurst"</td> <td>37</td> <td>37</td> <td>45</td> </tr> <tr> <td>R10</td> <td>"Meadholme"*</td> <td>39</td> <td>39</td> <td>45</td> </tr> <tr> <td>R11</td> <td>"Glenara"*</td> <td>39</td> <td>39</td> <td>45</td> </tr> <tr> <td>R12</td> <td>"Quipolly Railway Cottage"</td> <td>38</td> <td>38</td> <td>45</td> </tr> <tr> <td>R14</td> <td>"Greenslopes"</td> <td>39</td> <td>39</td> <td>45</td> </tr> <tr> <td>R20</td> <td>"Tonsley Park"*</td> <td>39</td> <td>37</td> <td>45</td> </tr> <tr> <td>R21</td> <td>"Alco Park"*</td> <td>39</td> <td>37</td> <td>45</td> </tr> <tr> <td>R22</td> <td>"Mountain View"</td> <td>36</td> <td>36</td> <td>45</td> </tr> <tr> <td>R24</td> <td>"Hazeldene"</td> <td>37</td> <td>37</td> <td>45</td> </tr> <tr> <td>R96</td> <td>"Talavera"##</td> <td>38</td> <td>37</td> <td>45</td> </tr> <tr> <td>R98</td> <td>"Kyooma"*</td> <td>36</td> <td>36</td> <td>45</td> </tr> <tr> <td colspan="2">All other privately-owned land</td> <td>35</td> <td>35</td> <td>45</td> </tr> </tbody> </table> <p>Notes: To interpret the locations referred to in Table 1, see the applicable figure in Appendix 3 of the project approval; and <i>Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.</i></p>			L _{Aeq(15min)} dB(A)		L _{A1(1min)} dB(A)	Location		Day	Evening & Night	Night	R7	83 Wadwells Lane	37	37	45	R8	"Almawillee"*	37	37	45	R9	"Gedhurst"	37	37	45	R10	"Meadholme"*	39	39	45	R11	"Glenara"*	39	39	45	R12	"Quipolly Railway Cottage"	38	38	45	R14	"Greenslopes"	39	39	45	R20	"Tonsley Park"*	39	37	45	R21	"Alco Park"*	39	37	45	R22	"Mountain View"	36	36	45	R24	"Hazeldene"	37	37	45	R96	"Talavera"##	38	37	45	R98	"Kyooma"*	36	36	45	All other privately-owned land		35	35	45	<p>Section 8 (Management Measures and Strategies)</p> <p>Section 7.1 (Noise Criteria)</p>
		L _{Aeq(15min)} dB(A)		L _{A1(1min)} dB(A)																																																																														
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R14	"Greenslopes"	39	39	45																																																																														
R20	"Tonsley Park"*	39	37	45																																																																														
R21	"Alco Park"*	39	37	45																																																																														
R22	"Mountain View"	36	36	45																																																																														
R24	"Hazeldene"	37	37	45																																																																														
R96	"Talavera"##	38	37	45																																																																														
R98	"Kyooma"*	36	36	45																																																																														
All other privately-owned land		35	35	45																																																																														
3(2)	<p>Noise Acquisition Criteria If the noise generated by the project causes sustained exceedance of the criteria established in Table 2 of the approval.</p>	Section 8.1																																																																																



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Schedule (Condition)	Requirement	Response Detailed in Section								
	<p>Table 2: Noise acquisition criteria</p> <table border="1"> <thead> <tr> <th>Location</th> <th>Day / Evening / Night $L_{Aeq,15minute}$ dB(A)</th> </tr> </thead> <tbody> <tr> <td>All privately-owned land</td> <td>40</td> </tr> </tbody> </table> <p>Note: Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.</p>	Location	Day / Evening / Night $L_{Aeq,15minute}$ dB(A)	All privately-owned land	40					
Location	Day / Evening / Night $L_{Aeq,15minute}$ dB(A)									
All privately-owned land	40									
3(3)	<p>Additional Noise Mitigation Measures WCC shall implement additional noise mitigation measures at any property listed in Table 3 of the approval.</p> <p>Table 3: Land subject to additional noise mitigation measures</p> <table border="1"> <tbody> <tr> <td>R10</td> <td>R18</td> <td>R12</td> <td>R21</td> </tr> <tr> <td>R11</td> <td>R20</td> <td>R14</td> <td>R96</td> </tr> </tbody> </table> <p>Note: To interpret the locations referred to in Table 3, see the applicable figure in Appendix 3</p>	R10	R18	R12	R21	R11	R20	R14	R96	Section 8.12
R10	R18	R12	R21							
R11	R20	R14	R96							
3(4)	<p>Operating Conditions WCC shall:</p> <p>(a) implement best practice noise management to minimise the operational, low frequency, rail and road traffic noise of the project;</p> <p>(b) regularly assess the real-time noise monitoring and meteorological forecasting data and relocate, modify, and/or stop operations on site to ensure compliance with the relevant conditions of this approval;</p> <p>(c) minimise the noise impacts of the project during temperature inversions;</p> <p>(d) use its best endeavours to achieve the long-term noise goals in Table 4, where this is reasonable and feasible, and report on the progress towards achieving these goals in the annual review; and</p> <p>(e) carry out a comprehensive noise audit of the project in conjunction with each independent environmental audit, to the satisfaction of the Director-General.</p> <p>Table 4: Long-term noise goal</p> <table border="1"> <thead> <tr> <th>Location</th> <th>Day/Evening/Night dB(A) L_{Aeq} (15min)</th> </tr> </thead> <tbody> <tr> <td>All privately-owned land</td> <td>35</td> </tr> </tbody> </table> <p>Note: Noise generated by the project is to be measured in accordance with the relevant requirements and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.</p>	Location	Day/Evening/Night dB(A) L_{Aeq} (15min)	All privately-owned land	35	Section 8 Section 9 Section 9 Section 12 Section 13.3				
Location	Day/Evening/Night dB(A) L_{Aeq} (15min)									
All privately-owned land	35									
3(5)	<p>Noise Management Plan WCC shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must:</p> <p>(a) be prepared in consultation with OEH by a suitably qualified expert whose appointment has been approved by the Director-General;</p> <p>(b) be submitted to the Director-General for approval by the end of April 2012;</p> <p>(c) describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval, including:</p> <p>a real-time noise management system that employs both reactive and proactive mitigation measures; and</p> <p>a rail spur management plan, that has been prepared in consultation</p>	Appendix A Appendix A Section 8.3 & 8.4 Section 8.19								



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Schedule (Condition)	Requirement	Response Detailed in Section
	with ARTC and the rail freight company; and (d) include a Noise Monitoring Program that: uses a combination of real-time and supplementary attended noise monitoring measures to evaluate the performance of the project; is capable of monitoring temperature inversion strengths at an appropriate sampling rate; evaluates and reports on the effectiveness of the real-time noise management system; includes a protocol for determining exceedances of the relevant conditions of this approval.	Section 9
3(20)	Meteorological Monitoring For the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that: (a) complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and (b) is capable of continuous real-time measurement of temperature lapse rate, in accordance with the NSW Industrial Noise Policy, or as otherwise approved by OEH.	Section 9
5(7)	Regular Reporting WCC shall provide regular reporting on the environmental performance of the project on its website, in accordance with the reporting arrangements in any plans or programs approved under the conditions of the approval.	Section 12



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3.2 LOM Environmental Assessment Statement of Commitments

The requirements for noise management outlined in the Final Statement of Commitments in the “Response to Submissions for the Environmental Assessment for Werris Creek Coal Mine Life of Mine Project” (R.W. Corkery & Co, 2011) are summarised in **Table 3** and identifies where these requirements are addressed within the NMP.

Table 3: WCC Statement of Commitments

Desired Outcome	Action	Response Detailed in Section
Attenuate mining noise sources to ensure compliance with the Project Specific Noise Criteria	6.1 Construct an Acoustic and Visual Amenity Bund at the northern extent of mining operations.	Section 8.6
	6.2 Locate all mining-related infrastructure, (e.g. coal processing area and site administration and facilities Area), in such a way that local topography (of “Old Colliery” and “Cintra” Hills) provides a natural acoustic barrier to the town of Werris Creek and the residential receivers located to the south of the town.	Section 8.15
	6.3 Use temporary ROM coal stockpiles from time to time within the open cut mine area to minimise the transmission of noise during night-time operations	Section 8.16
	6.4 Continue to enclose the conveyor belt of the rail load out facility.	Section 8.17
	6.5 Ensure that all noise mitigation measures are implemented to ensure that all noise emissions from the Project Site meet predicted noise levels. This may include the following:	
	(a) apply the manufacturer specified attenuator kits to each truck to achieve a noise reduction of 8dB.	Section 8.2
	(b) apply a 1 600rpm reverse gear limiter on bulldozers operating on exposed areas of the Project Site such as the Product Coal Storage Area and ROM Pad.	Section 8.9
	(c) construct a 5m high barrier around the north-eastern perimeter of the relocated coal processing infrastructure.	Section 8.14
	(d) ensure that all equipment exhibits sound power levels consistent with the schedules in Appendix D of Spectrum Acoustics (2010).	Section 8.11
	(e) limit the number of operating drills (non-exploration) on the Project Site to two at any one time.	
	(f) stand down all mobile equipment operating to the north of the advancing open cut under noise enhancing conditions during the evening and night-time, i.e. temperature inversion and winds from the south-southeast or northwest.	Section 8.8 Section 8.7
	(g) whilst the Coal Processing Area remains in its current location, limit the number of trucks and excavators operating during inversion conditions to 10 and 3 respectively.	Section 8.10
	(h) ensure that during periods of noise enhancing winds, overburden emplacement activities are preferentially undertaken ‘in-pit’.	Section 8.7
6.6 Update the Noise Management Plan (NMP) for the LOM Project.		
6.7 Continue the existing monthly Noise Monitoring Program at the existing site to include five new locations to be affected by the Project.	Section 9.1	
6.8 Implement a real-time noise monitoring program at selected residential locations that would be most affected by the LOM Project.	Section 0	
6.9 Implement a real-time meteorological monitoring program at the Project Site to gather data on wind speed and direction, and deduce	Section 0	



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Desired Outcome	Action	Response Detailed in Section
	inversion conditions.	
	6.10 Use the real time meteorological data in the management of mining operations to minimise impact of noise on the environment.	Section 8.4

3.3 Environment Protection Licence 12290

The requirements for noise management outlined in the Environment Protection Licence (EPL) 12290 for WCC are summarised in **Table 4** and identifies where these requirements are addressed within the NMP.

Table 4: Conditions established in EPL 12290

Condition	Action	Response Detailed in Section																																													
L4.1	<p>Noise from the premises must not exceed the noise limits established below:</p> <table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="2">L_{Aeq}(15min) dB(A)</th> <th>L_{A1}(1min) dB(A)</th> </tr> <tr> <th colspan="2">Location</th> <th>Day</th> <th>Evening & Night</th> <th>Night</th> </tr> </thead> <tbody> <tr> <td>R7</td> <td>83 Wadwells Lane</td> <td>37</td> <td>37</td> <td>45</td> </tr> <tr> <td>R9</td> <td>"Gedhurst"</td> <td>37</td> <td>37</td> <td>45</td> </tr> <tr> <td>R12</td> <td>"Quipolly Railway Cottage"</td> <td>38</td> <td>38</td> <td>45</td> </tr> <tr> <td>R22</td> <td>"Mountain View"</td> <td>36</td> <td>36</td> <td>45</td> </tr> <tr> <td>R24</td> <td>"Hazeldene"</td> <td>37</td> <td>37</td> <td>45</td> </tr> <tr> <td>R96</td> <td>"Talavera"[#]</td> <td>38</td> <td>37</td> <td>45</td> </tr> <tr> <td colspan="2">All other privately-owned land</td> <td>35</td> <td>35</td> <td>45</td> </tr> </tbody> </table> <p>For the purposes of the noise criteria in this condition, 5dB(A) must be added to the measurement level if the noise is substantially tonal or impulsive in character.</p>			L _{Aeq} (15min) dB(A)		L _{A1} (1min) dB(A)	Location		Day	Evening & Night	Night	R7	83 Wadwells Lane	37	37	45	R9	"Gedhurst"	37	37	45	R12	"Quipolly Railway Cottage"	38	38	45	R22	"Mountain View"	36	36	45	R24	"Hazeldene"	37	37	45	R96	"Talavera" [#]	38	37	45	All other privately-owned land		35	35	45	<p>Section 8 (mgmt.)</p> <p>Section 9 (monitoring)</p>
		L _{Aeq} (15min) dB(A)		L _{A1} (1min) dB(A)																																											
Location		Day	Evening & Night	Night																																											
R7	83 Wadwells Lane	37	37	45																																											
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R12	"Quipolly Railway Cottage"	38	38	45																																											
R22	"Mountain View"	36	36	45																																											
R24	"Hazeldene"	37	37	45																																											
R96	"Talavera" [#]	38	37	45																																											
All other privately-owned land		35	35	45																																											
L4.2	<p>For the purpose of the condition above;</p> <p>(a) Day is defined as the period from 7am to 6pm on any day;</p> <p>(b) Evening is defined as the period 6pm to 10pm on any day.</p> <p>(c) Night is defined as the period from 10pm to 7am on any day.</p>	Section 9 (monitoring)																																													
L4.3	<p>The noise limits set out in the Noise Limits table apply under all meteorological conditions except for the following:</p> <p>(a) Wind speeds greater than 3 metres/second at 10 metres above ground level; or</p> <p>(b) Temperature inversion conditions up to 12°C/100m and wind speeds greater than 2 metre/second at 10metres above ground level; or</p> <p>(c) Temperature inversion conditions greater than 12°C/100m</p> <p>For the purposes of this condition, data recorded by the meteorological station identified as EPA ID Point No. 9 and the lower level temperature sensor identified as EPA ID Point No. 31 must be used to determine meteorological conditions.</p> <p>Temperature inversion conditions (vertical temperature gradient in</p>	Section 9 (monitoring)																																													



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	degrees (°C) are to be determined by direct measurement over a minimum 50m height interval as referred to in Part E2 of Appendix E to the NSW Industrial Noise Policy.	
L4.4	Noise impacts where wind speed exceeds 3 metres per second at 10 metres above the ground level must be addressed by: <ul style="list-style-type: none"> (a) Documenting noise complaints received to identify any higher level of impacts or wind patterns; (b) Where levels of noise complaints indicate a higher level of impact then actions to quantify and ameliorate any enhanced impacts where wind speed exceeds 3 metres per second at 10 metres above the ground must be developed and implemented. 	Section 8.4 Section 12
L4.5	The noise limits set by condition L4.1 of the licence do not apply where a current legally binding agreement exists between the proponent and the occupant of a residential property that: <ul style="list-style-type: none"> (a) agrees to an alternative noise limit for that property; or (b) provides an alternative means of compensation to address noise impacts from the premises. A copy of any agreement must be provided to the EPA before the proponent can take advantage of the agreement.	Section 8.1
L4.6	To determine compliance: <ul style="list-style-type: none"> (a) with the $L_{eq(15 \text{ minute})}$ noise limits in the Noise Limits table, the noise measurement equipment must be located: <ul style="list-style-type: none"> i. approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or ii. within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, iii. where applicable iv. within approximately 50 metres of the boundary of a National Park or a Nature Reserve. (b) with the $L_{A1(1 \text{ minute})}$ noise limits in the Noise Limits table, the noise measurement equipment must be located within 1 metre of a dwelling façade. (c) with the noise limits in the Noise Limits table, the noise measurement equipment must be located: <ul style="list-style-type: none"> v. at the most affected point at a location where there is no dwelling at the location; or vi. at the most affected point within an area at a location prescribed by part (a) or part (b) of this condition. 	Section 9.1 Appendix E
M8.2	To assess compliance with the noise limits presented in the Noise Limits table, attended noise monitoring must be undertaken in accordance with the condition titled Determining Compliance, outlined above, and: <ul style="list-style-type: none"> (a) at the locations marked as "R7" (83 Wadwells Lane), "R9" ("Gedhurst"), "R22" ("Mountain View"), "R24" ("Hazeldene"), "R12" 	Section 9.1



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Condition	Action	Response Detailed in Section
	("Quipolly Railway Cottage"), "R96" ("Talavera" listed as "Millbank") and "R62" (43 Kurrara Street) on Appendix 3 of Project Approval 10_0059; (b) occur monthly in a reporting period; (c) occur during each day, evening and night period as defined in the NSW Industrial Noise Policy for a minimum of: i. 1 hour during the day; and i. 1 hour during the evening or night. Note: The frequency of monitoring may be varied by the EPA once the variability of the noise impact is established	

3.4 Relevant Guidelines and Standards

The NMP was also prepared with regard to the following standards and guideline documents:

- AS1055.1-1997: Acoustics – Description and measurement of environmental noise;
- AS1259 – 1990. Acoustics – Sound Level Meters;
- AS2659 – 1998: Guide to the use of sound measuring equipment – portable sound level meters;
- AS 2706-1984: Numerical Values: Rounding and interpretation of limiting values; and
- NSW Department of Environment and Conservation (2006), *Assessing Vibration: a technical guideline*, Department of Environment and Conservation, Sydney;
- NSW Department of Environment and Conservation (2005). *Approved methods for the Modelling and Assessment of Air Pollutants in New South Wales*;
- NSW Environment Protection Authority (2000). *NSW Industrial Noise Policy*, NSW Environment Protection Agency, Sydney;
- NSW Department of Environment, Climate Change and Water (2011). *NSW Road Noise Policy*, NSW Department of Environment, Climate Change and Water, Sydney;
- NSW Office of Environment and Heritage (2012). *Draft Rail Noise Guideline*, NSW Office of Environment and Heritage, Sydney;
- Werris Creek Coal Environment Protection License (EPL12290);
- Werris Creek Coal Project Approval (PA 10_0059); and
- Werris Creek Coal Project Approval Modification (PA 10_0059 (MOD1)).



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4 BASELINE CONDITION

This section includes a summary of the background noise environment, historical noise monitoring data surveyed as part of the attended noise monitoring, continuous noise monitoring results, and noise complaints recorded since 2005.

4.1 Background Noise Monitoring

Noise monitoring for the purposes of characterising the ambient (existing) noise environments adjacent to the WCC mine was undertaken during as part of the Noise Impact Assessment (NIA) (Spectrum Acoustics, 2010). Background monitoring was undertaken at three locations considered representative of the broader receiving environments:

- to the north of the project site, on the southern edge of Werris Creek (N1) at residence R62 as identified in the LOM Environmental Assessment (EA);
- to the northeast of the project site (N2) approximately 1km south of Werris Creek at residence R14; representing isolated receivers exposed to existing sources of transportation noise; and
- to the south of the project site (N3), representing receivers in Quipolly locality at residence R105.

The results of this monitoring indicate that transportation (road and rail), urban activities and agricultural operations contribute to the ambient noise environment.

The NIA presented quantitative assessment of monitoring data in accordance with the provisions established in the INP, to establish baseline conditions against which potential mining noise impacts may be assessed. These results are summarised in **Table 5**.

Table 5: Measured ambient and background noise levels

Location	Rating Background Levels (L _{A90})			Ambient Noise Level (L _{Aeq})		
	Day	Evening	Night	Day	Evening	Night
N1 (Werris Creek R62)	31	31	26	50	49	44
N2 (Northeast R14)	32	30	21	46	46	42
N3 (Quipolly R105)	29	27	26	47	45	42

The NIA notes that while generally representative of the ambient noise environment, the measured background levels at the N1 and N2 monitoring locations may represent some influence from the existing WCC operations at the time of monitoring.

4.2 Mining Noise Environment

This section summarises attended and continuous noise monitoring results measured for WCC's operations. A detailed summary of noise monitoring results is presented for 2010-2011 and 2011-2012, while a discussion of noise non-compliances incurred since WCC commenced operations in 2005 has also been presented.



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4.2.1 Attended Noise Monitoring

A review of attended noise monitoring records from April 2010 to March 2012 was undertaken in an effort to establish baseline mine noise impact. A summary of WCC contribution to measured noise levels is provided in **Table 6** to **Table 8**. Periods for which there is no data implies that no monitoring took place, or any WCC contribution was masked by ambient noise sources (and therefore inaudible).

Table 6: Evaluated Day Period WCC noise levels, April 2010 to March 2012

Year	Receiver	April	May	June	July	August	September	October	November	December	January	February	March
2010-2011	Almawillee	17					30	32		30			
	Glenara						34	35	25	33			25
	Cintra	20	38#*	35	36#*	30	34	40#*	40#*				
	Marengo	15				35	27	30					
	Tonsley Park				33			28	34	36#			25
	Railway Cottage	15											
	Greenslopes												36#
	Kyooma										20	27	37#
2011-2012	R5 Rosehill	NM	NM	NM	NM	NM	NM	IA#	IA#	IA#	30#	<30#	31
	Almawillee* ¹	IA*#	IA*#	<20*	<20*#	*IA	*<25#	IA#	IA#	IA	IA#	<25#	31
	Glenara* ²	IA*#	IA*#	37*#	34*#	*<30	*BA#	IA#	IA#	IA#	IA#	IA#	30
	R24 Hazeldene	NM	NM	NM	NM	NM	NM	IA#	IA#	IA#	IA#	IA#	29
	R12 Railway Cottage	IA#	IA#	BA	32#	30#	IA#	IA#	IA#	IA#	IA#	IA#	<25
	R96 Talavera	NM	NM	NM	NM	NM	NM	<30	IA#	30#	IA#	<30#	21
	R97	NM	NM	NM	NM	NM	NM	NM	IA#	33#	25#	24#	<20
	R98 Kyooma*	IA*#	31*	27*	IA*#	*28#	*<30#	BA	IA#	35#	<20#	25#	<20
	R57 Kurrara St	IA#	IA	IA	IA#	33	IA#	30	IA#	IA#	IA#	IA#	IA
	Coronation Ave	IA#	IA	IA	IA#	IA#	IA#	IA	IA#	IA#	IA#	<30#	IA
	R14 Greenslopes	BA#	<25	IA	IA#	BA#	IA#	34	25	35	NM	NM	NM
	Tonsley Park* ³	IA*#	28*	IA*	IA*#	*IA#	*IA#	IA#	IA#	IA#	IA#	IA#	IA
	R103	NM	NM	NM	NM	NM	NM	IA#	IA#	IA	IA#	<25#	IA

- Adverse weather conditions enhancing noise emission not applicable to noise criteria when wind >3m/s or temperature inversion lapse rate >3°C/100m

* Non-project related property due to private agreement or WCC acquired property;

IA – WCC specific noise is inaudible;

BA – WCC specific noise is barely audible <20dB;

1 – Almawillee monitoring location is representative of R7*, R8, R9 & R22;

2 – Glenara monitoring location is representative of R10* and R11*;

3 – Tonsley Park monitoring location is representative of R20* and R21*;

Note: Blank cells indicate periods for which there is no data implies that no monitoring took place, or any WCC contribution was masked by ambient noise sources.



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Table 7: Evaluated Evening Period WCC noise levels, April 2010 to March 2012

Year	Receiver	April	May	June	July	August	September	October	November	December	January	February	March
2010-2011	Almawillee	30	36	35	28	29	25			38#			
	Glenara	34	34	39#	25	30	28	36		38#			
	Cintra	35	40#*	43#*	34	30	25	38#*	38#*				
	Marengo		25			40#	37#	32	30				
	Tonsley Park	35		37#	30		32	40#	31			25	36#
	Railway Cottage	31		36#		33	27	33		39#			
	Greenslopes											26	40#
	Kyooma												38#
2011-2012	R5 Rosehill	NM	NM	NM	NM	NM	NM	IA#	33	IA#	BA#	IA#	33
	Almawillee* ¹	IA*#	35*#	37*#	32*#	*IA#	*32#	IA#	30	IA#	IA#	IA#	32
	Glenara* ²	IA*#	38*#	33*#	30*#	*IA#	*33#	IA#	28	IA#	IA#	IA#	32
	R24 Hazeldene	NM	NM	NM	NM	NM	NM	IA#	IA	IA#	IA	IA#	25
	R12 Railway Cottage	IA#	IA#	<30#	34#	IA	32#	IA#	IA#	IA#	IA	IA#	31
	R96 Talavera	NM	NM	NM	NM	NM	NM	IA#	33	25#	BA#	<30#	<20
	R97	NM	NM	NM	NM	NM	NM	NM	30	30#	20#	<30#	<20
	R98 Kyooma*	IA*#	IA*#	36*#	37*#	*40#	*32#	BA#	30	33#	<20#	<30#	<20
	R57 Kurrara St	32#	IA#	<30#	IA#	34#	32#	IA	25	IA#	IA#	<30#	IA
	Coronation Ave	32#	IA#	33#	IA#	30#	IA#	IA	IA	IA#	IA#	IA#	IA
	R14 Greenslopes	35#	28#	40#	31#	42#	36#	34	35	33#	NM	NM	NM
	R20 Tonsley Park* ³	33*#	IA*#	35*#	IA*#	*34#	*31#	30	IA	37#	IA	30#	33
R103	NM	NM	NM	NM	NM	NM	IA	IA	IA#	IA#	IA#	IA	

- Adverse weather conditions enhancing noise emission not applicable to noise criteria when wind >3m/s or temperature inversion lapse rate >3°C/100m

* Non-project related property due to private agreement or WCC acquired property;

IA – WCC specific noise is inaudible;

BA – WCC specific noise is barely audible <20dB;

1 – Almawillee monitoring location is representative of R7*, R8, R9 & R22;

2 – Glenara monitoring location is representative of R10* and R11*;

3 – Tonsley Park monitoring location is representative of R20* and R21*;

Note: Blank cells indicate periods for which there is no data implies that no monitoring took place, or any WCC contribution was masked by ambient noise sources.



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Table 8: Evaluated Night Period WCC noise levels, April 2010 to March 2012

Year	Receiver	April	May	June	July	August	September	October	November	December	January	February	March
2010-2011	Almawillee	20	37#	30			20						
	Glenara	26	32	32			30						
	Cintra	42#*	39#*	32	36	33	27						
	Marengo		30	25		38#	38#						
	Tonsley Park	29	40#	30	25	32	32						
	Railway Cottage	25	31	33	30		31						
	Greenslopes												
	Kyooma												
2011-2012	R5 Rosehill	NM	NM	NM	NM	NM	NM	IA	IA	IA	25#	<30	27#
	Almawillee* ¹	30*	32*#	38*#	33*#	*27#	*32#	29	BA	35	32#	<25	32#
	Glenara* ²	<25*#	32*#	38*#	34*#	*29#	*33#	<20	<25	<25	30#	<25	32#
	R24 Hazeldene	NM	NM	NM	NM	NM	NM	IA#	IA	IA	25#	<25	31#
	R12 Railway Cottage	IA#	25#	32#	34#	28#	IA#	IA#	25	IA	IA	<30#	31#
	R96 Talavera	NM	NM	NM	NM	NM	NM	24#	27	<20	<20#	<30#	BA#
	R97	NM	NM	NM	NM	NM	NM	NM	29	IA#	IA	<30	<20#
	R98 Kyooma*	IA*#	IA*#	35*#	35*#	*35#	*41#	23#	36	<20	<20#	<30	BA#
	R57 Kurrara St	34#	IA#	35#	IA#	38#	30#	30#	<25	26	IA#	<30	IA#
	Coronation Ave	34	IA#	34#	IA#	35#	30#	25#	IA	IA	IA#	IA#	IA#
	R14 Greenslopes	39#	IA#	45#	36#	38#	31#	33#	39	34	NM	NM	NM
	R20 Tonsley Park* ³	38*#	IA*#	38*#	IA*#	*32#	*IA#	34#	IA	37	30	30#	IA#
	R103	NM	NM	NM	NM	NM	NM	IA#	IA	IA#	IA	IA#	IA#

- Adverse weather conditions enhancing noise emission not applicable to noise criteria when wind >3m/s or temperature inversion lapse rate >3°C/100m

* Non-project related property due to private agreement or WCC acquired property;

IA – WCC specific noise is inaudible;

BA – WCC specific noise is barely audible <20dB;

1 – Almawillee monitoring location is representative of R7*, R8, R9 & R22;

2 – Glenara monitoring location is representative of R10* and R11*;

3 – Tonsley Park monitoring location is representative of R20* and R21*;

Note: Blank cells indicate periods for which there is no data implies that no monitoring took place, or any WCC contribution was masked by ambient noise sources.

A summary of mine noise impacts is considered in terms of trends in compliance with the project noise criteria, assessed on the basis of attended noise monitoring results. A summary of these results is presented in **Table 9**, and indicates significant reductions in non-compliance rates since Whitehaven Coal took management control of WCC in December 2007. These trends are used to inform performance goals, as outlined in **Section 7.2**.



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Table 9: Observed trends in noise non-compliance events

	Annual Reporting Period (April to March)							
	2005 to 2006	2006 to 2007	2007 to 2008	2008 to 2009	2009 to 2010	2010 to 2011	2011 to 2012	2012 to 2013
Number of Non-compliance events	2	46	23	3	1	1	0	0

4.2.2 Continuous Noise Monitoring

Unattended noise measurement results observed by the SentineX real time monitoring system were also reviewed, although it should be noted that these analyses provide indication of cumulative noise levels (all sources), rather than assessment of discrete mining contribution. It is considered that the distribution of measured $L_{A90,15\text{minute}}$ noise levels may be an appropriate measure by which baseline noise levels may be quantified, as:

- L_{A90} noise levels are less likely to be influenced by short term, high impact transient noise sources. Utilisation of this metric provides for description of background noise levels in these receiving environments, whilst excluding impacts associated with highly localised (therefore non-mining) sources;
- while subject to some variation, aggregate mine noise (typically described as 'mine hum') is generally continuous in nature. Therefore, L_{A90} noise levels would be sensitive to these impacts, which ensures their capture in the presentation of baseline monitoring data.

No meteorological exclusions were applied to the results in **Table 10** to ensure these results remain comparable, and representative of background noise levels under all conditions. Analysis of night period monitoring results for the period November 2010 to February 2011 is presented in **Table 10**.

As the unattended (continuous) monitoring data represents received noise levels from all sources, results are specific to receiver locations rather than receiving environments. Results are therefore reported by receiver to account for site specific contributions from ambient noise sources, including road and rail traffic, and environmental sources.

Table 10: $L_{A90\ 15\ \text{Minute}}$ measured noise levels by receiver location for November 2010 to February 2012 (dB(A))

Location	Mountain View	Tonsley Park	Greenslopes	Hazeldene	Kyooma
November 2010	30-44				
December 2010	31-40				
January 2011	34-43				
February 2011		46-53			
March 2011		41-48			
April 2011			29-41		
May 2011			27-35	21-33	
June 2011				<20-32	
July 2011				<20-32	
August 2011				<20-33	
September 2011				<20-33	
October 2011					21-34
November 2011					29-37



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Location	Mountain View	Tonsley Park	Greenslopes	Hazeldene	Kyooma
December 2011					33-37
January 2012					31-39
February 2012	38-43				

4.3 Meteorological Monitoring

4.3.1 Weather Data

R.W. Corkery & Co. (2010) prepared a baseline analysis of meteorological monitoring data for the period September 2007 to August 2008 as part of the EA and summarised what meteorological conditions that may influence noise propagation. Prevailing winds at WCC are predominately light to moderate (between 1.5 m/s and 8 m/s) from the southeast to south-southeast (approximately 25% combined) and from the west-northwest to north-northwest (approximately 33% combined) and calm wind conditions (wind speed less than 0.5 m/s) occur approximately 9% of the year (R.W. Corkery & Co., 2010).

Seasonal wind roses are presented in **Figure 4**, and R.W. Corkery & Co. (2010) made the following observations regarding seasonality of winds adjacent to WCC:

- **Spring:** light to moderate winds are experienced predominantly from the southeast to south-southeast (approximately 22% combined) and west to northwest (approximately 27% combined).
- **Summer:** light to moderate winds are experienced predominantly from the east-southeast to south-southeast (approximately 44% combined).
- **Autumn:** light to moderate winds are experienced predominantly from the east-southeast to south (approximately 41% combined).
- **Winter:** light to moderate winds are experienced from the west to north (approximately 47% combined) and from the southeast to south (approximately 23% combined).

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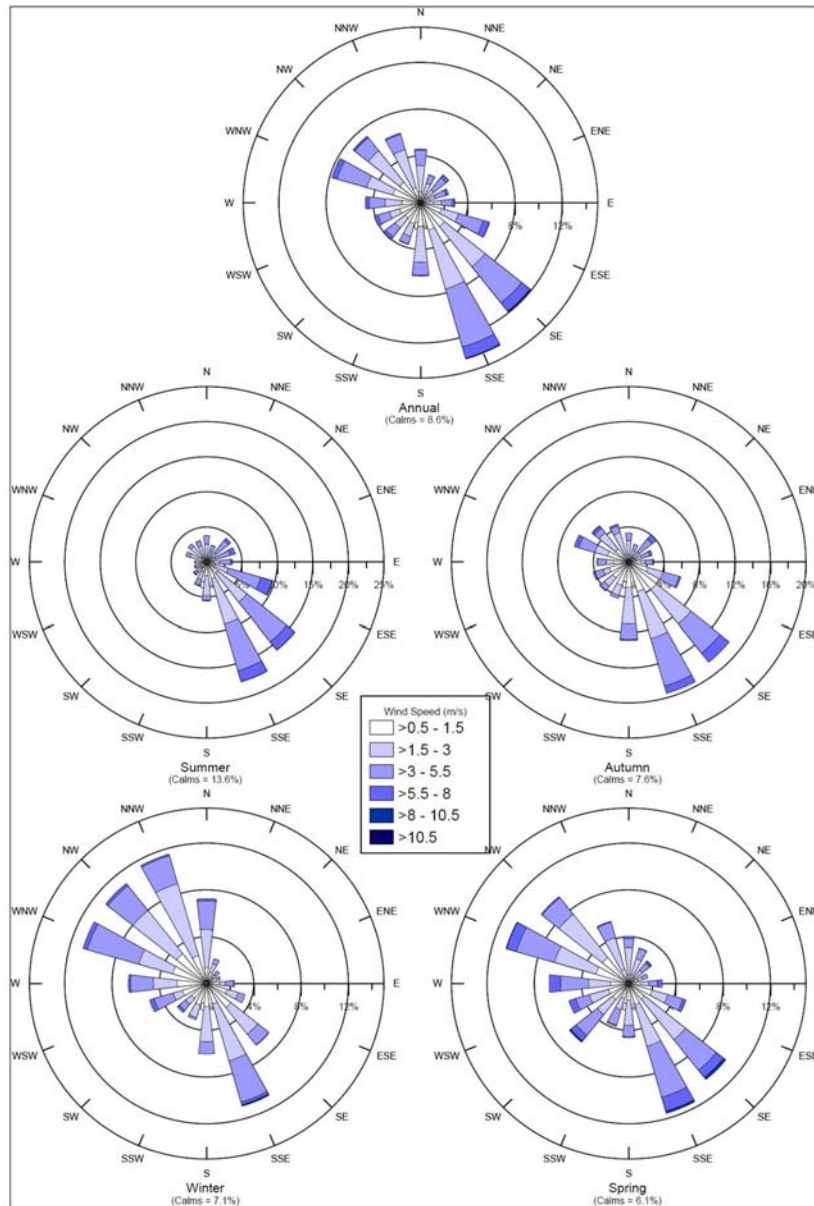


Figure 4: Seasonal wind rose, September 2007 to August 2008

Temperature inversions also exert significant influence on noise propagation. Historically, inversion monitoring has been undertaken at the WCC mine at 15 minute intervals by determining temperature difference between the 10m above ground sensor at the onsite weather station located on top of the WCC mine overburden emplacement area at RL445m, and the 2m above ground sensor on the continuous noise monitoring location when located at “Mountain View” property in Quipolly at RL353m, and extrapolating the difference to determine the temperature differential over a vertical distance of 100m.

Where the temperature increases with elevation, an inversion is present (i.e. positive lapse rate +°C/100m). Analysis presented in the EA indicates that inversions are common in the Quipolly Valley area all year round, however their intensity increases during winter. Measurements undertaken as part of the NIA observed temperature inversions during 20 out of 23 nights (monitored) in June, with a 90th percentile inversion strength of 12°C/100m.



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Figure 5 presents further analysis of continuous meteorological monitoring for the period April 2011 to March 2012. The results of this assessment are summarised in **Table 11**.

Table 11: Summary of inversion conditions (°C/100m) April 2011 to March 2012

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Occurrence (Days)	29	26	29	28	31	29	n/a	n/a	n/a	14 ¹	29	31
90 th percentile strength	+3.7	+13.8	+8.2	+9.4	+9.6	+10.2	n/a	n/a	n/a	+2.1	+4.1	+5.4

Note 1: represents analysis of monitoring results from part of month. n/a: lapse rate not measurable as vertical distance not greater than 50m.

As discussed in **Section 9**, temperature inversion monitoring is now subject to Condition L4.3 of EPL12290 and is continuously monitored by weather stations at the top and toe of the of the overburden emplacement separated vertically by 80m.

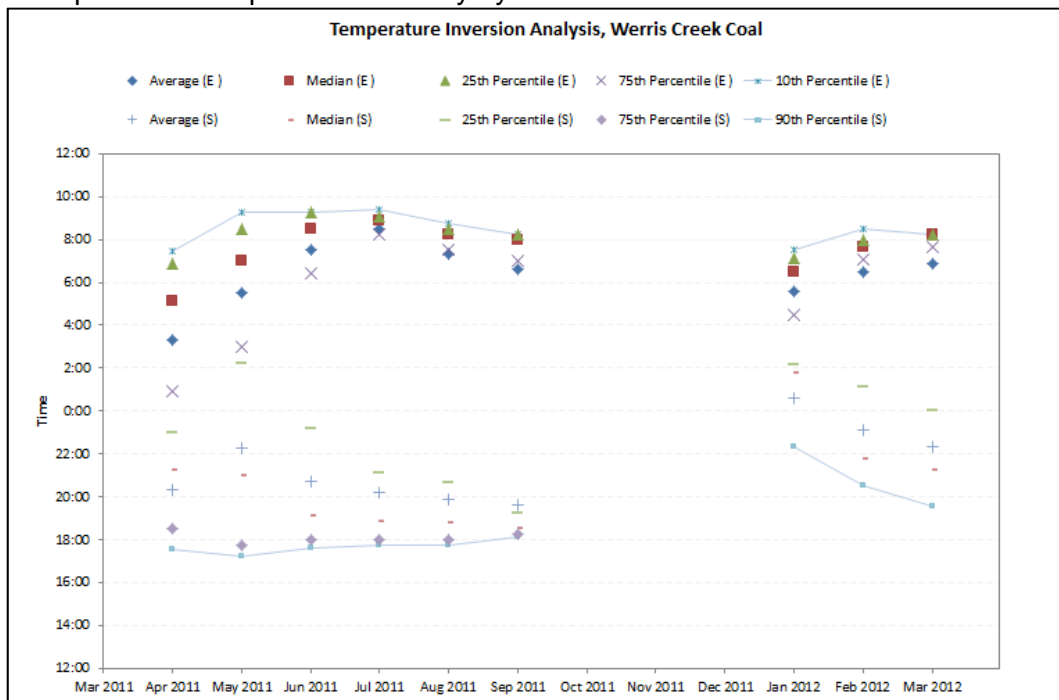


Figure 5: Temperature lapse rate analysis, April 2011 to March 2012

4.4 Noise Complaints

4.4.1 Noise Complaint Data

A summary of noise complaints received by WCC since operations commenced in 2005 is presented in **Table 12**. The WCC annual reporting period is from 1st April to 31st March. Noise complaints represent approximately a quarter of all complaints received by WCC since 2006. The number of complaints and the number of complainants have increased significantly since 2010, however noise complaints still represent approximately 25% of all complaints for the 2010-2011 and 2011-2012 reporting periods.



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Table 12: WCC Noise Complaints since 2005

Complaint Issue	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Noise – Mine	1	3	4	10	4	6	15	14
Noise – Rail Load Out	0	0	0	0	0	7	16	6
All Complaints (inc Noise)	8	10	7	16	12	52	117	56

Until 2010, the majority of complaints relating to the mine (including noise) were from Quipolly residents and a single receiver located to the east of the mine; however since 2010, complaints have been dominated by Werris Creek residents with over 80% of complaints. It is considered that the both the number of complaints and number of complainants has increased because WCC operations are moving closer to Werris Creek, which it has a higher population density compared to the rural Quipolly area.

Since 2010, nearly half the noise complaints (29 out of 64) relate to the Rail Load Out Facility, and significantly the majority of these complaints are from a single complainant located on the southern limits of Werris Creek. All noise complaints were thoroughly investigated, and on further review identified that a number of these complaints for noise alleged from the Rail Load Out Facility were in relation to train shunting and other activities at the Werris Creek Rail Yard, which is a separate facility within Werris Creek township itself and is unrelated to WCC operations.

While one complainant has biased the analysis of the noise complaint data, WCC does recognise that overall noise complaints have increased, the number of complainants has increased and that there is a shift towards Werris Creek residents making noise complaints that requires further management by WCC.

4.4.2 Analysis of Noise Complaint Data

Review of noise complaints for the period April 2011 to February 2012 was undertaken to investigate the relationship between prevailing meteorology and perceived noise impact. Where valid monitoring data is available (for the receiving environment at the time individual complaints were received) results of this analysis indicate that:

- noise complaints from receivers in the Werris Creek receiving environment (approximately 4km north of WCC operations) were observed to be influenced:
 - by noise allegedly generated at the Rail Load Out Facility (including train shunting and dozer operations) more so than extractive (pit based) operations;
 - by strong source to receiver winds (southerly to westerly) although temperature inversions could also be present.
- noise complaints from receivers in the Quipolly receiving environment (approximately 2km south of WCC operations) were observed to be influenced:
 - by truck noise generated by extractive (pit based) operations;
 - by both strong source to receiver winds and temperature inversion.

A summary of valid monitoring data associated with noise complaints is provided in **Table 13**.



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Table 13: Summary of monitoring data at times complaints were observed

Complaint	Location / Affected Receiving Environment	Wind Speed (m/s)	Wind Direction (degrees)	Lapse Rate (degC/100m)
11/04/2011 22:30	Werris Creek	2.3	338	2.9
14/04/2011 22:00	Werris Creek	2.3	200	8.8
16/04/2011 18:00	Werris Creek	3.4	133	-1
17/04/2011 18:00	Werris Creek	6.5	136	-0.5
13/04/2011 21:30	Werris Creek	1.9	338	3.8
14/04/2011 21:15	Werris Creek	1.8	173	5.9
26/04/2011 22:15	Werris Creek	5.2	151	0.4
8/05/2011 23:30	Werris Creek	1.4	177	3.9
4/07/2011 19:50	Quipolly	8	313	1
2/08/2011 22:30	Quipolly	1.2	297	11.9
17/08/2011 20:15	Quipolly	7.5	13	0.7
24/08/2011 21:30	Quipolly	1.4	129	5.4
29/08/2011 19:45	Quipolly	1.2	149	3.4



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5 ENVIRONMENTAL IMPACTS

As part of the LOM EA, the Spectrum Acoustics NIA (2010) predicted noise levels from operational, sleep disturbance and ancillary (transport) activities, and assessed the potential noise impacts. Four scenarios were assessed, representing Year 3 (2014), Year 7 (2018), Year 12 (2023) and Year 15 (2026) operations (**Figure 6**). The Year 3 scenario represents mining operations at the southern end of the LOM Project area and prior to the relocation of the Coal Processing Plant. Year 7 represents the mid-point of the LOM Project as well as during the construction of the Acoustic and Visual Amenity Bund and with the Coal Processing Plant relocated to the north. Year 12 represents mining through “Old Colliery Hill” with the Acoustic and Visual Amenity Bund completed and Year 15 represents mining activities at the northern end of the LOM Project area at the closest point to the Werris Creek township.

Each mining scenario was modelled under a range of meteorological conditions. The following meteorological scenarios were deemed ‘significant’ and detailed assessment of the impact of these conditions on noise propagation was presented in the NIA:

- **Daytime lapse:** 20°C, 70% relative humidity, no wind and Dry Adiabatic Lapse Rate (DALR -1°C/100m);
- **Inversion:** 5°C air temp, 85% relative humidity and inversion strengths of +3, +6 and +12 °C/100m;
- **Prevailing winds:** 3m/s from northwest and 3m/s from southeast.

Preliminary modelling results indicated that noise levels at adjacent sensitive receivers may be greater than 40dB(A), exceeding the intrusiveness noise criterion (35dB(A)) by more than 5dB(A). Consequently, a review of reasonable and feasible mitigation options was carried out, and iterative modelling undertaken to quantify achievable reductions. On the basis of this modelling, WCC committed to implement a range of noise management measures to ensure that the LOM Project could achieve project specific noise levels. The noise management measures are outlined in **Section 8**.

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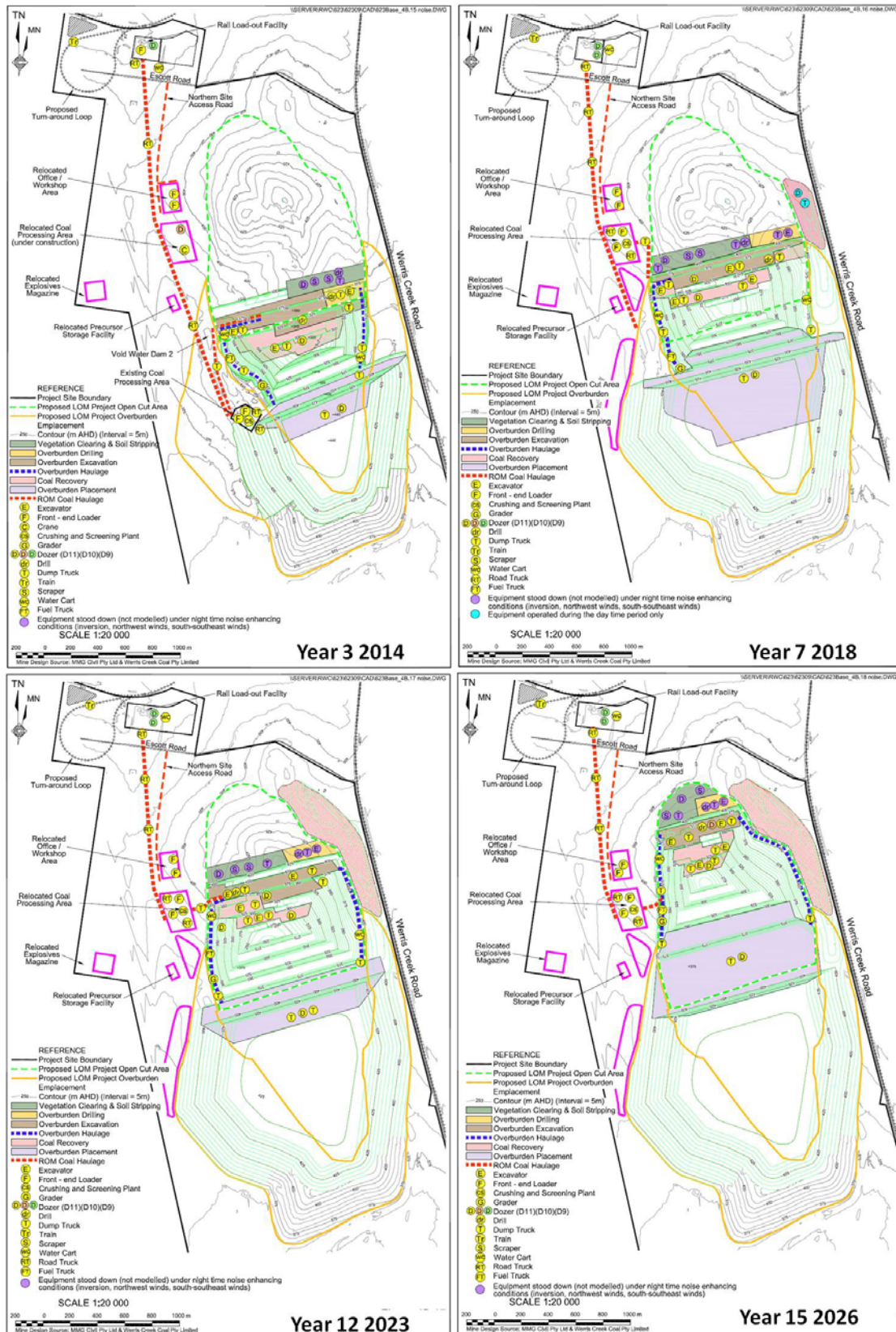


Figure 6: Noise Modeling Scenarios (modified from Figure 4B.15, 4B.16, 4B.17 and 4B.18 R.W. Corkery & Co, 2010)



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5.1 Operational Noise Impacts

The NIA predicted worst case mining noise levels at neighbouring privately owned properties at Year 3, Year 7, Year 12 and Year 15 of the LOM Project (Spectrum Acoustics, 2010). Each mining scenario was modelled under calm, +3°C/+6°C/+12°C per 100m temperature inversions and north westerly/south-south easterly winds at 3m/s for day, evening and night periods. **Table 14** presents only the highest noise level for each scenario with the NIA predicting that noise levels may still exceed 35dB(A) at some receivers under specific meteorological conditions.

Table 14: Summary of Worst Case Operational Noise Impact Predictions

ID	Receiver	Year 3		Year 7		Year 12		Year 15		Worse Case	
		Day	Evening/ Night	Day	Evening/ Night	Day	Evening/ Night	Day	Evening/ Night	Day	Evening/ Night
R18*	Railway Cottage	35	37	39	36	40	37	37	37	40	37
R20*	Tonsley Park	35	37	39	36	39	37	37	37	39	37
R21	Alco Park	34	37	38	35	39	37	37	37	39	37
R3a/ R3b	Lomax	30	33	34	33	34	34	33	34	34	34
R101	Westfall	29	32	33	32	33	32	32	33	32	33
R102	De Haart	29	32	33	32	33	32	32	33	32	33
R103	Parsons	30	33	34	33	34	33	33	34	34	34
R105	Lewis	30	34	34	33	34	33	33	34	34	34
R26	X Kurrara St	31	34	35	33	35	34	34	34	35	34
R55	X Kurrara St	30	34	35	33	35	34	34	34	34	35
R62	X Kurrara St	30	34	34	33	34	35	34	34	35	35
R98	Kyooma	31	34	34	36	33	36	31	33	35	36
R14*	Greenslopes	38	38	38	37	39	39	38	39	39	39
R96	Talavera	37	37	38	35	34	35	33	34	38	37
R17	Woodlands	34	34	32	34	29	34	30	33	35	35
R12	Quipolly Railway Cottage	38	38	35	36	32	36	33	36	38	38
R24	Hazeldene	35	37	33	35	30	35	32	35	35	37
R15*	Plain View	39	43	37	38	34	38	36	38	39	43
R11	Glenara	35	39	34	36	31	36	33	36	35	39
R10	Meadholme	34	39	34	36	30	36	32	36	35	39
R9	Gedhurst	31	37	30	35	27	35	29	35	35	37
R8	Almawillee	31	37	30	35	27	35	29	35	35	37
R7	83 Wadwells Ln	31	37	30	35	27	34	29	35	35	37
R22	Mountain View	30	36	30	35	27	34	28	34	30	36
R5	Rosehill	25	32	24	31	23	29	25	30	25	32

* Project related property purchased by WCC; bold modelled noise level greater than 35dB(A).

The results presented in **Table 14** identify that even with the implementation of the operational controls and management measures described in **Section 0**, elevated noise levels above 35dB(A) noise criterion are predicted mainly for night time periods under +12°C/100m temperature inversion conditions. **Section 8** of the INP notes that if a regulator / consent authority is satisfied that all reasonable and feasible mitigation measures have been applied, that predicted noise levels >35dB(A) can set as the Project Specific Noise Limits. DoPI and EPA accepted that that WCC had implemented all reasonable and feasible measures to reduce or manage noise levels by reducing/attenuating noise at the source; reducing the number of operating noise sources and also committing to active monitoring and management of noise levels.



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With the exception of R15 (“Plain View”), all the other predicted elevated noise results fall within the noise management zone as they do not exceed 5dB(A) above 35dB(A). WCC has subsequently purchased R14, R15, R18 and R20, with those properties now becoming project related. The remaining properties within the noise management zone are only predicted to experience noise levels >35dB(A) under noise enhancing conditions which would only be experienced for limited periods each year. These noise enhancing conditions are generally only a feature of the local environment during specific seasons and periods of the day resulting in the elevated noise levels unlikely to occur very often or for extended periods.

5.2 Sleep Disturbance Impacts

The NIA (Spectrum Acoustics, 2010) presented an assessment of potential sleep disturbance impacts associated with WCC operations. The NIA notes that little variation is observed between L_{Aeq} and peak noise levels (whether indicated by L_{AMax} or $L_{A1,1minute}$ noise levels) from mining plant, and that the source of potential peak noise impacts would be more likely associated with project related rail (including the Rail Load Out Facility) and road traffic.

The predicted sleep disturbance impact noise levels (maximum over the four operational scenarios) at all modelled residences are presented in **Table 15**. Given compliance with the $L_{A1(1-minute)}$ noise levels at R18, R20 and R21, compliance at the residences further north (R3a, R3b, R101, R102, R103 and R105) is implied and no specific model results were obtained. The only predicted exceedance was at R15 which has subsequently been purchased by WCC.



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Table 15: Summary of worst case Sleep Disturbance impact predictions

ID	Noise Levels dB(A) _{LA1min} under Specific Meteorological Conditions			Criterion dB(A)
	Inversion 12°C/100m	NW wind 3 m/s	SSE wind 3 m/s	
R18*	41	26	40	45
R20*	41	26	40	45
R21	41	26	40	45
R3a / R3b	38	24	38	45
R101	38	23	37	45
R102	38	23	37	45
R103	37	24	37	45
R105	37	24	37	45
R26	38	24	37	45
R55	37	23	37	45
R62	37	23	37	45
R98	33	33	<20	45
R14*	42	34	21	45
R96	39	36	<20	45
R17	37	37	<20	45
R12	41	41	22	45
R24	39	38	<20	45
R15*	46	42	21	45
R11	41	39	<20	45
R10	41	37	<20	45
R9	39	35	<20	45
R8	39	35	<20	45
R7	39	35	<20	45
R22	38	35	<20	45
R5	34	27	<20	45

* Project related property purchased by WCC; bold modelled noise level greater than 35dB(A).

5.3 Coal Transport

The closest non project residence (identified as R6 in EA) is setback approximately 40m from the road haulage route (Taylors Lane). The NIA considered a maximum of 10 truck pass-bys (sound power level of 108 dB(A)). The predicted 1 hour traffic noise level at this receiver was calculated to be approximately 48dB(A). This is 7dB below the daytime road traffic noise criterion ($L_{Aeq,1hour}$ 55dB(A)), and 2 dB below the night-time road traffic noise criterion ($L_{Aeq,1hour}$ 50dB(A)). This analysis was based on 100,000t of coal per annum to be transported by road, however WCC subsequently committed to maintaining the current maximum coal transport by road of 50,000t per annum and thus this assessment is worst case for road transport.

The noise environment adjacent to the rail corridor may be divided into two receiver types:

- isolated rural receivers subject to high speed rail pass-by events; and
- suburban received subject to lower speed rail pass-by events.



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Assessment presented in the NIA indicates that, on the basis of minimum setback distances, and current pass-by frequencies of project related rail traffic, maximum rail noise levels would be of the order of:

- isolated rural receivers:
 - $L_{Aeq,15hour}$ (day period): 57dB(A);
 - $L_{Aeq,9hour}$ (night period): 53dB(A);
- suburban receivers (Werris Creek):
 - $L_{Aeq,9hour}$ (night period): 53dB(A);

These impact predictions are below the rail noise criteria of 65dB(A), $L_{eq(15hour)}$ during the day and 60dB(A), $L_{eq(9hour)}$ during the night.

5.4 Noise Re-Modelling

Since the original commitments were made in the LOM EA (2010), some economic and operational conditions have changed, with these changes presenting scenarios which could potentially modify the noise levels predicted in the LOM EA. As a result of economic conditions, Whitehaven Coal has equipment available which was originally purchased for the now deferred Vickery Project. In April 2013 it was thought that this equipment would consist of six CAT 793XQ haul trucks and one Hitachi EX5600 excavator. As WCC is Whitehaven Coal's lowest cost producer, Whitehaven Coal management propose to integrate this equipment into the existing fleet at the WCC mine to offset lower production from its other operations by mining at 2.5Mtpa (up from the previous budget of 2Mtpa). The integration of this equipment into the WCC fleet will allow WCC to maximise operational efficiencies enabling 2.5Mtpa coal production despite increasing strip ratios/overburden thickness as mining progresses through the syncline (deepest point) of the coal deposit. In fact ten CAT 793XQ haul trucks and one Hitachi EX5600 excavator were delivered and are in use at WCC; leaving five CAT 785 haul trucks with Stage 1 attenuation and one CAT 785 haul truck with Stage 2 attenuation (**Section 8.2**).

During the development of the LOM EA it was determined that the Statement of Commitments should state that dozers would only operate in first gear (1600rpm) in reverse. This restriction was adopted in 2009 as a means of reducing the potential noise impacts to the properties "Escott", "Cintra", "Preston Park", "Zeolites", "Old Colliery" and "Tonsley Park". These properties have all since been acquired by Whitehaven Coal, with the nearest potentially impacted non-project related receivers now significantly further north in Kurrara Street, Werris Creek. The construction of the rail loop facility adjacent to the existing Train Load Out Facility will enable WCC to load 6200t capacity standard trains, as opposed to the existing 5200t trains currently loaded by WCC. Operating dozers in first gear when reversing will not allow for the loading of the larger capacity trains within the time allocated by the rail transport contractor and ARTC rail provider.

Given the above considerations, a Noise Re-Model Report 2013 and 2014 were prepared (Spectrum Acoustics 2013 and 2014 – **Appendix C**) to assess the noise impacts of the proposed equipment changes summarised below:

- Operation of the dozers in second gear in reverse;
- The partial replacement of CAT 785 haul trucks with the quieter CAT 793XQ haul trucks;
- Flexibility to use up to five production excavators (consistent with LOM EA) rather than restricted to four in the 2013 report;
- Use of three non-exploration drills; and



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- Instead of two fixed plant crushers, Whitehaven Coal management wanted increase the flexibility to meet specialist product coal types and have gone for one fixed plant and two mobile crushers.

Table 1 of the Noise Re-Model Report 2014 has been reproduced as **Table 16**. This determined that nine locations reduce by 1 dBA and ten locations have no change in predicted noise levels in comparison to the LOM EA noise levels and Noise Re-Model Report 2013. The use of as measured sound power levels for the trucks and excavators demonstrate better than originally predicted noise levels from WCC operations. The Noise Re-Model Report 2014 concluded WCC could still be in compliance with the project specific noise criteria based on the proposed modified fleet configuration.

Table 16: Predicted Noise Levels Under Intense Temperature Inversions dB(A) Leq_(15 minute)

ID	Location	Inversion 12°C/100m				Criterion dB(A)
		LOM EA ¹	Re-modelled 2013	Re-modelled 2014	Difference	
R21	Currey ²	37	38	37	-1	37
R103	Parsons	-	32	32	0	35
R26	Woods	34	35	35	0	35
R55	Pitkin	34	34	34	0	35
R62	Cunningham	35	35	35	0	35
R99	"Werriston South" ³	31	32	32	0	35
R98	Colville ²	36	36	35	-1	36
R97	A & J Davison ³	--	35	35	0	35
R96	Hamilton-Smith	37	37	36	-1	37
R17	Doolan & Hogan	33	33	33	0	35
R12	Bojba	38	38	37	-1	38
R24	P. George	37	37	36	-1	37
R11	Ryan ²	39	39	38	-1	39
R10	Blackwell ²	39	39	38	-1	39
R9	Smith ²	37	37	37	0	37
R8	Hird ²	37	37	36	-1	37
R7	Andrews ²	37	37	37	0	37
R22	Parkes ²	36	36	36	0	36
R5	R. & A. George	30	31	30	-1	35

¹ Highest predicted level for the four operational scenarios considered.

² Private agreements are in place with these receivers.

³ Vacant Land



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6 RISK ASSESSMENT

The NMP has identified operations associated with the LOM Project, the relevant approval conditions relating to noise, the performance of WCC with regards to noise impacts and community complaints received, and the predicted noise emissions of the LOM Project. The next step is to identify the risks of noise hazards from WCC LOM Project operations.

Two separate risk assessments were conducted for WCC to address noise hazard identification, risk (consequence and likelihood) and management controls to mitigate noise risks. The completed risk assessments are located in **APPENDIX D (Risk Assessment)** for:

- Environmental Risk Assessment from LOM Project (R.W. Corkery & Co., 2010);
- Whitehaven Coal Broadbrush Environmental Risk Assessment for WCC (SMS, 2012); and

A summary of those risk assessments for noise are outlined in **Table 17** with the key noise hazards identified, risk ranking (existing controls), and the existing controls and proposed additional management actions to be implemented further mitigate potential noise impacts.

Table 17: WCC LOM Project Risk Summary

Activity	Hazard	Current Management Control	Risk	Additional Management Action
Mining Operations – General (all) activities	Community Complaint	<ul style="list-style-type: none"> ▪ Property Acquisition and Private Agreements ▪ Daily Noise Reduction Mine Planning ▪ Equipment Maintenance ▪ Quipolly Real Time Monitoring Response 	M	<ul style="list-style-type: none"> ▪ MIA and Acoustic and Visual Amenity Bund
Truck Hauling – Attenuated	Noise Criteria Exceedance	<ul style="list-style-type: none"> ▪ CAT 793/785 Truck Noise Attenuation ▪ Truck Maintenance ▪ Quipolly and Werris Creek Real Time Monitoring Response 	M	<ul style="list-style-type: none"> ▪ Noise Control Operator
Train Load Out Facility – Dozer Operations	Community Complaint	<ul style="list-style-type: none"> ▪ Dozer Maintenance ▪ Quipolly and Werris Creek Real Time Monitoring Response 	M	<ul style="list-style-type: none"> ▪ Noise Control Operator



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7 OBJECTIVES AND TARGETS

The previous section of the NMP identified the noise hazards for the LOM Project, the risk rankings and outlined the management actions required to mitigate potential noise impacts from the project. In this section, WCC outline the revised noise criteria for the LOM Project and develop noise related objectives and targets as part of the Environmental Management System (EMS) for WCC.

7.1 Noise Criteria

The Project Specific Noise Criteria and EPL Noise Criteria for the WCC LOM Project are outlined in **Table 2** for Project Approval 10_0059 and **Table 4** for EPL 12290. Based on further property acquisitions and negotiated private agreements by Whitehaven Coal, WCC has revised the relevant noise criteria for the LOM Project for properties to which the Project Specific Noise Criteria apply in **Table 18**.

Table 18: LOM Project Noise Criteria

Location		Day	Evening/Night	Night	Long Term	Acquisition
		$L_{Aeq,15minute}$	$L_{Aeq,15minute}$	$L_{A1(1min)}$	$L_{Aeq,15minute}$	$L_{Aeq,15minute}$
R12	"Quipolly Cottage" Railway	38	38	45	35	40
R24	"Hazeldene"	37	37	45	35	40
R96	"Talavera" [#]	38	37	45	35	40
All other privately-owned land		35	35	45	35	40

[#] "Talavera" property was listed in the EA under its previous property name of "Millbank"

The relevant noise limits apply under all meteorological conditions except for the following adverse weather conditions defined as:

- Wind speeds greater than 3m/s at 10m above ground level; or
- Temperature inversion conditions of up to 12°/100m and wind speeds greater than 2m/s at 10m above ground level; or
- Temperature inversion conditions greater than 12°/100m.

7.2 EMS Objectives and Targets

Objectives and targets are set as part of the EMS planning process to drive organisations towards continuous improvement in environmental performance. WCC will establish specific objectives and targets for the noise hazards that were assigned the highest risks in **Section 6**; these risks include exceedance of noise criteria and receipt of community complaints. The noise objectives and targets will be incorporated into the WCC Environmental Management Strategy which is the overarching document describing the EMS. The objectives and targets (**Table 19**) will be reviewed monthly as part of the End of Month Report prepared by the Environmental Officer as outlined in **Section 12**, and revised annually based on the annual performance. The objectives and targets proposed for the future years are only indicative and will be subject to the results of the Noise Performance Annual Review.



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Table 19: EMS Noise Objectives and Targets

Objective		Performance Indicator	Performance			Target	
Activity	Environmental Hazard		2011-2012	2012-2013	2013-2014	2014-2015	Reason
Mining related noise generation	Exceedance of Noise Criteria	# Exceedances	0	0	4	0	Exceedance of noise criteria is not acceptable
Mining related noise generation	Community Complaint	# Complaints	15	15	2	2	10% reduction year on year
Train Load Out Facility related noise generation	Community Complaint	# Complaints	17	6	9	8	10% reduction year on year
All activities	Community Complaint	# Complainants	5	4	3	3	10% reduction year on year



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8 MANAGEMENT STRATEGIES AND MEASURES

Management controls and actions required to be implemented by WCC have previously been identified in **Section 3** Requirements (Summary of Commitments) and **Section 6** Risk Assessment. This section of the NMP will outline those management measures previously identified plus additional controls and actions proposed to be implemented by WCC to mitigate potential noise related impacts from LOM Project operations. The management measures listed in **Table 20** are discussed individually below.

Table 20: WCC Noise Management Measures

Section	Measure	Responsibility	Timing / Comment
8.1	Property Acquisitions and Private Agreements	OM, EO	As required
8.2	785 Truck Noise Attenuation	OM	Commence Q2 2012
8.2	Noise Control Operator	NCO, OM	Commence March 2012
8.4	Real Time Monitoring Response	OCE, OM, EO	Ongoing
8.5	Noise Reduction Mine Planning	OM, MPE, OCE, EO	Ongoing
8.6	Acoustic and Visual Amenity Bund	OM	2018
8.7	Night Time Surface Operations and Dump Locations	OM, OCE, NCO, EO	Ongoing
8.8	Drill Operations	OM, OCE, NCO, EO	Ongoing
8.9	Dozer Operations	OM, CPM	Ongoing
8.10	Restricted Scenario 1 Operations	OM, OCE, NCO, EO	Ongoing, until relocation of CHPP
8.11	Maximum Sound Power Levels	MM, EO	Annual commence Q3 2012
8.12	Additional Property Noise Mitigation Measures	EO	Residents advised on 20 December 2012
8.13	Operational Noise Controls	OM	Ongoing
8.14	Coal Processing Plant Acoustic Bund	OM, CPM	Within 6 months of relocating CHPP
8.15	Topographic Screening	OM	Within 6 months of relocating CHPP
8.16	Temporary ROM Coal Stockpiles	OCE	As required
8.17	Enclosed Conveyors	OM, CPM	As required
8.18	Squashed frog reverse alarms & silent horns	OM, MM	Ongoing
8.19	Rail Spur Management Plan	CPM, EO	Ongoing

OM – Operations Manager, CPM – Coal Preparation Manager, MPE - Mine Planning Engineer, MM - Maintenance Manager, OCE – Open Cut Examiner, NCO – Noise Control Operator, EO – Environmental Officer

During the preparation of the EA, WCC identified operational controls and management measures to reasonably and feasibly reduce noise emissions from the LOM Project. The list of reasonable



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and feasible management measures listed in **Table 20** was identified based on the noise management categories:

- Noise reduction/attenuation at the source;
- Reduction in the number of operating noise sources; and
- Active monitoring and management of noise levels.

While the EA (R.W. Corkery & Co., 2010) specifically mentioned a range of management and mitigation measures included in the list above, WCC also committed to implementing alternative measures that would achieve an equivalent noise level reduction. It is considered likely that alternative noise attenuation measures or controls may become available over time which would provide similar or greater levels of noise mitigation than just those options listed above. While some of these management measures form commitments in the EA, WCC considers it appropriate that the Project Approval and EPL do not require application of specific noise controls but rather require that the project specific noise criteria is met and allows the implementation of alternative or other methods of control.

8.1 Property Acquisition and Private Agreements

While efforts to reduce noise impacts at receivers are preferred, WCC has acquired a number of adjacent properties since commencement of mining. These acquisitions occurred through private negotiation to alleviate any current or future environmental impacts on these residents; allowing mining to continue in the most productive and efficient method possible and avoiding the need to restrict operations impacting on production. **Table 21** presents the properties that have been acquired by WCC since 2004.

Table 21: Adjacent Properties Purchased by WCC

Property Name		Purchase Date
R1	“Narrawolga”	1 st July 2004*
R1	“Eurunderee”	1 st March 2005*
R1	“Hillview”	28 th July 2006*
R1	“The Colliery”	14 th February 2008
R1	“Railway View”	5 th June 2008
R1	“Preston Park”	20 th October 2008
R1	“Branga”	20 th October 2008
R1	“Escott”	7 th November 2009**
R19	“W C Railway Cottage”	23 rd September 2009
R2	“Cintra”	31 st March 2010
R1	“Marengo”	17 th May 2010
R4	O’Donnells Quarry	27 th October 2010
R15	“Plain View”	7 th February 2011
R18	“W C Railway Cottage”	3 rd November 2011
R14	“Greenslopes”	20 th December 2011
R100	“Banool”	20 th December 2011
R65	“Banool” (Subdivision)	20 th December 2011
R20	“Tonsley Park”	2 nd November 2012

* Whitehaven Coal acquired took 100% ownership on 7th July 2010; ** Zeolight Australia property also become a project related property through the property purchase of “Escott”.



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Noise acquisition criteria is specified for the LOM Project in PA 10_0059 Schedule 3 Condition 2. If noise at any time from WCC exceeds 40 dB(A) $L_{Aeq(15min)}$ at a privately owned residence or on more than 25% of privately owned land and the landowner requests in writing to be acquired, then WCC must make a binding written offer to the landowner within 3 months to purchase the property in accordance with PA 10_0059 Schedule 4 Condition 5.

During the EA process and following approval of the LOM Project, Whitehaven Coal have actively sought private agreements with those properties identified in the EA as being within the WCC noise management zone (where noise modelling indicates worst case noise levels between 35dB(A) and 40dB(A) may be experienced). Whitehaven Coal has successfully negotiated an extra three private agreements in 2014 in addition to those originally negotiated in 2010/2011 as listed in **Table 22**. The noise thresholds established in this table determine when additional works or acquisition are triggered under the private agreement. The details of these agreements remain confidential; DoPI and EPA have reviewed the private agreements with those properties (January 2012 and April 2014) and made no objections as to the validity of the agreements.

Table 22: Properties with Private Agreements Noise Criteria

Location		Noise Criteria dB(A) Leq	Works Leq	Noise Criteria dB(A) Leq	Acquisition
R8	“Almawillee”	40		45	
R10	“Meadholme”	40		45	
R11	“Glenara”	40		45	
R21	“Alco Park”	40		45	
R98	“Kyooma”	40		45	
R7	“83 Wadwells Lane”	40		45	
R9	“Gedhurst”	40		45	
R22	“Mountain View”	40		45	

8.2 Truck Noise Attenuation

The LOM EA (2010) originally committed WCC to attenuating the entire fleet of CAT 785 trucks to 116dB $L_{W Max}$ dynamic sound power level (L_W) to achieve compliance with the project specific noise levels outlined in **Section 7.1**. The economic conditions for Whitehaven Coal have changed since 2010 resulting in ten CAT 793XQ trucks becoming available as the equipment was initially purchased for the now deferred Vickery Project. Whitehaven Coal management propose to use the larger equipment at WCC to offset lower production from its other operations by mining at 2.5Mtpa (up from the previous budget of 2Mtpa) as WCC is Whitehaven Coal's lowest cost producer. The proposed fleet configuration will allow WCC to maximise operational efficiencies enabling 2.5Mtpa coal production despite increasing strip ratios/overburden thicknesses as mining progresses through the syncline (deepest point) of the coal deposit.

The ten CAT 793XQ trucks are manufactured with noise attenuation fitments included with a sound power level specification of 115dB L_W which has been confirmed by independent sound power level testing by WCC. The two Noise Re-Model Reports (Spectrum Acoustics, 2013 and 2014) as discussed in Section 5.4; commit WCC to have one Stage 2 attenuated CAT 785 truck (116dB L_W) and five Stage 1 attenuation CAT 785 trucks (117.7dB L_W). As the haul trucks are collectively the dominant noise source from WCC; the geometric average sound power level for the combined truck fleet will be still meet the 116dB L_W per truck and achieves compliance with the project specific noise levels for all non-project related properties.

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In early 2013, WCC successfully attenuated one CAT 785 truck (Plant ID #608) to 115.9dB L_w called Stage 2 attenuation. As the Noise Re-Model Report 2014 identified, the remaining five CAT 785 trucks will only need the Stage 1 attenuation as actually measured during the full attenuation of #608. Stage 1 attenuation consists of an exhaust silencer kit and a radiator acoustic enclosure to achieve 117.7dB L_w and was successfully completed in March 2014.

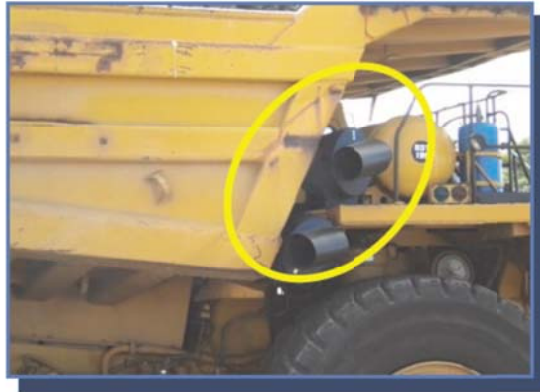
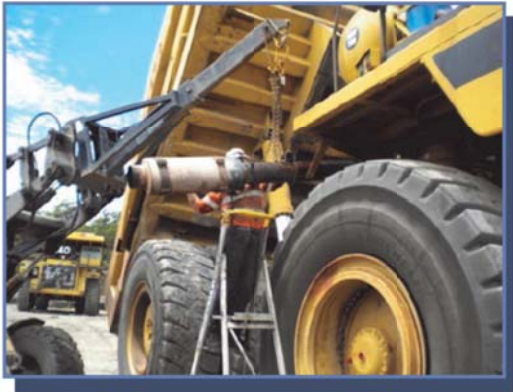


Figure 7: Example 785 Exhaust Silencer Kit (from Humex, 2012)

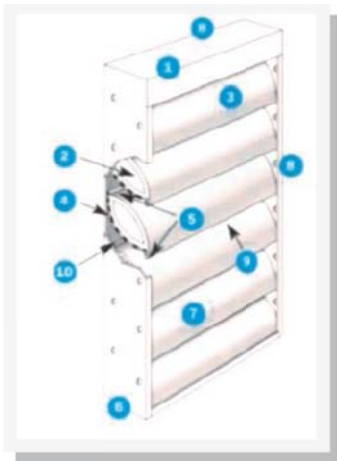


Figure 8: Example 785 Acoustic Enclosure on the Radiator (from Humex, 2012)

8.3 Noise Control Operator

WCC have developed a Noise Control Operator (NCO) procedure (**Appendix E**) to review real time audio and noise levels of WCC operations (**Section 0**) from the Continuous Noise Monitoring Units located to the south (Quipolly) and the north (southern edge of Werris Creek).

Using the continuous monitoring data (**Section 8.4**) available via the SentineX repository, a dedicated person acts as the NCO and together with the OCE have been trained to review the (real time) 5 minute average low frequency $L_{eq(20-630Hz)}$ noise level, and determine whether the corresponding audio streamed over the internet is dominated by mining noise.

Mining noise is considered to include (but is not limited to) mine hum, truck revving or fan noise and dozer track clatter. The objective is to actively manage the mine noise level to ensure the WCC mine remains below 35dB(A) (long term noise goal in PA10_0059). The trigger for operational response is if the real time noise monitoring data for two consecutive five minute



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periods is at 35dBA. The OCE is authorised to make ongoing modifications to the operation until such time as the impact is reduced to a level below 35dB(A). If the ongoing modifications do not reduce the mining noise level, then the OCE is authorised to suspend the entire operation.

8.4 Real Time Monitoring Response

The continuous noise monitors at WCC are mounted on a standard road registered trailer. The mobile design promotes a flexible monitoring regime and the ability to relocate the trailer based on complaints received. WCC has committed to maintain two continuous noise monitoring trailers, one would be dedicated to monitoring locations representative of Werris Creek (northern) receptors and the other trailer employed to monitor Quipolly (southern) receptors. Continuous noise monitoring is undertaken using SentineX system which provides remote data acquisition in near-real time. The SentineX system integrates noise and meteorological monitoring data together and the information is available via:

- the dedicated website (SentineX Repository) in real time;
- daily emails containing 24hr summary data, issued to configurable user group;
- configurable SMS / 2-way radio alarming (as required); and
- real time audio stream.

The receiving environments adjacent to WCC mine are complex, which presents challenges in identifying and measuring mining noise levels. Complex receiving environments and masking noise sources create significant challenges in establishing an effective management control. Where extraneous noise impacts 'contaminate' the mine signal, management responses may be based on non-mining impacts; this serves to reduce performance and erode credibility of the real time response protocol. The real time monitoring program seeks to address these challenges by: providing operations staff with access to local meteorological monitoring data, enabling meteorological influences to be considered, and 'adverse' weather conditions to be managed proactively:

- utilising a band pass filter (20 to 630 Hz) to exclude impacts associated with birds, insect and other environmental noise sources;
- providing access to 'audio streams', enabling the source of impacts at the receiving point to be verified remotely (without leaving site) in near real time;

The above information is available to the NCO, however the $L_{eq,20-630Hz}$ bandpass filter is also subject to influence from road traffic noise, rail noise, barking dogs and other industrial sources with strong low to mid frequency signals. Automatic modification to mine operations may unnecessarily restrict site activities where extraneous sources are found to cause high noise levels at the monitoring locations or highly localised noise sources may mask mining noise contribution, meaning that mine noise impacts cannot be evaluated. Additional constraints associated with operation of the real time monitoring system include:

- factors external to the monitoring system, including issues such as local internet speeds;
- routine systems and quality checks performed by the real time monitor. Some restrictions may occur with data acquisitions at these times, however this is generally limited to a period less than 15 minutes.

This system will assist with monitoring noise levels under adverse weather conditions such as wind speeds greater than 3m/s (EPL 12290 Condition L4.4) and quantifying impacts, although as wind speeds increase this tends to dominate the audio and increases the low frequency noise levels unrelated to mining operations.



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8.5 Noise Reduction Mine Planning

The Environmental Officer provides daily reports (**Section 10.1**) to WCC management (including OCE's and Operations Manager) on the previous day's noise performance as well as the forecast weather conditions and the risk of noise impacts based on current mining operations. A "traffic light" code system is used to visually present high (red), moderate (yellow) and green (low) risk of noise impacts. If moderate or high risks are identified then discussions are immediately held on what additional control measures will need to be implemented for night shift to mitigate potential noise impacts; this may include modifying excavator load faces, truck haul routes and dump locations if practicable. **Section 10.1** outlines the visual inspection procedure undertaken by the Environmental Officer to inform this planning process.

Table 23: Daily Meeting Report and Noise Reduction Mine Planning

ENVIRONMENT			
Thursday 18 th April 2013			
	YESTERDAY ACTUAL	THURSDAY FORECAST	FRIDAY FORECAST
WEATHER	DAY 257° 2.1m/s NIGHT 185° 1.7m/s +6.9°C/100m Inversion	DAY W 2.0m/s NIGHT SW 2.5m/s Moderate Inversion	DAY SSW 3.5m/s NIGHT SSE 3.0m/s Moderate Inversion
NOISE	OK – Q=28.5dBA WC=44.9dBA	Chance of Noise Impact	OK
BLASTING	BLAST – Results OK	No Blast	BLAST – potential issue with wind direction
DUST	OK – PM10=10.8µg/m3	OK	OK
LIGHTING	OK	OK	OK
WATER	Pump Pit to 238ML Dam & Evaporator & Water Curtain	Pump Pit to 238ML Dam & Evaporator & Water Curtain	Pump Pit to 238ML Dam & Evaporator & Water Curtain
COMPLAINT/DATE/TIME		DETAIL	

8.6 Acoustic and Visual Amenity Bund

The EA notes that the potential for unacceptable noise and/or visual amenity related impacts on the residents of Werris Creek and surrounds would increase as the open cut mine advances north; and, in particular, as the "Old Colliery" hill is removed. To mitigate these potential impacts, WCC would use overburden and interburden from the open cut mine to construct an Acoustic and Visual Amenity Bund around the north-eastern limit of the LOM Project open cut. It is estimated that approximately 3.7 Million loose cubic metres of material would be required to construct the Acoustic and Visual Amenity Bund.

Commencing near the top of the "Cintra" Hill (at approximately 415m AHD), the Acoustic and Visual Amenity Bund would initially be an extension of road side visual bund rising from 5m up to



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25m high adjacent to property R14 before reducing to 10m in elevation as it bends around joining with "Cintra" Hill (**Figure 6**). The bund would be approximately 2.2km in length and constructed with an outer slope of 10°. The distance between the toe of the bund and the Werris Creek Road easement would gradually increase as the bund is constructed to the north.

The Acoustic and Visual Amenity Bund would be constructed once mining operations reach the base of the "Old Colliery" Hill to ensure noise and visual impacts from operations advancing northwards towards the town of Werris Creek are minimised. Revegetation would be undertaken in advance of the construction of the Acoustic and Visual Amenity Bund to provide a native vegetation screen at the base of the bund footprint to lessen the visual impacts from Werris Creek.

8.7 Night Time Surface Operations and Dump Locations

Analysis presented in the NIA noted that controls to restrict overburden dump locations near to the top of the dump or operation of plant at exposed locations near to natural surface during the night period would be required to comply with the noise criteria. It is considered that real time noise monitoring (**Section 8.4**) and the NCO procedure (**Section 8.3**) will achieve or surpass the anticipated noise reduction of the restricted surface operations and dump locations by limiting overall WCCM noise to 35dB(A) during the evening and night time period.

The modification of this proposed noise control is to promote operational flexibility where it is considered risks of adverse impacts under noise enhancing conditions may be reasonably managed. The success of this measure would be subject to review based on monitoring data and records required to be kept by the NCO procedure (**Appendix E**). Where it is considered that this procedure cannot adequately control risks associated with operation of plant at exposed locations, the management action would revert to that outlined in the statement of commitments:

- stand down all mobile equipment operating within 20m of natural surface to the north of the advancing open cut under noise enhancing conditions during the evening and night-time, i.e. temperature inversion and winds from the south-southeast or northwest; and
- ensure that during periods of noise enhancing winds, overburden emplacement activities are preferentially undertaken 'in-pit' (not within 20m of the top of dump).

8.8 Drill Operations

Analysis presented in the NIA noted that controls to restrict site activities to 2 operating drilling rigs at any one time would be required to comply with noise criteria. It is considered that real time noise monitoring and the NCO procedure will achieve or surpass the anticipated noise reduction by limiting overall WCCM noise to 35dB(A) during the evening and night time period.

The modification of this proposed noise control is to promote operational flexibility where it is considered risks of adverse impacts under noise enhancing conditions may be reasonably managed allowing three non-exploration drills to operate at any one time. The success of this measure would be subject to review based on monitoring data and records required to be kept by the NCO procedure (**Section 8.3** and **Appendix E**). Where it is considered that this procedure cannot adequately control risks associated with operation of drill rigs, the management action would revert to that outlined in the statement of commitments (limiting operating to 2 non-exploration drill rigs at any time).



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8.9 Dozer Operations

Previous noise testing and analysis at WCC and other Whitehaven operations found that by limiting dozers travelling in reverse to first gear and/or engine speeds <1600rpm would reduce L_w noise emissions by 7dB(A). As discussed in **Section 5.4**, WCC has identified that dozers using second gear in reverse will be required to load normal capacity trains (larger than the current trains transporting coal) within the same allocated time by the rail network provider to avoid penalties. Since the first gear reverse policy was first implemented in 2009, WCC has purchased a number of properties or signed private agreements to the north of WCC in the vicinity of the Train Load Out facility. The WCC LOM Project noise model was re-modelled (Spectrum Acoustics, 2013 – **Appendix C**) and found that WCC could maintain noise levels with in compliance with dozers operating in second gear reverse at the next closest privately owned properties on Kurrara St in Werris Creek. Where loading time is adequate, WCC will endeavour to use first gear reverse at the Train Load Out Facility to mitigate potential noise complaints but only if the train can be loaded within the allowed two hour period. There are no restrictions on dozers in the Open Cut.

It is considered that real time noise monitoring and the NCO procedure will achieve or surpass the anticipated noise reduction by limiting overall WCCM noise to 35dB(A) during the evening and night time period.

8.10 Restricted Scenario 1 Operations

WCC has progressed past Scenario 1 Operations (Year 3 = 2014) and the proposed excavator / truck fleet (3 digger x 10 trucks) restriction no longer applies as long as the Mine Infrastructure Area relocation is complete. It is considered that real time noise monitoring and the NCO procedure will achieve or surpass the anticipated noise reduction of the restricted Scenario 1 operations by limiting overall WCC noise to 35dB(A) during the evening and night time period.

The objective of this control is to promote operational flexibility where it is considered risks of adverse impacts under noise enhancing conditions may be reasonably managed. The success of this measure would be subject to review based on monitoring data and records required to be kept by the NCO procedure (**Section 8.3** and **Appendix E**).

8.11 Maximum Sound Power Levels

As a condition of the Project Approval, WCC committed to ensuring that all mining equipment are consistent with and within a couple of decibels of the Sound Power Levels (SWLs) applied to the operational noise model. The SWL assumptions used in the noise model were updated from the LOM EA by the Noise Re-Model Report (Spectrum Acoustics, 2013 and 2014 - **Appendix C**) and are reproduced in **Table 24**.

Table 24: Plant Sound Power Levels (SWL), dB(A)

Operational Noise Sources	L_w , dB(A)
Haul truck CAT 785 (Stage 1 Attenuation)	117.7
Haul truck CAT 793XQ	115
Water Cart	113
Scrapers	118
Excavator (3x Hitachi EX1900 and Hitachi 3600)	115
Excavator (Hitachi EX5600)	116



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Dozers (D5, D6, D8, D9, D10, D11)	118
Fixed Crushing Plant	116
Drills	116
Front End Loader	114
Rail Load Out Facility	112
Trains on Rail Loop	87
Semi-trailer Truck	113
Mobile Crushing Plant	118

The exact number or type of equipment used at the WCC mine will change based business or operational requirements or as new/improved technology is available and the exact fleet listed in Table 2.11 of the LOM EA is only indicative of what the LOM noise model used to achieve noise compliance. It is considered that real time noise monitoring and the NCO procedure (**Section 8.3 & 8.4** and **Appendix C**) will limit overall WCC mine noise to 35dB(A) during the evening and night time period. WCC will implement routine SWL testing of equipment as outlined in **Section 9.4** and if there is a significant change in the SWL of existing or replacement equipment, then WCC will initiate a noise re-model. If this identifies potential compliance issues, then noise attenuation or other management options will be implemented.

8.12 Additional Property Noise Mitigation Measures

The project approval makes provisions for, and identifies those receivers that may request implementation of additional noise mitigation measures at their property. While the approval notes that these mitigation measures may include double glazing, insulation and / or air conditioning, WCC may seek advice from an acoustic consultant if required to address impacts specific to the receiver. The receivers that may request such action are outlined in **Table 25**. WCC issued correspondence to these landowners on 20 December 2012 advising them of the availability of additional property noise mitigation measures.

Table 25: Land subject to additional noise mitigation measures

R10*	R12	R18^	R21*
R11*	R14^	R20^	R96

* Private agreement in place with landowner; ^ Property acquired by WCC

8.13 Operational Noise Controls

The NIA identified several opportunities to manage noise impacts through implementation of operational controls on mining plant. These controls require training of operators to ensure that plant is operated in a quiet, efficient and safe manner.

Examples of controls implemented by the OCE and operators at WCC include:

- The use the highest gear available in haul trucks to enable operation of trucks at lower engine speeds during long or downhill haulage routes. This control is subject to constraints associated with safety and prevailing weather conditions;
- truck operators to use the minimum revs to hoist tray when dumping on night shift (matching engine speeds to required load);
- changing ramps and dumps locations (if possible/practicable) based on noise emission risk; and



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- suspending excavator loading operations and truck fleets based on business priorities and noise emission risk if the above controls are not effective at reducing noise levels.

8.14 Mine Infrastructure Area Bund

WCC constructed the MIA Bund greater than 5m high prior to the completion of the crushing plant and workshop in December 2013 on the northern end of the relocated northern MIA. In accordance with the commitments of the LOM EA, WCC had to within 6 months build a 5m high acoustic barrier on the north and eastern boundaries of the CHPP to manage potential noise emissions at receivers to the north of the site.

8.15 Topographic Screening

The fixed crushing plant was relocated to the Northern MIA in December 2013 and sited on the southern section of the MIA increase natural screening provided by 'Old Colliery Hill' towards Werris Creek town. In accordance with the commitments of the LOM EA, WCC had to site the CHPP in such a way as to take advantage of natural topographic relief provided by 'Old Colliery Hill' to minimise noise and visual amenity impacts associated with the relocation of this plant.

8.16 Temporary ROM Coal Stockpiles

In order to mitigate noise impacts at offsite receivers, temporary in-pit ROM coal stockpiles could be established below the natural surface level during periods of adverse meteorological conditions that would postpone trucks hauling to the ROM pad at the CHPP. The location of the temporary stockpiles would be at the discretion of the OCE, determined on the basis of inventory and suitable stockpile locations.

8.17 Enclosed Conveyors

The NIA and LOM EA noted that WCC committed to enclose coal conveyors on the site to facilitate improvements in noise impacts. While conveyors at the Train Load Out have roofs enclosed on the conveyor, the fixed plant and mobile crusher conveyors are not enclosed. It is not considered the noise from crushing activities will exceed that of mining noise, however real time noise monitoring (**Section 8.4**) and the NCO procedure (**Section 8.3**) will achieve or surpass the anticipated noise reduction achieved of enclosed conveyors by limiting overall WCC noise to 35dB(A) during the evening and night time period. The objective of this control is to promote operational flexibility where it is considered risks of adverse impacts under noise enhancing conditions may be reasonably managed. The success of this measure would be subject to review based on monitoring data and records required to be kept by the NCO procedure (**Section 8.3** and **Appendix E**).

8.18 Audible Alarms and Horns

As part of the NIA, Whitehaven Coal committed to the installation of broadband style reversing alarms and 'silent horns' on mining plant. Broadband ('squashed frog' or 'quacker') style reversing alarms are designed to generate a non-tonal noise signal to ensure people working around mobile plant are aware that plant may be in motion while minimising noise propagation offsite by eliminating the tonal characteristics of traditional reversing alarms. All plant, equipment and vehicles are subject to a safety "103" statutory inspection where reversing alarms are checked for function and broadband style. If the maintenance fitter finds that a broadband reverse alarm is not



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installed then the plant, equipment or vehicle can only be used if based on risk will not contribute to offsite night time noise impacts. Plant and equipment operators complete a pre-start inspection and check that the broadband reversing alarm is fitted.

Silent horns are used onsite by excavator operators during the night period to signal to truck drivers that loading is complete. During the day period, this signal is issued by sounding an audible (external) horn from the excavator. During the night period, excavator operators are instructed to use an alternate 'silent horn' system (manually engaged by the operator); when engaged, the 'horn' signal is transmitted to a speaker located within the cabin of trucks, advising the driver that loading is complete. The infrastructure supporting this network is located within the excavator / truck instrumentation, and is designed to ensure that signals issued may only be received by equipment working as part of the same digger / truck fleet. The objective of the 'silent horn' is to eliminate potentially intrusive noise impacts associated with the sounding of air horns during the night period. The OCE will ensure that excavators are using the silent horns on night shift.

8.19 Rail Spur Management Plan

WCC leases a portion of the disused Binnaway rail line from the Australian Rail Track Corporation (ARTC) which is also known as the Werris Creek Rail Spur. To manage potential impacts associated with the use of the Rail Spur, WCC was required as part of the NMP to prepare a Rail Spur Management Plan (RSMP) in accordance with PA 10_0059 Schedule 3 Condition 5(c) Dot Point 2. The RSMP was originally developed to manage potential noise impacts from train movements on the Rail Spur with particular regard to R20 and R21, as the predicted noise impacts were above their respective specific noise criteria. Versions 2 to 4 of the RSMP reflected the potential refuelling of trains on the Rail Spur and the various controls that would be implemented to manage the potential impacts associated with this. Advice from Pacific National and the Australian Rail Track Corporation in September 2012 identified that refuelling on the Rail Spur would no longer be required. The RSMP was again revised for the first draft this NMP, however now it is considered that a standalone RSMP is no longer required because rail noise criteria has been replaced by Project Specific Noise Criteria for the entire WCCM and also that Whitehaven Coal has purchased R18, R19 and R20 ("Tonsley Park") which were the most affected properties and has a private agreement for mining noise in place with R21 ("Alco Park").

The key management controls outlined in the previous RSMP will continue to be implemented by WCC and its rail transport contractors to manage potential noise impacts from train movements on the Rail Spur including:

- Speed limit of 15km/h on the Rail Spur;
- STOP Boards located at the boundary with R20 maximising the distance that the idling train is from the residence while waiting for a rail path on the Great Northern Rail Line;
- Train movement along the Rail Spur is via push-pull locomotive at either end of the train. This procedure will be revised once the rail loop is constructed. If for safety it is possible to propel trains, the additional noise generated assessed in the LOM EA NIA determined that the increased distance between the rail loop and the closest Kurrara St residents in Werris Creek would not result in any additional noise impacts; and
- Consultation over RSMP controls undertaken with ARTC and the two rail transport contractors that operate at WCC (**Appendix A**).



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9 MONITORING AND PERFORMANCE REVIEW

Section 3 identifies the noise monitoring requirements established in PA 10_0059 Condition 4(b), 5(c) & (d) and EPL 12290 Condition M8. To address these, WCC will implement a noise monitoring program that includes:

- methods to monitor compliance with the noise impact criteria at adjacent sensitive receivers (**Section 7.1** and **9.1**); and
- performance indicators (**Section 7.2**) to enable review of the effectiveness of measures established in the NMP to manage noise impacts.

WCC have developed a noise monitoring program utilising complimentary approaches of:

- Operator attended monitoring (**Section 9.1**) to:
 - quantify the contribution from WCC operations to measured noise levels;
 - evaluate compliance with the project specific noise levels.
- Real time monitoring (**Section 9.2**) to:
 - enabling pro-active management of operations, including capacity to identify trends and schedule site activities accordingly;
 - allowing for re-active management, including ability to review conditions and respond to feedback in near real time;
 - collecting data and defining methods to evaluate the performance of the LOM Project.
- Meteorological monitoring (**Section 9.3**); and
- Plant and equipment sound power level (L_w) testing (**Section 9.4**).

9.1 Attended Noise Monitoring Program

A summary of the attended noise monitoring program is provided in **Table 26**, and the locations are shown in **Figure 10**. All locations will be monitored on a monthly basis, in accordance with the monitoring methodology provided in **Appendix E**.



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Table 26: WCC Attended Noise Monitoring Program

Monitoring Point	Duration	ID	Receiver	Relevant Monitoring Requirements
A	15 minutes ¹	R5	Rosehill	No PSNL in PA10_0059 or EPL12290
B (B1 & B2)	15 minutes ¹	R7*	83 Wadwells Lane	Private Agreement
		R8*	Almawillee	Private Agreement
		R9*	Gedhurst	Private Agreement
		R22*	Mountain View	Private Agreement
C	15 minutes ¹	R10*	Meadholme	Private Agreement
		R11*	Glenara	Private Agreement
D	60 minutes ²	R24	Hazeldene	60 minutes as per EPL 12290
E	60 minutes ²	R12	Quipolly Cottage Railway	60 minutes as per EPL 12290
F	60 minutes ²	R96	Talavera	60 minutes as per EPL 12290
G	15 minutes ¹	R97		No PSNL in PA10_0059 or EPL12290
H	15 minutes ¹	R98*	Kyooma	Private Agreement
I	60 minutes ²	R57	Kurrara Street [@]	60 minutes as per EPL 12290
J	15 minutes ¹		Coronation Avenue [@]	No PSNL in PA10_0059 or EPL12290
K	15 minutes ¹	R21*	Alco Park	Private Agreement
L	15 minutes ¹	R103		No PSNL in PA10_0059 or EPL12290

*: WCC has a private agreement for noise impacts with these property owners (**Section 8.1**);

@: Kurrara Street is representative of sensitive receptors in southern Werris Creek while Coronation Avenue is representative of sensitive receptors in central Werris Creek.

PSNL: Project Specific Noise Level outlined in either PA10_0059 or EPL12290

Note 1: For each monthly monitoring event a total of 15 minutes (per location) during the day period, and 15 minutes (per location) during the evening or night period;

Note 2: For each monthly monitoring event a total of 60 minutes (per location) during the day period, and 60 minutes (per location) during the evening or night period.

The attended noise monitoring program includes 13 monitoring points representative of 14 privately owned properties and the residents of southern and central Werris Creek. The eight properties have negotiated private agreements with WCC accepting potential noise impacts above the relevant project specific noise criteria. The monitoring points have been selected in accordance with siting requirements established in the INP and EPL 12290 monitoring points B1, B2 and C are located within 30m of adjacent dwellings, and are therefore considered representative of multiple receivers.

The attended noise monitoring program will be used to evaluate compliance with the relevant criteria outline in **Table 18** and **Table 22**. The attended monitoring is undertaken by an experienced acoustic engineer who is able to assign noise levels measured by the sound level meter to the relevant noise source heard by the acoustic scientist (**Figure 9**). A noise level measure at a monitoring location above the relevant Project Specific Noise Level or 35dB(A) and is determined to have been from WCC mining operations or activities during weather conditions that are not defined as adverse weather (**Section 7.1**) will be deemed as a noise exceedance. Reporting requirements for the attended noise monitoring program and any noise exceedances are provided in **Section 12**.



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Figure 9 Acoustic Scientist undertaking attending noise monitoring

9.2 Real Time Noise Monitoring Program

As discussed in **Section 8.4**, WCC has committed to two continuous noise monitors fixed to trailers for portability with one monitoring trailer dedicated to Werris Creek (SX116 N1 – northern) receptors and the other monitoring trailer dedicated to Quipolly (SX95 N1 – southern) receptors (**Figure 11**).

Figure 10 identifies the indicative locations of the Werris Creek and Quipolly noise trailers. Given the mobility of the noise trailers, they may occasionally be relocated in response to noise complaints; however the indicative locations shown are the preferred locations representative of the respective communities. It is also noted that these preferred are established to maximise the distance from other significant rail, road, urban and agricultural noise sources that can impact on the reliability of the data obtained by the system.

Each continuous noise monitoring (trailer) system includes a Type 1 sound level meter which records the following parameters:

- 15 minute statistical data (L_{A1} , L_{A10} , and L_{A90});
- $L_{Aeq,15minute}$ and $L_{Aeq,period}$ noise levels;
- $L_{Aeq,1minute}$ in 1/3 octave;
- $L_{Aeq,15minute}$ in the 20 to 630 Hz range ($L_{Aeq,LF}$);

In addition the noise trailers also are capable of digital audio recording 24 hours per day.

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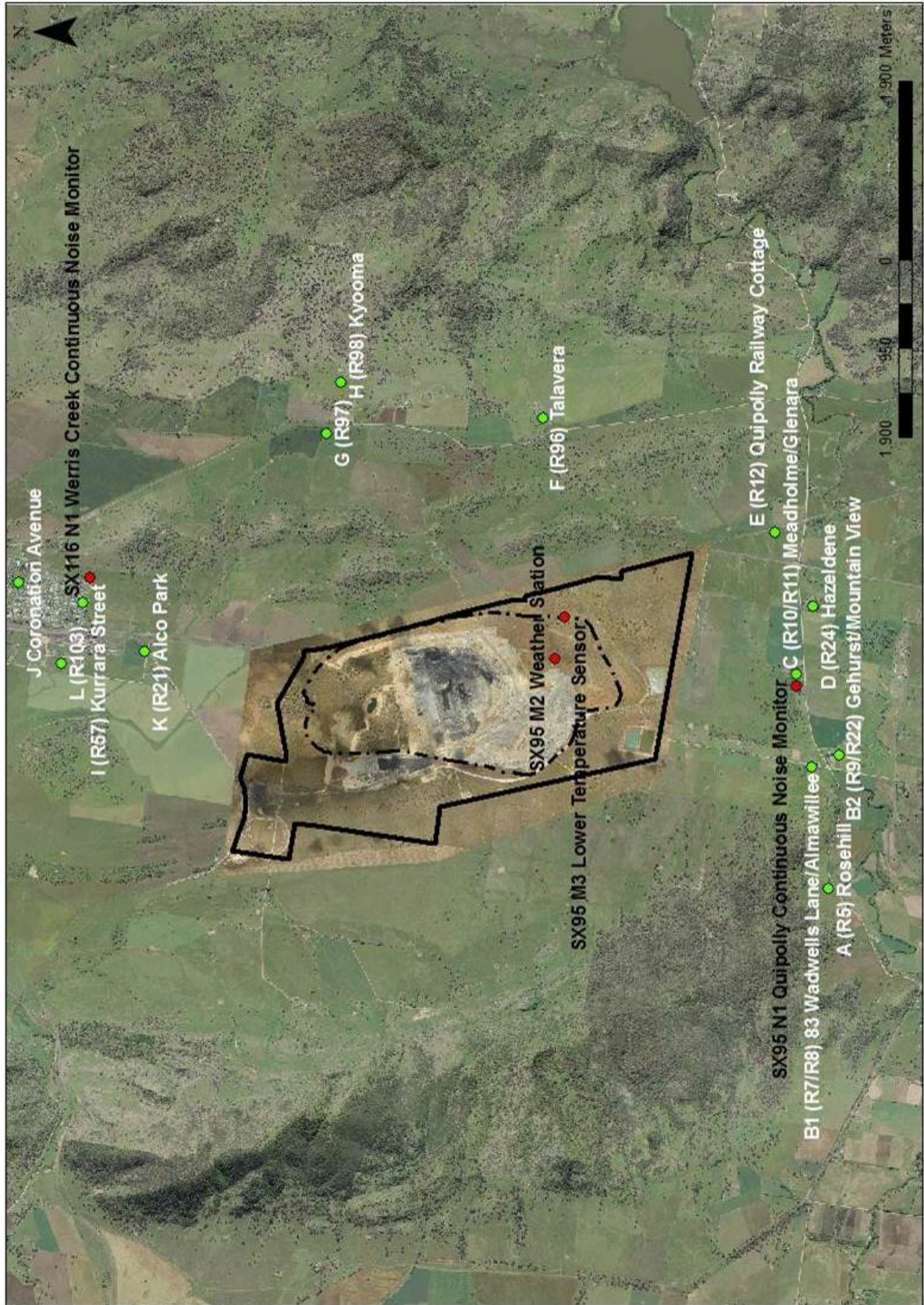


Figure 10 Attended and Continuous Noise Monitoring Locations



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Figure 11 Continuous noise monitoring trailer with WCC mine in background

9.3 Meteorology

WCC maintains an on-site weather station identified as “M2” (EPL 12290 EPA ID #9) located on the top level of the overburden emplacement (at final rehabilitated landform surface RL445.5m) as well as “M3” (EPL 12290 EPA ID #31) lower level temperature sensor (base of overburden emplacement area at RL373.5m) as shown in **Figure 14**. The direct measurement of the temperature difference between M2 and M3 over 80m is the method approved in EPL 12290 for WCC to measure temperature inversions(Condition L4.4 – formula is $(M2-M3-0.7)*1.25$).

In addition, WCC also maintains “mini” weather stations associated with the Continuous Noise Monitors (“M1” for SX95 and SX116). “M2” is the main weather station utilised by WCC on a 10m mast which continuously monitors the meteorological parameters in **Table 27**.



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Table 27: WCC “M2” Weather Station meteorological parameters

Parameter	Unit	Frequency	Period	Method	Serial #	Calibrated
Rainfall	mm/h	Continuous	15 minute	AM-4	-	23/09/2013
Wind Speed @ 10m	m/s	Continuous	15 minute	AM-2 & AM-4	F1757	23/09/2013
Wind Direction @ 10m	°*	Continuous	15 minute	AM-2 & AM-4	F1757	23/09/2013
Temperature @ 2m	°C	Continuous	15 minute	AM-4	1009-	23/09/2013
Temperature @ 10m	°C	Continuous	15 minute	AM-4	1009-	23/09/2013
Sigma Theta @ 10m	-	Continuous	15 minute	AM-2 & AM-4	-	23/09/2013
Solar Radiation	W/m ²	Continuous	15 minute	AM-4	1010	23/09/2013
Barometer	hPa	Continuous	15 minute	-	-	23/09/2013
Humidity	%	Continuous	15 minute	-	1010-	23/09/2013
Location Siting	-	-	-	AM-1, AM4 & EPL 12290 Special Method 2	-	-

* Degrees clockwise from true north.

“M2” weather station operates in accordance with EPL 12290 (including AM-1, AM-2, AM-4 and Special Method 2) and AS 2923 -1987: *Guide for measurement of horizontal wind for air quality applications*.

9.4 Sound Power Level Testing

WCC will commit to testing plant and equipment on an annual basis to ensure that the required L_w in the noise model is actually achieved and actively managed. L_w testing will involve:

- 785 trucks initially undertaken as part of the Stage 1 noise attenuation program (**Section 8.2**), and then annually to ensure ongoing compliance;
- all other plant and equipment would be subject to annual monitoring depending on availability at the time of monitoring;
- monitoring would be undertaken (or staged) in such a way as to minimise offsite noise impacts or disruption to production schedules;
- monitoring would be undertaken generally in accordance with:
 - ISO6395:2008 Earth-moving machinery – Determination of sound power level – Dynamic test conditions; or
 - AS1217.5-1985 Acoustics – Determination of sound power levels of noise sources – Engineering methods for free-field conditions over a reflecting plane.

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10 INSPECTIONS

As part of the EMS, inspection systems are integral to environmental management by identifying issues and observing the effectiveness of control measures. WCC have inspection systems to identify and manage noise impacts.

10.1 Noise Reduction Mine Planning

As part of the management measure (**Section 8.5**), Noise Reduction Mine Planning involves a visual inspection of the open cut operations and a photographic record kept of excavator loading face locations (Strip and RL), truck haul routes and night shift dump locations (RL - identified with lighting plants) as well as other ancillary mining operations i.e. drills and scraper operations. The Environmental Officer uses this information to determine the risk of noise enhancement due to the location of operations and the forecast weather conditions for night shift, and if high or medium risk operations are identified then this is communicated with the Operations Manager at the daily meeting and with the night shift OCE at the start of shift. Figure 12 presents an example of excavator loading faces (left) and night shift dump locations (right).



Figure 12: Indicative Excavator loading faces and Night Time Dump Location

10.2 Continuous Noise Monitoring

Routine inspection and maintenance of the real time monitoring systems is required to ensure ongoing and reliable access to measurement data (**Section 9.2**). Review of system function is undertaken on a number of schedules, including:

- daily checks to confirm stable operation or identify defects;
- monthly field inspections and maintenance; and
- annual service.



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Review of the real time systems would be undertaken on a daily (weekday) basis by WCC representatives or external service contractors (or both) to ensure stable operation of the system. This review would be undertaken via remote access methods, and include:

- open daily email to ensure results for past 24 hours are available;
- login via the online repository and confirm unit is sending data to the web server in real time;
- download and review a representative sample of recorded audio to ensure acceptable quality; and
- make a note of any obvious data defects and raise work order to investigate and rectify (WCC may action this request via the service contractor).

Routine maintenance would be scheduled on a monthly (4 weekly) basis, and require physical inspection of the unit by the service contractor to:

- carry out a field calibration of the noise meter;
- physically download monitoring data (and archive on secure file server for later reference);
- clean the meteorological monitoring station and solar panels as required;
- make a note of any obvious maintenance defects;
- record all observations and maintenance work undertaken as required by relevant quality management procedures;
- ensure the unit is left in a secure state.

In addition to monthly maintenance and field calibrations:

- the sound level meter would be removed from service and subject to laboratory calibration at an interval of 12 months. A replacement sound level meter (with valid calibration certificate) would be installed during this period to ensure continuity of data;
- 'call outs' may be undertaken to service specific issued relating to the monitoring systems.



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11 TRAINING

Effective implementation and maintenance of this plan requires communication and training to all levels of operational and management staff at WCC. In addition, all persons conducting work at Whitehaven Coal should be authorised as competent to perform their work or job. The open cut operations training requirements require specialist skills and experience to operate safely and productively while mitigating potential environmental impacts. Where possible, environmental training required by this NMP will be incorporated as part of the WCC training and competency management system approved by the Department of Resources and Energy.

Employees and contractors engaged in noise generating activities and those responsible for implementing noise management controls would be required to undertake additional training. This training will be targeted to provide the appropriate level of skills and knowledge to employees and contractors to enable them to manage noise issues in accordance with NMP. **Table 28** outlines the WCC training requirements for noise management.

Table 28: WCC NMP Training Program

Training	Who	Relevant Procedure	Frequency/When	Appendix
Induction – Whitehaven Coal Generic and WCC Site Specific	All Employees All Contractors	Not Applicable	Biennial	Not Applicable
WCC Noise Management Plan Toolbox	WCC Management Environmental Officer External Service Contractor	Not Applicable	Annual	Not Applicable
Noise Control Operations	Noise Control Operator Open Cut Examiner	Section 8.3	Annual	Appendix E
Dozer Operations	Dozer Operators	WHC_PRO_Safe Operation of a Dozer and Section 8.9	Biennial	Not Applicable
Truck Operations	Truck Operations	WHC_PRO_Safe Operation of a Dump Truck and Section 8.13	Biennial	Not Applicable



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12 REPORTING

Reporting of monitoring and management information is an integral component of an EMS. This NMP outlines the internal and external noise monitoring and management reporting processes implemented at WCC. **Table 29** outlines the types of reports that include noise information; the reporting frequency, requirements, distribution and timing. Any reporting processes that are linked to approval conditions are *italicised*.

Table 29: Reporting schedules for noise monitoring and management

Report	Frequency	Requirements	Distribution	Timing
Noise Minor Incident	As required	Complete Whitehaven Coal Incident Report Form.	Whitehaven	Immediate
Noise Non-Compliance (Serious Incident)	As required	Complete Whitehaven Coal Incident Report Form.	Whitehaven	Immediate
		Notification of noise non-compliance or incident to Government Agency & Landowner. <i>Meet PA 10_0059 Schedule 5 Condition 6.</i>	EPA DoPI Landowner	Earliest opportunity (Material Harm) otherwise soon as practicable*
		Detailed report of noise non-compliance including cause/nature, date, time, duration and location of event; contact details of WCC representatives or witnesses; action taken and measures to prevent recurrence. <i>Meet PA 10_0059 Schedule 5 Condition 6 and EPL 12290 Conditions R2 & R3.</i>	EPA DoPI Landowner	Within 7 working days of incident*
Noise Complaints	As required	Complete Whitehaven Coal/WCC Complaints Form including complainant, complaint reported date & time, date & time of compliant event, complaint method, complainant details, complaint nature, actions taken and follow up contact. <i>Meet Condition M5 of EPL 12290.</i>	WCC Complainant EPA/DoPI (if requested)	As soon as practicable Within 7 days of complaint
	Monthly	Update Complaints Register with a summary of complaints received. <i>Meet PA 10_0059 Schedule 5 Condition 10 Dot Point 5.</i>	Website	Within 14 days of month end
End Of Month Report	Monthly	Summary of noise monitoring results and complaints received collated into site report for Whitehaven Coal management.	WCC	As soon as practicable



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Report	Frequency	Requirements	Distribution	Timing
Attended Noise Monitoring	Monthly	Report the EPL required noise monitoring data as well as provide monthly summaries in EPA approved format. <i>Meet Section 66(6) of the Protection of the Environment Operations Act 1997.</i>	Website	Within 14 days of receipt of monitoring report
		Email the Monthly Attended Noise Monitoring Report to the EPA. <i>Meet Condition R4.1 of EPL 12290.</i>	EPA	30 days of completion of monitoring
Environmental Monitoring Report	Quarterly	Summary of noise monitoring results for discussion at CCC meetings. <i>Meet PA 10_0059 Schedule 5 Condition 10 Dot Point 4.</i>	CCC WCC Website	2 weeks prior to meeting
EPL 12290 Annual Return	Annually	Report EPL required dust deposition and HVAS monitoring data in Annual Return format and EPL non-compliances during the period. <i>Meet EPL 12290 Condition R1.</i>	WCC EPA	Due by 31 st May
AEMR	Annually	Summarise operational and environmental activities for the previous year including annual review requirements, review of compliance with MOP, PA and other approvals and description of non-compliance/exceedances, rehabilitation progress, comprehensive monitoring results and complaints information. <i>Meet PA 10_0059 Schedule 5 Condition 3 and ML 1563/1671/1672 Condition 4.</i>	DoPI DRE WCC Website	Due by 31 st May (unless extension approved)

* Given that noise non-compliance/exceedance do not cause or threaten material harm to the environment, "immediate" reporting timeframes in the EPL 12290 and PA 10_0059 do not apply. PA 10_0059 Schedule 5 Condition 6 specifies that other incidents be notified to DoPI at the earliest opportunity. Noise non-compliance with EPL 12290 monitoring requirements will be reported monthly with the submission of the attended noise monitoring report.

Further details on WCC incident and community complaint processes is provided in the WCC Environmental Management Strategy in accordance with Whitehaven Coal incident reporting standard and relevant procedure. WCC maintains a designated community complaints line (0267687001) which is regularly published through community newsletters, in the Werris Creek Flyer and signposted on the front entrance to the mine site. The complaints line is a PABX based system, which gives callers the option to be directly transferred to the Site Environmental Officer, transferred to the Open Cut Examiner on shift or leave a message for the Site Environmental Officer to return their call. This system facilitates an instantaneous operational response.



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13 REVIEW AND AUDITING

A key component of this NMP (as part of WCC EMS) is that WCC is able to review the effectiveness and performance of noise management onsite. WCC will implement a number of review processes to ensure that there is continuous improvement of noise management including:

- Noise Management Plan Review;
- Noise Performance Annual Review;
- Noise Audits.

Any of these review mechanisms may trigger a revision of the NMP in **Section 14.4** below.

13.1 Noise Management Plan Review

A protocol for the NMP Review is provided in **Appendix G**. WCC will annually complete the NMP Review Protocol prior to writing the Annual Review section of the AEMR, to outline the management measures implemented for the previous year, track progress against the objectives and targets, make changes to risks associated with noise hazards, demonstrate whether accountabilities been followed, and determine whether inspections and reporting process have been completed. The outcomes from the NMP Review will be incorporated into the Annual Review section of the AEMR.

13.2 Noise Performance Annual Review

WCC will annually review its noise performance and management as a part of writing the AEMR in accordance with PA 10_0059 (Schedule 5 Condition 3). The Noise Performance Annual Review will include a comprehensive review of the noise monitoring results and noise complaints over the period 1st April to 31st March and make comparison of these results against the:

- Noise Criteria (**Table 18**) and Noise Objectives and Targets (**Table 19**);
- Noise Monitoring Results from previous years;
- Noise modelling predictions from the EA (**Table 14**);
- Discuss any noise non-compliances and what actions were taken;
- Identify any trends in noise monitoring data;
- Identify any discrepancies between predicted and actual noise levels and discuss potential causes;
- Outline management measures to be implemented over the next year to continual improve noise performance; and
- Outline whether a revision to the NMP is required.

13.3 Noise Audit

WCC is required to undertake a comprehensive Noise Audit every three years in accordance with the PA 10_0059 (Schedule 3 Condition 4e) and EPL 12290 (Condition E1) incorporated as part of the Independent Environmental Audit. The first Noise Audit will be undertaken prior to June 2014 and every three years after. The Noise Audit will include

- An assessment of noise emissions against the Noise Limits as well as the long term noise goal and noise acquisition criteria;
- An evaluation of current mine noise impacts at all non-project related receptors;



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- The effectiveness of noise mitigation practices that have been implemented at the premises against the best available economically achievable technology and current best practice principles for minimising noise emissions; and
- Document evidence that demonstrates reasonable attempts to negotiate private agreements with affected receptors that have had noise impacts over the long term noise goal.

During the second Noise Audit (and thereafter), if noise levels at affected receptors that continue over the long term noise goal, WCC will outline a program over the next three year period to further reduce noise impacts from the mine in accordance with EPL 12290 (Condition E2).

13.4 Revision of Noise Management Plan

The NMP is planned to be revised in three years, or after 2015. However, in accordance with PA 10_0059 (Schedule 5 Condition 4), WCC will revise the NMP following:

- The AEMR Noise Performance Annual Review (including the NMP Review), where this review recommends a revision of the NMP;
- A noise non-compliance incident report recommending a revision of the NMP;
- Noise Audit recommending a revision of the NMP;
- Modification of PA 10_0059 or Variation to EPL 12290 recommending a revision of the NMP.

WCC would be required to submit the revised NMP in consultation with the EPA for DoPI's approval within 3 months of any triggering event listed above.



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14 CONTINGENCY PLAN

WCC is required to implement a contingency plans to manage any unpredicted impacts and their consequences. In regards to contingency plans for noise management, WCC have a number of management strategies that would identify unpredicted noise impacts and management measures to mitigate or ameliorate those impacts.

The need to implement noise contingency plans will be identified by WCC using the reporting processes in **Table 30**.

Table 30: Identification of Noise Contingency Plan Triggers

Reporting Process	Frequency	Method	NMP Section
Community Complaint	As required	Complaint investigation identifies noise impact outside predicted impact or exceeds noise criteria	12
Noise Non-compliance (Incident)	As required	Incident investigation identifies noise impact outside predicted impact, non-compliance or exceeds noise criteria	12
Environmental End Of Month Report	Monthly	Noise monitoring results identifies noise impact outside predicted impact or exceedances noise criteria	12
Environmental Monitoring Report	Quarterly	Noise monitoring results trend outside predicted impact	12
Annual Environmental Management Report	Annual	Noise monitoring results trend outside predicted impact or noise management measures not effective at mitigating noise impacts	12

A number of management measures and actions already discussed in the NMP can be implemented as noise contingency plans are outlined in **Table 31**.



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Table 31: Noise Management Contingency Plans

Contingency Plan	Method	NMP Section
Community Complaint	Response to community complaint outlining contingency plan actions to be implemented the satisfaction of the complainant and EPA	13
Noise Non-compliance (Incident)	Response to relevant government departments regarding non-compliance outlining contingency plan actions to be implemented the satisfaction of the relevant government departments	13
Property Acquisition	Either private negotiation or landowner triggers PA 10_0059 acquisition negotiation process for Whitehaven Coal/WCC to purchase noise impacted property	8.1
Noise Control Operator	Set tighter parameters for NCO triggering operations to be modified	8.4
Real Time Monitoring Response	Modify real time monitoring response processes or continuous monitoring locations to prevent further noise impacts	8.5
785 Truck Noise Attenuation	Identify further noise attenuation options	8.2
Maximum Sound Power Levels	Maintenance to bring relevant plant or equipment into required sound power level range. Investigate noise attenuation options.	8.11 and 9.4



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APPENDIX A (Related correspondence with Government Agencies)



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Subject: FW: Air Quality MP Consultation and Rehabilitation Management Plan

From: Andrew Wright
Sent: Thursday, 19 April 2012 1:45 PM
To: 'Simon Lund'
Subject: RE: Air Quality MP Consultation and Rehabilitation Management Plan

Thanks Simon.

To confirm that the EPA has been given the opportunity to be consulted regarding Werris Creek Coal:

- Rehabilitation Management Plan;
- Air Quality and Greenhouse Gas Management Plan;
- Noise Management Plan;
- Water Management Plan; and
- Blast Management Plan

When DoP (DRE for Rehab MP) has approved the relevant management plans, WCC will provide hardcopy and electronic copies of these plans to the EPA.

Cheers, Andrew

Andrew Wright
Environmental Officer
Werris Creek Coal
0488497701

From: Simon Lund [<mailto:Simon.Lund@epa.nsw.gov.au>]
Sent: Thursday, 19 April 2012 1:36 PM
To: Andrew Wright
Subject: RE: Air Quality MP Consultation and Rehabilitation Management Plan

Andrew

Sorry its taken a while to respond.

The Environment Protection Authority encourages the development of such plans to ensure that proponents have determined how they will meet their statutory obligations and designated environmental objectives. However, we do not approve or endorse these documents as our role is to set environmental objectives for environmental/conservation management, not to be directly involved in the development of strategies to achieve those objectives.

Should you have any further enquiries please do not hesitate to contact me.

Regards

Simon Lund Regional Operations Officer | NSW Environment Protection Authority |
☎: (02) 6773 7000 | Mobile ☎: 0407 209 283 | 📠: (02) 6773 2336 | ✉: simon.lund@epa.nsw.gov.au



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Mining & Industry Projects
Contact: Stephen O'Donoghue
Phone: (02) 9228 6393
Fax: (02) 9228 6466
Email: stephen.o'donoghue@planning.nsw.gov.au

Mr Andrew Wright
Environmental Officer
Werris Creek Coal Mine
Whitehaven Coal Limited
PO Box 125
Werris Creek NSW 2341

Dear Mr Wright

**Werris Creek Coal Mine (MP10_0059)
Approval of expert to prepare noise management plan**

I refer to your email of 21 November 2011. The Department has reviewed the information you provided and the Director-General has approved the appointment of Mr Clayton Sparke from Advitech to prepare the Noise Management Plan for the Werris Creek Coal Mine.

Yours sincerely

 22/11/11

David Kitto
Director
Mining & Industry Projects
as Delegate for the Director-General



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From: Sally Hewson
Sent: Thursday, 21 June 2012 10:19 AM
To: Andrew Wright
Subject: FW: Werris Creek Rail Spur Management Plan CRM:0021625

Hi Andrew

Received below email from PN this morning. Is this ok? I have chased John Brown at ARTC and left a message for him to call. Will let you know if any issues there.

Sal

Sally Hewson
Shipping and Logistics Officer

Whitehaven Coal Limited
Level 4, 6 Newcomen Street, Newcastle NSW 2300 Australia
Tel: +61 2 4927 0711 Fax: +61 2 4926 3177 Mobile: +61 418 613 546
Email: shewson@whitehavencoal.com.au www.whitehavencoal.com.au



From: Perry, Leanne [mailto:Leanne_Perry@pacificnational.com.au]
Sent: Thursday, 21 June 2012 5:33 AM
To: Sally Hewson
Cc: Chaffer, Brett; Loveridge, Julie; Mullard, Philip
Subject: Werris Creek Rail Spur Management Plan CRM:0021625

Hi Sal,

As discussed yesterday, Pacific National confirm we have received a copy of the Werris Creek Rail Spur Management Plan that Whitehaven will be submitting as part of Werris Creek's Life of Mine.

Kind Regards,
Leanne

Leanne Perry | Senior Customer Relationship Manager | Coal
Pacific National
M: 0457 505 196 | P : 02 4927 4929 | F : 02 4927 4990
E : leanne_perry@pacificnational.com.au
Suite 1 Level 1 426 King St Newcastle West NSW 2302
PO Box 2298 Dangar NSW 2309

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From: Sally Hewson
Sent: Wednesday, 20 June 2012 11:01 AM
To: Andrew Wright
Subject: FW: Attached Image
Attachments: 2065_001.pdf

FYI

Sally Hewson
Shipping and Logistics Officer

Whitehaven Coal Limited
Level 4, 6 Newcomen Street, Newcastle NSW 2300 Australia
Tel: +61 2 4927 0711 Fax: +61 2 4926 3177 Mobile: +61 418 613 546
Email: shewson@whitehavencoal.com.au www.whitehavencoal.com.au



From: Phil Carey [<mailto:Phil.Carey@mountainindustries.com.au>]
Sent: Monday, 21 May 2012 10:25 AM
To: Jack Macpherson
Cc: Paul Smith; Sally Hewson; Peter Easey
Subject: FW: Attached Image

Hi Jack,

No Issues from our rail service providers perspective regarding the proposed management plan.
Please pass on to Greg Gardner.

Thanks & regards
Phill Carey

Supervisor - Terminal Operations
Mountain Industries
P - 02 4923 4533
M - 0439 438 783
F - 02 4923 4539
E - Phil.Carey@MountainIndustries.com.au
W - www.MountainIndustries.com.au

From: Sidney Kim [<mailto:Sidney.Kim@qube.com.au>]
Sent: Wednesday, 9 May 2012 2:04 PM
To: Phil Carey; Greg Sprod
Cc: Paul Smith; Craig Maher
Subject: RE: Attached Image

Phil,

Apologies for late reply.

Have run this past our guys and all looks compliant to current procedures.



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No problems from our end.

Cheers

Sidney Kim | Rail Services Manager - NSW
0423 847 558

QUBE Logistics | Rail Services



Tel: +61 2 8760 3265 Fax: +61 2 8760 3297
Sidney.Kim@qube.com.au
Building 5, Loftus Road, Yennora, NSW, 2161
www.qube.com.au

From: Phil Carey [<mailto:Phil.Carey@mountainindustries.com.au>]
Sent: Friday, 27 April 2012 1:51 PM
To: Sidney Kim; Greg Sprod
Cc: Paul Smith; Craig Maher
Subject: FW: Attached Image

Sid, Greg,

Received this from Whitehaven regarding some modifications planned for the loop at werris creek. Could you please peruse the document and provide your comments. I have already nodes some corrections on page 9.

I hope to be able to get back to Whitehaven with our input prior to the end of next week.

Thanks & regards
Phill Carey

Supervisor - Terminal Operations
Mountain Industries
P - 02 4923 4533
M - 0439 438 783
F - 02 4923 4539
E - Phil.Carey@MountainIndustries.com.au
W - www.MountainIndustries.com.au

From: canon.rail@mountainindustries.com.au [<mailto:canon.rail@mountainindustries.com.au>]
Sent: Friday, 27 April 2012 1:44 PM
To: Phil Carey
Subject: Attached Image



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APPENDIX B (Environmental Policy)

	WHITEHAVEN GROUP	Document Owner:	Managing Director
		Revision Period:	3 Yearly
		Issue:	3
		Last Revision Date:	29/10/12

WHC-POLICY-HEALTH, SAFETY & ENVIRONMENT

Whitehaven Coal intends to conduct business in a way that maintains a safe and healthy workplace for its workers visitors and the surrounding community, and protect the environment in all stages of exploration, project development and construction, mining, processing and train loading.

Whitehaven Coal aims to:

- Achieve zero workplace injuries and illnesses.
- Achieve zero plant and equipment damage.
- Achieve zero environmental incidents.

Whitehaven Coal will strive to achieve these goals by:

- Considering health, safety, welfare and environmental matters when planning and completing work activities.
- Consulting and communicating in a fair and effective manner regarding health, safety, welfare and environment matters.
- Having in place processes for identifying hazards and eliminating or minimising health, safety, welfare and environmental risks and impacts.
- Having in place processes for receiving and considering information regarding incidents, hazards, and risks and impacts, and responding to that information in a timely way, including learning's applied and shared.
- Working to improve safety and environmental performance through continuous improvement.
- Providing an effective injury management and return to work program for employees.
- Complying with applicable health, safety and environmental legal and other requirements.
- Providing workers with necessary health, safety, welfare and environment information, instruction, training and supervision to allow for the safe performance of their work.
- Making available for use, and using, health, safety, welfare and environment resources and processes to implement and maintain the requirements of this Policy and associated health, safety, welfare and environment management systems.
- Verifying the availability and use of health, safety and welfare resources and processes.

Responsibilities of Workers:

- Workers have a responsibility to comply with the applicable legislation, this policy and associated health, safety and environment management systems. No work is to be undertaken without a clear understanding of a safe method that minimises the risk of injury or illness, plant or equipment damage and environmental harm.
- Workers must take reasonable care for their own health and safety and have an obligation to take reasonable care that their acts or omissions don't adversely affect themselves or the health and safety of others at the operation.
- Workers must also comply with any reasonable instruction given by Whitehaven Coal and cooperate with any reasonable policy or procedure relating to health or safety notified to them.

This policy applies to all sites managed by Whitehaven Coal and its subsidiaries, and to all workers, visitors and clients of Whitehaven Coal.

Tony Haggarty
Managing Director

Date: 29/10/12

"If it's not safe, don't do it."

UNCONTROLLED COPY WHEN PRINTED.

1 of 1

REFER TO INTRANET FOR LATEST VERSION



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APPENDIX C (Data Tables)

Presentation of data analysis for baseline conditions that informs the impact assessment and management actions is presented **Section 4** of the management plan.

Spectrum Acoustics Noise Re-model Report (2013).



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30 April 2013

Ref: 04035/4696

Mr Andrew Wright
 Werris Creek Coal
 1435 Werris Creek – Quirindi Road
 Werris Creek NSW 2341

RE: PLANT NOISE TESTING AND NOISE RE-MODELLING – WERRIS CREEK COAL

This letter report presents the findings of Noise Re-Modelling for Werris Creek Coal (WCC) operations based on a number of minor modifications to plant/fleet configurations. The re-modelling incorporates the results of noise testing conducted on dozers and trial attenuation of a CAT 785C haul truck (plant #608) during February 2013. The purpose of the tests was to measure the sound power level ($L_w, dB(A)$) difference between operating the dozers in first and second gears and to establish the L_w of truck #608 after fitment of final noise reduction components, in addition to the sound suppression exhaust system and radiator silencer unit previously tested (Ref: 04035-4521).

MONITORING PROCEDURES

Dynamic testing of the truck in motion was conducted using a modified version of ISO 6395:2008. The layout of the machinery path of motion and measurement points is shown in **Figure 1**. When applied to dump trucks in motion, the forward measurement path is uphill from point A to point B and the reverse path from B to A has the machine travelling downhill. The truck was loaded travelling uphill and empty travelling downhill.

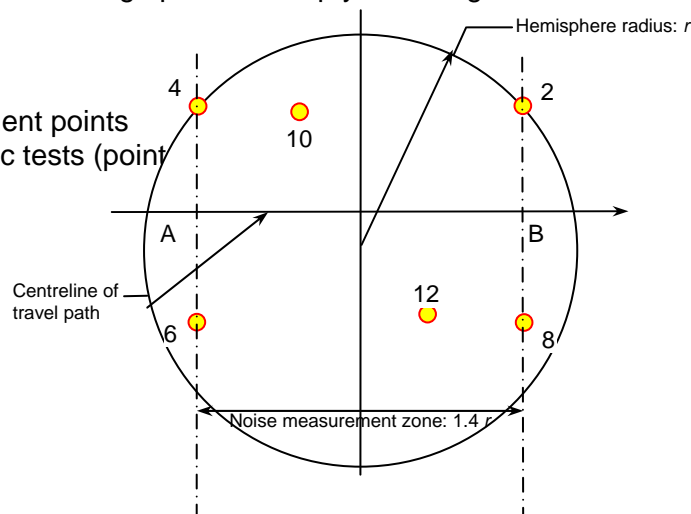


Figure 1. Measurement points for ISO 6395 dynamic tests (point 10 and 12 omitted).



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Dynamic testing of a D10T and a D9R dozer in motion was also conducted on the coal stockpile using the above modified version of ISO 6395. A single measurement point was used at a distance of 10m from the effective noise source, being the near-side track. The layout of the machinery path of motion and measurement point (halfway between points 6 and 8) is shown in **Figure 1**. The forward measurement path was uphill from point A to point B and the reverse path from B to A. The uphill/downhill cycles were measured at least three times and the average of the two results in closest agreement were calculated and reported in accordance with the standard.

SOUND POWER RESULTS

Truck # 608

Sound power levels (in third-octave bands) calculated for CAT 785C haul truck (plant #608) in accordance with the methodology of ISO 6395 are summarised in Table 1. Table 1 includes the previously measured unattenuated levels; the noise level achieved after fitment of the sound suppression exhaust system and radiator silencer (Stage 1 attenuation) and Stage 2 attenuations including engine bay walling and other final noise reduction components.

The results at some low frequencies below 125 Hz are higher for the February 2013 (fully attenuated) test than for the September 2012 (Stage 1 attenuation) test. This is because of the steeper slope used for the final test and slightly greater exhaust noise on uphill travel. The noise spectrum is dominated by the mid-high frequencies up to around 2500 Hz and the specification level of 116 dB(A) was achieved with the full attenuation applied.

TABLE 1 MEASURED TRUCK SOUND POWER LEVELS, dB(A) – CAT 785C WCC UNIT #608					
Frequency (Hz)	Unattenuated (Aug 2012)		Partial (Stage 1) attenuation (Sep 2012)		Full attenuation (Feb 2013)
	Stationary	Dynamic	Stationary	Dynamic	Dynamic
50	76.5	80.5	73.5	77.3	79.4
63	81.9	89.3	79.8	82.8	86.3
80	96.7	108.0	84.6	93.5	101.4
100	103.9	106.8	99.2	97.9	98.7
125	100.6	102.6	93.9	94.9	102.0
160	110.0	109.6	105.9	100.6	101.1
200	105.3	106.9	102.3	100.6	99.3
250	103.7	103.6	100.6	98.9	100.8
315	107.8	109.3	105.3	104.5	103.3
400	108.2	107.6	103.8	103.4	104.3
500	113.7	111.3	109.1	108.7	106.3
630	110.2	111.3	107.1	107.7	106.2
800	114.9	111.3	107.7	107.4	104.4
1000	111.2	110.7	107.5	107.7	103.3
1250	111.4	110.5	108.4	108.2	105.4
1600	111.7	109.7	108.3	107.7	104.5
TABLE 1 (cont'd) MEASURED TRUCK SOUND POWER LEVELS, dB(A) – CAT 785C WCC UNIT #608					
2000	110.9	109.8	107.6	107.0	106.3



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2500	109.1	107.2	105.8	105.2	102.5
3150	105.5	104.2	102.2	101.8	98.8
4000	103.6	102.3	100.4	100.0	97.0
5000	101.9	100.4	96.8	96.3	93.4
6300	98.0	98.8	93.0	95.4	92.2
8000	94.3	96.7	88.5	93.1	92.1
10000	90.1	91.2	82.7	86.5	84.3
Sum dB(A)	122.2	121.4	118.3	117.7	115.9

* All data are A-weighted.

Stockpile Dozers

The measured LAeq levels over the (approximately) 14m travel path averaged over the forward and backward cycles were:

	D10T	D9R
First gear reverse	109	113
Second gear reverse	118	118

NOISE RE-MODELLING

The initial noise model developed for the WCC Life of Mine (LOM) Project Environmental Assessment (EA) (Corkery & Co, 2011) Noise Impact Assessment was re-modelled to incorporate the proposed fleet configuration changes and revised truck and dozer sound power level commitments. The re-model was triggered by equipment initially purchased for the deferred Vickery Project now available for use and Whitehaven Coal management wanting to offset lower production from its other operations by mining at 2.5Mtpa (up from the previous budget of 2Mtpa) from WCC as it is Whitehaven Coal's lowest cost producer. The proposed fleet configuration and noise management commitments outlined in this report will allow WCC to maximise operational efficiencies enabling 2.5Mtpa coal production despite increasing strip ratios/overburden thicknesses as mining progresses through the syncline (deepest point) of the coal deposit.

Excavators

The modelling for the latter stages of the LOM project incorporated five excavators rated at 116 dB(A) each as a worst case (earlier stages may use fewer excavators).

Advice from Whitehaven Coal is that two of the excavators may be replaced by a single Hitachi EX5600 excavator with a manufacturer's sound power rating of 121 dB(A). An excavator fleet of three units at 116 dB(A) and one unit at 121 dB(A) was incorporated in the model.



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Dozers

The construction of the rail loop adjacent to the existing Train Load Out Facility will enable WCC to load the standard capacity coal trains (6200t) compared to the existing 5200t trains. The Statement of Commitments states that dozers will only operate in first gear in reverse. This restriction was adopted prior to the LOM EA as a means of reducing potential noise impacts at the “Escott”, “Cintra”, “Preston Park”, “Zeolites”, “Old Colliery” and “Tonsley Park”. By the time on the LOM EA, all of these properties except “Tonsley Park” had become project-related; with “Tonsley Park” acquired by Whitehaven Coal in late 2012 and the nearest potentially impacted non-project related receivers now significantly further north in Kurrara Street, Werris Creek. The existing practice of operating dozers in first gear when reversing on the stockpiles will not load the larger capacity trains within the allocated time allowed by the rail transport contractor and ARTC rail provider. The remodelling incorporated the dozers operating in second gear on the stockpile.

Haul Trucks

The Statement of Commitments states that all of the CAT 785 haul truck fleet will be attenuated to a level not exceeding 116 dB(A), as determined with an ISO 6395 dynamic test, in order to achieve the noise criteria at all receivers, especially during the latter stages of the mine as it gets nearer to Werris Creek.

Almost half of the total CAT 785 fleet has been (or is in the process of being) replaced by new CAT 793XQ (extra-quiet) trucks. Our previous measurements on site found a 793XQ to have a dynamic sound power level (combined uphill/downhill travel) of 115 dB(A).

Instead of the originally modelled fleet of fifteen CAT 785's attenuated to 116 dB(A), the re-modelled worst case scenario considers eleven CAT 785's partially attenuated to 117.7 dB(A) as shown in Table 1 and six of the CAT 785's replaced by the considerably quieter CAT 793XQ's tested on site to achieve 115 dB(A). Haul trucks are collectively the predominant noise source from WCC. The geometric average sound power for the proposed truck fleet is 116.9 dB(A) per truck which is less than 1 dB higher than the fully attenuated level of 116 dB(A) adopted in the LOM noise model.

Model Results

The original noise model for the LOM project had utilised in point-calculation mode which allowed this remodel to investigate the implications of the proposed composite fleet of 785's and 793XQ's, the use of dozers in second gear while reversing on the coal stockpile and the replacement of two excavators with a single larger unit. Table 2 shows the worst case noise predictions from the LOM EA for the four scenarios considered, under an intense temperature inversion of 12°C/100m (from Table 17 of the LOM EA Noise Impact Assessment), the worst case re-calculated levels for the same four scenarios under the same inversion conditions, the noise level difference and the night time noise criteria as contained in the project consent.

Table 2 only includes non project-related receivers. Receivers 103 (Parsons residence) and R97 (Davison, vacant land) are included in the re-model but were not included in the original LOM EA Noise Impact Assessment.



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**TABLE 2
PREDICTED NOISE LEVELS UNDER INTENSE TEMPERATURE INVERSION,
dB(A),Leq(15minute)**

Rec #	Receiver	Inversion 12 ⁰ C/100m			Criterion dB(A)
		LOM EA ¹	Re- modelled ¹	Difference	
R21	Currey ²	37	38	+1	37
R103	Parsons	--	32	-	35
R26	Woods	34	35	+1	35
R55	Pitkin	34	34	<0.5	35
R62	Cunningham	35	35	-	35
--	"Werriston South" ³	31	32	+1	35
R98	Colville ²	36	36	<0.5	36
R97	A & J Davison ³	--	35	--	35
R96	B. Davison	37	37	<0.5	37
R17	Doolan & Hogan	33	33	<0.5	35
R12	Bojba	38	38	<0.5	38
R24	P. George	37	37	<0.5	37
R11	Ryan ²	39	39	<0.5	39
R10	Blackwell ²	39	39	<0.5	39
R9	Smith	37	37	<0.5	37
R8	Hird ²	37	37	<0.5	37
R7	Andrews	37	37	<0.5	37
R22	Parkes	36	36	<0.5	36
R5	R. & A. George	30	31	+1	35

¹ Highest predicted level for the four operational scenarios considered.

² Private agreements are in place with these receivers.

³ Vacant Land

The results in Table 2 indicate that operation of the dozers on the stockpile in second gear rather than first gear marginally increases noise levels at some receivers to the north and east of WCC. For the majority of receivers, the change in predicted noise levels is within the rounding margin of 0.5 dB and in all cases except R21, the proposed changes do not result in exceedances of the current noise criteria.

The Consolidated WCC Consent 10_0059 (MOD 1, August 2012) states the following under Table 1 "Noise Criteria":

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

There is an existing written agreement between WCC and R21 and accordingly, the noise criteria do not apply at this receiver. Notwithstanding, noise monitoring is conducted at this receiver and will continue to be conducted so that the effect of using dozers in second gear on the stockpile may be quantified.

It is noted that there is a future possibility of replacing additional CAT 785's with the quieter CAT 793XQ's. This would reduce the overall noise emissions from WCC by between 1-2



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dB(A) and therefore the above existing assessment represents a conservative/worse case analysis for noise.

Sound Power Levels

Some of the sound power levels presented in the LOM EA were calculated levels based on levels measured under the various standards for static and dynamic conditions. Table 3 presents for the major plant items at WCC the sound power levels and the appropriate measurement methodology in order to achieve the predicted levels in Table 2.

Plant Type	Method	Lw, dB(A)
Haul truck CAT 785 (Stage 1 Attenuation)	ISO 6395 (dynamic, on slope)	117.7 ¹
Haul truck CAT 793XQ	ISO 6395 (dynamic, on slope)	115 ¹
Water Cart	ISO 6395 (dynamic, on slope)	113
Scrapers	ISO 6395 (dynamic)	118
Excavator (Hitachi 1900 Hitachi 3600 and Komatsu PC4000)	ISO 6395 (dynamic, rotation)	116
Excavator (Terex EX5600)	ISO 6395 (dynamic, rotation)	121
Dozers (D5/D6/D8/D9/D10/D11)	ISO 6395 (dynamic, on slope)	118
Crushing Plant	AS2012 (stationary)	116
Drills	AS2012 (stationary)	116
Front End Loader	ISO 6395 (dynamic, on flat)	114
Rail Load Out Facility	AS2012 (stationary)	112
Trains on Rail Loop	AS2377-2002	87 (L _{Amax})
Semi-trailer Truck	ADR 28/01	113

¹ The method for calculating haul truck sound power levels followed ISO 6395, averaged over a 15 minute period for a given number of truck pass-bys and taken as an equivalent point source for a 350m section of the haul route.

SUMMARY

Based on the results of this assessment, we recommend that the Noise Management Plan may be modified to reflect the following commitments:

1. Dozers will operate in second gear in reverse;
2. Reduce the number of production excavators from five to four to allow a single larger excavator with a Lw at 121 dB(A), and
3. Four of the existing CAT 785 haul trucks will be replaced with CAT 793XQ trucks and the remaining eleven CAT 785 trucks will have Stage 1 attenuation fitted.



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I trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0409 181888.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Neil Pennington
Acoustical Consultant



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Spectrum Acoustics Noise Re-model Report (2014).



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15 April 2014

Ref: 04035/5150

Mr Andrew Wright
Werris Creek Coal
1435 Werris Creek – Quirindi Road
Werris Creek NSW 2341

RE: NOISE RE-MODELLING – WERRIS CREEK

This letter report presents the findings of Noise Re-Modelling for Werris Creek Coal (WCC) operations based on a number of minor modifications to plant/fleet configurations. The results are the second re-modelling conducted for WCC since approval of the LOM project and are based on minor changes to the re-modelling conducted in April 2013 (Ref: 04035/4696). The 2013 re-modelling incorporated the results of noise testing conducted on dozers and trial attenuation of a CAT 785C haul truck (plant #608) during February 2013.

The current re-modelling was based on the following minor fleet changes;

- Ten CAT793XQ haul trucks.
- Six CAT785 haul trucks.
- Three drills.
- Five excavators (EX5600, 1x3600, 3x1900).
- Two mobile crushers on the ROM pad.

Sound power levels of these plant items and other information relevant to the remodelling are discussed below.

Excavators

The modelling for the latter stages of the LOM project incorporated five excavators rated at 116 dB(A) each as a worst case (earlier stages may use fewer excavators) with a total sound power of 123 dB(A). Two of the excavators have been replaced by a single Hitachi EX5600 excavator since the 2013 remodelling in which the manufacturer's sound power rating of 121 dB(A) was adopted. Site measurements have since confirmed sound power levels of 116 dB(A) for the 5600 and 115 dB(A) for the 1900/3600's for a total excavator fleet sound power level of 122 dB(A).



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Dozers

The Statement of Commitments states that dozers will only operate in first gear in reverse on the stockpiles. This restriction was adopted more than one year before the LOM EA was conducted as a means of reducing noise impacts at “Escott”, “Cintra”, “Preston Park”, “Zeolites”, “Old Colliery” and “Tonsley Park”. By the time on the LOM EA, all of these properties except “Tonsley Park” had become project-related. The existing practice of operating dozers in first gear when reversing on the stockpiles was incorporated into the LOM noise modelling without specifically reviewing if the practice was still necessary with regard to non project-related receivers.

“Tonsley Park” is now also project-related and the nearest potentially impacted non-project related receivers are significantly further north in Kurrara Street Werris Creek.

The current remodelling incorporated the dozers operating in second gear on the stockpile, as did the 2013 remodelling.

Drills

The Statement of Commitments states that only two non-exploration drills will operate at any one time at WCC. The 2014 remodelling was updated to reflect three drills in operation using as measured sound power levels from testing undertaken at WCC.

Haul Trucks

The Statement of Commitments states that all of the CAT 785 haul truck fleet will be attenuated to a level not exceeding 116 dB(A), as determined with an ISO 6395 dynamic test, in order to achieve the noise criteria at all receivers, especially during the latter stages of the mine as it gets nearer to Werris Creek.

The majority of the CAT 785 fleet has been replaced by ten new CAT 793XQ (extra-quiet) trucks. Our previous measurements on site found a 793XQ to have a dynamic sound power level (combined uphill/downhill travel) of 115 dB(A).

Instead of the originally modelled fleet of fifteen CAT 785's attenuated to 116 dB(A), the 2013 re-modelled worst case scenario considered eleven CAT 785's partially attenuated to 117.7 dB(A) and six of the CAT 785's replaced by the considerably quieter CAT 793XQ's tested on site to achieve 115 dB(A). The haul trucks are collectively the predominant noise source on site.

The geometric average sound power for the proposed truck fleet for the 2013 remodelling was 116.9 dB(A) per truck which is less than 1 dB higher than the fully attenuated level of 116 dB(A) adopted in the LOM noise model. The current remodelling based on ten CAT 793XQ's at 115 dB(A) each, a fully attenuated CAT 785 fully attenuated to 116 dB(A) and five CAT 785's partially attenuated to 117.7 dB(A), giving a geometric mean sound power level of 116.1 dB(A). This is almost 1 dB below the average truck sound power level used in the 2013 remodelling.

Crushing Plant

Two mobile crushers measured at 118 dB(A) each were included in the current remodelling based on their use during the Mine Infrastructure Area relocation while the fixed plant crusher was not operational. These were modelled as measured, within the ROM area where acoustic shielding was provided by the surrounding stockpiles.



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Model Results

The original ENM model for the LOM project has been utilised in point-calculation mode to investigate the implications of the proposed composite fleet of 785's and 793XQ's, the use of dozers in second gear while reversing on the coal stockpile, three non-exploration drills and the use of up to five production excavators. Table 1 shows the worst case noise predictions from the LOM EA for the four scenarios considered, under an intense temperature inversion of 12^oC/100m (from Table 17 of the LOM acoustic assessment), the worst case re-calculated levels from the 2013 remodelling for the same four scenarios under the same inversion conditions, the current (2014) remodelled levels under the same conditions, the noise level difference between the 2013 and 2014 remodelled levels and the night time noise criteria as contained in the project consent.

Table 1 only includes non project-related receivers. Receivers 103 (Parsons residence) and R97 (Davison, vacant land) are included in the re-modelling but were not included in the original LOM assessment.

Rec #	Receiver	Inversion 12 ^o C/100m				Criterion dB(A)
		LOM EA ¹	Re- modelled 2013 ¹	Re- modelled 2014	Difference (2014- 2013)	
R21	Currey ²	37	38	37	-1	37
R103	Parsons	--	32	32	0	35
R26	Woods	34	35	35	0	35
R55	Pitkin	34	34	34	0	35
R62	Cunningham	35	35	35	0	35
--	"Werriston South" ³	31	32	32	0	35
R98	Colville ²	36	36	35	-1	36
R97	A & J Davison ³	--	35	35	0	35
R96	Hamilton-Smith	37	37	36	-1	37
R17	Doolan & Hogan	33	33	33	0	35
R12	Bojba	38	38	37	-1	38
R24	P. George	37	37	36	-1	37
R11	Ryan ²	39	39	38	-1	39
R10	Blackwell ²	39	39	38	-1	39
R9	Smith	37	37	37	0	37
R8	Hird ²	37	37	36	-1	37
R7	Andrews	37	37	37	0	37
R22	Parkes	36	36	36	0	36
R5	R. & A. George	30	31	30	-1	35

¹ Highest predicted level for the four operational scenarios considered.

² Private agreements are in place with these receivers.

³ Vacant Land

The results in Table 2 indicate that noise levels remodelled for the 2014 were the same as the 2013 remodelling, with some receivers receiving 1 dB less due to the slightly quieter excavators and truck fleet. This reduction is consistent with statements made in the 2013 remodelling report. The Consolidated WCC Consent 10_0059 (MOD 1, August 2012) states the following under Table 1 "Noise Criteria":



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

There is an existing written agreement between WCC and R21 and accordingly, the noise criteria do not apply at this receiver. Notwithstanding, noise monitoring is conducted at this receiver and will continue to be conducted so that the effect of using dozers in second gear on the stockpile may be quantified.

SUMMARY

Based on the results of this assessment, we recommend that the Noise Management Plan may be modified to reflect the following changes which still achieve compliance with the noise criteria and consistent with the original noise prediction but differ from the approved Statement of Commitments:

1. Dozers on the coal stockpile will operate in second gear in reverse;
2. Allow the number of production excavators to remain at five since the sound power level of the new EX5600 achieves the level of 116 dB(A) used in the noise modelling, and
3. The majority of existing CAT 785 haul trucks replaced with ten CAT 793XQ trucks. One of the remaining six CAT 785 trucks will have Stage 2 attenuation to 116 dB(A) and the other five will have Stage 1 attenuation fitted to achieve 117.7 dB(A).
4. The two mobile crushers currently used on site will remain in use within the ROM stockpile area.
5. Three non-exploration drills.

I trust this report fulfils your requirements at this time, however, should you require additional information or assistance please contact the undersigned on 4954 2276 or 0409 181888.

Yours faithfully,

SPECTRUM ACOUSTICS PTY LIMITED

Neil Pennington
Acoustical Consultant



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APPENDIX D (Risk Assessment)

R1. Environmental Risk Assessment from LOM Project

With reference to Section 3 of the EA , risk is *the chance of something happening that will have an impact upon the objectives or the task*, in this case operation of the LoM project with minimal effects on the local environment. Consultation in the early phase of the LoM project assisted in identifying a range of potential environmental impacts associated with the proposal. Each of these issues was subject to qualitative risk analysis, to evaluate and prioritise the need to actions to investigate or ameliorate these risks.

With regards to noise impacts, the process methodology is summarised as follows:

- conduct assessment of noise impacts associated with unmitigated mine operations to identify, quantify and prioritise risks;
- these results were used to guide a detailed noise impact assessment. The assessment considered the unmitigated impacts, and proposed (and evaluated) measures that could be implemented to mitigate these impacts;
- re-visit the risk assessment and re-score noise risks based on the mitigated scenario presented in the NIA;
- prepare a plan to document how these measures would be implemented.

The noise impact risk assessment table presented in the LoM environmental assessment (Table 3.2 and 6.1) is reproduced below. This assessment indicates that, following implementation of the mitigation measures and the risk rating of impacts associated with LoM operations is reduced.



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Table 32: High level risk assessment (reproduced from EA (Corkery 2010))

Risk Source	Noise		Receptor	Potential Impact	Risk Rating ¹	
	Potential Consequence	Receptor			Unmitigated	Mitigated
Elevated noise level resulting from construction, mining, transport and processing activities moving closer to the town of Werris Creek and operations running 24 hours a day	Reduced reputation within the local community	Residents, of landowners properties on and surrounding the mine site	Health related issues	H	M	
	Community complaints Decreased land values	Livestock located on properties on and surrounding the mine site	Sleep deprivation	E	M	
Elevated overpressure (noise) from blasting operations as mining operations move closer to Werris Creek	Reduced reputation within the local community Community complaints	Surrounding residences, building and other structures Local livestock	Impacts on livestock	M	L	
			Reduced amenity of the local area	H	M	
			Minor structural damage to building and structures	M	L	
			Significant structural damage to building and structures	M	M	

Note 1: Refer to Table 3.5 of the Environmental Assessment (2010) for explanation of Risk Rating



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R2. Whitehaven Coal Broadbrush Environmental Risk Assessment

Further assessment of noise related project risk was undertaken as part of a broadbrush environmental risk assessment by internal WCC stakeholders. This risk assessment sought to identify specific hazards relating to noise management, the consequences of these hazards, and the risk associated with the current level of control of these potential environmental impacts.

The risk assessment then sought to re-evaluate the risk following implementation of additional controls that would become available as part of future (including planned but currently not implemented) management actions, as a means of quantifying opportunities for further risk reduction.

The objective of this assessment is to quantify risk and inform the (and future revisions of) the NMP. The results of this assessment are provided below.



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Table 33: Broadbrush environmental risk assessment (WCC 2012)

Task Step/ Activity	Hazard	Causes	Existing Controls (What has been done to prevent it from happening?)	Current Risk			Additional Controls (What else can I do to prevent it from going wrong?)	Residual Risk		
				C	L	R		C	L	R
Operational Noise	Neighbours complaint	<ol style="list-style-type: none"> Noise generated by mine operations Proximity of properties to the north, south and east Wind direction 	<ol style="list-style-type: none"> Reaction to complaints Monthly attended noise monitoring (Spectrum Acoustics) Mobile real time noise monitor able to be placed at properties where complaints originate Community liaison officer Complaints procedure Noise management plan Private noise agreements Strategic purchase of properties as required Monitoring of real time noise monitor via earphones and modification of operations as required Monitoring of weather conditions and reporting at daily meeting Purchase of noise attenuated dozer Operation in first gear at Rail Load Out facility 	3	A	H	<ol style="list-style-type: none"> Implement EA commitments for noise Implement noise attenuation on trucks Consider alternative equipment with noise attenuation on replacement Reviewing rosters to minimise time working during temperature inversions 	3	D	M



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Task Step/ Activity	Hazard	Causes	Existing Controls (What has been done to monitoring (Spectrum Acoustics) 1. Monthly real time noise monitor able to be placed at properties where complaints originate 2. Mobile real time noise monitor able to be placed at properties where complaints originate 3. Noise management plan 4. Private noise agreements 5. Strategic purchase of properties as required 6. Monitoring of real time noise monitor via earphones and modification of operations as required 7. Monitoring of weather conditions and reporting at daily meeting 8. Purchase of noise attenuated dozer 9. Operation in first gear at Rail Load Out facility	Current Risk 3 B M	Additional Controls (What else can I do to prevent it from noise 1. Implement EA commitments for noise 2. Implement noise attenuation on trucks 3. Consider alternative equipment with noise attenuation on replacement 4. Reviewing rosters to minimise time working during temperature inversions 5. Continue to pursue private noise agreements	Residual Risk 3 D M
Operational Noise	Non compliance with noise requirements	1. Noise generated by mine operations 2. Wind direction and temperature inversions	1. Monthly real time noise monitoring (Spectrum Acoustics) 2. Mobile real time noise monitor able to be placed at properties where complaints originate 3. Noise management plan 4. Private noise agreements 5. Strategic purchase of properties as required 6. Monitoring of real time noise monitor via earphones and modification of operations as required 7. Monitoring of weather conditions and reporting at daily meeting 8. Purchase of noise attenuated dozer 9. Operation in first gear at Rail Load Out facility	3 B M	1. Implement EA commitments for noise 2. Implement noise attenuation on trucks 3. Consider alternative equipment with noise attenuation on replacement 4. Reviewing rosters to minimise time working during temperature inversions 5. Continue to pursue private noise agreements	3 D M



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Task Step/ Activity	Hazard	Causes	Existing Controls (What has been done to)	Current Risk	Additional Controls (What else can I do to prevent it from)	Residual Risk
Transport Noise	Neighbours complaint	<ol style="list-style-type: none"> Truck movement Light vehicle traffic Trains 	<ol style="list-style-type: none"> Approved routes for offsite coal haulage Road noise assessed in EA Toolbox talks Private agreements with individual neighbours Coal haulage by road approved hours 7am - 5pm Rail spur stop sign located to avoid neighbour Rail spur speed limit 15km/h 	<p>2 C</p>	<ol style="list-style-type: none"> Coal haulage contracted to 5000 tonnes on 1st July Ongoing negotiations with neighbours Rail works associated with extension will result in lower noise 	<p>3 D M</p>
Transport Noise	Non compliance against project approval conditions	<ol style="list-style-type: none"> Truck movement Light vehicle traffic Trains 	<ol style="list-style-type: none"> Approved routes for offsite coal haulage Road noise assessed in EA Toolbox talks Private agreements with individual neighbours Coal haulage by road approved hours 7am - 5pm Rail spur stop sign located to avoid neighbour Rail spur speed limit 15km/h 	<p>3 C H</p>	<ol style="list-style-type: none"> Coal haulage contracted to 5000 tonnes on 1st July Ongoing negotiations with neighbours Rail works associated with extension will result in lower noise 	<p>3 D M</p>



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APPENDIX E (Procedures)

This appendix contains definitions of procedures, protocols and methodologies relevant to the implementation of the Noise Management Plan, including:

- P1. Attended Noise Monitoring Protocol
- P3. Noise Control Operator Procedure

P1. Attended Noise Monitoring Protocol

Application

To provide a standard attended noise monitoring work practice for evaluating impacts against the noise criteria outlined in the NMP, and to maintain compliance with project approval 10_0059 and EPL 12290 conditions.

Methodology

Attended noise surveys will be conducted in accordance with the following methodology:

1. attended noise monitoring will be carried out in accordance with the NSW Industrial Noise Policy (2000), and applicable Australian Standards;
2. noise levels will be measured in one-third octave bands using an instrument with IEC Type 1 characteristics as defined in AS 1259-1990 "Sound Level Meters". The instrument will have current calibration as per manufacturer's instructions and field calibration will be confirmed before and after measurements with a sound level calibrator;
3. the instrument will be set to A-weighting, "fast" response and measurements of $L_{Aeq,15\text{ minute}}$ will be taken at each location in the attended noise monitoring program. Each measurement will be stored at a sampling rate of no greater than 5 seconds for further analysis;
4. attended surveys will be conducted within a 24-hour period with at least 2 measurements taken at each monitoring location. These measurements will be representative of that day period, and evening or night periods of operation;
5. field notes will be taken during each measurement recording the time and duration of noise events, noise sources, instantaneous noise levels and frequency range of identified site noise sources;
6. extraneous noise sources will be filtered from the measured signal using Bruel & Kjaer Evaluator Software, and the $L_{Aeq,15\text{ minute}}$ level attributable to WCC activities will be identified and compared with the relevant criterion;
7. where relevant, details regarding plant configuration, survey interval, weather conditions, extraneous noise sources, monitoring locations and times of measurement will be recorded for inclusion in the noise monitoring report;
8. meteorological data will be obtained from the onsite weather station to help identify sources of noise and for use in comparing data against the EPL and Consent Criteria in relation to strength of temperature inversion and wind speeds;
9. the specialist acoustical consultant will provide data collected in a report for WCC.



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P3. Noise Control Operator Procedure

SCOPE

This procedure outlines the process of monitoring real time noise levels and audio to manage noise emissions from mining operations at Werris Creek Coal below the long term noise criteria of 35dB(A) outlined in Project Approval 10_0059 and the Noise Management Plan.

MAJOR HAZARDS

- Excessive noise generated from Werris Creek Coal leading to an exceedance of noise criteria at privately owned properties;
- Community complaints related to noise generated from mining operations in the open cut pit; and
- Community complaints related to noise generated from the Rail Load Out Facility.

PROCEDURE

The following procedure applies to all noise generated by Werris Creek Coal. Noises from mining operations are recognised as having potentially high environmental risks; particularly with a partially attenuated truck fleet. The purpose of this procedure is to minimise the potential for the community complaints and exceedances due to noise generated by Werris Creek Coal.

Continuous Noise Monitoring

1. Turn on the computer and at the windows log-in, enter the following Username and Password:
 USERNAME: wccnco
 PASSWORD: Wcno1se
2. Double click on the desktop shortcut called "Noise and Weather"; otherwise open Internet Explorer web browser page and enter the following web address:

www.novecom.com.au/sentinex

3. At the website login page, enter the following Username and Password:
 USERNAME: wccoce
 PASSWORD: wccoce



REAL TIME NOISE AND WEATHER DATA



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4. The first method is to capture noise and weather data is by selecting “Site Map / Dashboard” from the top right drop down menu.

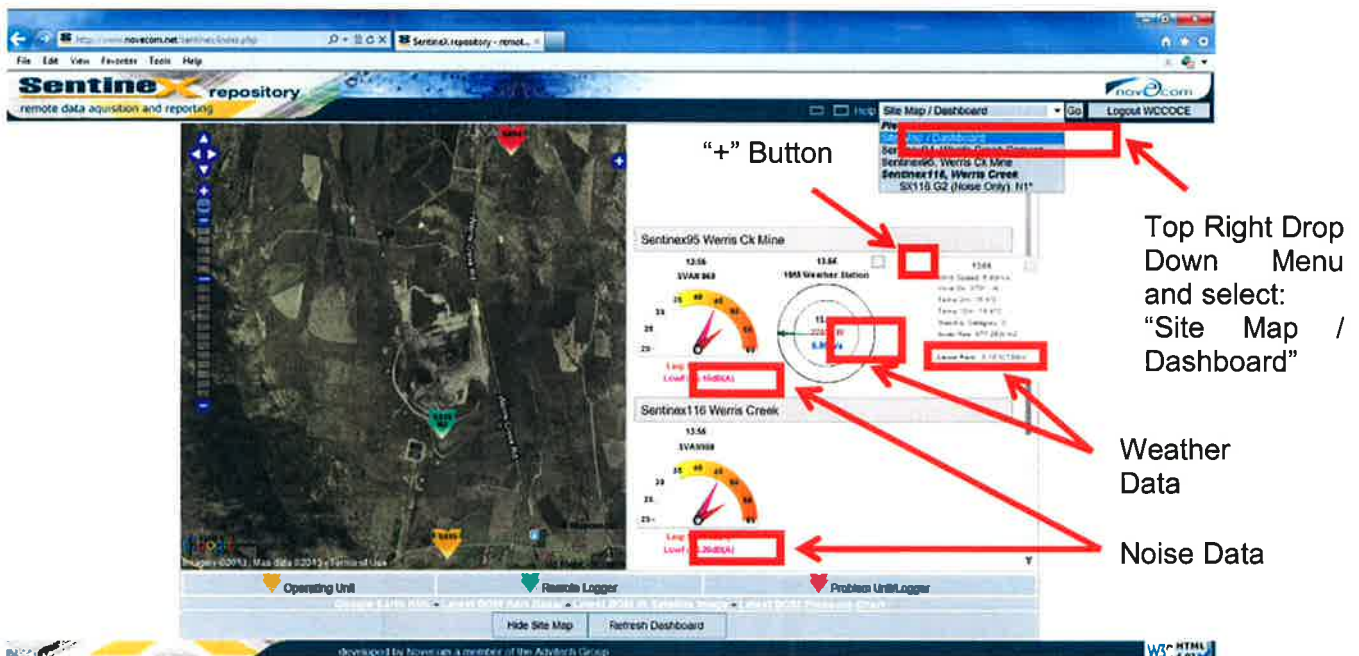
The “Dashboard” will be displayed with a map of Werris Creek Coal on the left and noise/weather data on the right.

Sentinex95 Werris Ck Mine displays the noise levels from the Quipolly continuous noise monitor (SX95) and onsite weather station (SX95 M2).

Sentinex116 Werris Creek displays the noise levels from the Werris Creek continuous noise monitor (SX116 next to SX94).

The relevant mining related noise levels for Quipolly (below SVAN959 under Sentinex95 Werris Ck Mine) and Werris Creek (below SVAN959 under Sentinex116 Werris Creek) can be read from next to the LowF (Low Frequency) label.

Wind direction (° degrees and orientation) and wind speed (m/s) can be read from the middle of the wind rose (below 10M Weather Station). Click on the “+” button next to 10M Weather Station wind rose to display the lapse rate/temperature inversion (°C/100m).



5. The second method is to select either “Sentinex95, Werris Ck Mine” for the Quipolly continuous noise monitor or “SX116 G2 (Noise Only) N1*” for the Werris Creek continuous noise monitor.

Click on the “General” tab and locate the “Low Frequency”, “Wind Speed”, “Wind Direction” and “Lapse Rate” (temperature inversion) data on the bottom right panel of the screen.



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The screenshot shows the Sentinel repository interface with the following data:

- Location:** G1 (Noise) (-31.42701, 150.63706 GPS Flt N/A)
- Weather Data:**
 - Barometer: 1016 hPa
 - Daily Rain: 0.00mm
 - Gust: 7.30m/s
 - Humidity: 40%
 - Lapse Rate: -3.10°C/100m
 - Solar Radiation: 405.80W/m2
 - Temp 10m: 14.9°C
 - Temp 2m: 16.0°C
 - Wind Direction: 292°
 - Wind Speed: 5.00m/s
- Noise Data:**
 - Leq Total: 32.00(dB(A))
 - Low Frequency: 40.50dB(A)

Red arrows point to the 'G1 (Noise Only) N1*' dropdown menu (labeled 'Quipolly' and 'Werris Creek'), the weather data section (labeled 'Weather Data'), and the noise data section (labeled 'Noise Data').

- The third method is to click on the “Noise Data” tab and select “Omni Directional” option for either “Sentinex95, Werris Ck Mine” for the Quipolly continuous noise monitor or “SX116 G2 (Noise Only) N1*” for the Werris Creek continuous noise monitor. The 5 minute noise level (bottom strip chart) and weather data (top strip chart) screen will appear. Move the mouse cursor over the lines in the bottom strip chart. If the cursor is over the right edge of the line, this is the most recent 5 minute noise level average. The actual noise level value is given immediately above the bottom strip chart to the left. Here you will find the 5 minute noise level average for “Leq Total (dB(A))” and “Low Frequency (dB(A))” for a specific date and time that is on the right above the strip chart. Follow the same process for the top strip chart to record the wind speed (m/s).

The screenshot shows the 'Noise Data Tab & Omni Directional' view with the following elements:

- Wind Speed:** A strip chart showing wind speed over time. A red box highlights the current value of 4.5 m/s.
- Low Frequency Noise Data:** A strip chart showing noise levels over time. A red box highlights the current value of 28.7 dB(A).
- Date & Time:** A red box highlights the date and time: 2013-05-17 09:29.

Red arrows point to the 'Noise Data Tab & Omni Directional' title, the 'Wind Speed' label, the 'Date & Time' label, and the 'Low Frequency Noise Data' label.

REAL TIME AUDIO

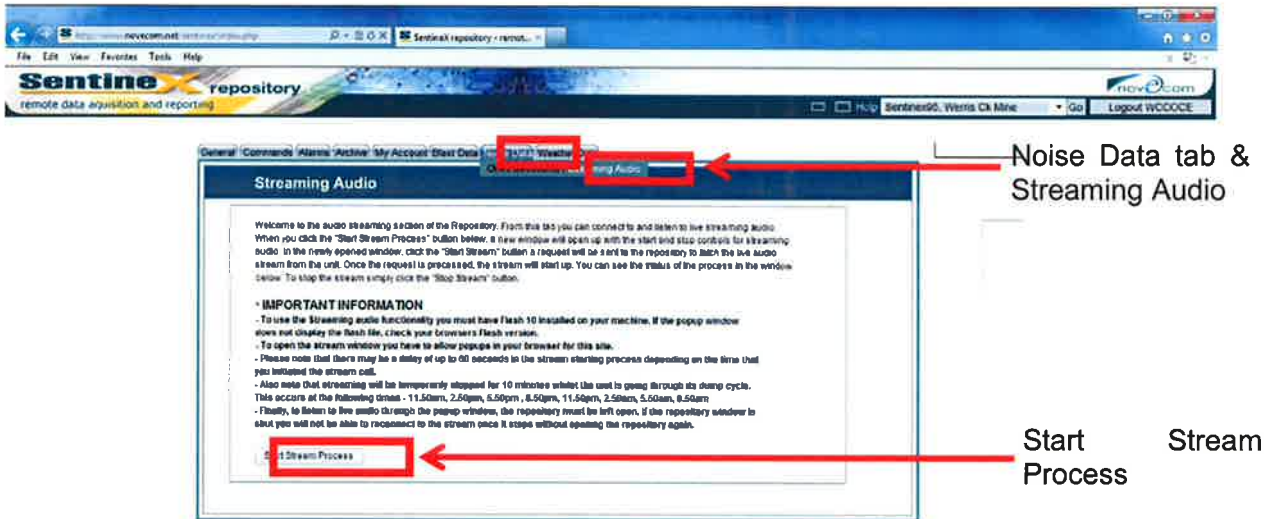


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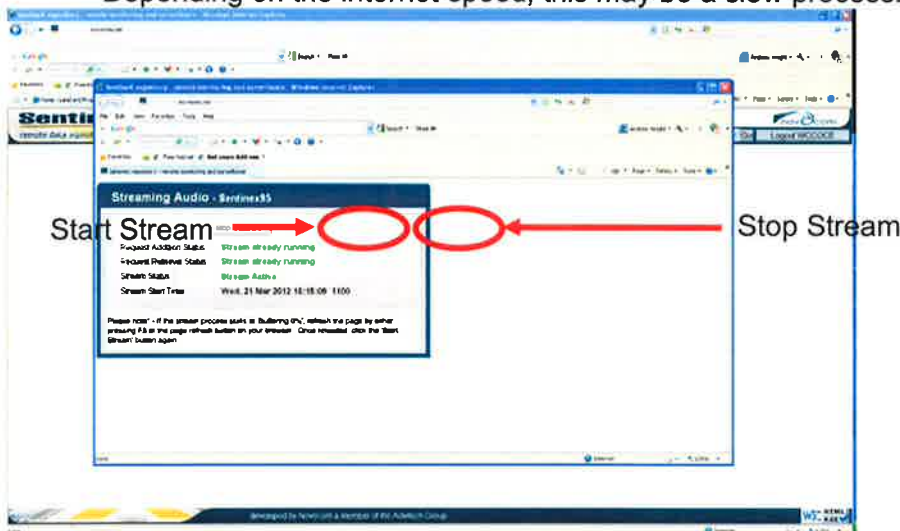
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Revision Period:	3 Years
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Last Revision Date:	16 April 2014
Date Printed:	16 April 2014

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- To stream near-real time audio, click on the “Noise Data” tab and select “Streaming Audio” option for either “Sentinex95, Werris Ck Mine” for the Quipolly continuous noise monitor or “SX116 G2 (Noise Only) N1*” for the Werris Creek continuous noise monitor. At the Streaming Audio page, click on the “Start Streaming Process” button.



- A new webpage will appear with a box titled “Streaming Audio – Sentinex95 or Sentinex116”. Click on the “Start Stream” button. The Streaming Audio box will start “Checking Status” and “Buffering...” while the audio is loading. After 30 seconds, you should have audio. Insert and turn on speakers to improve audio from the computer. Insert headphones into headphone jack if you need to listen in detail. If you need to stop the audio stream (i.e. operations finished for the night), click on the “Stop Stream” button.
NOTE: the audio will occasionally be interrupted and “Buffering X%” will appear. Depending on the internet speed, this may be a slow process.





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Noise Control Operator

9. The Noise Control Operator will complete the Continuous Noise Monitoring Proforma during night shift. Each night shift period will start on a new page of the Continuous Noise Monitoring Proforma.
10. List the time in the first column in 24 hour format.
11. The Noise Control Operator will initially listen to the audio from the Werris Ck Mine (Quipolly) continuous noise monitor; however if noise levels are low <35dB(A) then the Noise Control Operator will stream audio from the Werris Creek continuous noise monitor. The noise level will be circled corresponding to which continuous noise monitor audio is being streamed from.
12. Write down the dominant noise source and/or whether mining noise was audible in the background. Dominant noise source is the noise/s that are the most audible for greater than half of the previous 5 minute period.

Continuous Noise Monitoring Proforma

Version 2.3 17th May 2013

Time	Description of Audio	Noise LF _{15min} dB(A)		Weather			Operation Change
		Werris Ck Mine	Werris Creek	m/s	Dir	Inv	
0120	DOMINANT NOISE: E.g. Non Mining (non-mining vehicle, insects, train, dog, cattle, pressure pump, wind, rain, human, non-mining machinery and other local noises) if mining is audible for <math>< \frac{1}{2}</math> the 5 minute period or not audible.	36	33	3.6	114	+2.4	(No action required. Not required to notify OCE) E.g. None
	DOMINANT NOISE: OTHER NOISES:						

13. If mining noise is not audible or in the background for less than $\frac{1}{2}$ the 5 minute period, then no action is required.
14. If Mining is the dominant noise source in the audio & the Low Frequency noise level is greater than 35dB(A) (rounding down) FOR TWO CONSECUTIVE FIVE MINUTE PERIODS then ...

Continuous Noise Monitoring Proforma

Version 2.3 17th May 2013

Circle the Noise Level corresponding to which audio streaming you are listening to – either Werris Ck Mine or Werris Creek

Time	Description of Audio	Noise LF _{15min} dB(A)		Weather			Operation Change
		Werris Ck Mine	Werris Creek	m/s	Dir	Inv	
2335	DOMINANT NOISE: E.g. Mining (hum, rev, fan whir, clatter, horn etc) if audible for $> \frac{1}{2}$ the 5 minute period.	37	42	1.5	315	+11.1	(No Action Required Yet until 2 nd 5 Minute Period) E.g. None
2340	DOMINANT NOISE: E.g. Mining (hum, rev, fan whir, clatter, horn etc) if audible for $> \frac{1}{2}$ the 5 minute period. If noise >35dB(A) for second consecutive 5 minute period, then action required to be documented in Operation Change Column	39	37	1.2	308	+10.7	(Action Required. Notify OCE and document what change OCE made to operations) E.g. 1900 Strip 11 and 3 trucks suspended
	DOMINANT NOISE: OTHER NOISES:						

15. The Noise Control Operator contacts the Open Cut Examiner advising “Copy OCE, mining noise has been greater than 35dB(A) for the last 10 minutes”.
16. The Noise Control Operator what action is taken by OCE under Operation Change i.e. “OCE told truck operators to minimise revs”; “Trucks use in pit dump or ramp” or “1900 Strip 11 and 3 trucks suspended”.



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Production Response by the Open Cut Examiner

17. When the Open Cut Examiner is advised by the Noise Control Operator that noise levels for two consecutive 5 minute periods were over 35dB(A); the Open Cut Examiner is to manage operations to reduce noise levels by:
 - a. Changing haul route/s (if possible/practicable).
 - b. Change dump location/s (if possible/practicable).
18. If the above does not reduce noise below 35dB(A):
 - c. Suspend excavator/truck fleets based on business priorities and noise exposure risk.
19. The Open Cut Examiner must contact the Noise Control Operator to advise what operational changes have been implemented so it can be accurately documented in case investigation following noise exceedance or noise complaint.

Trouble Shooting

Internet Access:

- Use "Telstra 4G Sierra Wireless USB" and double click on "Mobile Broadband" icon on desktop. Enter the SIM PIN (2025) and click connect.
- If there is an issue with the Wireless internet access, connect to a blue serial network cable and use the Whitehaven internet, however this can have the slowest speeds at night.

Slow or Frozen Internet:

- Close down (or force exit "Ctrl+Alt+Tab") Internet Explorer and re-open.
- If this does not work; shut down (or force shut down "Ctrl+Alt+Tab") the computer.

SUPPORTING DOCUMENTATION

- Werris Creek Coal Noise Management Plan
- Noise Control Operations Training Tool Box Talk Presentation
- Noise Control Monitoring Proforma v2.3

DEFINITIONS

Term	Definition
dB(A)	Decibels (audible to human ear)
LF	Low Frequency Noise Level – Noise level passed through a filter to exclude high frequency noise (birds and insects) so the results is more representative of industrial noises (i.e. mining, traffic and rail noise)



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APPENDIX F (Inspection Proforma)

No Proforma



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APPENDIX G (Review Proforma)

Period of Review:

Date:

Name:

Signed:

NMP Section	Summary of Requirement	Compliant	Evidence/Comment	Recommendation
2.0	Responsibilities completed for Roles in Table 1			
3.1	Compliance with PA 10_0059 in Table 2			
3.2	Compliance with WCC Statement of Commitments in Table 3			
3.3	Compliance with EPL 12290 in Table 4			
5.0	Actual noise levels within predicted noise impact levels			
6.0	Based on actual performance/results, does the risk assessment need to be revised			
7.1	Compliance with noise criteria in Table 18			
7.2	Objectives and targets are reviewed monthly and revised annually			
8.1	Changes to private agreements or property acquisition. Noise levels in accordance with Private Agreement.			
8.2	Truck noise attenuation: <ul style="list-style-type: none"> • 6 x CAT793XQ SWL 115dBL • 11 x CAT785 Stage 1 Attenuation SWL 117.7dBL 			
8.3	Implementation and operation of Noise Control Operator procedure			
8.4/9.2	Implementation and operation of Real Time Monitoring Response			
8.5/10.1	Noise Reduction Mine Planning undertaken			
8.6	Construction of Acoustic and Visual Amenity Bund			
8.7, 8.8, 8.9, 8.10, 8.13 & 8.16	Review of Noise Control Operator procedure to determine need to commit to specific management measures, such as Night Time Surface Operations and Dump Locations, Drill Operations, Dozer Operations, Restricted Scenario 1 Operations, Operational Noise Controls, and Temporary ROM Stockpiles			
8.12	Requests for additional property noise mitigation measures investigated and actioned			



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NMP Section	Summary of Requirement	Compliant	Evidence/Comment	Recommendation
8.14	Construction of Coal Processing Plant Acoustic Bund			
8.15	Topographic screening of Coal Processing Plant			
8.17	Roof over conveyors			
8.18	Installation broadband reversing alarms and silent horns on all plant			
8.19	Implementation of Rail Spur Management Plan			
9.1	Monthly attended noise monitoring			
9.3	Operation of M2 weather station in accordance with EPL 12290			
8.11/9.4	Annual SWL testing of all plant			
10.2	Daily checks, monthly field inspections and annual services for Continuous Noise Monitoring systems			
11	Staff appropriately trained as per Table 28			
12	Reports completed in accordance with the frequency, distribution and timing requirements listed in Error! Reference source not found.			
13.1	Noise Management Plan Annual Review			
13.2	Noise Performance Annual Review			
13.3	Undertake Noise Audit			
13.4	Revision of Noise Management Plan			
14.0	Implementation of any Contingency Plans			