Air Quality and Greenhouse Gas MANAGEMENT PLAN

Edition	Rev.	Comments	Author	Authorised By	Date
1	Rev D	First Draft for WCC Approval	Advitech	Danny Young	26 March 2012
2	Rev E	Draft for EPA Consultation	WCC	Danny Young	17 April 2012
3	Rev F	Submission to DoP	Advitech	Danny Young	27 April 2012
4	Rev G	Annual Review Amendment	WCC	Peter Easey	30 September 2013
5	Rev H	Final	WCC	Danny Young	31 March 2014

EXECUTIVE SUMMARY

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

Werris Creek Coal was granted Project Approval (PA 10_0059) on 25th October 2011 from DoP for the Life of Mine (LOM) Project. The LOM 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 19, Schedule 3 of PA 10_0059, WCC are required to prepare and implement an Air Quality and Greenhouse Gas Management Plan (AQGHGMP) for the project. The plan has also been prepared to meet the management plan requirements specified in Condition 2, Schedule 5 of the Project Approval.

The AQGHGMP summarises the results of the predictive air quality assessment and outlines the control measures to be implemented as a part of the continued operations at the mine to minimise the potential for air quality and greenhouse gas impacts on the local community and the environment. The AQGHGMP also contains an updated Air Quality Monitoring Program, developed to quantify the air quality impacts of the operation and to assess compliance against the revised air quality criteria.

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ACRONYMS USED THROUGHOUT THIS DOCUMENT

AEMR	-	Annual Environmental Management Report
AQGHGMP	-	Air Quality and Greenhouse Gas Management Plan
AQIA	-	Air Quality Impact Assessment
AS	-	Australian Standard
CCC	-	Community Consultative Committee
DGG	-	Dust Deposition Gauge
EA	-	Environmental Assessment
EEO	-	Energy Efficiency Opportunities
EPL	-	Environment Protection Licence
ESAP	-	Energy Savings Action Plan
HVAS	-	High Volume Air Sampler
LOM	-	Life of Mine
ML	-	Mining Lease
EPA	-	Environmental Protection Authority
PA	-	Project Approval
PRP	-	Pollution Reduction Program
SAIL	-	Steel Authority of India Limited
TEOM		Tapered Element Oscillating Microbalance
TSP	-	Total Suspended Particulates
WCC	-	Werris Creek Coal

1 INTRODUCTION

The existing Werris Creek Coal No.2 Coal Mine 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 bord 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.

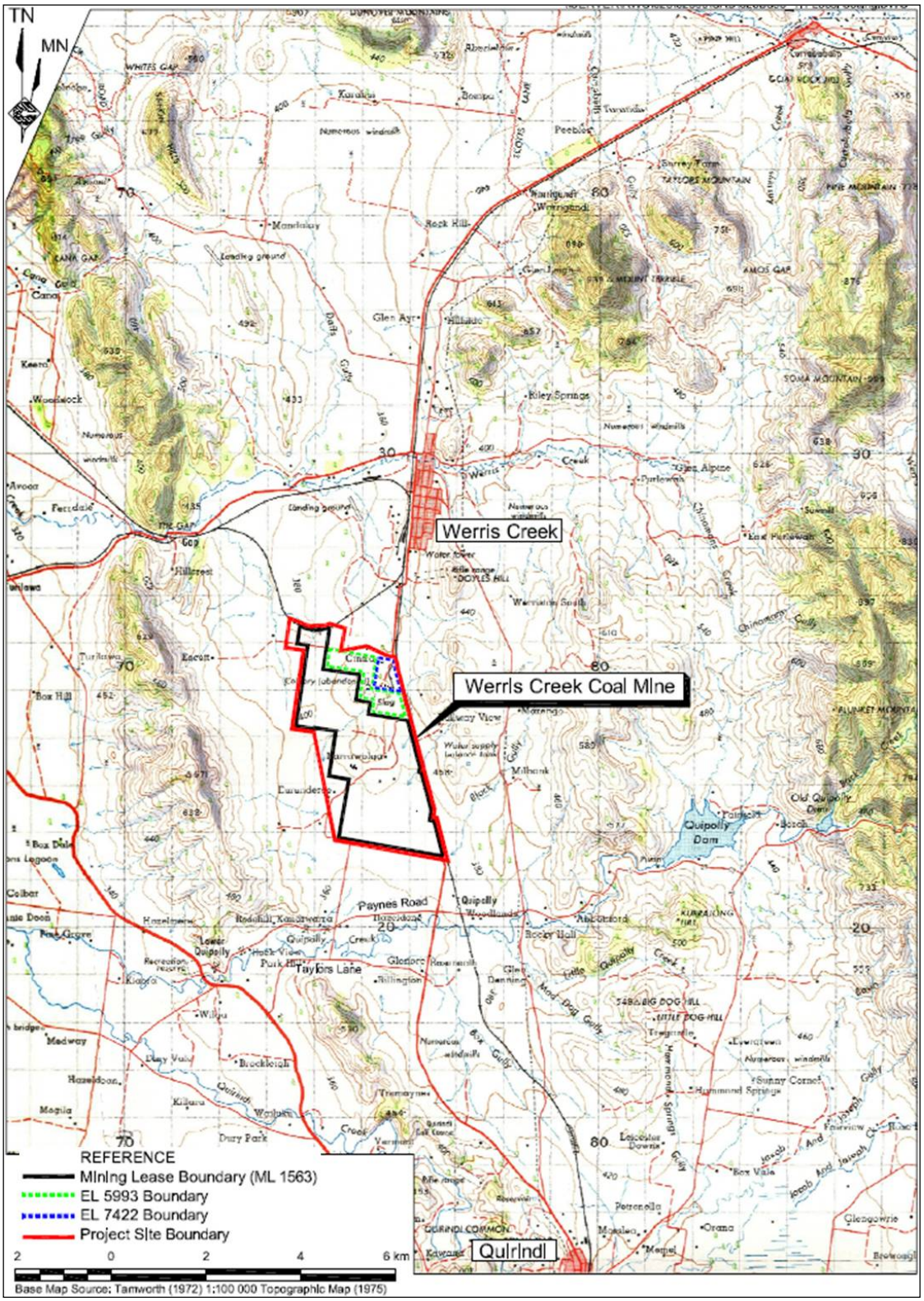

Figure 2: WCC Mine Local Area (modified from Figure 1.1 R.W. Corkery & Co, 2011)

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

The purpose of the Plan is to:

- Address and comply with the relevant conditions of the Project Approval (PA 10_0059) and Environmental Protection Licence (EPL 12290);
- Provide employees with a clear outline of their responsibilities in relation to air quality and greenhouse gas management;
- Consolidate information relating to baseline conditions, and potential impacts associated with operations associated with the LOM project;
- Address all relevant commitments made by in the Werris Creek Coal Mine LOM Project: Environmental Assessment;
- Outline measures to minimise the air quality and greenhouse gas impacts from the mine on the surrounding community and environment;
- Establish an air quality monitoring programs to assess and report the impact on air quality as required by statutory approvals; and
- To keep the local community and relevant agencies informed and to provide a mechanism to respond to air quality issues and complaints effectively.

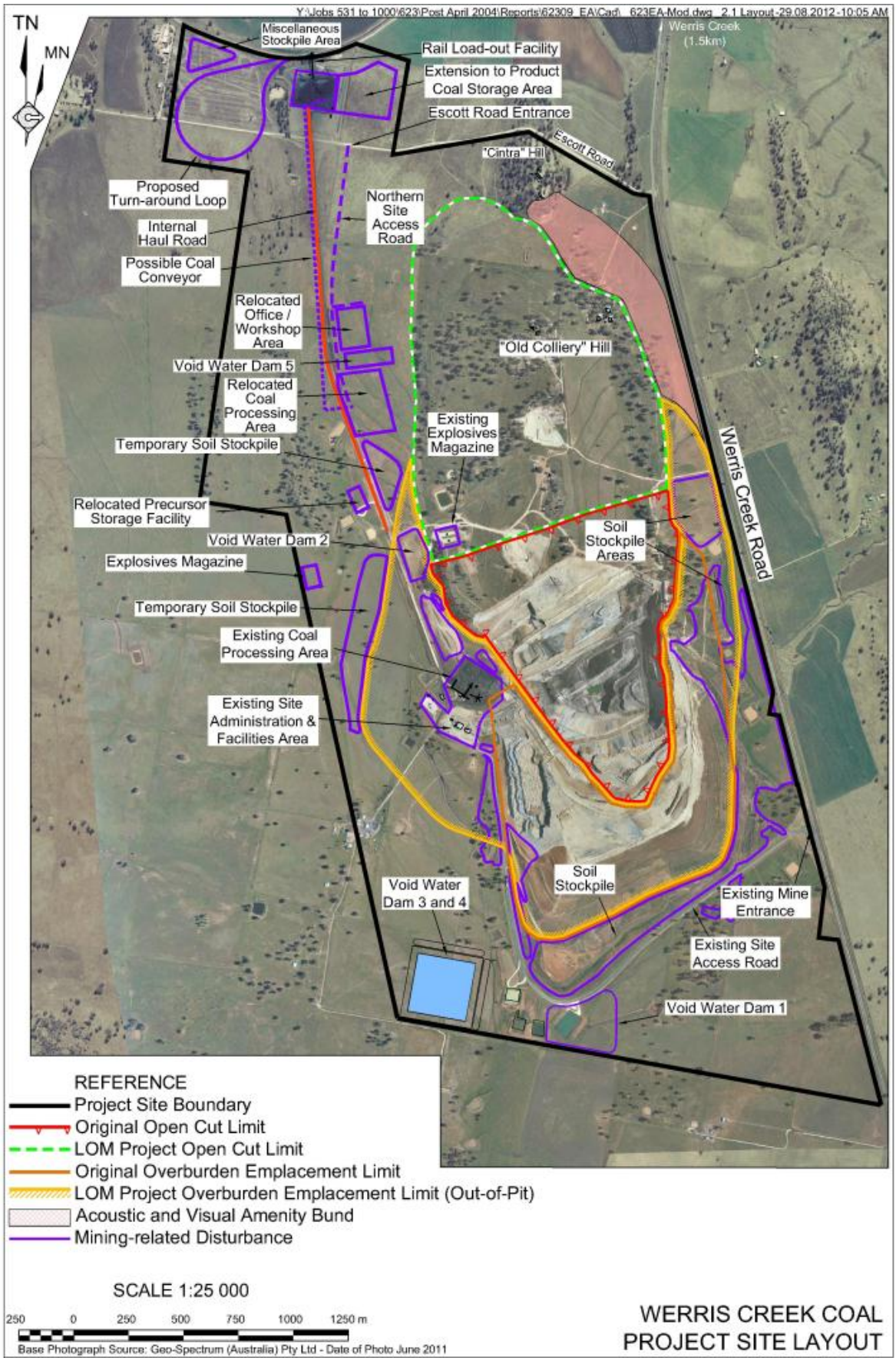

Figure 3: LOM WCC Layout (modified from Appendix 2 PA10_0059MOD1

The AQGHGMP has been prepared by Advitech Pty Ltd and WCC with reference to relevant legislation and guidelines and is consistent with the commitments in the following documentation:

- The Life of Mine (LOM) Project Approval 10_0059 approved by the Department of Planning and Infrastructure (DoP) on 25 October 2011;
- Environment Protection License (EPL 12290) issued by the NSW Environment Protection Authority (EPA);
- Advitech Pty Limited, Werris Creek Mine EEO Assessment, December 2011;
- Denis Cooke & Associates Pty Limited, Energy Savings Action Plan, June 2010;
- Heggies Pty Ltd, Air Quality Assessment for Werris Creek Coal Mine Life of Mine Project 2010;
- Pacific Environment Limited, Werris Creek Coal Pollution Reduction Monitoring Plan – U1 Wheel Generated Dust, 2013;
- Pacific Environment Limited, Werris Creek Coal Pollution Reduction Monitoring Plan – U2 Overburden Handling in Adverse Weather, 2013;
- R.W Corkery & Co, Environmental Assessment for Werris Creek Coal Mine Life of Mine Project, 2010;
- R.W. Corkery & Co, Response to Submissions for the Environmental Assessment for Werris Creek Coal Mine Life of Mine Project, 2011;
- Werris Creek Coal Pty Ltd, Annual Environmental Management Report 2010-2011, May 2011; and
- Werris Creek Coal Pty Ltd, Life of Mine Mining Operations Plan for the Werris Creek, November 2011.

1.4 Scope

The AQGHGMP applies to all potential air quality impacting activities undertaken by WCC as part of the LOM Project, within the areas defined as the Project Site Boundary (**Figure 3**).

2 RESPONSIBILITIES

Specific responsibilities in relation to air quality management for key management positions are outlined in **Table 1**.

Table 1: Roles and Responsibilities

Role	Responsibilities
Operations Manager	■ Ensure that operations are undertaken in accordance with relevant regulations, licenses and approvals. ■ Monitor the effectiveness of air quality management strategies and provide ongoing guidance as needed. ■ Maintain overall responsibility for activities undertaken on the mine site.
Group Environment Manager	■ Ensure the air quality management controls are implemented in accordance with this plan. ■ Ensure sufficient resources are allocated for the implementation of this plan. ■ Ensure all site personal have received the appropriate training for their responsibilities. ■ Monitor the effectiveness of air quality management strategies and provide ongoing guidance as needed. ■ Ensure all internal and external reporting requirements are met, including incident reporting in accordance with relevant internal protocols.
Site Environment Officer	■ Implementing the procedures contained in this management plan. ■ Post induction education and contact with all employees and contractors on air quality issues. ■ Ensure the dust monitoring network is maintained and results are routinely collected. ■ Analysis of monitoring results and inclusion in the AEMR. ■ Manage dust-generating activities in response to real-time monitoring results. ■ Timely reporting of environmental monitoring data on the Whitehaven website. ■ Undertake regular environmental inspections to ensure air quality controls are working effectively. Including a visual inspection of the mine area. ■ Regularly revise the performance of air quality management strategies. ■ Regularly report environmental performance to Group

Role	Responsibilities
	Environmental Manager. ▪ Develop strategies to prevent or reduce environmental impacts. ▪ Attend Community Consultation Committee meetings. ▪ Receive and respond to community complaints in relation to air quality.
Supervisors	▪ Ensure that all operations on site are undertaken in compliance with this management plan. ▪ Ensure all site personal have received the appropriate training for their responsibilities and are aware of the air quality obligations. ▪ Conduct regular inspections of the work area to monitor compliance with this plan. ▪ Implement dust controls. ▪ Report any incidences or complaints immediately to the Site Environmental Officer. ▪ Provide feedback on the adequacy and effectiveness of this plan.
Employees and Contractors	▪ Ensure the implementation of this plan with respect to their specific work practices. ▪ Act in accordance with the air quality and greenhouse gas management procedures or protocols outlined in this plan. ▪ Ensure any potential or actual air quality issues, including environmental incidents, are reported to the immediate supervisor.

3 REQUIREMENTS

The AQGHGMP for the WCC LOM Project has been prepared in accordance with the requirements established under various legislative and best practice instruments. The requirements established under these instruments are outlined in the following sections.

3.1 Project Approval

Specific conditions relating to the implementation of the WCC LOM Project were issued by the NSW DoP under delegation from the Minister of Planning and Infrastructure in Project Approval 10_0059. **Table 2** summarises the requirements relating to air quality and greenhouse gas from the Project Approval, and identifies where these requirements are addressed within this management plan.

Table 2: Conditions Established in Project Approval 10_0059 as modified

<table>
<tr><th>Schedule (Condition)</th><th>Requirement</th><th>Response Detailed in Section</th></tr>
<tr><td>3(14)</td><td>Odour
The Proponent shall ensure that no offensive odours, as defined under the POEO Act, are emitted from the site.</td><td>8.2</td></tr>
<tr><td>3(15)</td><td>Greenhouse Gas Emissions
The Proponent shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Director-General.</td><td>8.3</td></tr>
<tr><td>3(16)</td><td>Air Quality Criteria
The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria listed in Tables 6, 7 and 8 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.
Table 6: Long-term criteria for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>[d] Criterion</th></tr>
<tr><td>Total suspended particulate (TSP) matter</td><td>Annual</td><td>[a] 90 µg/m^3</td></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>Annual</td><td>[a] 30 µg/m^3</td></tr>
</table>
Table 7: Short-term criterion for particulate matter
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>[d] Criterion</th></tr>
<tr><td>Particulate matter < 10 µm (PM_{10})</td><td>24 hour</td><td>[a] 50 µg/m^3</td></tr>
</table>
Table 8: Long-term criteria for deposited dust
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Maximum increase in deposited dust level</th><th>Maximum total deposited dust level</th></tr>
<tr><td>[c] Deposited dust</td><td>Annual</td><td>[b] 2 g/m^2/month</td><td>[a] 4 g/m^2/month</td></tr>
</table>
Notes to Tables 6-8:
• [a] Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);
• [b] Incremental impact (ie incremental increase in concentrations due to the project on its own);
• [c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.
• [d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with OEH.</td><td>7.1</td></tr>
</table>

<table>
<tr><th>Schedule (Condition)</th><th>Requirement</th><th>Response Detailed in Section</th></tr>
<tr><td>3(17)</td><td>

Air Quality Acquisition Criteria

If particulate matter emissions generated by the project exceed the criteria in Tables 9, 10, and 11 at any residence on privately-owned land, or on more than 25 percent of any privately owned land, then upon written request for acquisition from the landowner, the Proponent shall acquire the land in accordance with the procedures in conditions 5-6 of schedule 4.

Table 9: Long term land acquisition criteria for particulate matter

Pollutant	*Averaging period*	*[d] Criterion*
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 10: Short term land acquisition criteria for particulate matter

Pollutant	*Averaging period*	*[da] Criterion*
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 150 µg/m^3
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3

Table 11: Long term land acquisition criteria for deposited dust

Pollutant	*Averaging period*	*Maximum increase[2] in deposited dust level*	*Maximum total[1] deposited dust level*
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes to Tables 9-11:

- [a] *Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources);*
- [b] *Incremental impact (i.e. incremental increase in concentrations due to the development on its own);*
- [c] *Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and*
- [d] *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Director-General.*

</td><td>8.1.1</td></tr>
<tr><td>3(18)</td><td>

Operating Conditions

The Proponent shall:

a) implement best practice air quality management on site to minimise the off-site odour, fume and particulate matter emissions of the project, including the dust emissions associated with the transport coal produced on site by road or rail;
b) transport coal produced on site by road or rail;
c) minimise any visible air pollution generated by the project;
d) minimise any surface disturbance on site; and
e) regularly assess the real-time air quality monitoring and meteorological forecasting data and relocate, modify and/or stop operations on site to ensure compliance with the relevant conditions of this approval, to the satisfaction of the Director-General.

</td><td>8</td></tr>
</table>

Schedule (Condition)	Requirement	Response Detailed in Section
3(19)	**Air Quality Management Plan** The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the project to the satisfaction of the Director-General. This plan must: a) be prepared in consultation with EPA, and submitted to the Director-General by the end of April 2012; b) describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval, including a real-time air quality management system that employs both reactive and proactive mitigation measures; c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the site; and d) include an air quality monitoring program, that: ▪ uses a combination of real-time monitors and supplementary monitors, to evaluate the performance of the project; ▪ evaluates and reports on the effectiveness of the real-time air quality management system; and ▪ includes a protocol for determining any exceedances of the relevant conditions of this approval.	Appendix A 8 & 9 8.3 8 & 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 EPA.	9.5
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	12

3.3 Statement of Commitments

The requirements for air quality 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 AQGHGMP.

Table 3: Statement of Commitments

Desired Outcome	Action	Response Detailed in Section
Minimise impacts to air quality relating to the Project.	8.1 Maintain the enclosed conveyor belt on the rail load out facility.	8.1.12
	8.2 Cleared vegetation would not be burnt.	8.1.3
	8.3 Limit groundcover removal in advance of mining to be consistent with operational requirements.	8.1.3
	8.4 Where practicable, soil stripping operations would be undertaken at a time when there is sufficient soil moisture to prevent significant lift-off of dust.	8.1.3
	8.5 Overburden emplacement would be limited on the top lift of the overburden emplacement area when winds are from a northerly direction and greater than 3 m/s over more than four consecutive 15 minute periods during operations similar to those operations modelled in Scenario 1.	8.1.9
	8.6 Apply water at the feed hopper, crusher and at all conveyor transfer and discharge points.	8.1.12
	8.7 Fit all conveyors with appropriate cleaning and collection devices to minimise the amount of material falling from the return conveyor belts.	8.1.12
	8.8 Cease coal processing activities during periods of concurrent high winds and temperatures which cause coal dust dispersal, independent of water applications.	8.1.9
	8.9 Apply water to exposed surfaces with emphasis on those areas subject to frequent vehicle/equipment movements which may cause dust generation and dispersal.	8.1.4
	8.10 Water all internal haul roads regularly.	8.1.4
	8.11 Ensure operators use appropriate speeds to limit trafficable dust emissions on all vehicles and equipment.	8.1.6
	8.12 Progressively rehabilitate areas of disturbance once they are no longer required for mining purposes.	8.1.2
	8.13 Use water injection on all drill rigs.	8.1.8
	8.14 Cover all product coal trucks prior to leaving the Project Site.	8.1.13
	8.15 Water all product coal prior to being railed from site.	8.1.13
Monitor and manage dust emissions generated by the LOM Project	8.16 Update the Air Quality Monitoring Program (AQMP) for the LOM Project.	9
	8.17 Continue the existing deposited dust, PM_{10} and TSP monitoring at the existing site locations.	9
	8.18 Implement a real-time particulate matter monitoring program at locations to be determined within 12 months of approval.	9.4

Desired Outcome	Action	Response Detailed in Section
	8.19 Use the real time monitoring data in the management of mining operations to minimise the impact of PM_{10} on the environment.	8.1.5 & 9.4
	8.20 Review the existing Energy Savings Action Plan.	**Error! Reference source not found.**
Implementation of an appropriate air quality monitoring program to ensure compliance with EPA guideline levels.	14.9 Maintain the existing dust (WC1 to WC10), PM_{10} (WCHV1 to WCHV4) and TSP (WCTSP) monitoring network as identified in the Werris Creek Coal Mine Air Quality Monitoring Program.	9.1.2
	14.10 Install a new High Volume Air Sampler, monitoring for $PM_{2.5.}$	9.4.2
	14.11 Implement a real-time particulate matter monitoring program at locations to be determined within 12 months of approval.	9.4

3.4 Environmental Protection Licence

Table 4 summaries the monitoring and reporting requirements established in the Environment Protection Licence (EPL12990) for scheduled activities undertaken as part of the WCC LOM project.

Table 4: Conditions established in EPL 12290

<table>
<tr><th>Condition</th><th>Action</th><th>Response Detailed in Section</th></tr>
<tr><td>P1</td><td>Location of monitoring/discharge points and areas</td><td></td></tr>
<tr><td>P1.1</td><td>The following points referred to in the table below are identified in this licence for the purposes of monitoring and/or the setting of limits for the emission of pollutants to the air from the point.
Air
<table>
<tr><th>EPA identification no.</th><th>Type of Monitoring Point</th><th>Type of Discharge Point</th><th>Location Description</th></tr>
<tr><td>1</td><td>Ambient Air Monitoring / Air Discharge Quality</td><td>Ambient Air Monitoring / Air Discharge Quality</td><td>Within 100 metres of the residence "Tonsley Park" identified as “R20” in Appendix 3 of Project Approval 10_0059</td></tr>
<tr><td>9</td><td>Ambient Weather Monitoring</td><td></td><td>Weather station located on the top level of the overburden emplacement at RL445m</td></tr>
<tr><td>28</td><td>Ambient Air Monitoring / Air Discharge Quality</td><td>Ambient Air Monitoring / Air Discharge Quality</td><td>Within 100 metres of the residence "Kyooma" identified as “R98” in Appendix 3 of Project Approval 10_0059</td></tr>
<tr><td>29</td><td>Ambient Air Monitoring / Air Discharge Quality</td><td>Ambient Air Monitoring / Air Discharge Quality</td><td>Within 100 metres of the residence "Glenara" identified as “R11” in</td></tr>
</table></td><td>9</td></tr>
</table>

Condition	Action				Response Detailed in Section
				Appendix 3 of Project Approval 10_0059	
	30	Ambient Air Monitoring / Air Discharge Quality	Ambient Air Monitoring / Air Discharge Quality	Location identified as property number "92" in Figure 4A.5 of Environmental Assessment for Werris Creek Coal Mine, Life of Mine Project Dated December 2010 prepared by R.W. Corkery & Co. Pty Limited	
	31	Ambient Weather Monitoring		Lower level temperature sensor located at the toe of the south eastern rehabilitation area at RL373.5 AHD.	
L7	**Potentially offensive odour**				
L7.1	No condition in this licence identifies a potentially offensive odour for the purposes of section 129 of the Protection of the Environment Operations Act 1997. Note: Section 129 of the Protection of the Environment Operations Act 1997 provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of a licence directed at minimising odour.				8.2
O3	**Dust**				
O3.1	All operations and activities occurring at the premises must be carried out in a manner that will minimise the emission of dust from the premises.				8.1
O3.2	Trucks transporting coal from the premises must be covered immediately after loading to prevent wind blown emissions and spillage. The covering must be maintained until immediately before unloading the trucks.				8.1.13
M1	**Monitoring records**				
M1.1	The results of any monitoring required to be conducted by this licence or a load calculation protocol must be recorded and retained as set out in this condition.				12
M1.2	All records required to be kept by this licence must be: a) in a legible form, or in a form that can readily be reduced to a legible form; b) kept for at least 4 years after the monitoring or event to which they relate took place; and c) produced in a legible form to any authorised officer of the EPA who asks to see them.				12
M1.3	The following records must be kept in respect of any samples required to be collected for the purposes of this licence: a) the date(s) on which the sample was taken; b) the time(s) at which the sample was collected; c) the point at which the sample was taken; and d) the name of the person who collected the sample.				Appendix E
M2	**Requirement to monitor concentration of pollutants discharged**				
M2.1	For each monitoring/discharge point or utilisation area specified below (by a point number), the licensee must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The				9

<table>
<tr><th>Condition</th><th>Action</th><th>Response Detailed in Section</th></tr>
<tr><td></td><td>licensee must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:</td><td></td></tr>
<tr><td>M2.2</td><td>Air Monitoring Requirements
POINT 1,28,29,30
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Sampling Method</th></tr>
<tr><td>PM10</td><td>Micrograms per cubic metre</td><td>Every 6 days</td><td>AM-18</td></tr>
<tr><td>Solid Particles</td><td>Grams per square metre per month</td><td>Continuous</td><td>AM-19</td></tr>
</table></td><td>9</td></tr>
<tr><td>M3</td><td>Testing methods - concentration limits</td><td></td></tr>
<tr><td>M3.1</td><td>Monitoring for the concentration of a pollutant emitted to the air required to be conducted by this licence must be done in accordance with:
a) any methodology which is required by or under the Act to be used for the testing of the concentration of the pollutant; or
b) if no such requirement is imposed by or under the Act, any methodology which a condition of this licence requires to be used for that testing; or
c) if no such requirement is imposed by or under the Act or by a condition of this licence, any methodology approved in writing by the EPA for the purposes of that testing prior to the testing taking place.

Note: The Protection of the Environment Operations (Clean Air) Regulation 2010 requires testing for certain purposes to be conducted in accordance with test methods contained in the publication "Approved Methods for the Sampling and Analysis of Air Pollutants in NSW".</td><td>9 & Appendix E</td></tr>
<tr><td>M4</td><td>Weather monitoring</td><td></td></tr>
<tr><td>M4.1</td><td>Weather monitoring requirements
Point 9
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Averaging Period</th><th>Sampling Method</th></tr>
<tr><td>Rainfall</td><td>mm/h</td><td>Continuous</td><td>15 minute</td><td>AM-4</td></tr>
<tr><td>Wind Speed @ 10m</td><td>m/s</td><td>Continuous</td><td>15 minute</td><td>AM-2 & AM-4</td></tr>
<tr><td>Wind Direction @ 10m</td><td>°*</td><td>Continuous</td><td>15 minute</td><td>AM-2 & AM-4</td></tr>
<tr><td>Temperature @ 2m</td><td>°C</td><td>Continuous</td><td>15 minute</td><td>AM-4</td></tr>
<tr><td>Temperature @ 10m</td><td>°C</td><td>Continuous</td><td>15 minute</td><td>AM-4</td></tr>
<tr><td>Sigma Theta @ 10m</td><td>-</td><td>Continuous</td><td>15 minute</td><td>AM-2 & AM-4</td></tr>
<tr><td>Solar Radiation</td><td>W/m^2</td><td>Continuous</td><td>15 minute</td><td>AM-4</td></tr>
<tr><td>Location Siting</td><td>-</td><td>-</td><td>-</td><td>AM-1, AM4 & Special Method 2</td></tr>
</table></td><td>9.5</td></tr>
<tr><td>M4.2</td><td>Point 31
<table>
<tr><th>Pollutant</th><th>Units of measure</th><th>Frequency</th><th>Averaging Period</th><th>Sampling Method</th></tr>
<tr><td>Temperature @ 2m</td><td>°C</td><td>Continuous</td><td>15 minute</td><td>AM4 & Special Method 2</td></tr>
</table></td><td>9.5</td></tr>
</table>

Condition	Action	Response Detailed in Section
	Note: For the purposes of conditions M4.1 & M4.2, Special Method 2 means that the location of the meteorological monitoring equipment and details of that equipment, the equipment operation and maintenance/service procedures and schedules must be submitted in writing and approved in writing by the EPA before any sampling or analysis is carried out. The meteorological monitoring equipment must be calibrated at least once every 12 months. Any proposed changes to the meteorological monitoring equipment location, operating and maintenance/service procedures and schedules, or to the monitoring hardware itself must also be submitted in writing and approved in writing by the EPA. The EPA is to be provided with monitoring data on request in a Microsoft Office software compatible format.	
M5	**Recording of pollution complaints**	
M5.1	The licensee must keep a legible record of all complaints made to the licensee or any employee or agent of the licensee in relation to pollution arising from any activity to which this licence applies.	12
M5.2	The record must include details of the following: a) the date and time of the complaint; b) the method by which the complaint was made; c) any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect; d) the nature of the complaint; e) the action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and f) if no action was taken by the licensee, the reasons why no action was taken.	12
M5.3	The record of a complaint must be kept for at least 4 years after the complaint was made.	12
M5.4	The record must be produced to any authorised officer of the EPA who asks to see them.	12
M6	**Telephone complaints line**	
M6.1	The licensee must operate during its operating hours a telephone complaints line for the purpose of receiving any complaints from members of the public in relation to activities conducted at the premises or by the vehicle or mobile plant, unless otherwise specified in the licence.	12
M6.2	The licensee must notify the public of the complaints line telephone number and the fact that it is a complaints line so that the impacted community knows how to make a complaint.	12
M6.3	The preceding two conditions do not apply until 3 months after: a) the date of the issue of this licence or b) if this licence is a replacement licence within the meaning of the Protection of the Environment Operations (Savings and Transitional) Regulation 1998, the date on which a copy of the licence was served on the licensee under clause 10 of that regulation.	12
U1	**Particulate Matter Control Best Practice Implementation – Wheel Generated Dust**	
U1.1	The Licensee must achieve and maintain a dust control efficiency of 80% or more on all active haul roads by 22 March 2013. Control efficiency is calculated as: CE = (E (uncontrolled) - E (controlled))/E (uncontrolled) x 100 Where E = the emission rate of the activity	8.1.15

Condition	Action	Response Detailed in Section
U1.2	To assess compliance with Condition U1.1, the Licensee must: - measure uncontrolled and controlled haul road emissions on at least 2 occasions using a mobile dust monitor; - continuously measure and record 'additional site data' including: · vehicle kilometres travelled (VKT), · meteorological conditions, · water use for dust suppression. - undertake silt content and soil moisture sampling during sampling events; and - determine if a site specific relationship can be derived between the measured control efficiency, additional site data, water use, meteorological data; and silt content and soil moisture levels. The measurement of uncontrolled and controlled haul road PM10 emissions must be undertaken under varying meteorological conditions, including at those times when analysis of meteorological data indicates that elevated levels of dust are most likely at the Premises. Note: The EPA acknowledges that in order to determine uncontrolled PM10 emissions, the section of haul road to be sampled will need to be left untreated for a period of up to 12 hours prior to the sampling taking place.	8.1.15
U1.3	The Licensee must submit a report to the EPA which documents the results of the assessment undertaken in accordance with Condition U1.1. The report must include an assessment of: - the dust control effectiveness, - the dust levels recorded, and - any relationship established between control effectiveness and the additional site data. The report must be submitted by the Licensee to the Environment Protection Authority Regional Manager Armidale, at PO Box 494, ARMIDALE by 15 August 2014.	8.1.15
U1.4	The report required by condition U1.3 must be made publicly available by the Licensee on the Licensee's website by (two weeks from submission date nominated in U1.3).	8.1.15
U2	**Particulate Matter Control Best Practice Implementation – Disturbing and Handling Overburden under Adverse Weather Conditions**	
U2.1	The licensee must alter or cease the use of equipment on overburden and the loading and dumping of overburden during adverse weather conditions to minimise the generation of particulate matter from 22 March 2013.	8.1.19
U2.2	To assess compliance with Condition U2.1, the Licensee must: - undertake daily visual dust level assessments, continuously record real-time PM10 levels and continuously measure and record real-time meteorological conditions; and - record changes to mining activities due to adverse weather conditions.	8.1.19
U2.3	The Licensee must submit a report to the EPA which documents the results of the actions taken in accordance with Condition U2.1. The report must include an assessment of the effectiveness of changes made to mining activities due to adverse weather and document meteorological conditions and the resultant dust levels. The report must be submitted by the Licensee to the Environment Protection Authority Regional Manager Armidale, at PO Box 494, ARMIDALE by 15 August 2014.	8.1.19
U2.4	The report required by Condition U2.3 must be made publicly available by the	8.1.19

Condition	Action	Response Detailed in Section
	Licensee on the Licensee's website by (two weeks from submission date in 2.3 above).	
U3	**Particulate Matter Control Best Practice Implementation – Trial of Best Practice Measures for Disturbing and Handling Overburden**	
U3.1	The Licensee must submit a report documenting an investigation and trial of best practice measures for the control of particulate matter from the use of equipment on overburden and the loading and dumping of overburden. Best practice measures may include, but should not be limited to, the following: • the use of foggers; • the use of water sprays; and • reduction of drop heights. The report must document the investigation and trial of each best practice measure. It must quantify the particulate matter control effectiveness and discuss the practicability of each best practice measure. The report must be submitted by the Licensee to the Environment Protection Authority Regional Manager Armidale, at PO Box 494, ARMIDALE by 14 April 2014.	8.1.15

3.5 Relevant Guidelines and Standards

In addition to the regulatory requirements outlined in **Sections 3.1** and **3.4**, air quality and greenhouse gas management at the mine will be undertaken with regard to the following standards and guideline documents.

3.5.1 Standards

- AS/NZS 3580.9.6:2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} high volume sampler with size-selective inlet – Gravimetric method.
- AS/NSS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.
- AS/NZS 3580.9.10:2006 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – $PM_{2.5}$ low volume sampler – Gravimetric method.
- AS/NZS 3580.9.3:2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method.
- AS/NZS 3580.9.8: 2008: Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} continuous direct mass method using a tapered element oscillating microbalance analyser.
- AS 2923 -1987 (AM-2): Guide for measurement of horizontal wind for air quality applications.
- USEPA (2000) EPA 454/R-99-005 (AM-4): Meteorological monitoring guidance for regulatory modelling applications.

3.5.2 Guidelines

- Department of Climate Change and Energy Efficiency, *National Greenhouse and Energy Reporting Guidelines*, 2008.
- Department of Energy, *Utilities and Sustainability, Guidelines for Energy Savings Action Plans*, 2005.
- NSW Department of Environment, Climate Change and Water, *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*, 2005.
- NSW Department of Environment, *Climate Change and Water, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW*, 2007.

4 BASELINE CONDITION

4.1 Existing Air Quality Environment

An air quality monitoring network of Dust Deposition Gauges (DDG), High Volume Air Samplers (HVAS), for TSP and PM_{10} has been in place surrounding the Project Site since 2005, although monitoring locations have been modified over time. No monitoring data is currently available for $PM_{2.5}$ for the Project Site or for the wider region. **Figure 4** presents the current and former air quality monitoring locations.

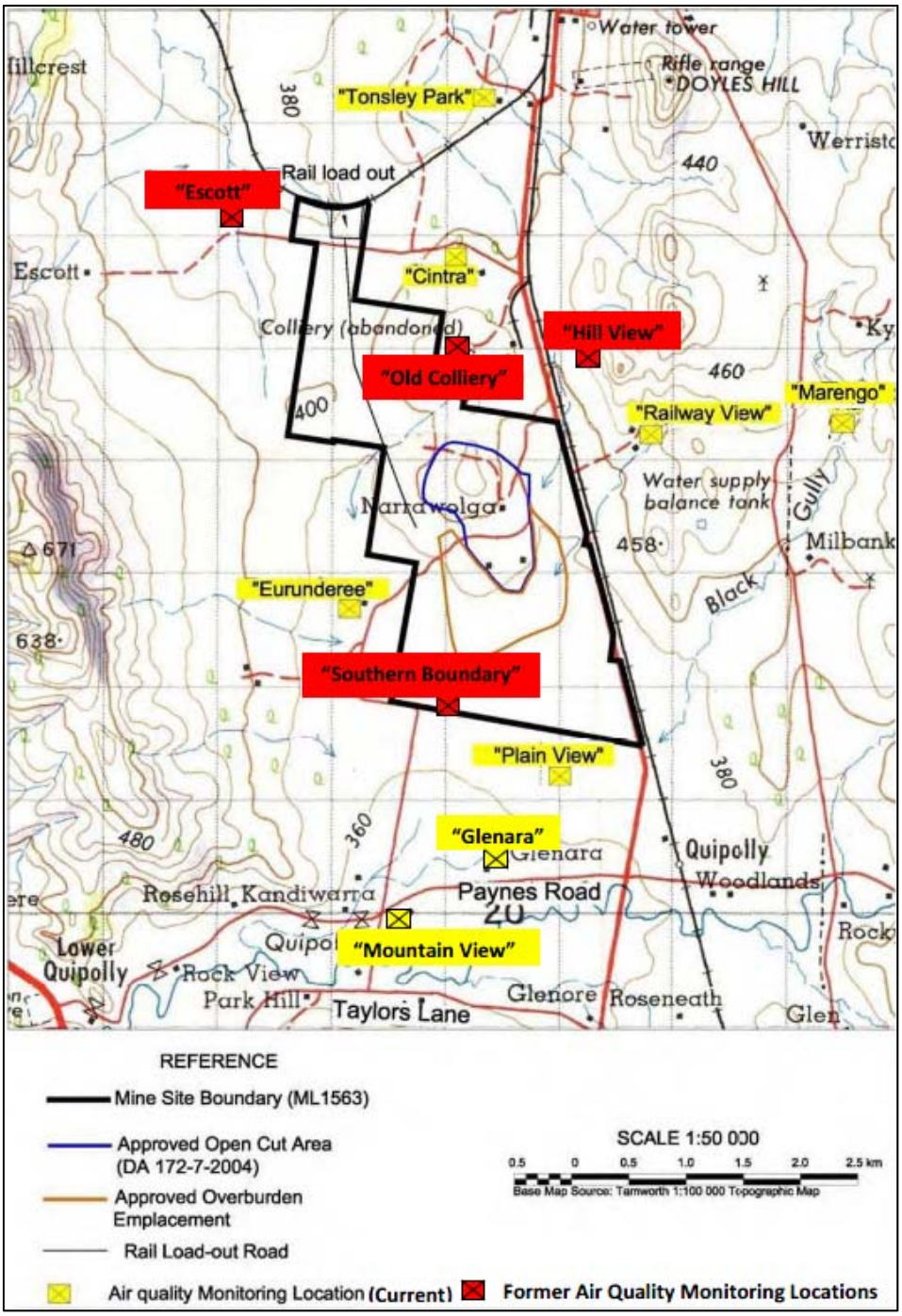

Figure 4: Current and Former Air Quality Monitoring Locations

4.1.1 Dust Emission Inventory

Air emissions from operations at the mine are emitted predominantly from the disturbance of soil, overburden and coal as well as diesel exhaust emissions. Sources of significant air emissions from the LOM operations include:

- Overburden removal, including use of scraper on topsoil and excavator;
- Coal extractions operations, including drilling and blasting, bulldozer and excavator use;
- Placement of materials within the site, including topsoil, subsoil, overburden/interburden and mined coal;
- Coal processing activities, including emissions from front-end loader, crushing, handling and transfers, conveying, product bin loading coal into trucks;
- Wind erosion from exposed surfaces, including the open cut area, soil stockpiles, overburden emplacement and coal stockpiles;
- Wheel generated dust from the general movement of heavy vehicles on unsealed roads;
- Operation of the Rail Load-out facility; and
- Combustion engine exhaust.

4.1.2 Dust Deposition

Dust deposition monitoring has been conducted at seven locations in the area surrounding the Project Site since September 2004. Annual averages for dust depositional monitoring since 2005 are presented in **Table 5.** Full Dust deposition monitoring results can be found in **Appendix C**.

Table 5: Historic Dust Depositional Monitoring Results (g/m^2/month)

ID	Property	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013
WC1	Escott*	0.6	0.8	0.7	0.5	0.7	-	-	0.8
WC2	Cintra*	1.2	1.4	1.1	1.3	1.6	1.4	1.4	1.5
WC3	Old Colliery/ Eurunderee*	1.5	2.3	2.9	3.7	2.5	-	-	0.7
WC4	Hill View*	0.8	0.9	0.7	0.7	1.2	-	-	-
WC5	Railway View*	2.0	1.2	0.6	0.7	1.1	1.3	0.9	1.2
WC6	Southern Boundary*	5.4	9.4	5.1	4.8	2.3	-	-	-
WC7	Tonsley Park*	1.3	2.3	1.6	0.9	1.3	0.8	0.6	0.9
WC8	Plain View*	-	-	-	-	1.9	0.9	0.9	1.8
WC9	Marengo*	-	-	-	-	1.5	0.7	0.6	0.8
WC10	Mountain View	-	-	-	-	-	0.9	0.7	1.3
WC11	Glenara	-	-	-	-	-	1.3	1.2	1.6

* Property owned by Werris Creek Coal.

4.1.3 TSP

Annual averages for TSP monitoring since 2005 are presented in **Table 6**. Full TSP monitoring results can be found in **Appendix C**.

Table 6: TSP Monitoring Results (µg/m3)

ID	Property	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013
WCTSP	Railway View*	21.6	24.8	25.0	25.9	35.7	29.7	44.1	23.5

* Property owned by Werris Creek Coal.

4.1.4 PM_{10}

Annual averages for PM_{10} monitoring since 2005 are presented in **Table 7**. Full PM_{10} monitoring results can be found in **Appendix C**.

Table 7: Historic PM_{10} Monitoring Results (µg/m3)

ID	Property	2005/ 2006	2006/ 2007	2007/ 2008	2008/ 2009	2009/ 2010	2010/ 2011	2011/ 2012	2012/ 2013
WCHV1	Cintra*	-	-	-	-	19.2	13.7	16.9	-
WCHV2	Tonsley Park *	12.1	11.4	12.1	12.1	16.4	11.2	14.1	13.7
WCHV3	Railway View*	11.0	11.5	12.1	11.8	15.0	12.2	17.9	-
WCHV4	Eurunderee*	13.5	15.4	16.8	16.9	17.7	12.2	11.7	11.9
	Old Colliery*	10.5	13.5	16.0	13.6	-	-	-	-

* Property owned by Werris Creek Coal.

4.2 Meteorological Conditions

A meteorological station was installed at the mine in 2005 to assess local meteorological conditions including wind speed and direction, among other parameters. In late 2010 the meteorological station was relocated to the top of the rehabilitation area on top of the overburden emplacement. Analysis of meteorological monitoring data from the WCC Project Site was undertaken as part of the Air Quality Impact Assessment (AQIA) for the WCC LOM Environmental Assessment. **Figure 5** presents the annual wind roses from 2006 until 2010 recorded at WCC's meteorological station. The wind roses demonstrate that the prevailing wind directions are from the south-east and north-west.

4.3 Air Quality Complaints

Historically complaints have predominantly concerned blasting, lighting and noise issues, a summary of complaints received from 2005 to 2013 are provided in **Table 8**.

Table 8: WCC Complaint Issues from 2005 to 2013

Issue	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013
Dust – Mine	1	2	0	3	0	5	7	12
Dust – Rail Load Out	0	0	0	1	0	0	0	0
All Complaints (inc Air Quality)	**8**	**10**	**7**	**16**	**12**	**52**	**117**	**56**

There has been a significant increase in all complaints since 2010 mainly due to blasting and noise issues due to the increase in scale of mining operations and as a consequence of operations moving closer to the town of Werris Creek. However dust related complaints have only slightly increased with Quipolly and Werris Creek residents evenly accounting for the number of complaints since 2010.

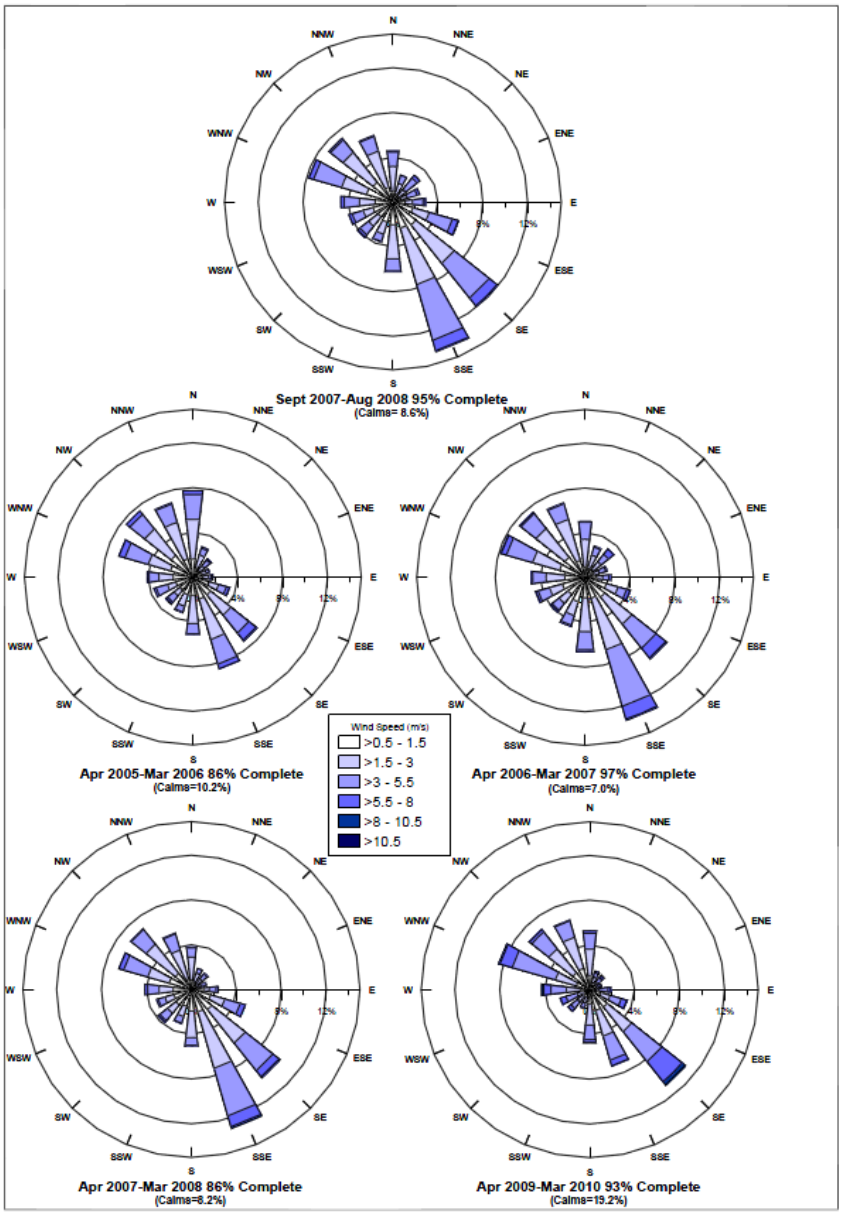

Figure 5: Annual Wind Roses from 2006 to 2010

4.4 Greenhouse Gas

The total GHG emissions for the mine increased 34% for 2010-2011 mainly due to the 17% increase in the production rate for the same period following the trend since 2005 of production related increases in GHG emissions. Diesel combustion decreased 5% to 12,908,722L of fuel used in 2012-2013 due to WCC truck fleet reducing the number of off highway trucks used in preference for larger and more efficient CAT XQ793 trucks. **Table 9** presents the CO_2 equivalent GHG emissions since 2005.

Table 9: Total GHG Emissions by the Mine since 2005

Year	CO_2 Equivalent Tonnes
2005-2006	15,757
2006-2007	17,260
2007-2008	22,161
2008-2009	20,423
2009-2010	26,481
2010-2011	35,477
2011-2012	39,544
2012-2013	37,354

5 ENVIRONMENTAL IMPACTS

An AQIA covering the key stages of the WCC LOM Project (based on a detailed air quality assessment by Heggies Pty Limited) are provided in Section 4B.5 of the EA. The assessment made predictions for PM_{10} and $PM_{2.5}$, TSP and dust deposition for three representative mining scenarios, to ensure that the range and extent of proposed activities were considered. The three scenarios were as follows:

1. Year 3 – mining at the southernmost point of the current open cut area.
2. Year 7 – mining in the mid-point of the LOM Project and construction of the Acoustic and Visual Amenity Bund, the scenario includes the new location of the Coal Processing Area.
3. Year 15 – mining activities at the northernmost point of the LOM Project area.

Modelling results were presented as an increment value which includes on-site mining operations and rail transport operations and a cumulative value which includes the increment value plus the background concentrations adopted in the AQIA as shown in **Table 10**.

Table 10: Ambient Air Quality Environment

Air Quality Parameter	Averaging Period	Assumed Background Ambient Level
TSP	Annual	30.2µg/m^3 [1]
PM_{10}	24-Hour	Daily Varying
	Annual	15.1µg/m^3 [2]
$PM_{2.5}$	24-Hour	None assumed[3]
	Annual	None assumed[3]
Dust Deposition	Annual	0.6 g/m^2/month[4]

[1] Based on the data set from the EPA air quality monitoring station in Tamworth.
[2] Based on the data set from the EPA air quality monitoring station in Tamworth. Where data from the Tamworth data set was determined to be as a result of a regional event. The data has been replaced for that day with the annual average PM_{10} concentration recorded at the Tamworth monitoring station of 15.1µg/m^3
[3] As $PM_{2.5}$ is not an EPA adopted assessment criterion, a $PM_{2.5\ background}$ concentration was not assumed.
[4] Based on annual average at WC1 which was considered the best representation of background levels due to its location.

5.1 Dust Deposition

The incremental and cumulative dust deposition impact predictions from the AQIA are reproduced in **Table 11**.

Table 11: Summary of Predicted Incremental (Mining and Coal Transportation) and Cumulative Dust Deposition (g/m^2/month)

Receiver		Year 3		Year 7		Year 15	
		Inc.	Cum.	Inc.	Cum.	Inc.	Cum.
5	"Rosehill"	<0.1	0.6	<0.1	0.6	<0.1	0.6
7	83 Wadwells Lane	0.1	0.7	0.1	0.7	<0.1	0.6
8	"Almawillee"	0.1	0.7	0.1	0.7	<0.1	0.6
9	"Gedhurst"	0.1	0.7	0.1	0.7	<0.1	0.6
10	"Meadholme"	0.2	0.8	0.1	0.7	0.1	0.7
11	"Glenara"	0.2	0.8	0.1	0.7	0.1	0.7
12	"Quipolly Railway Cottage"	0.2	0.8	0.2	0.8	0.1	0.7
14	"Greenslopes"*	0.4	1	0.5	1.1	0.7	1.3
15	"Plain View"*	0.4	1	0.3	0.9	0.2	0.8
17	"Woodlands"	0.1	0.7	0.1	0.7	0.1	0.7
18	"Werris Creek Railway Cottage"*	0.4	1	0.5	1.1	0.5	1.1
20	"Tonsley Park"	0.5	1.1	0.6	1.2	0.5	1.1
21	"Alco Park"	0.4	1	0.4	1	0.4	1
22	"Mountain View"	0.1	0.7	0.1	0.7	<0.1	0.6
24	"Hazeldene"	0.2	0.8	0.1	0.7	0.1	0.7
96	"Talavera"#	0.2	0.8	0.2	0.8	0.2	0.8
98	"Kyooma"	0.1	0.7	0.1	0.7	0.1	0.7
99	"Werriston South"	0.1	0.7	0.1	0.7	0.1	0.7

* Owned by Werris Creek Coal
# Property formerly known as "Millbank"

The results indicate that annual average dust deposition at all nominated residences or properties surrounding the LOM Project were predicted to be below the cumulative dust deposition criteria of 4 g/m^2/month when adopting a background deposition level of 0.6 g/m^2/month. All of the predicted dust deposition levels were also shown to be under the increment criteria of 2 g/m^2/month, with the maximum incremental dust deposition level predicted to be 0.7 g/m^2/month during Scenario 3 at property R14 (now owned by WCC).

Coal transport operations by rail were included in the incremental predictions of dust deposition. The AQIA predicted that coal transport operations by rail would contribute a maximum of 0.1 g/m^2/month to dust deposition levels.

5.2 Total Suspended Particulates (TSP)

The incremental TSP impact predictions from the AQIA are reproduced in **Table 12**.

Table 12: Summary of Predicted Incremental (Mining and Coal Transportation) and Cumulative TSP (µg/m3)

ID	Receiver	Year 3		Year 7		Year 15	
		Inc.	Cum.	Inc.	Cum.	Inc.	Cum.
5	"Rosehill"	1.2	31.4	1.0	31.2	0.7	30.9
7	83 Wadwells Lane	2.3	32.5	1.7	31.9	1.2	31.4
8	"Almawillee"	2.3	32.5	1.7	31.9	1.2	31.4
9	"Gedhurst"	2.2	32.4	1.7	31.9	1.2	31.4
10	"Meadholme"	4.1	34.3	2.8	33.0	1.9	32.1
11	"Glenara"	4.3	34.5	3.0	33.2	2.0	32.2
12	"Quipolly Railway Cottage"	5.7	35.9	4.5	34.7	3.4	33.6
14	"Greenslopes"*	9.2	39.4	12.1	42.3	17.1	47.3
15	"Plain View"*	10.6	40.8	6.3	36.5	4.2	34.4
17	"Woodlands"	3.0	33.2	2.3	32.5	1.6	31.8
18	"Werris Creek Railway Cottage"*	10.4	40.6	11.5	41.7	11.5	41.7
20	"Tonsley Park"	12.6	42.8	13.8	44.0	13.1	43.3
21	"Alco Park"	9.8	40.0	10.6	40.8	10.4	40.6
22	"Mountain View"	2.1	32.3	1.6	31.8	1.1	31.3
24	"Hazeldene"	3.9	34.1	2.7	32.9	1.9	32.1
96	"Talavera"#	5.7	35.9	4.9	35.1	4.2	34.4
98	"Kyooma"	2.4	32.6	2.4	32.6	2.0	32.2
99	"Werriston South"	1.6	31.8	1.8	32.0	1.8	32.0

As presented in **Table 12** the annual average TSP concentrations were well below the criteria of 90 µg/m^3 at all modelled residences and properties incorporating a conservative background concentration of 30.2 µg/m^3.

The AQIA predicted that coal transport operations by rail would contribute a maximum of 1.9 µg/m^3 to TSP concentrations.

5.3 Particulate Matter (PM_{10})

The annual incremental PM_{10} impact predictions from the AQIA are reproduced in **Table 13**.

Table 13: Summary of Predicted Annual Incremental (Mining and Coal Transportation) and Cumulative PM_{10} ($\mu g/m^3$)

ID	Receiver	Year 3		Year 7		Year 15	
		Inc.	Cum.	Inc.	Cum.	Inc.	Cum.
5	"Rosehill"	0.5	15.6	0.4	15.5	0.3	15.4
7	83 Wadwells Lane	0.8	15.9	0.7	15.8	0.5	15.6
8	"Almawillee"	0.8	15.9	0.7	15.8	0.5	15.6
9	"Gedhurst"	0.8	15.9	0.7	15.8	0.5	15.6
10	"Meadholme"	1.5	16.6	1.1	16.2	0.8	15.9
11	"Glenara"	1.6	16.7	1.2	16.3	0.8	15.9
12	"Quipolly Railway Cottage"	2.3	17.4	1.9	17	1.5	16.6
14	"Greenslopes"*	3.2	18.3	4.3	19.4	6.1	21.2
15	"Plain View"*	3.8	18.9	2.4	17.5	1.6	16.7
17	"Woodlands"	1.2	16.3	0.9	16.0	0.7	15.8
18	"Werris Creek Railway Cottage"*	3.7	18.8	4.2	19.3	4.3	19.4
20	"Tonsley Park"	4.3	19.4	4.9	20.0	4.8	19.9
21	"Alco Park"	3.6	18.7	3.9	19.0	4.0	19.1
22	"Mountain View"	0.8	15.9	0.6	15.7	0.5	15.6
24	"Hazeldene"	1.5	16.6	1.1	16.2	0.8	15.9
96	"Talavera"#	2.1	17.2	1.9	17.0	1.6	16.7
98	"Kyooma"	0.9	16.0	0.9	16.0	0.8	15.9
99	"Werriston South"	0.6	15.7	0.7	15.8	0.7	15.8

An annual average background concentration of 15.1 $\mu g/m^3$ was applied to calculate the potential cumulative impacts associated with the LOM Project and to enable a comparison with the annual average PM_{10} criteria. Annual average PM_{10} concentrations are predicted to satisfy the criteria of 30 $\mu g/m^3$ at all modelled residences and properties applying the annual average background concentration.

The AQIA predicted that coal transport operations by rail would contribute a maximum of 1.0 $\mu g/m^3$ to incremental annual average PM_{10} concentrations.

The 24 hour incremental PM_{10} impact predictions from the AQIA are reproduced in **Table 14**.

Table 14: Summary of Predicted 24 hour Incremental (Mining and Coal Transportation) and Cumulative PM_{10} (µg/m^3)

ID	Receiver	Year 3		Year 7		Year 15	
		Inc.	Cum.	Inc.	Cum.	Inc.	Cum.
5	"Rosehill"	6.1	32.1	5.0	32.0	3.5	32.0
7	83 Wadwells Lane	6.7	32.1	6.0	32.2	4.4	32.1
8	"Almawillee"	6.9	32.1	6.2	32.2	4.4	32.1
9	"Gedhurst"	6.0	32.2	5.9	32.2	4.2	32.1
10	"Meadholme"	10.3	36.8	7.2	36.2	5.2	34.6
11	"Glenara"	10.9	37.8	7.9	35.9	5.5	34.6
12	"Quipolly Railway Cottage"	13.8	36.0	10.1	33.0	7.5	32.8
14	"Greenslopes"*	17.5	41.3	20.7	41.9	39.4	60.7
15	"Plain View"*	28.1	47.7	17.9	37.5	13.7	35.5
17	"Woodlands"	8.7	34.8	6.7	32.2	5.0	32.0
18	"Werris Creek Railway Cottage"*	19.2	40.5	20.8	44.6	23.7	47.5
20	"Tonsley Park"	21.4	41.8	27.3	41.8	24.7	44.9
21	"Alco Park"	16.4	38.4	20.7	39.6	18.4	42.2
22	"Mountain View"	6.1	32.1	5.6	32.2	4.2	32.1
24	"Hazeldene"	12.3	34.9	8.9	34.4	6.5	34.0
96	"Talavera"#	12.5	37.7	13.7	36.3	11.2	33.9
98	"Kyooma"	7.2	32.6	6.2	32.7	5.8	32.2
99	"Werriston South"	6.2	32.8	5.3	32.6	6.8	32.6

A daily varying PM_{10} background concentration file from an EPA air quality monitoring station, located at Tamworth, was used in modelling 24 hour PM_{10} concentrations to identify cumulative impacts of the LOM on the surrounding environment. Maximum 24 hour PM_{10} concentrations were predicted to satisfy the criteria of 50 µg/m^3 at all the modelled residences and properties with the exception of three occasions at property R14 in Scenario 3. Further investigation into the exceedances showed that they occurred during days with average south-southwesterly and west-southwesterly winds, and during wind speeds of between 2.4 m/s and 5.2 m/s. WCC purchased R14 in December 2011.

The AQIA predicted that coal transport operations by rail would contribute a maximum of 3.2 µg/m^3 to incremental 24 hour average PM_{10} concentrations.

5.4 Particulate Matter ($PM_{2.5}$)

There was no background $PM_{2.5}$ data available that could be used in the AQIA to predict cumulative annual and 24 hour concentrations. Therefore the predictions for $PM_{2.5}$ are highly

uncertain and should therefore be viewed as indicative only. The annual incremental $PM_{2.5}$ impact predictions from the AQIA are reproduced in **Table 15**.

Table 15: Summary of Predicted Annual Incremental (Mining and Coal Transportation) $PM_{2.5}$ ($\mu g/m^3$)

ID	Receiver	Year 3	Year 7	Year 15
5	"Rosehill"	0.8	0.5	0.4
7	83 Wadwells Lane	1	0.7	0.6
8	"Almawillee"	1	0.7	0.6
9	"Gedhurst"	1	0.7	0.6
10	"Meadholme"	1.4	0.9	0.8
11	"Glenara"	1.4	1.0	0.8
12	"Quipolly Railway Cottage"	1.5	1.1	0.9
14	"Greenslopes"*	2.8	2.7	3.1
15	"Plain View"*	2.2	1.4	1.2
17	"Woodlands"	1.2	0.9	0.7
18	"Werris Creek Railway Cottage"*	2.6	2.4	2.4
20	"Tonsley Park"	2.9	2.6	2.5
21	"Alco Park"	2.5	2.3	2.3
22	"Mountain View"	1.0	0.7	0.6
24	"Hazeldene"	1.4	0.9	0.8
96	"Talavera"#	2.0	1.6	1.4
98	"Kyooma"	1.4	1.2	1.1
99	"Werriston South"	1.1	1.0	1.0

Annual average $PM_{2.5}$ concentrations were predicted to satisfy the criteria of 8 $\mu g/m^3$ at all the modelled residences and properties with the maximum predicted $PM_{2.5}$ concentration accounting for approximately 40% of the criteria.

The 24 hour incremental $PM_{2.5}$ impact predictions from the AQIA are reproduced in **Table 16**.

Table 16: Summary of Predicted 24 hour Incremental (Mining and Coal Transportation) $PM_{2.5}$ ($\mu g/m^3$)

ID	Receiver	Year 3	Year 7	Year 15
5	"Rosehill"	10.3	7.3	6.2
7	83 Wadwells Lane	13.2	9.1	7.6
8	"Almawillee"	13.1	9.1	7.5
9	"Gedhurst"	12.8	8.8	7.3
10	"Meadholme"	14.6	10.0	8.3
11	"Glenara"	14.7	10.1	8.3
12	"Quipolly Railway Cottage"	13.5	9.5	7.9
14	"Greenslopes"*	17.9	15.1	15.5
15	"Plain View"*	19.5	13.5	11.3
17	"Woodlands"	11.0	7.8	6.5
18	"Werris Creek Railway Cottage"*	18.0	15.4	15.4
20	"Tonsley Park"	19.0	16.4	16.4
21	"Alco Park"	17.5	15.1	15.1
22	"Mountain View"	12.6	8.7	7.2
24	"Hazeldene"	13.5	9.3	7.7
96	"Talavera"#	15.0	11.5	10.0
98	"Kyooma"	10.3	8.7	8.4
99	"Werriston South"	8.5	7.2	7.0

Maximum 24 hour $PM_{2.5}$ concentrations were predicted to satisfy the criteria of 25 $\mu g/m^3$ at all modelled residences and properties. However, several predicted incremental $PM_{2.5}$ concentrations were more than 75% of the criteria (or 18.7 $\mu g/m^3$), a background concentration of 7 $\mu g/m^3$ would therefore result in exceedances of the cumulative criteria.

The AQIA predicted that coal transport operations by rail would contribute a maximum of 3.2 $\mu g/m^3$ to incremental 24 hour average PM_{10} concentrations.

5.5 Quirindi Rail Transport Air Quality Impact Assessment Results

It is estimated that 26 trains pass through Quirindi each day. There will be no increase in the number of train movements as a result of the LOM Project; a maximum of three trains per day will come from the mine. A worst case assessment of the impacts of the mine wagon particulate

emissions on the township of Quirindi was undertaken as part of the AQIA. The incremental and cumulative concentration results for TSP and $PM_{2.5}$ and deposition rate results were below the relevant criterion.

The AQIA determined that the incremental maximum 24 hour average concentrations of PM_{10} was approximately 34 µg/m^3 at the rail centre, decreasing to 30 µg/m^3 10 metres from the rail centre line and 15 µg/m^3 at 130 metres from the rail centre line. When adding the incremental concentration results to the maximum 24 hour average concentration from the Tamworth monitoring station of 31.9 µg/m^3 it resulted in some exceedances of the EPA criterion of 50 µg/m^3 up to 100 metres from the rail centre line.

5.6 Greenhouse Gas Emissions

The National Greenhouse and Energy Reporting (NGER) guideline outlines three types of emissions depending on whether the activity is within the organisation's boundary (direct - Scope 1) or outside the organisation's boundary (indirect - Scope 2 and Scope 3).

Scope 1 (or direct source) emissions are greenhouse gas emissions which occur as a direct result of activities at a facility. These activities include:

- Combustion of fuel for energy;
- Mining activities where extraction, production, processing and distribution of fossil fuels generate greenhouse gases on-site; and
- Industrial processes where a mineral, chemical or metal product is formed using a chemical reaction that generates greenhouse gases as a by-product.

Scope 2 (or energy indirect) emissions are greenhouse gas emissions which occur from the generation of the electricity purchased and consumed by a facility. Scope 2 emissions are physically produced by the burning of fuels (coal, natural gas, etc.) at a power station.

Scope 3 covers all indirect emissions that are not included in Scope 2. Scope 3 emissions are a consequence of the activities of the organisation occurring from sources not owned or controlled by the organisation. Some examples are the extraction, production and transport of fuels and use of sold products and services. Reporting Scope 3 emissions is not mandatory under the NGER scheme.

Entities have a high level of control over Scope 1 emissions and Scope 2 emissions. As a consequence, greenhouse gas emission reduction and energy efficiency programs often target these emission sources.

5.6.1 Greenhouse Gas Impact Assessment

Calculated Scope 1, Scope 2 and Scope 3 emissions for greenhouse gas resulting from the LOM project (based on a detailed greenhouse gas assessment by Heggies Pty Limited) were provided in the EA.

Quantification of potential emissions from the LOM Project was undertaken in relation to carbon dioxide (CO_2) and other non CO_2 greenhouse gas emissions (which are awarded a "CO_2-equivalence" calculated based on their global warming potential).

A summary of the potential LOM Project greenhouse gas emission sources is provided in **Table 17**.

Table 17: Summary of Potential LOM Project Greenhouse Gas Emissions

Emission Source	Direct Emissions	Indirect Emissions	
	Scope 1	Scope 2	Scope 3
Fugitive Emissions	Emissions from the release of coal bed methane and CO_2 as a result of the LOM Project.	Not applicable	Not applicable
Diesel	Emissions from the combustion of diesel at the LOM Project (stationary energy and transport purposes).	Not applicable	Estimated emissions attributable to the extraction, production and transport of diesel consumed at the LOM Project.
Explosives	Emissions from explosives used as part of the LOM Project.	Not applicable	Not applicable
Electricity	Not applicable	Emissions associated with the consumption of generated and purchased electricity at the LOM Project.	Estimated emissions from the extraction, production and transport of fuel burned for the generation of electricity consumed at the LOM Project Site and the electricity lost in delivery in the transmission and distribution network.
Combustion of Coal	Not applicable	Not applicable	Emissions from the combustion of coal from the LOM Project.

The greenhouse gas impact of the LOM Project was estimated using the activity data for the year 2008/2009, associated with 1.2 Mtpa coal extraction rate and scaled up to represent the LOM Project production rate of 2.5 Mtpa.

Table 18 presents results of the greenhouse gas assessment; as emissions from the LOM Project compared to 1.2 Mtpa coal extraction operations.

Table 18: Greenhouse Gas Emissions Attributable to the LOM Project

Operations	GHG Emissions t $CO_{2\text{-}e}$/annum			
	Scope 1	**Scope 2**	**Scope 3**	**Total**
1.2 Mtpa (year 2008/2009)	79,752	907	2,905,836	2,986,495
2.5 Mtpa (LOM Project)	165,283	1,857	6,053,800	6,220,939
Emission Increase	**85,531**	**950**	**3,147,963**	**3,234,444**

The primary source (approximately 68%) of Scope 1 greenhouse gas emissions from the LOM Project at Werris Creek is due to fugitive emissions of methane and carbon dioxide released from the coal seam during the coal mining process. Carbon dioxide and methane emissions from the combustion of diesel duel during mining operations on site make up approximately 30% of emissions from the LOM Project.

The total greenhouse gas emissions from the LOM Project were estimated to comprise 0.1% of the NSW greenhouse gas total emissions, and 0.03% of the Australian national emissions for 2007. Given the small contribution, it was determined that the greenhouse gas emissions from the LOM Project will not have a significant impact on national greenhouse gas emissions or global warming.

6 RISK ASSESSMENT

The AQGHGMP has discussed the proposed LOM Project operations, the relevant approval conditions relating to air quality and greenhouse gas emissions, the air quality and greenhouse gas performance of the mine and community complaints received and the predicted air quality and greenhouse gas emissions of the LOM Project. The next step is to determine the risks of air quality and greenhouse gas hazards from WCC LOM Project operations. Two separate risk assessments were conducted for WCC which covered air quality and greenhouse gas hazard identification, risk (consequence and likelihood) and management controls to mitigate air quality risks. The completed risk assessments are located in **Appendix D** for:

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

A summary of those risk assessments for air quality are outlined in **Table 19** with the key air quality and greenhouse gas hazards identified, risk ranking (existing controls), and the existing controls and proposed additional management actions to be implemented to further mitigate potential air quality and greenhouse gas impacts.

Table 19: WCC LOM Project Risk Summary

Activity	Hazard	Current Management Control	Risk	Additional Management Action
General Open Cut	Dust related Community Complaint	▪ Property Acquisition ▪ Rehabilitation Program ▪ Dust Suppression – Water Carts ▪ Overburden and Interburden Excavation Dust Management ▪ Blasting Dust Management	**M**	▪ Real Time Monitoring Response ▪ Visual Inspection ▪ Pollution Reduction Program
Trafficable Areas	Trafficable Dust related non-compliance	▪ Overburden and Interburden Excavation Dust Management ▪ Dust Suppression – Water Carts ▪ Truck and Other Vehicle Operation ▪ Haul and Other Roads	**M**	▪ Real Time Monitoring Response ▪ Visual Inspection ▪ Pollution Reduction Program
Overburden Emplacement	Wind Erosion Dust related non-compliance	▪ Rehabilitation Program ▪ Dust Suppression – Water Carts ▪ Overburden and Interburden Excavation Dust Management	**M**	▪ Real Time Monitoring Response ▪ Visual Inspection ▪ Pollution Reduction Program
General Open Cut	Revised Air Quality Criteria Exceedance	▪ Property Acquisition ▪ Rehabilitation Program ▪ Dust Suppression – Water Carts	**L**	▪ Real Time Monitoring Response ▪ Visual Inspection ▪ Pollution Reduction Program

7 OBJECTIVES AND TARGETS

WCC will outline the revised air quality criteria for the LOM Project and develop air quality and greenhouse gas related objectives and targets as part of the Environmental Management System (EMS) for WCC.

7.1 Air Quality Criteria

The air quality criteria for the LOM project was established in accordance with the Project Approval 10_0059 and commitments given in the EA for the LOM Project in **Table 20**. Criteria for $PM_{2.5}$ was not specified in the Project Approval or EPL and therefore not linked to compliance, however the guidelines from the National Environment Protection Measure for Ambient Air Quality (the 'Air NEPM') have been adopted as the $PM_{2.5}$ criteria for the LOM Project.

Table 20: Air Quality Criteria

Pollutant	Method	Period	[d] Criterion
Total Suspended Particulate	HVAS	Annual	[a] 90 µg/m^3
Particulate Matter <10 microns (PM_{10})	HVAS & TEOM	24 hours (Total)	[a] 150 µg/m^3
		24 hours (Incremental)	[b] 50 µg/m^3
		Annual	[a] 30 µg/m^3
Particulate Matter <2.5 microns ($PM_{2.5}$)	TEOM	24 hours	25 µg/m^3
		Annual	8 µg/m^3
[c] Dust Deposition	Dust Depositional Gauges	Annual (Incremental)	[b] 2 g/m^2/month
		Annual (Total)	[a] 4 g/m^2/month

[a] *Total impact (ie incremental increase in concentrations due to the project plus background concentrations due to all other sources);*

[b] *Incremental impact (ie incremental increase in concentrations due to the project on its own);*

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

[d] *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents, illegal activities or any other activity agreed by the Director-General in consultation with OEH.*

The methods for evaluating compliance with these air quality goals are presented in **Section 9**.

7.2 Air Quality Objectives and Targets

As part of the planning process in EMS, objectives and targets are set to drive organisations towards continuous improvement in environmental performance. WCC will establish specific objectives and targets for the air quality and greenhouse gas hazards that were assigned the highest risks in **Section 6**. These risks include exceedance of revised air quality criteria and receipt of community complaints. The air quality and greenhouse gas 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 21**) will be reviewed monthly and revised annually based on the overall year's performance. The objectives and targets

proposed for the future years are only indicative and will be subject to the results of the AQGHG Performance Annual Review.

Table 21: EMS Air Quality and Greenhouse Gas Objectives and Targets

Objective		Performance Indicator	Performance		Target		
Activity	**Environmental Hazard**		**2011-2012**	**2012-2013**	**2013-2014**	**2014-2015**	**Reason**
General Open Cut	Dust related Community Complaint	Number of Community Complaints for Dust	7	12	12	12	Same number of complaints as previous year due to the mine moving closer to Werris Creek & Werris Creek Road
		Number of Complainants	7	11	11	11	Same number of complainants as previous year due to the mine moving closer to Werris Creek & Werris Creek Road
Trafficable Areas	Trafficable Dust related non-compliance	Number of EPL Fines for Dust	0	0	0	0	No Dust related EPA Fines
Overburden Emplacement	Wind Erosion Dust related non-compliance	Number of EPL Fines for Dust	0	0	0	0	No Dust related EPA Fines
General Open Cut	Air Quality Criteria Exceedance	Number of exceedances from Air Quality Monitoring	0	0	0	0	No exceedance of air quality criteria

8 MANAGEMENT STRATEGIES AND MEASURES

For the three distinct environmental aspects of Air Quality (primarily dust), Odour and Greenhouse Gas emissions, the management strategies and measures relating to each will be discussed separately in the following sections.

8.1 Air Quality Management

In order to mitigate any potential air quality impacts from the WCC LOM Project, a number of air quality management controls will be implemented throughout the life of the operation. Particulate emission controls are detailed in **Table 22**.

Table 22: Particulate Management Controls

Section	Measure	Responsibility	Timing
8.1.1	Property Acquisition	CLO	As required
8.1.2	Rehabilitation Program	EO	Annual
8.1.3	Pre-Strip and Other Disturbance Areas	MPE	Annual/As required
8.1.4	Dust Suppression – Water Carts	OCE	Daily
8.1.5	Real Time Monitoring Response	EO	Daily/As required
8.1.6	Truck and Other Vehicle Operation	Operator/OCE	Daily
8.1.7	Haul and Other Roads	OCE	Daily
8.1.8	Drilling Dust Management	Operator/OCE	Daily
8.1.9	Overburden and Interburden Excavation	Operator/OCE	Daily
8.1.10	Blasting Dust Management	MPE	As required
8.1.11	Dust Suppression – Water Sprays	CPM	Daily
8.1.12	Conveyor Dust Management	CPM	Daily
8.1.13	Offsite Coal Transport	CPM	As required
8.1.14	Equipment and Plant Maintenance	MS	Daily
8.1.15	Acoustic and Visual Amenity Bund	MPE	As required
8.1.16	Pollution Reduction Programs	EO/OM	2012
8.1.17	Coal Stockpile Dust Management	CPM	As required
8.1.18	Air Quality Mine Planning	EO	Daily
8.1.19	Adverse Weather Dust Management	OCE/EO	As required

CLO – Community Liaison Officer; EO – Environmental Officer; OCE – Open Cut Examiner; MPE – Mine Planning Engineer; CPM – Coal Processing Manager; MS – Maintenance Supervisor; OM – Operations Manager.

8.1.1 Property Acquisition

While efforts to mitigate air quality 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 which impact production. **Table 23** presents the properties that have been acquired by WCC since 2004.

Table 23: Adjacent Properties Purchased by WCC

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

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

Air quality acquisition criteria are specified for the LOM Project in PA 10_0059 Schedule 3 Condition 17. If dust at any time from the mine exceeds the revised air quality criteria, contained in **Table 20,** 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. Dust levels resulting from extraordinary events not related to mine activities can be excluded from the acquisition criteria, including events such as bushfires, prescribed burns, dust storms, sea fog, fire incidents or any other activity agreed by DoP.

8.1.2 Rehabilitation Program

WCC progressively rehabilitates areas disturbed by mining activities, including the overburden emplacement area. As of the end of March 2013, WCC has rehabilitated 93.65 of mining disturbance which is 13.27ha ahead of the rehabilitation targets set in the LOM Project Mining Operations Plan (MOP) approved by Department of Resources and Energy on 29 November 2012. The MOP forms the basis of the Rehabilitation Management Plan, also approved by the Department of Resources and Energy in April 2012. **Table 24** summarises the annual rehabilitation targets proposed by WCC in the MOP and Rehabilitation Management Plan which as well as achieving the required final land uses (for WCC is Woodland Ecological Communities and Agriculture) and it also provides a significant control for fugitive dust emissions from wind erosion.

Table 24: LOM Rehabilitation Targets

Period		Annual Total (ha)	Cumulative Total (ha)
Year 1	2012-2013	25.7	76.2
Year 2	2013-2014	21.6	97.8
Year 3	2014-2015	22.4	120.2
Year 4	2015-2016	23.5	143.7
Year 5	2016-2017	15.1	158.8
Year 6	2017-2018	24.0	182.8
Year 7	2018-2019	14.3	197.1
Total		**197.1**	**197.1**

The first stage of revegetation activities as part of mine rehabilitation programs is to sow a cover crop. The cover crop is used to stabilise the soil surface which mitigates erosion that causes dust generation. The cover crop step is called temporary rehabilitation, which is a short term step prior to further revegetation to achieve the desired final land use. Disturbed areas that are no longer required for mining or ancillary activities in the short or longer term will be temporarily rehabilitated to mitigate wind erosion and potential dust generation. This includes topsoil and subsoil stockpiles at the mine which are regularly sown with a cover crop to maintain the temporary rehabilitation ground cover.

8.1.3 Pre-Strip and Other Disturbance Areas

Pre-strip areas include the areas immediately in front of the direction of mining to enable the mine to advance into the next strip. Open cut coal mines are divided up into strips perpendicular to the direction of mining, which are then mined in sequence from the upper coal seams until the basal coal seam is extracted. That strip can then become a dump and can be progressively in filled with overburden material from the following strip. Other areas of disturbance required for ancillary

activities associated with mining are usually located adjacent to the open cut or infrastructure areas.

In preparing pre-strip or other disturbance areas to become available for the next strip of mining, vegetation will need to be cleared and the soil stripped. Given the sparse nature of the vegetation communities at the mine, only large paddock trees are required to be cleared. This activity generates little dust. Where practicable, the cleared timber is stockpiled by WCC to be reused on rehabilitation areas for habitat augmentation. If there is excess timber, then the timber will be buried in pit and will not be burnt.

The ground cover and soil is left untouched until the area is required to be drilled for the next blast design pattern. Only then is the soil disturbed for the immediate area required for the drill pattern in the next strip. This process ensures that only the minimum area required for mining is disturbed at any one time minimising the amount of land open to wind erosion and potential dust generation. Soil is only stripped when sufficiently moist to minimise dust generation. At the mine, scrapers are principally used to strip soil and generate less dust, as scrapers move soil in one pass as opposed to using dozers to strip soil into wind rows and front end loaders and trucks haul to soil stockpiles. If required water carts are used to increase soil moisture to minimise dust generation during stripping (**Section 8.1.4**). As described in **Section 8.1.2**, topsoil and subsoil stripped will be placed into stockpiles directly by the scrapers and a cover crop will be sown as soon as practicable after completion of stockpiling.

8.1.4 Dust Suppression – Water Carts

WCC utilises water carts as the principle daily control measure to actively control dust emissions from our operations (**Figure 6**). The application of water from water carts to exposed surfaces aims to increase the moisture content of the surface material and resist forces (e.g. wind and wheel movement) mechanically causing dust generation. Water carts focus on the areas subject to frequent vehicle and equipment movements which may cause dust generation and dispersion. WCC aims to achieve a level of watering equivalent to 80% dust control effectiveness for the actively used haul roads on any given shift. Water carts will operate before the start of shift to ensure that haul roads to be used that shift are already damp to mitigate dust generation especially during early morning temperature inversions.

WCC has two dedicated water carts for the open cut operations, one water cart for coal processing and the rail load out facility and one water cart for campaign activities, such as for the scrapers. Water cart capacity varies across the year based on maintenance requirements and seasonal conditions that can result in higher potential dust emissions. Based on the daily load counts, WCC used approximately 389ML of void water for dust suppression during 2012/2012, up from 190ML in 2011/2012, 140ML in 2010/2011 and 154ML in 2009/2010.

Water carts are installed with water cannons allowing them to water stockpiles when required.

Figure 6: 30,000L Volvo Wobbly Water cart in operations at Werris Creek

8.1.5 Real Time Monitoring Response

As committed for the LOM Project, WCC has installed Tapered Element Oscillating Microbalance (TEOM) analyser which will provide real time PM_{10} and $PM_{2.5}$ dust monitoring via a dedicated website. The justification for the location of the TEOM in Werris Creek (**Figure 7**) is outlined in **Section 9.4.1**. The SentineX system that collates the real time data from the TEOM will be set up so that an alarm can be sent to the Environmental Officer when PM_{10} dust concentration levels reach the following trigger levels:

- Short Term Event Trigger: >90µg/m^3 over two consecutive 15 minute periods; and
- 24 Hour Event Trigger: Rolling 24 hour average >40µg/m^3; and
- Only when the wind direction is from 182^o to 204^o.

The data from the TEOM can be analysed in conjunction with local and mine site weather station data in real time to determine the contribution of dust levels from the direction of the mine compared to dust levels from other wind directions. Upon receiving an alarm, the Environmental Officer can investigate the source of dust emissions, and if found to be as a result of mine operations the Operations Manager and Open Cut Examiner (OCE) will take actions to mitigate dust emissions by modifying operations and/or suspending certain actives until conditions improve. While the rolling 24 hour trigger value is similar to the compliance criteria, the trigger values are designed to identify dust events (whether or not as a result of the mine) that may require further management.

A commitment was made in the LOM Project EA to modify dump locations after an hour of northerly winds due to the potential to exceed dust criteria at property R15 (“Plain View”) during Scenario 1. As WCC has acquired this property and no other air quality exceedances are predicted in the EA, this commitment is no longer valid.

8.1.6 Truck and Other Vehicle Operation

All operators at the mine are trained and certified as competent to operate all equipment onsite. As part of the training, operators are instructed that trucks and other mobile equipment must be driven to the conditions to minimise trafficable dust generation and utilise existing tracks onsite. Truck operators are encouraged to slow down and contact the water cart operator to water particular sections of haul roads, as well as loading and dump faces that are at risk of drying out. All personnel are trained as part of the induction process on the speed limit restrictions for vehicles and equipment at the mine site.

8.1.7 Haul Roads and Other Roads

In addition to the regular watering of internal haul roads by water carts (**Section 8.1.4**), haul roads and other frequently trafficked roads onsite are constructed so that the road condition can be adequately maintained, which in turn assists in reducing wheel generated dust emissions. A speed limit of 60 km/hr is enforced within the pit, and 80 km/hr on sealed roads. Graders that are operating with the blade down will work at lower speeds to minimise dust generation. Sealed roads onsite are routinely swept to remove potential dust generating debris and silt. All unsealed haul roads are routinely sheeted with local gravel found onsite to improve road surfaces.

The design of the LOM Project included the relocation the Coal Processing Plant (CPP) to the north of the site within the first three years which will reduce the haul distance by approximately 1.3km (compared to using the current CPP) to the active open cut area particularly later in the mine life reducing potential wheel generated dust.

8.1.8 Drilling Dust Management

If possible, prior to drilling, a water cart will spray the surface of the drill site to create a surface crust and minimise dust developing on the surface, once the holes are drilled it is not possible for a water cart to access the site until after it has been blasted.

The drill rigs at the mine site utilise a combination of curtains, vacuum extraction and water sprays to minimise dust after the hole has been started. At completion of a hole, the drill rig will spray water on the cuttings that have accumulated on the surface to prevent cuttings generating dust around the hole collar.

8.1.9 Overburden and Interburden Excavation Dust Management

As discussed in **Section 8.1.4**, water carts will be used to water exposed surfaces at excavator loading faces and dump sites to minimise dust generation in these high activity areas. During high wind periods causing dust generation, where possible mining operations will be undertaken in pit if there are available loading or dump sites. If these activities continue to generate excessive dust from a visual inspection, the Operations Manager will make a decision whether the activities will be suspended until conditions improve. The extension of the out-of-pit overburden emplacement areas and construction of the Acoustic and Visual Amenity Bund will be undertaken during favourable conditions to mitigate dust generation. Once constructed, the extended overburden emplacement and Acoustic and Visual Amenity Bund will increase the protection of mining operations from wind erosion.

A commitment was made in the LOM Project EA to modify dump locations after an hour of northerly winds due to the potential to exceed dust criteria at property R15 ("Plain View") during Scenario 1. As WCC has acquired this property and no other air quality exceedances are predicted in the EA, this commitment is no longer valid.

8.1.10 Blasting Dust Management

As outlined in Blast Management Plan, WCC will not fire blasts towards Werris Creek township based on 5 minute average wind direction between 182^{o} and 204^{o}. Blasting is also limited in PA 10_0059 and EPL 12290 to one blast per day (some exemptions) and blasting between 9am to 5pm Monday to Saturday (excluding public holidays). WCC aims to fire all blasts (depending on scheduling) in the middle of the day between 12pm and 2pm during crib break. Blasting in the middle of the day has the benefit of when the circulation in the lower atmosphere has reached its maximum mixing depth and improves dispersion of any dust generated by the blast. WCC on average fires 100 blasts per year.

Cast blasting will be used where practicable to minimize the material required to be loaded and transported and reducing handling and wheel dust emissions. Cast blasting is only possible towards the base of coal measures lower in pit because of the need to uncover the basal coal seam.

8.1.11 Dust Suppression – Water Sprays

ROM coal is generally moist when mined from the pit due to coal seams acting as aquifers within coal measure strata. However, to further mitigate dust emissions from handling coal at the Coal Processing Area and Rail Load Out Facility, water sprays have been set up at conveyor transfer points. Approximately 1ML of void water is used for dust suppression at both facilities per month.

8.1.12 Conveyor Dust Management

In addition to water sprays, conveyors at the Coal Processing Area and Rail Load Out Facility have been fitted with cleaning and collection devices to minimise the amount of material falling from the return conveyor belt and prevent fines build up which has the potential to generate dust. Only conveyors at the Train Load Out Facility have a roof which assists in reducing wind erosion when in operation. If WCC was to replace internal coal haulage from the Coal Processing Area to the Rail Load Out Facility with a conveyor, the conveyor would also have a roof and have cleaning and collection devices installed.

8.1.13 Off-site Coal Transport

Coal is transported offsite to domestic and export markets by rail and road. The majority of coal is transported by trains (greater than 98%) at the Rail Load Out Facility. As mentioned in **Section 8.1.11**, coal is generally moist which mitigates dust generation. In addition, the rail load out bin is enclosed and each loaded train wagons is sprayed with water to create surface crust to minimise dust generation. In addition, the new generation wagons are designed to be taller and concave which reduces the coal surface area, thereby reducing wind erosion during rail transport.

All trucks that transport coal offsite are road registered trucks. In accordance with standard road safety practices, all trucks are not filled above gunnel level of each tray and are tarped to cover their loads preventing spillage and wind erosion dust emissions.

8.1.14 Equipment and Plant Maintenance

Each individual item of plant onsite is tracked within the maintenance system which identifies the required routine maintenance based on hours worked. By undertaking preventative maintenance of earthmoving equipment and trucks improves operational performance; as well as ensuring that exhaust emissions are within the required standard for the relevant machines.

8.1.15 Acoustic and Visual Amenity Bund

An Acoustic and Visual Amenity Bund has been constructed along the north eastern boundary of the LOM Project. The bund will be 2.2km long and up to 25m high and will provide some protection to neighbouring properties from particulate emissions generated by the mining operations.

8.1.16 Pollution Reduction Programs

Pollution Reduction Program (PRP) is a regulatory tool available to the Environment Protection Authority (EPA) to enforce the reduction of environmental impacts that are not explicitly cover by the standard conditions of an Environmental Protection Licence (EPL). In consultation with the NSW Minerals Council, all Coal Mines in NSW have had Particulate Matter PRPs enforced as a condition of the EPL including WCC's EPL 12290. EPL 12290 was modified to include three new conditions:

- U1: Particulate Matter Control Best Practice Implementation – Wheel Generated Dust;
- U2: Particulate Matter Control Best Practice Implementation – Disturbing and Handling Overburden under Adverse Weather Conditions; and
- U3: Particulate Matter Control Best Practice Implementation – Trial of Best Practice Management for Disturbing and Handling Overburden.

U1 requires WCC to achieve and maintain a dust control efficiency of >80% on all active haul roads. To measure and verify, WCC is required to monitor haul road dust using REX (Road Emissions eXpert) system on two occasions in 2013-2014 and report back to the EPA in August 2014. If less than 80% dust control efficiency achieved, WCC will need to increase watering; use dust suppressants on haul roads and/or fix roads/intersections that are dusty. If greater than 80% achieved, WCC will need to set KPIs requiring ongoing monitoring to confirm compliance.

U2 requires WCC to alter or cease the operation of equipment on overburden and the loading and dumping of overburden during adverse weather conditions to minimise dust generation. In order to satisfy condition U2, WCC needs to report back to the EPA by August 2014 on the results of the monitoring program which is discussed in more detail in **Section 8.1.19**.

U3 requires WCC to trial best practice measures for the control of dust from the use of equipment on overburden and the loading and dumping of overburden. The NSW Minerals Council will respond summarising the effectiveness and practicability of these options to the EPA by April 2014 on behalf of its member organisations including Whitehaven Coal.

8.1.17 Coal Stockpile Dust Management

In general the inherent moisture within ROM and Product coal mitigates coal dust emissions. However during periods of dry conditions or high winds, water carts can be used to spray coal stockpiles. In addition, the mine's highest value product coal is a very fine semi coking coal known as SAIL (Steel Authority of India Limited) is covered by a tarp when stockpiled at the Rail Load Out Facility to prevent moisture content increasing (as required weather dependent - risk to coal quality) but also prevents dust generation. SAIL coal is produced periodically dependent on availability of low ash coal and ship arrival.

8.1.18 Air Quality Mine Planning

At the daily 9am meetings, the Environmental Officer reports to the WCC management including OCE's and Operations Manager on the previous days dust performance as well as the forecast weather conditions and the risk of dust impacts based on current mining operations. A "traffic light" code is used in the presentation to visually present high (red), moderate (yellow) and green (low) risk of air quality impacts. If moderate or high risks are identified then discussions are immediately held on what additional control measures will need to be implemented for day shift to mitigate potential air quality impacts including additional monitoring/inspections outlined in **Section 10**.

8.1.19 Adverse Weather Dust Management

WCC engaged Pacific Environment to assess at what wind speed and direction that Total Suspended Particulate dust emissions become excessive. The air quality model found that dust levels start to increase after 7m/s and increase exponentially after 9m/s. This information was used to develop a Trigger Action Response Plan (TARP) for responding to adverse weather conditions and is outlined in **Table 25**.

Table 25: Adverse Weather TARP

Location	**Wind Speed >7m/s**	**Wind Speed >9m/s**			
Wind Direction	**All**	**East**	**West**	**North**	**South**
RL445m Dump	Check for Dust	STOP	STOP	STOP	STOP
Out of Pit East		Check	STOP	STOP	STOP
Out of Pit West		STOP	Check	STOP	Check
Crushing Plant		STOP – if required for train loading then Check for Dust			
Train Load Out					
In of Pit East	Check for Dust				

When any of the above conditions are triggered, an SMS will be generated and sent to the OCE and Environmental Officer mobile phones advising them of the weather conditions and what action is required. A "Check for Dust" will require a visual inspection to be undertaken while a "STOP" dust will require operations to relocate if that location of the mine is being used; otherwise cease if no other area is available. The Environmental Officer will document what actions are undertaken.

8.2 Odour

In accordance with PA 10_0059 Schedule 3 Condition 14 and EPL 12290 L7.1, WCC will ensure that no offensive odours are emitted from the LOM Project. Spontaneous combustion events have the potential to cause odours. The risk of odour generation as a result of localised spontaneous combustion from coal stockpiles or waste carbonaceous material will be identified by close monitoring for the presence of smoke and heat. If heating is detected the affected material will be

dug out, spread and cooled. If localised spontaneous combustion was to be detected, the affected material will be isolated and drenched with water.

8.3 Greenhouse Gas Management Controls

WCC forms part of the Whitehaven Group's National Greenhouse and Energy Reporting Scheme (NGERS) reporting requirements. As the Group consumed greater than 0.5 PJ of energy in the 2008-2009 financial year, Whitehaven is now required to manage and report on energy consumption via the Energy Efficiency Opportunities (EEO) program.

The EEO Assessment and Reporting Schedule was prepared and submitted in December 2010 and approved in March 2011. Following this, an energy efficiency consultant was engaged to assist with the EEO process. An EEO team was formed which included the WCC Operations Manager, the Maintenance Manager – Open Cuts, Open Cut Electrical Supervisor, Group Environmental Manager and Environmental Officers.

Site meetings are held periodically whereby energy initiatives are discussed and investigated. It is anticipated that greenhouse gas management by Whitehaven sites, including the Werris Creek Coal Mine, will continue to develop as part of the EEO program. This Plan will be updated when significant changes to greenhouse gas management and monitoring occur. Energy efficiency measures described in the Annual EEO report (**Appendix E**) is directly applicable to how the site intends to manage and minimise greenhouse gas emissions. GHG measures that have been implemented to minimise the release of greenhouse gas emissions by WCC as part of the LOM Project:

- Relocation of the Mine Infrastructure Area (MIA) to the north to reduce the haul lengths of trucks transporting ROM Coal to the Crushing Plant. This initiative will particularly reduce haul lengths later in the life of the mine;
- Relocated Coal Crushing Plant electrical switch room will be upgraded and will include a power correction factor to improve energy efficiency of the crushing plant outside of peak crushing;
- Larger mining equipment (1 x Hitachi EX5600 replace 1 x Hitachi EX1900 and 10 x CAT XQ793 replacing 11 x CAT 785) replacing older and smaller equipment will improve productivity (bcm) for the same diesel consumption;
- Energy efficient external lighting around the MIA connected to main electricity supply replacing mobile lighting plants consuming diesel;
- New workshop with brand new compressed air system (no leaks) and new air compressor; and
- Completion of western dump extension will shorten overburden haul lengths and flatten the haul profile.

9 MONITORING

The following Air Quality Monitoring Program (AQMP) has been developed to quantify potential air quality impacts and measure the effectiveness of air quality control measures. Monitoring is undertaken in accordance with WCC's EPL 12290 and PA 10_0059 conditions, which specify required methods of sampling, analysis and frequency of monitoring.

To monitor air quality impact as a result of mining operations, WCC has established the air quality monitoring network as shown in **Figure 7** and **Table 26**. Air quality monitoring locations will be reviewed, and if necessary, modified in consultation with DoP and EPA over the life of the project, in response to monitoring results and changes in the mining operations. These changes will be updated in the AEMR and a revision to the AQGHGMP.

9.1 High Volume Air Samplers

9.1.1 Total Suspended Particulates

A High Volume Air Sampler (HVAS) monitors Total Suspended Particulates (TSP) at R98 ("Kyooma"), as shown in **Figure 7** and **Table 26**. R98 is representative of private property to the east of the mine. The TSP HVAS will be sited together with a PM_{10} HVAS to analyse the relationship between TSP and PM_{10} in mining dust emissions. Other than agriculture, the only other potential dust source for R98 is from the mine due to the distance the property is from transport infrastructure and urban areas isolates those dust emissions at this location. **Figure 8** is an example of a TSP HVAS.

Sample collection, changeover and analysis, and unit maintenance is undertaken by a specialist contractor (and NATA accredited), Australian Laboratory Services (ALS) based in Gunnedah. The HVAS will monitor TSP concentrations over a six day continuous cycle in accordance with *AS/NZS 3580.9.3:2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method*. The HVAS will be affixed to a concrete slab on the ground and the TSP inlet filter positioned within the breathing zone 1-2m off the ground. HVAS sampling procedures and maintenance is outline in **Appendix F**.

9.1.2 PM_{10}

Four HVAS have been installed to monitor Particulate Matter less than 10 micrometers (PM_{10}) surrounding the mine, as shown in **Figure 7** and **Table 26** at R10 ("Glenara" representative of private property in the Quipolly district to the south), R98 ("Kyooma" representing private property to the east), "Escott" property to the west of WCC and R20 ("Tonsley Park" property to the north but south of Werris Creek township). **Figure 9** is an example of a PM_{10} HVAS.

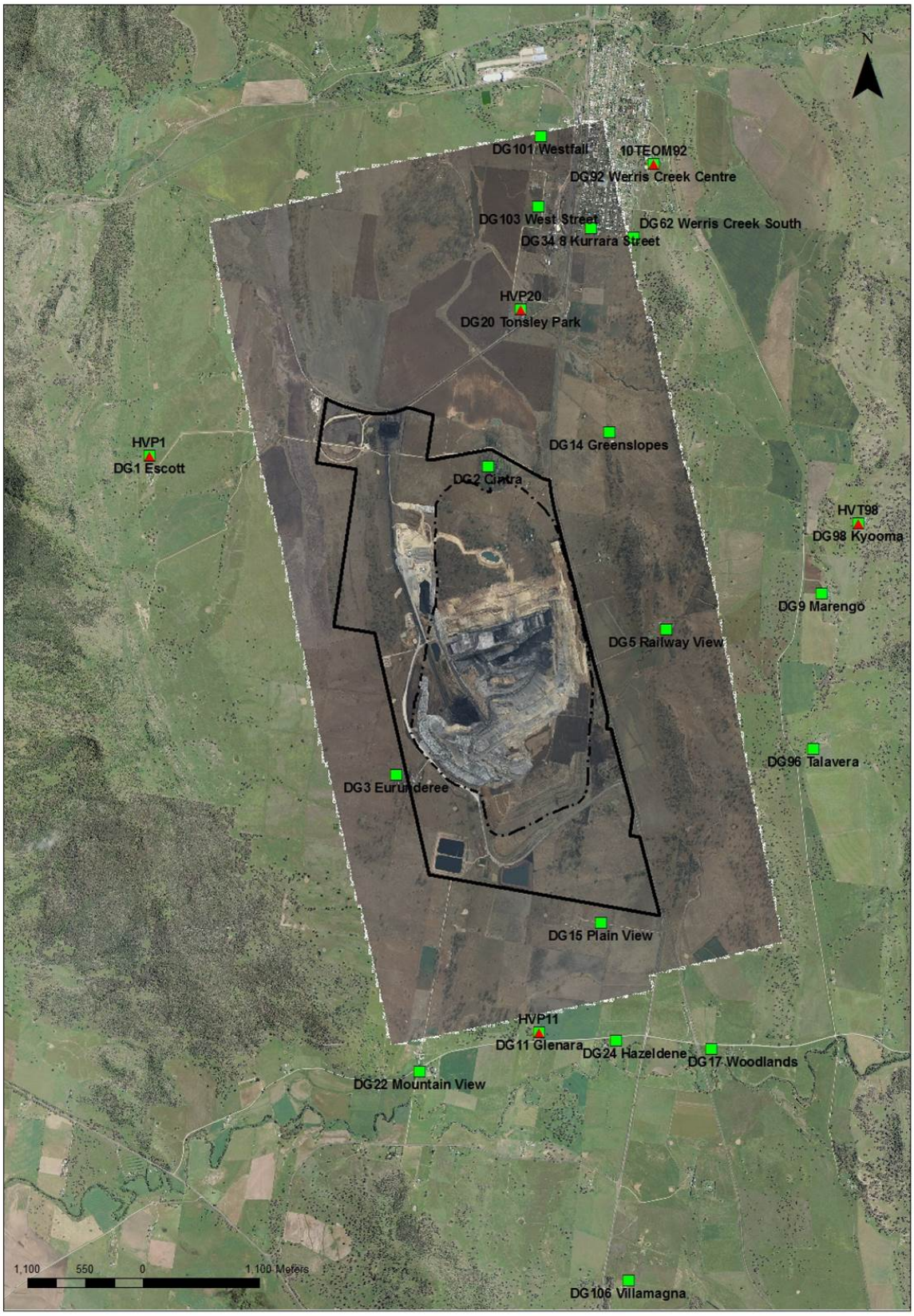

Figure 7: Air Quality Monitoring Locations

Figure 8: Example of TSP HVAS

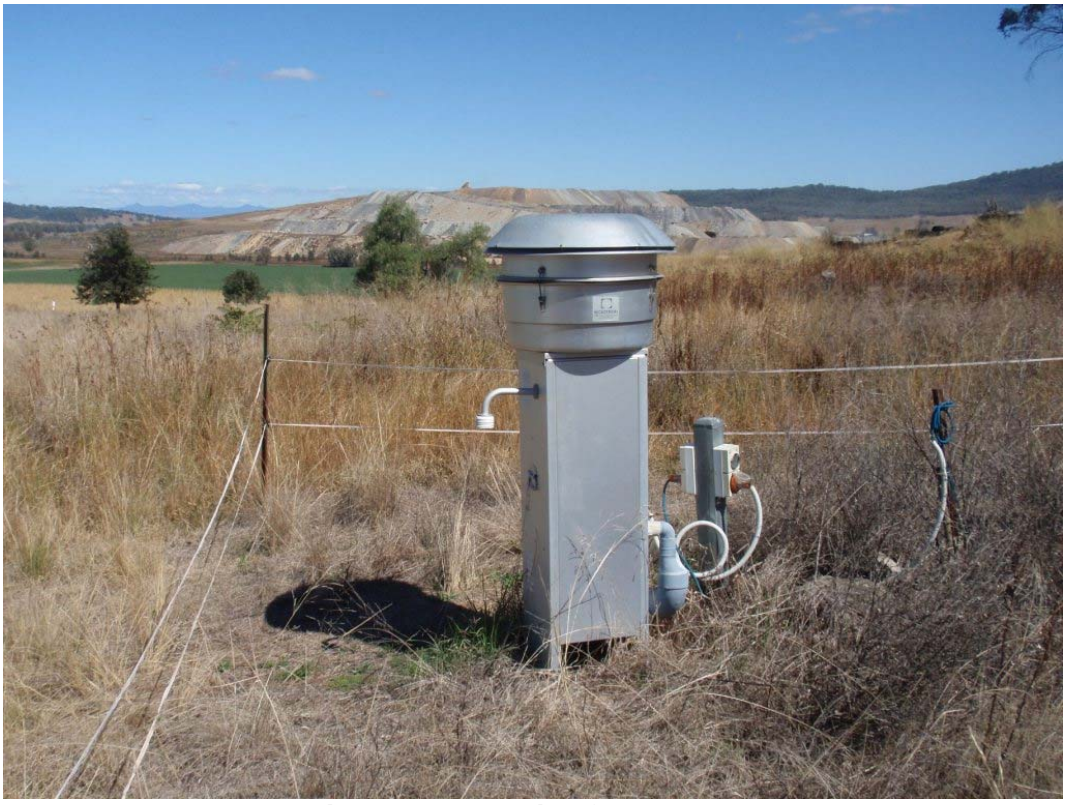

Figure 9: Example of PM_{10} HVAS

Table 26: Air Quality Monitoring Locations and Frequency

Locations Name	ID	Monitoring Method	Frequency	Ownership
TSP				
"Kyooma"	HVT98	HVAS	Every 6 days	J. Colville
PM_{10}				
"Kyooma"	HVP98	HVAS	Every 6 days	J. Colville
"Glenara"	HVP11	HVAS	Every 6 days	W.H & S.I. Ryan
"Escott"	HVP1	HVAS	Every 6 days	WCC
"Tonsley Park"	HVP20	HVAS	Every 6 days	L. Patterson
"Werris Creek Centre"	10TEOM92	TEOM	Continuous	LPSC
$PM_{2.5}$				
"Werris Creek Centre"	2.5TEOM92	TEOM	Continuous	LPSC
Dust Deposition				
"Cintra"	DG2	Dust Gauge	Continuously	WCC
"Escott"	DG1	Dust Gauge	Continuously	WCC
"Plain View"	DG15	Dust Gauge	Continuously	WCC
"Railway View"	DG5	Dust Gauge	Continuously	WCC
"Marengo"	DG9	Dust Gauge	Continuously	WCC
"Greenslopes"	DG14	Dust Gauge	Continuously	WCC
"Talavera"	DG96	Dust Gauge	Continuously	D. Hamilton-Smith
"Kyooma"	DG98	Dust Gauge	Continuously	J. Colville
"Werris Creek Centre"	DG92	Dust Gauge	Continuously	LPSC
"Werris Creek South"	DG62	Dust Gauge	Continuously	LPSC
"Tonsley Park"	DG20	Dust Gauge	Continuously	L. Patterson
"Mountain View"	DG22	Dust Gauge	Continuously	L.F. & R.M. Parkes
"Glenara"	DG11	Dust Gauge	Continuously	W.H & S.I. Ryan
"Hazeldene"	DG24	Dust Gauge	Continuously	P. George
"Quipolly Railway Cottage"	DG12	Dust Gauge	Continuously	P. Bojba
"West Fall"	DG101	Dust Gauge	Continuously	J.L. & G.D. O'Brien
"West Street"	DG103	Dust Gauge	Continuously	M.W. & T.M. Parsons
"Woodlands"	DG17	Dust Gauge	Continuously	R. & A. Hogan
"Villamagna"	DG106	Dust Gauge	Continuously	A. & D. Lawson
34 Kurrara St	DG34	Dust Gauge	Continuously	M. & M. Simmons

Sample collection, changeover and analysis, and unit maintenance is undertaken by ALS. The HVAS will monitor PM_{10} concentrations over a six day continuous cycle in accordance with *AS/NZS 3580.9.6:2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM_{10} high volume sampler with size-selective inlet – Gravimetric method.* The HVAS will be affixed to a concrete slab on the ground and the TSP inlet filter positioned within the breathing zone 1-2m off the ground. HVAS sampling procedures and maintenance is outline in **Appendix F**.

9.2 Mining Depositional Dust Gauges

A network of 20 static dust deposition gauges have been installed to monitor ambient dust deposition (including mining operations) surrounding the mine, as shown in **Figure 7** and **Table 26**. The dust deposition gauge network is proposed on both private and project related properties to provide an idea of dust fall out in all directions (north, east, south and west) and with distance away centred on the mine site. The data could be used to report dust isopleth diagrams showing the orientation of dust emissions in the area and locations of higher dust concentrations which may not be related to the mine, such rail and road transport, agriculture and urban sources.

Sample collection, changeover and analysis are undertaken by ALS. Dust deposition gauges are analysed monthly for insoluble solids and have been installed and operated in accordance with *Standards Australia, AS/NSS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method*. **Figure 10** is an example of a dust deposition gauge.

Figure 10: Example of Dust Deposition Gauge

Each deposited dust gauge comprises a glass funnel (150 ± 10 mm diameter) sitting over a sample bottle (approximately 4 L) housed within a PVC holder mounted 2.0 m ± 0.2 m above ground level on a star picket or similar support. The support will be sufficiently sturdy as to prevent any noticeable sway and ensure that the funnel aperture is maintained in a horizontal position. A bird deterrent may be installed that could be a ring, spikes or cable ties.

Sites for the deposited dust gauges will be selected to avoid areas with restricted airflows, minimum clear sky angle of 120° and avoid localized sources of pollution (e.g. unsealed roads).

9.3 Train Dust Depositional Gauges

In the LOM EA, Whitehaven Coal committed to work with the Australian Rail Track Corporation and Pacific National on coal dust generated from rail transport given community and Liverpool Plains Shire Council (LPSC) concerns. As part of the commitment, WCC established monitoring deposited dust from rail transport in Quirindi township to determine the contribution of coal dust to overall dust levels adjacent to the Main Northern rail corridor. **Figure 11** outlines the location of the train dust deposition monitoring site.

Figure 11: Dust Deposition Monitoring Locations within Quirindi Township

Figure 12 outlines a plan and cross section view of the six dust deposition gauges separated into a Western Section (road side – Hawkins St) with three dust deposition gauges spaced at 13m, 20m and 30m from the rail line and the Eastern Section (park side – Council Park) with three dust deposition gauges at 13m, 20m and 30m from the rail line.

As for mine dust deposition gauges in **Section 9.2**, train dust deposition gauge monitoring will be undertaken in accordance with *AS/NSS 3580.10.1:2003*. Further analysis of train dust deposition samples will be undertaken by visual analysis under a microscope to determine the percentage of each material contributing to the sample including coal.

9.4 TEOM

A real time particulate monitor (TEOM) measures continuous PM_{10} and $PM_{2.5}$ concentrations and the data is reported via website for operational response. The TEOM is located at the Werris Creek Centre monitoring site location, as shown in **Figure 7** and **Table 26**. **Figure 13** is an example of a TEOM in the field.

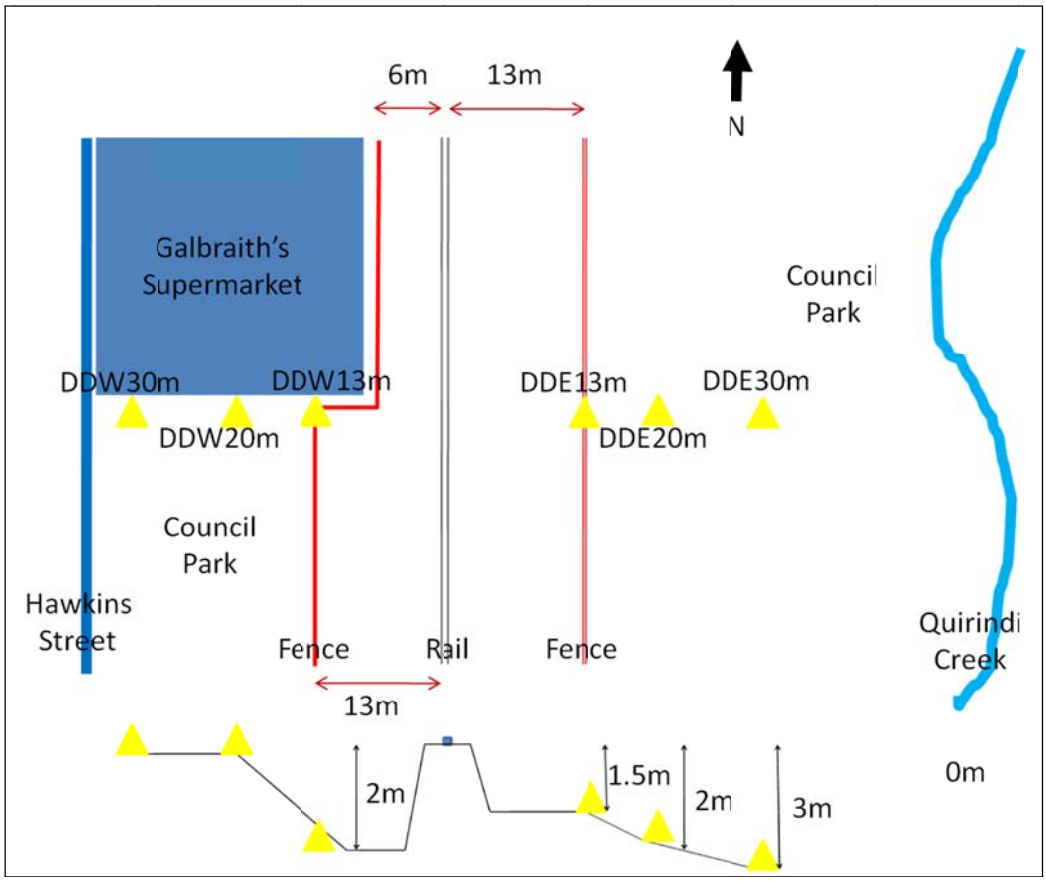

Figure 12: Mud Map of Proposed Coal Train Dust Monitoring Site and Cross Section

Figure 13: Example of a TEOM in the field

9.4.1 PM_{10}

The TEOM will monitor PM_{10} concentrations in accordance with *AS/NZS 3580.9.8: 2008: Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM10 continuous direct mass method using a tapered element oscillating microbalance analyser*. The Werris Creek Centre monitoring site is located close to the corner of Punyarra Street and Coronation Avenue representative of R92 and other residences on the elevated eastern section of Werris Creek township. The eastern location minimises the influence of road and rail dust emissions as well as other urban dust sources, while still at the same distance from the mine and representative of mining dust emissions in Werris Creek. Other sites were considered for the TEOM but as it requires mains power and generates noise due to the air conditioning unit, other suitable locations were limited.

Planned maintenance of the TEOM unit will be undertaken by a specialist contractor at least every three months.

9.4.2 $PM_{2.5}$

The LOM EA committed to $PM_{2.5}$ monitoring using a HVAS at "Tonsley Park" (R20). Following the EA, WCC purchased a TEOM capable of monitoring $PM_{2.5}$ as well as PM_{10} and as WCC has acquired "Tonsley Park"; $PM_{2.5}$ monitoring is now undertaken at the Werris Creek Centre monitoring site, which is representative of the largest potentially affected community. In additional, $PM_{2.5}$ is now capable of being monitored continuously in real time as opposed to 1 in 6 days for a HVAS.

Planned maintenance of the TEOM unit will be undertaken by a specialist contractor at least every three months.

9.5 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 7**. 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**. "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.*

Table 27: WCC "M2" Weather Station meteorological parameters

Parameter	Unit	Frequency	Period	Method	Serial #	Calibrated
Rainfall	mm/h	Continuous	15 minute	AM-4	N/A	22/11/2011
Wind Speed @ 10m	m/s	Continuous	15 minute	AM-2 & AM-4	F7157	22/11/2011
Wind Direction @ 10m	°*	Continuous	15 minute	AM-2 & AM-4	F7157	22/11/2011
Temperature @ 2m	°C	Continuous	15 minute	AM-4	1009-2748	22/11/2011
Temperature @ 10m	°C	Continuous	15 minute	AM-4	1009-2752	22/11/2011
Sigma Theta @ 10m	-	Continuous	15 minute	AM-2 & AM-4	N/A	22/11/2011
Solar Radiation	W/m^2	Continuous	15 minute	AM-4	1010	22/11/2011
Barometer	hPa	Continuous	15 minute	-	N/A	22/11/2011
Humidity	%	Continuous	15 minute	-	1010-8760	22/11/2011
Location Siting	-	-	-	AM-1, AM4 & EPL 12290 Special Method 2	-	-

* – Degrees clockwise from true north; N/A – not applicable

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 air quality impacts.

10.1 OCE Inspections

The OCE is required by coal mine health and safety legislation to undertake inspections of mining operations during every shift. As part of these inspections, the OCE undertakes informal observations of dust emissions from operations and water carts available during the shift, with only notable issues documented on the shift inspection proforma. If there are any notable issues for air quality observed during the shift, the OCE will immediately implement the required control measures; for example modify excavator or dump operations (**Section 8.1.9**), increase water cart usage (**Section 8.1.4**), change haul route (**Section 8.1.6**) or suspend operations if required to manage dust levels.

10.2 Visual Inspections

Based on the exposure of mining operations and prevailing meteorological conditions, the Environmental Officer will undertake routine inspections of mining operations from onsite and offsite vantage points. The offsite vantage point is located to the east of the mine on the opposite side of the Werris Creek Road adjacent to current open cut pit and overburden emplacement area. Copies of the photographs from the Visual Inspections will be saved onto the server. If any air quality issues are identified by the Environmental Officer, the Operations Manager will be notified and the OCE will implement actions similar to **Section 10.1** above.

10.3 Air Quality Monitoring Equipment Inspections and Maintenance

Routine inspection and maintenance of the air quality monitoring network is required to ensure ongoing and reliable measurement data. A NATA certified contractor will be engaged to undertake routine inspections and maintenance of the dust deposition gauge and HVAS equipment, including the cleaning and bi-monthly calibration of the HVAS in accordance with **Appendix F**.

A suitably qualified contractor will undertake routine inspections and maintenance of the TEOM and weather station units including:

- Daily checks to confirm stable operation or identify defects via remote access methods;
- Planned field inspections and maintenance a minimum of every three months;
- Unplanned maintenance may be undertaken to service specific issues relating to the monitoring systems; and
- Annual field and laboratory calibration of weather station sensors.

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 AQGHGMP 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 potential air polluting activities and those responsible for implementing air quality 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 air quality issues in accordance with AQGHGMP. **Table 28** outlines the WCC training requirements for air quality management:

Table 28: WCC AQGHGMP Training Program

Training	Who	Relevant Procedure	Frequency
Induction – Whitehaven Coal Generic and WCC Site Specific	All Employees All Contractors	Not Applicable	Biennial
WCC AQGHGMP	WCC Management	Not Applicable	Annual
Dust Monitoring	Environmental Officer External Service Contractor	Dust Monitoring Procedure (**Section 9** and **10.3**)	Annual
Water Cart Operations	Water Cart Operators	WHC_PRO_Safe Operation of a Water Cart (**Section 8.1.4**)	Biennial
Pre-Strip & Disturbance Operations	Scraper and Dozer Operators	WHC_PRO_Safe Operation of a Dozer, WHC_PRO_Safe Operation of a Scraper and Dozer (**Section 8.1.3**)	Biennial
Truck Operations	Truck Operations	WHC_PRO_Safe Operation of a Dump Truck (**Section 8.1.6**)	Biennial
Drill Operations	Drill Operators	WHC_PRO_Safe Operation of a Drill (**Section 8.1.8**)	Biennial

12 REPORTING

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

Table 29: Reporting Schedules for Air Quality Monitoring and Management

Report	Frequency	Requirements	Distribution	Timing
Air Quality Minor Incident	As required	Complete Whitehaven Coal Incident Report Form.	Whitehaven	Immediate
Air Quality Non-Compliance (Serious Incident)	As required	Complete Whitehaven Coal Incident Report Form. Notification of air quality non-compliance or incident. *Meet PA 10_0059 Schedule 5 Condition 6*.	Whitehaven	Immediate
			DoP Landowner	Earliest opportunity (Material Harm) otherwise soon as practicable*
		Detailed report of air quality 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. *Meet PA 10_0059 Schedule 5 Condition 6 and EPL 12290 Conditions R2 & R3.*	DoP Landowner	Within 7 working days of incident*
Air Quality 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. *Meet Condition M5 of EPL 12290.*	WCC Complainant	As soon as practicable
			EPA/DoP (if requested)	Within 7 days of complaint
	Monthly	Update Complaints Register with a summary of complaints received. *Meet PA 10_0059 Schedule 5 Condition 10 Dot Point 5.*	Website	Within 14 days of month end
End Of Month Report	Monthly	Summary of air quality monitoring results and complaints received collated into site report for Whitehaven Coal management.	WCC	7 working days following month end
Dust Monitoring Database	Monthly	Update database spreadsheets with dust deposition gauge, TSP and PM_{10} monitoring data.	WCC	7 working days following month end
Dust Monitoring Data	Monthly	Report the EPL required obtained dust deposition gauge, TSP and PM_{10} monitoring data as well as provide monthly summaries in EPA approved format. *Meet Section 66(6) of the Protection of the Environment Operations Act 1997.*	Website	Within 14 days of receipt of monitoring report
Environmental Monitoring Report	Quarterly	Summary of air quality monitoring results for inclusion in environmental monitoring report for discussion at CCC meetings. *Meet PA 10_0059 Schedule 5 Condition 10 Dot Point 4.*	CCC WCC Website	2 weeks prior to CCC meeting

Report	Frequency	Requirements	Distribution	Timing
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. *Meet EPL 12290 Condition R1.*	WCC EPA	Due by 31st 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. *Meet PA 10_0059 Schedule 5 Condition 3 and ML 1563/1671/1672 Condition 4.*	DoP DRE WCC Website	Due by 31st May (unless extension approved)

* PA 10_0059 Schedule 5 Condition 6 specifies that other incidents be notified to DoP as soon as practicable which WCC is interpreting as no more than 7 days. Non-compliance with EPL 12290 monitoring requirements will only be reported annually in the Annual Return.

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.

13 REVIEW

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

- Air Quality and Greenhouse Gas Management Plan Review;
- Air Quality Performance Annual Review; and
- Independent Environmental Audits.

Any of these review mechanisms may trigger a revision of the AQGHGMP in **Section 13.4** below.

13.1 Air Quality and Greenhouse Gas Management Plan Review

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

13.2 Air Quality Performance Annual Review

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

- Revised Air Quality Criteria (**Table 20**) and Air Quality Objectives and Targets (**Table 21**);
- Air quality monitoring results from previous years;
- Air quality modelling predictions from the EA (**Table 10** to **15** and **17**);
- Discuss any air quality non-compliances and what actions were taken;
- Identify any trends in air quality monitoring data;
- Identify any discrepancies between predicted and actual air quality levels and discuss potential causes;
- Outline management measures to be implemented over the next year to continual improve air quality performance; and
- Outline whether a revision to the AQGHGMP is required.

13.3 Independent Environmental Audit

WCC is required to undertake an Independent Environmental Audit (IEA) every three years in accordance with the PA 10_0059 (Schedule 5 Condition 8). The first IEA will be undertaken prior to June 2014 and every three years after. The IEA will:

- Be conducted by a suitably qualified, experienced and independent team of experts whose appointment will be endorsed by DoP;
- Include consultation with the relevant agencies;
- Assess the environmental performance of the project;
- Assess whether WCC is complying with the requirements of PA 10_0059, EPL 12290, ML 1563, ML 1671, ML 1672 and including any assessment, plan or program required under these approvals; and
- Recommend appropriate measures or actions to improve environmental performance and rehabilitation at the mine site.

13.4 Revision of AQGHG Management Plan

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

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

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

14 CONTINGENCY PLAN

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

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

Table 30: Identification of Air Quality Contingency Plan Triggers

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

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

Table 31: Air Quality Management Contingency Plans

Contingency Plan	Method	AQGHGMP Section
Community Complaint	Response to community complaint outlining contingency plan actions to be implemented the satisfaction of the complainant and DoP/EPA/DRE if involved	13
Air Quality 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 air quality impacted property	8.1.1
Real Time Monitoring Response	Modify real time monitoring response processes or continuous monitoring locations to prevent further air quality impacts	8.1.5
Rehabilitation Program	Identify areas requiring additional rehabilitation	8.1.2
Dust Suppression – Water Cart	Hire additional water cart capacity to increase water usage for dust suppression of haul roads or other exposed surfaces.	8.1.4

15 REFERENCES

Advitech Pty Limited, Werris Creek Mine EEO Assessment, December 2011

AS/NZS 3580.9.6:2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM10 high volume sampler with size-selective inlet – Gravimetric method.

AS/NSS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

AS/NZS 3580.9.10:2006 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – $PM_{2.5}$ low volume sampler – Gravimetric method.

AS/NZS 3580.9.3:2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method.

AS/NZS 3580.9.8: 2008: Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM10 continuous direct mass method using a tapered element oscillating microbalance analyser.

AS 2923 -1987: Guide for measurement of horizontal wind for air quality applications.

Denis Cooke & Associates Pty Limited, Energy Savings Action Plan, June 2010

Department of Climate Change and Energy Efficiency, National Greenhouse and Energy Reporting Guidelines, 2008

NSW Department of Environment, Climate Change and Water, Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales, 2005

NSW Department of Environment, Climate Change and Water, Approved Methods for the Sampling and Analysis of Air Pollutants in NSW, 2007

Heggies Pty Ltd, Air Quality Assessment for Werris Creek Coal Mine Life of Mine Project 2010

Pacific Environment Limited, Werris Creek Coal Pollution Reduction Management Plan – U1 Wheel Generated Dust, 2013

Pacific Environment Limited, Werris Creek Coal Pollution Reduction Management Plan – U2 Overburden Handling in Adverse Weather, 2013

R.W. Corkery & Co. Pty. Limited, Werris Creek Coal Mine LOM Project: Environmental Assessment, Dec 2010

Werris Creek Coal Pty Ltd, Annual Environmental Management Report 2010-2011, May 2011

Werris Creek Coal Pty Ltd, Air Quality Monitoring Program, August 2009

Werris Creek Coal Pty Ltd, Life of Mine Mining Operations Plan for the Werris Creek, November 2011

APPENDIX A - Related correspondence with Government Agencies

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

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.

Date: 29/10/12

Tony Haggarty
Managing Director

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

1 of 1

UNCONTROLLED COPY WHEN PRINTED. *REFER TO INTRANET FOR LATEST VERSION*

APPENDIX C - Data Tables

Deposited Dust Monitoring Results

Deposited Dust - Werris Creek Coal Mine 2008

MONTH	WC-1 Escott	WC-2 Cintra	WC-3 The Colliery	WC-4 Hillview	WC-5 Railway View	WC-6 Southern Boundary	WC-7 Patterson Residence		ANNUAL AVERAGE LIMIT
January 2008	0.1	2.4	1.0	0.1	0.1	32.5	0.2		3.6
February 2008	0.7	1.0	1.5	0.5	0.5	9.8	1.6		3.6
March 2008	0.5	0.4	0.9	0.3	0.3	0.3	6.1		3.6
April 2008	1.3	3.4	5.5	2.0	1.5	3.8	2.9		3.6
May 2008	1.0	1.2	4.8	0.7	0.7	5.9	0.7		3.6
June 2008	0.4	0.7	2.5	0.5	0.4	6.5	0.4		3.6
July 2008	0.4	0.7	2.7	0.6	0.4	3.1	0.8		3.6
August 2008	0.4	0.7	5.9	0.5	0.5	6.9	0.4		3.6
September 2008	0.8	0.7	2.5	0.5	0.6	8.5	0.8		3.6
October 2008	0.4	1.2	6.7	0.5	0.5	2.7	0.8		3.6
November 2008	0.4	0.6	1.5	0.7	0.6	6.7	0.4		3.6
December 2008	0.3	3.7	2.0	0.2	0.2	6.4	0.2		3.6
ANNUAL AVERAGE	0.56	1.39	3.13	0.59	0.53	7.76	1.28		3.60

Note: All results are in the form of Insoluble Matter (g/m2/month)

Deposited Dust - Werris Creek Coal Mine 2009

MONTH	WC-1 Escott	WC-2 Cintra	WC-3 The Colliery	WC-4 Hillview	WC-5 Railway View	WC-6 Southern Boundary	WC-7 Patterson Residence	WC-8 Plain View	Marengo	ANNUAL AVERAGE LIMIT
January 2009	0.5	2.4	1.7	0.9	1.0	5.0	0.9			3.6
February 2009	0.7	1.2	3.1	0.9	0.7	2.5	1.0			3.6
March 2009	1.1	2.5	5.3	2.0	2.1	5.7	1.8			3.6
April 2009	0.3	0.6	2.2	0.7	0.4	2.3	0.4			3.6
May 2009	0.7	1.4	7.8	1.5	1.1	7.9	5.0			3.6
June 2009	0.3	0.6	2.2	0.7	0.4	2.3	0.4			3.6
July 2009	0.2	0.5	2.2	0.4	0.3	2.4	1.4			3.6
August 2009	1.3	1.5	2.9	1.6	1.5	6.6	4.0			3.6
September 2009	5.8	5.9	3.9	7.9	4.3	6.1	4.6			3.6
October 2009	1.7	3.3	2.9	2.5	2.4	37.5	2.1			3.6
November 2009		2.8			0.9		0.9	0.7	0.6	3.6
December 2009		1.4			1.0		1.5	1.4	1.4	3.6
ANNUAL AVERAGE	1.26	2.01	3.42	1.91	1.34	7.83	2.00			3.6

Note: All results are in the form of Insoluble Matter (g/m2/month)

Deposited Dust - Werris Creek Coal Mine 2009-2010

MONTH	WC-1 Escott	WC-2 Cintra	WC-3 The Colliery	WC-4 Hillview	WC-5 Railway View	WC-6 Southern Boundary	WC-7 Tonsley Park	WC-8 Plain View	WC-9 Marengo	ANNUAL AVERAGE LIMIT
April 2009	0.3	0.6	2.2	0.7	0.4	2.3	0.4			3.6
May 2009	0.7	1.4	c7.8*	1.5	1.1	c7.9*	c5.0*			3.6
June 2009	0.3	0.6	2.2	0.7	0.4	2.3	0.4			3.6
July 2009	0.2	0.5	2.2	0.4	0.3	2.4	1.4			3.6
August 2009	1.3	1.5	2.9	1.6	1.5	c6.6*	c4.0*			3.6
September 2009	c5.8^	c5.9^	c3.9^	c7.9^	c4.3^	c6.1^	c4.6^			3.6
October 2009	1.7	3.3	2.9	2.5	2.4	c37.5*	2.1			3.6
November 2009		2.8			0.9		0.9	0.7	0.6	3.6
December 2009		1.4			1.0		1.5	1.4	1.4	3.6
January 2010		2.1			0.9		2.0	2.1	1.2	3.6
February 2010		2.0			1.5		1.5	2.1	3.3	3.6
March 2010		1.7			1.2		c50#	3.1	1.1	3.6
ANNUAL AVERAGE	0.7	1.6	2.5	1.2	1.1	2.3	1.3	1.9	1.5	3.6
MINIMUM	0.2	0.5	2.2	0.4	0.3	2.3	0.4	0.7	0.6	3.6
MAXIMUM	1.7	3.3	2.9	2.5	2.4	2.4	2.1	3.1	3.3	3.6

Note: All results are in the form of Insoluble Matter (g/m2/month)

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

* - sample contaminated with organic matter from non-mining source (i.e bird droppings and insects)

- sample contaminated during laboratory analysis

^ - Dust results excluded due to dust storms events over eastern Australia

Deposited Dust - Werris Creek Coal Mine 2010-2011

MONTH	WC-2 Cintra	WC-5 Railway View	WC-7 Tonsley Park	WC-8 Plain View	WC-9 Marengo	WC-10 Mountain View	WC-11 Glenara	ANNUAL AVERAGE LIMIT
April 2010	2.0	1.6	0.9	0.7	0.4			3.6
May 2010	1.2	1.0	1.0	c5.1*	0.4			3.6
June 2010	2.1	1.6	1.2	2.0	2.0			3.6
July 2010	0.7	0.8	0.7	0.5	0.4			3.6
August 2010	0.5	0.9	0.6	0.9	0.3	0.7		3.6
September 2010	1.4*	0.6	0.5	0.8	0.5	0.7		3.6
October 2010	6.6*	0.5	0.6	0.9	0.9	0.9		3.6
November 2010	2.0	1.0	0.9	1.0	0.8	0.9	2.1	3.6
December 2010	0.6	3.9	0.6	0.6	c7.8	0.4	1.6	3.6
January 2011	1.5	0.7	0.7	0.6	0.6	0.4	1.0	3.6
February 2011	1.4	0.8	0.6	0.7	0.4	1.2	1.0	3.6
March 2011	1.6	1.6	0.7	0.7	0.9	2.2	0.6	3.6
ANNUAL AVERAGE	**1.4**	**1.3**	**0.8**	**0.9**	**0.7**	**0.9**	**1.3**	**3.6**
MINIMUM	**0.5**	**0.5**	**0.5**	**0.5**	**0.3**	**0.4**	**0.6**	**3.6**
MAXIMUM	**2.1**	**3.9**	**1.2**	**2.0**	**2.0**	**2.2**	**2.1**	**3.6**

Note: All results are in the form of Insoluble Matter (g/m2/month)

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the avera

Deposited Dust - Werris Creek Coal Mine 2011-2012

MONTH (g/m2/month)	EPL #7		EPL #4		EPL #1		EPL #8		-		-		-		ANNUAL AVERAGE LIMIT
	WC-2 Cintra		WC-5 Railway View		WC-7 Tonsley Park		WC-8 Plain View		WC-9 Marengo		WC-10 Mountain View		WC-11 Glenara		
	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	Total Matter	Ash Content	
April 2011	1.5	1.0	1.1	0.7	0.6	0.5	1.1	0.9	0.5	0.4	c2.3	1.6	0.6	0.6	4.0
May 2011	c0.6*	0.2	0.6	0.3	0.1	0.1	0.2	0.2	0.1	0.1	5.9*	2.0	0.2	0.2	4.0
June 2011	3.0	1.8	2.4	1.5	0.9	0.5	1.3	0.8	0.8	0.5	0.8	0.4	1.4	0.8	4.0
July 2011	0.5	0.3	0.5	0.4	0.3	0.2	0.8	0.5	0.2	0.2	0.9	0.5	0.6	0.5	4.0
August 2011	0.8	0.6	0.9	0.7	0.4	0.3	1.1	0.8	0.5	0.4	0.5	0.4	c20	c17.6	4.0
September 2011	1.5	1.0	1.4	0.9	1.2	0.8	1.4	1.0	0.5	0.5	0.5	0.3	c19.8	c17.1	4.0
October 2011	1.1	0.8	1.2	0.8	0.9	0.5	0.5	0.5	0.8	0.5	0.8	0.5	1.0	0.8	4.0
November 2011	3.3	2.0	1.2*	0.5	0.8*	0.3	1.2	0.6	1.7	1.3	0.8	0.4	2.2	1.7	4.0
December 2011	1.1	0.6	0.6	0.5	0.7	0.4	1.0	0.5	0.3	0.2	c2.2	0.7	3.5	2.3	4.0
January 2012	1.1	0.9	0.5	0.5	0.5	0.4	0.4	0.4	0.9	0.6	1.1	0.9	1.5	0.8	4.0
February 2012	0.7	0.5	0.5	0.3	0.5	0.2	0.5	0.2	0.8*	0.2	0.4	0.3	0.2	0.1	4.0
March 2012	1.2	0.7	0.6	0.4	0.7	0.4	1.2	0.9	0.5	0.2	0.8	0.4	c5	c2	4.0
ANNUAL AVERAGE	**1.4**		**0.9**		**0.6**		**0.9**		**0.6**		**0.7**		**1.2**		**4.0**
MINIMUM	**0.5**		**0.5**		**0.1**		**0.2**		**0.1**		**0.4**		**0.2**		**-**
MAXIMUM	**3.3**		**2.4**		**1.2**		**1.4**		**1.7**		**1.1**		**3.5**		**4.0**

Note: All results are in the form of Insoluble Matter (g/m2/month)

c - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

* - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

Deposited Dust - Werris Creek Coal Mine 2012-2013

MONTH (g/m2/month)				April 2012	May 2012	June 2012	July 2012	August 2012	September 2012	October 2012	November 2012	December 2012	January 2013	February 2013	March 2013	ANNUAL AVERAGE	AVERAGE - EXCLUDED	MINIMUM	MAXIMUM	AQGHGMP Criteria
-	DG2	Cintra	Total Matter	2.5	1.2	1.0	1.5	0.4	1.3	2.3	1.7	1.4	3.3	1.9	1.1	1.6	1.5	0.4	3.3	4.0
			Ash Content	1.4	0.8	0.8	1.0	0.3	0.7	1.2	1.0	0.7	1.6	1.2	0.7					
-	DG5	Railway View	Total Matter	1.1	1.0	0.5	0.7	2.5	1.0	1.2	1.2	1.6	3.2	0.6	0.3	1.2	1.2	0.3	3.2	4.0
			Ash Content	0.6	0.7	0.5	0.5	1.5	0.7	0.8	1.0	1.4	2.7	0.6	0.2					
EPL #1	DG20	Tonsley Park	Total Matter	0.6	0.4	0.3	0.5	0.3	1.2	1.0	1.0	1.2	3.3	0.9	0.4	0.9	0.9	0.3	3.3	4.0
			Ash Content	0.3	0.4	0.3	0.4	0.2	0.5	0.5	0.6	0.8	2.5	0.5	0.2					
-	DG15	Plain View	Total Matter	1.0	2.1	3.5	1.8	5.0	0.6	0.7	0.7	1.0	2.0	1.5	1.2	1.8	1.8	0.6	5.0	4.0
			Ash Content	0.6	1.2	2.5	0.6	2.8	0.5	0.5	0.4	0.8	1.5	1.0	0.7					
-	DG9	Marengo	Total Matter	0.7	1.3	0.8	0.2	0.6	0.7	0.7	0.5	0.6	1.6	1.0	0.2	0.7	0.8	0.2	1.6	4.0
			Ash Content	0.3	0.7	0.5	0.2	0.3	0.5	0.3	0.3	0.5	1.4	0.6	0.2					
-	DG22	Mountain View	Total Matter	3.5	0.5	0.5	1.2	0.5	0.6	0.3	0.1	3.2	3.0	1.2	0.4	1.3	1.3	0.1	3.5	4.0
			Ash Content	2.6	0.5	0.4	1.0	0.3	0.5	0.1	0.1	1.6	1.5	0.8	0.3					
EPL#29	DG11	Glenara	Total Matter	1.5	2.1	2.6	425.0	2.4	4.5	1.2	0.7	3.7	1.2	0.3	0.5	37.1	1.6	0.3	425.0	4.0
			Ash Content	0.8	0.9	0.9	391.0	1.2	4.0	0.8	0.5	1.6	0.9	0.3	0.4					
-	DG24	Hazeldene	Total Matter	NS	NS	NS	NS	0.5	0.5	0.7	0.6	3.6	1.8	0.8	0.4	1.1	0.8	0.4	3.6	4.0
			Ash Content	NS	NS	NS	NS	0.3	0.5	0.5	0.5	1.6	1.4	0.6	0.2					
-	DG17	Woodlands	Total Matter	NS	NS	NS	NS	0.3	0.5	2.8	1.8	2.5	2.7	0.6	0.5	1.5	1.5	0.3	2.8	4.0
			Ash Content	NS	NS	NS	NS	0.3	0.5	1.5	1.0	0.9	1.8	0.6	0.2					
-	DG96	Talavera	Total Matter	NS	NS	NS	NS	0.2	0.6	0.8	0.6	0.9	1.4	0.7	0.4	0.7	0.7	0.2	1.4	4.0
			Ash Content	NS	NS	NS	NS	0.2	0.4	0.6	0.4	0.5	0.3	0.6	0.2					
EPL#28	DG98	Kyooma	Total Matter	NS	NS	NS	NS	0.3	0.4	1.1	0.7	1.0	1.9	0.3	0.4	0.8	0.7	0.3	1.9	4.0
			Ash Content	NS	NS	NS	NS	0.1	0.3	0.5	0.3	0.6	1.2	0.3	0.1					
-	DG14	Greenslopes	Total Matter	NS	NS	NS	NS	0.3	0.5	0.6	0.8	1.0	1.5	0.6	0.4	0.7	0.8	0.3	1.5	4.0
			Ash Content	NS	NS	NS	NS	0.1	0.4	0.5	0.4	0.5	1.2	0.6	0.1					
-	DG62	Werris Creek South	Total Matter	NS	NS	NS	NS	0.7	0.5	0.3	0.7	0.5	0.9	0.6	0.3	0.6	0.6	0.3	0.9	4.0
			Ash Content	NS	NS	NS	NS	0.3	0.3	0.3	0.3	0.3	0.7	0.6	0.1					
EPL#30	DG92	Werris Creek Centre	Total Matter	NS	NS	NS	NS	0.6	0.5	0.7	2.5	1.1	1.2	0.5	0.2	0.9	0.6	0.2	2.5	4.0
			Ash Content	NS	NS	NS	NS	0.2	0.3	0.4	0.5	0.5	0.9	0.5	0.1					
-	DG101	Westfall	Total Matter	NS	NS	NS	NS	0.6	0.6	0.8	1.1	1.5	2.7	1.1	0.3	1.1	1.2	0.3	2.7	4.0
			Ash Content	NS	NS	NS	NS	0.2	0.4	0.4	0.6	0.8	2.2	0.9	0.2					
-	DG103	West Street	Total Matter	NS	NS	NS	NS	1.0	0.5	1.1	1.1	1.1	0.6	3.2	0.5	1.1	0.9	0.5	3.2	4.0
			Ash Content	NS	NS	NS	NS	0.5	0.5	0.7	0.6	0.7	0.6	1.5	0.2					
-	DG1	Escott	Total Matter	NS	NS	NS	NS	0.5	0.3	0.5	0.6	0.8	1.3	1.6	0.5	0.8	0.8	0.3	1.6	4.0
			Ash Content	NS	NS	NS	NS	0.2	0.3	0.3	0.3	0.4	1.0	1.4	0.4					
-	DG3	Eurunderee	Total Matter	NS	NS	NS	NS	0.6	0.4	0.4	0.8	1.2	1.6	0.2	0.6	0.7	0.7	0.2	1.6	4.0
			Ash Content	NS	NS	NS	NS	0.2	0.3	0.3	0.4	0.7	1.4	0.2	0.3					
-	DG34	8 Kurrara Street	Total Matter	NS	NS	NS	NS	0.5	1.2	1.9	1.1	1.2	1.4	11.9	0.4	2.5	1.0	0.4	11.9	4.0
			Ash Content	NS	NS	NS	NS	0.3	0.5	0.7	0.6	0.6	1.0	8.7	0.2					
-	DG106	Villamagna	Total Matter	NS	NS	NS	NS	NS	0.4	0.6	13.1	1.1	2.2	0.7	0.4	2.6	0.9	0.4	13.1	4.0
			Ash Content	NS	NS	NS	NS	NS	0.3	0.3	11.4	0.7	1.9	0.7	0.2					

Note: All results are in the form of Insoluble Matter (g/m2/month); NS - Not sampled

RED - indicates sample is contaminated from a Non-Werris Creek Coal dust source and is not counted in the average

YELLOW - sample contaminated with excessive organic matter (>50%) from non-mining source (i.e bird droppings and insects) and is excluded from the average

Deposited Dust - Quirindi Trains 2011-2012

	DDW30				DDW20				DDW13				DDE13				DDE20				DDE30				Guideline
	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	
April 2011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	4.0
May 2011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	4.0
June 2011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	4.0
July 2011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	4.0
August 2011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	4.0
September 2011	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	4.0
October 2011	1.0	30%	15%	55%	0.7	45%	10%	45%	0.6	40%	10%	50%	1.1	40%	15%	45%	3.8	10%	35%	25%	0.7	35%	15%	50%	4.0
November 2011	1.4	10%	70%	20%	1.6	25%	60%	15%	2.0	35%	55%	10%	0.9	5%	55%	40%	1.2	5%	50%	45%	2.6	5%	80%	15%	4.0
December 2011	0.8	10%	55%	35%	0.8	5%	70%	25%	0.9	25%	55%	20%	0.7	10%	70%	20%	0.9	5%	80%	15%	1.2	30%	55%	15%	4.0
January 2012	1.5	50%	30%	20%	1.5	20%	70%	10%	3.4	20%	60%	20%	0.5	20%	60%	20%	0.3	30%	50%	20%	0.5	40%	40%	20%	4.0
February 2012	0.5	10%	80%	10%	0.6	40%	50%	10%	0.8	60%	30%	10%	0.5	40%	55%	5%	0.7	10%	80%	5%	1.4	10%	80%	10%	4.0
March 2012	0.7	25%	50%	25%	0.5	25%	50%	25%	0.4	30%	45%	25%	0.7	25%	50%	25%	0.4	15%	25%	60%	0.4	15%	25%	60%	4.0
ANNUAL AVERAGE	1.0				1.0				1.4				0.7				1.2				1.1				4.0
MINIMUM	0.5				0.5				0.4				0.5				0.3				0.4				-
MAXIMUM	1.5				1.6				3.4				1.1				3.8				2.6				4.0

Note: All results are in the form of Insoluble Matter (g/m2/month); NM - Not Monitored as gauges not set up September 2011

Deposited Dust - Quirindi Trains 2012-2013

	DDW30				DDW20				DDW13				DDE13				DDE20				DDE30				Guideline
	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	Total Matter	% Coal	% Vegetation/ Insects	% Dirt	
April 2012	0.8	25%	50%	25%	0.3	25%	50%	25%	0.3	30%	40%	30%	0.7	25%	50%	25%	1.0	10%	60%	30%	0.5	25%	50%	25%	4.0
May 2012	1.1	30%	40%	30%	0.7	35%	25%	40%	0.6	20%	50%	30%	0.6	40%	40%	20%	0.4	10%	60%	30%	0.7	25%	50%	25%	4.0
June 2012	1.0	35%	45%	20%	0.8	45%	35%	20%	0.9	35%	55%	10%	0.5	45%	40%	15%	1.9	20%	60%	20%	1.3	15%	65%	20%	4.0
July 2012	1.2	40%	30%	30%	0.8	40%	30%	30%	1.2	40%	30%	30%	0.7	40%	30%	30%	2.4	10%	60%	30%	1.5	25%	50%	25%	4.0
August 2012	0.6	30%	30%	40%	0.6	30%	30%	30%	0.5	30%	50%	20%	0.5	30%	50%	20%	0.7	20%	50%	30%	2.7	15%	20%	60%	4.0
September 2012	1.7	20%	20%	60%	1.2	20%	50%	30%	1.3	15%	55%	30%	0.9	20%	50%	30%	0.7	20%	60%	20%	0.6	10%	60%	30%	4.0
October 2012	1.5	15%	50%	35%	1.4	15%	50%	35%	0.9	20%	40%	40%	1.0	25%	50%	25%	0.6	20%	40%	40%	1.6	10%	50%	40%	4.0
November 2012	1.2	10%	60%	10%	1.5	15%	50%	10%	0.8	15%	40%	25%	0.9	15%	15%	40%	2.4	5%	50%	25%	1.5	10%	35%	25%	4.0
December 2012	1.0	15%	60%	25%	1.4	5%	65%	30%	1.7	60%	25%	15%	2.4	15%	65%	20%	1.4	20%	60%	20%	3.6	5%	85%	10%	4.0
January 2013	1.8	10%	50%	30%	1.3	10%	70%	20%	1.5	10%	60%	30%	1.3	15%	65%	20%	1.0	10%	60%	30%	2.5	5%	70%	10%	4.0
February 2013	0.7	10%	35%	55%	0.6	15%	40%	45%	1.0	20%	40%	40%	0.5	15%	45%	40%	0.4	10%	45%	30%	1.0	10%	50%	20%	4.0
March 2013	0.3	10%	50%	40%	0.2	15%	50%	25%	0.7	15%	60%	25%	-	-	-	-	0.4	5%	65%	30%	0.2	5%	65%	15%	4.0
ANNUAL AVERAGE	**1.1**				**0.9**				**1.0**				**0.9**				**1.1**				**1.5**				**4.0**
Average Coal %	**20.8%**				**22.5%**				**25.8%**				**25.9%**				**13.3%**				**13.3%**				**-**
Average Coal g/m2	**0.22**				**0.20**				**0.25**				**0.24**				**0.15**				**0.20**				**-**
MINIMUM	**0.3**				**0.2**				**0.3**				**0.5**				**0.4**				**0.2**				**-**
MAXIMUM	**1.8**				**1.5**				**1.7**				**2.4**				**2.4**				**3.6**				**4.0**

Note: All results are in the form of Insoluble Matter (g/m2/month)

HVAS Monitoring Results

Site	WCHV1 Marquette/	Report	Current Annual	WCHV2 Tongsley	Report	Current Annual	WCHV3 Railway	Report	Current Annual	WCHV4	Report	Current Annual	WCTSP Railway	Report	Current Annual		PM10 annual Annual Average	TSP annual Annual Average
Date	Cintra	Average	Average	Park	Average	Average	View	Average	Average	Eurunderee	Average	Average	View	Average	Average	24hr Limit	Limit	Limit
5/04/2008	12		12.0	2		2.0	15		15.0	5		5.0	16		16.0	50	30	90
11/04/2008	24		18.0	6		4.0	6		10.5	6		5.5	23		19.5	50	30	90
17/04/2008	18		18.0	6		4.7	5		8.7	14		8.3	12		17.0	50	30	90
23/04/2008	11		16.3	3		4.3	2		7.0	5		7.5	12		15.8	50	30	90
29/04/2008	26	18.2	18.2	5	4.4	4.4	18	9.2	9.2	4	6.8	6.8	50	22.6	22.6	50	30	90
5/05/2008	11		17.0	7		4.8	12		9.7	10		7.3	35		24.7	50	30	90
11/05/2008	16		16.9	18		6.7	24		11.7	40		12.0	39		26.7	50	30	90
17/05/2008	26		18.0	29		9.5	23		13.1	25		13.6	39		28.3	50	30	90
23/05/2008	23		18.6	14		10.0	13		13.1	47		17.3	21		27.4	50	30	90
29/05/2008	23	19.8	19.0	17	17	10.7	20	18.4	13.8	21	28.6	17.7	28	32.4	27.5	50	30	90
4/06/2008	3		17.5	1		9.8	1		12.6	44		20.1	2		25.2	50	30	90
10/06/2008	2		16.3	2		9.2	1		11.7	2		18.6	5		23.5	50	30	90
16/06/2008	1		15.1	1		8.5	6		11.2	2		17.3	7		22.2	50	30	90
22/06/2008	1		14.1	1		8.0	1		10.5	1		16.1	3		20.9	50	30	90
28/06/2008	8	3	13.7	8	2.6	8.0	13	4.4	10.7	6	11	15.5	37	10.8	21.9	50	30	90
4/07/2008	9		13.4	8		8.0	3		10.2	19		15.7	17		21.6	50	30	90
10/07/2008	2		12.7	2		7.6	4		9.8	1		14.8	5		20.6	50	30	90
16/07/2008	5		12.3	2		7.3	7		9.7	7		14.4	15		20.3	50	30	90
22/07/2008	12		12.3	8		7.4	8		9.6	15		14.4	13		19.9	50	30	90
28/07/2008	3	6.2	11.8	1	4.2	7.1	3	5	9.3	8	10	14.1	4	10.8	19.2	50	30	90
3/08/2008	5		11.5	11		7.2	1		8.9	1		13.5	9		18.7	50	30	90
9/08/2008	4		11.1	10		7.4	6		8.7	8		13.2	11		18.3	50	30	90
15/08/2008	11		11.1	14		7.7	8		8.7	8		13.0	17		18.3	50	30	90
21/08/2008	19		11.5	21		8.2	18		9.1	21		13.3	30		18.8	50	30	90
27/08/2008	20	11.8	11.8	16	14.4	8.5	17	10.0	9.4	23	12.2	13.7	29	19.2	19.2	50	30	90
2/09/2008	14		11.9	9		8.5	9		9.4	17		13.8	19		19.2	50	30	90
8/09/2008	15		12.0	11		8.6	12		9.5	23		14.2	37		19.8	50	30	90
14/09/2008	15		12.1	20		9.0	17		9.8	18		14.3	34		20.3	50	30	90
20/09/2008	29		12.7	31		9.8	29		10.4	32		14.9	46		21.2	50	30	90
26/09/2008	12	17.0	12.7	10	16.2	9.8	13	16	10.5	11	20.2	14.8	23	31.8	21.3	50	30	90
2/10/2008	28		13.2	30		10.5	34		11.3	31		15.3	56		22.4	50	30	90
8/10/2008	16		13.3	11		10.5	12		11.3	14		15.3	27		22.5	50	30	90
14/10/2008	11		13.2	17		10.7	9		11.2	11		15.2	22		22.5	50	30	90
20/10/2008	12		13.1	12		10.7	11		11.2	15		15.1	45		23.2	50	30	90
26/10/2008	10	15.4	13.1	14	16.8	10.8	12	15.6	11.2	9	16.0	15.0	60	42.0	24.2	50	30	90
1/11/2008	17		13.2	19		11.0	15		11.3	19		15.1	27		24.3	50	30	90
7/11/2008	19		13.3	21		11.3	17		11.5	28		15.4	38		24.7	50	30	90
13/11/2008	8		13.2	10		11.3	8		11.4	37		16.0	21		24.6	50	30	90
19/11/2008	7		13.0	7		11.2	5		11.2	7		15.8	8		24.2	50	30	90
25/11/2008	16	13.4	13.1	12	13.8	11.2	11	11.2	11.2	32	24.6	16.2	34	25.6	24.4	50	30	90
1/12/2008	10		13.0	12		11.2	8		11.1	9		16.0	19		24.3	50	30	90
7/12/2008	9		12.9	7		11.1	7		11.0	10		15.9	15		24.0	50	30	90
13/12/2008	17		13.0	12		11.1	12		11.1	12		15.8	23		24.0	50	30	90
19/12/2008	12		13.0	11		11.1	12		11.1	16		15.8	35		24.3	50	30	90
25/12/2008	18		13.1	16		11.2	17		11.2	18		15.8	40		24.6	50	30	90
31/12/2008	18	14.0	13.2	16	12.3	11.3	17	12.2	11.3	18	13.8	15.9	40	28.7	25.0	50	30	90
6/01/2009	9		13.1	9		11.3	9		11.3	21		16.0	22		24.9	50	30	90
12/01/2009	17		13.2	16		11.4	16		11.4	45		16.6	29		25.0	50	30	90
18/01/2009	9		13.1	8		11.3	10		11.4	18		16.6	25		25.0	50	30	90
24/01/2009	15		13.2	16		11.4	13		11.4	16		16.6	26		25.0	50	30	90
30/01/2009	13	12.6	13.2	18	13.4	11.5	12	12	11.4	52	30.4	17.3	23	25	25.0	50	30	90
7/02/2009	20		13.3	25		11.8	21		11.6	32		17.6	40		25.3	50	30	90
11/02/2009	20		13.4	9		11.7	12		11.6	10		17.4	20		25.2	50	30	90
17/02/2009	2		13.2	4		11.6	1		11.4	4		17.2	5		24.8	50	30	90
23/02/2009	13	13.8	13.2	12	12.5	11.6	11	11.3	11.4	14	15.0	17.1	18	20.75	24.7	50	30	90
1/03/2009	20		13.3	23		11.8	19		11.5	20		17.2	45		25.0	50	30	90
7/03/2009	24		13.5	26		12.1	24		11.8	22		17.3	58		25.6	50	30	90
13/03/2009	11		13.5	11		12.0	7		11.7	10		17.1	24		25.6	50	30	90
19/03/2009	10		13.4	10		12.0	17		11.8	12		17.1	35		25.7	50	30	90
25/03/2009	22		13.6	23		12.2	21		11.9	22		17.1	50		26.1	50	30	90
31/03/2009	19	17.7	13.6	6	16.5	12.1	3	15.2	11.8	4	15	16.9	10	37	25.9	50	30	90

Site / Date	WCHV1 Cintra	Monthly Monthly Average	Rolling Annual Average	WCHV2 Tonsley Park	Monthly Monthly Average	Rolling Annual Average	WCHV3 Railway View	Monthly Monthly Average	Rolling Annual Average	WCHV4 Eurunderee	Monthly Monthly Average	Rolling Annual Average	WCTSP Railway View	Monthly Monthly Average	Rolling Annual Average	PM10 24hr Limit	PM10 annual Annual Average	TSP annual Annual Average
01-Apr-10	23		19.2	9		16.4	9		15.1	8		17.9	17		35.7	50	30	90
07-Apr-10	6		19.2	5		16.3	3		15.1	7		17.9	10		35.6	50	30	90
13-Apr-10	36		19.4	17		16.2	22		15.1	12		17.7	63		35.9	50	30	90
19-Apr-10	8		19.3	2		16.0	4		14.9	14		17.8	14		35.6	50	30	90
25-Apr-10	6	15.8	19.0	4	7.4	15.9	3	8.2	14.8	4	9.0	17.5	12	23.2	35.5	50	30	90
01-May-10	13		18.8	10		15.9	9		14.7	9		17.6	25		35.5	50	30	90
07-May-10	25		18.8	13		15.6	14		14.7	15		17.5	45		35.6	50	30	90
13-May-10	33		18.9	17		15.5	15		14.7	19		17.6	42		35.8	50	30	90
19-May-10	34		19.3	16		15.6	12		14.8	6		17.3	57		36.5	50	30	90
25-May-10	5	22.0	19.2	6	12.4	15.6	5	11.0	14.8	11	12.0	17.1	13	36.4	36.5	50	30	90
31-May-10	1		19.2	0		15.6	6		14.9	1		16.6	e1		37.1	50	30	90
06-Jun-10	6		19.2	6		15.6	8		15.0	3		16.3	8		37.1	50	30	90
12-Jun-10	5		19.1	9		15.7	4		15.0	4		16.0	11		37.2	50	30	90
18-Jun-10	9		19.1	8		15.7	7		15.0	5		15.7	17		37.2	50	30	90
24-Jun-10	19	8.0	19.2	8	6.2	15.8	11	7.2	15.2	8	4.2	15.5	22	14.5	37.5	50	30	90
30-Jun-10	21		20.1	16		16.4	15		16.0	14		16.3	30		39.2	50	30	90
06-Jul-10	14		20.1	13		16.3	9		15.8	13		16.2	19		38.8	50	30	90
12-Jul-10	11		20.2	11		16.4	7		15.9	8		16.2	12		38.8	50	30	90
18-Jul-10	17		20.3	20		16.5	9		16.0	10		16.2	14		38.7	50	30	90
24-Jul-10	13	15.2	20.2	15	15.0	16.3	10	10.0	15.9	23	13.6	16.4	15	18.0	38.6	50	30	90
30-Jul-10	14		20.1	16		16.1	13		15.8	14		16.2	15		38.3	50	30	90
05-Aug-10	17		20.3	19		16.1	25		15.9	14		16.4	56		38.5	50	30	90
11-Aug-10	16		20.2	17		16.0	16		15.8	15		16.2	19		38.1	50	30	90
17-Aug-10	22		20.2	21		16.0	23		15.8	17		16.2	41		38.3	50	30	90
23-Aug-10	16	17.0	20.5	16	17.8	16.2	17	18.8	15.8	14	14.8	16.1	21	30.4	38.6	50	30	90
29-Aug-10	6		20.1	9		15.9	5		15.5	5		14.5	10		37.9	50	30	90
04-Sep-10	4		20.0	5		15.8	4		15.4	3		14.4	12		36.8	50	30	90
10-Sep-10	2		19.5	1		15.2	2		15.0	2		13.8	14		35.8	50	30	90
16-Sep-10	6		19.1	3		14.7	7		14.6	5		13.3	25		35.0	50	30	90
22-Sep-10	21	7.8	19.1	14	6.4	14.8	17	7.0	14.8	11	5.2	13.5	48	21.8	35.3	50	30	90
28-Sep-10	19		19.2	14		15.0	16		14.8	13		13.5	42		34.6	50	30	90
04-Oct-10	6		18.9	4		14.5	5		13.9	4		13.5	12		32.6	50	30	90
10-Oct-10	3		18.9	5		14.6	0		13.9	1		13.2	12		32.7	50	30	90
16-Oct-10	2		18.4	0		14.4	4		13.7	1		13.2	20		32.4	50	30	90
22-Oct-10	10	8.0	18.5	8	6.2	14.4	15	8.0	13.9	9	5.6	13.3	65	30.2	33.3	50	30	90
28-Oct-10	20		18.5	13		14.3	14		13.9	13		13.5	56		33.8	50	30	90
03-Nov-10	9		17.6	8		13.9	13		13.6	10		13.4	36		33.5	50	30	90
09-Nov-10	10		17.2	8		13.5	10		13.3	16		13.5	30		33.3	50	30	90
15-Nov-10	9		17.0	13		13.6	8		13.3	9		13.4	20		32.8	50	30	90
21-Nov-10	6	10.6	16.0	8	9.9	13.0	9	10.6	13.2	7	11.0	13.3	16	31.5	32.2	50	30	90
27-Nov-10	11		15.3	11		12.4	12		12.8	20		13.4	24		31.6	50	30	90
03-Dec-10	10		15.1	9		12.3	7		12.6	12		13.4	10		30.7	50	30	90
09-Dec-10	8		15.0	9		12.2	6		12.4	9		13.3	13		29.8	50	30	90
15-Dec-10	12		15.1	9		12.2	22		12.6	10		13.2	64		30.7	50	30	90
21-Dec-10	9	9.9	15.0	9	9.4	12.0	11	11.4	12.6	8	11.6	13.1	26	27.2	30.7	50	30	90
27-Dec-10	5		14.6	3		11.7	3		12.3	3		13.0	10		30.1	50	30	90
02-Jan-11	12		14.5	20		11.7	16		12.1	15		13.0	29		29.4	50	30	90
08-Jan-11	4		14.0	5		11.3	5		11.7	6		12.9	8		28.8	50	30	90
14-Jan-11	8		13.8	9		11.2	19		11.8	21		13.0	47		29.1	50	30	90
20-Jan-11	10	8.0	13.9	8	8.9	11.1	6	9.9	11.7	9	10.7	12.7	15	21.4	29.1	50	30	90
26-Jan-11	38		14.1	23		11.1	46		12.1	31		12.9	79		29.7	50	30	90
01-Feb-11	22		14.2	26		11.3	28		12.4	46		12.4	48		30.1	50	30	90
07-Feb-11	12		14.1	13		11.3	8		12.3	12		12.4	21		30.0	50	30	90
13-Feb-11	7		14.0	6		11.2	6		12.3	7		12.2	16		30.0	50	30	90
19-Feb-11	9	17.7	13.7	15	16.6	11.2	8	19.3	12.2	20	23.1	12.2	22	37.0	29.7	50	30	90
25-Feb-11	18		13.9	14		11.4	27		12.6	14		12.3	68		30.7	50	30	90
03-Mar-11	18		13.7	14		11.2	19		12.5	12		12.1	43		30.4	50	30	90
09-Mar-11	9		13.4	7		10.9	10		11.8	11		11.9	34		28.8	50	30	90
15-Mar-11	14			6			8			6			25			50	30	90
21-Mar-11	11		13.6	12		11.0	5		11.8	7		11.9	27		29.1	50	30	90
27-Mar-11	7	12.8	12.7	3	9.5	10.5	8	12.9	11.2	8	9.7	10.9	15	35.3	27.6	50	30	90

Site / Date	WCHV1 Cintra	Monthly Monthly Average	Rolling Annual Average	WCHV2 Tonsley Park	Monthly Monthly Average	Rolling Annual Average	WCHV3 Railway View	Monthly Monthly Average	Rolling Annual Average	WCHV4 Eurunderee	Monthly Monthly Average	Rolling Annual Average	WCTSP Railway View	Monthly Monthly Average	Rolling Annual Average	PM10 24hr Limit	PM10 Annual Average	TSP Annual Average
02-Apr-11	11		11.2	15		15.4	11		10.8	13		13.3	19		18.8	50	30	90
08-Apr-11	25		18.2	11		13.1			10.8	9		11.1			18.8	50	30	90
14-Apr-11	24		20.2	20		15.3	39		24.7	15		12.2	97		57.8	50	30	90
20-Apr-11	51		27.8	21		16.6	50		33.1	18		13.6	114		76.5	50	30	90
26-Apr-11	11	24.5	24.5	7	14.7	14.7	12	27.8	27.8	7	12.2	12.2	28	64.3	64.3	50	30	90
02-May-11	38		26.7	26		16.6	35		29.1	16		12.9	85		68.4	50	30	90
08-May-11	13		24.8	16		16.5	12		26.2	12		12.8	20		60.4	50	30	90
14-May-11	7		22.5	5		15.1	14		24.5	7		12.1	50		58.9	50	30	90
20-May-11	34		23.9	34		17.2	50		27.8	28		13.8	100		64.0	50	30	90
26-May-11	27	23.9	24.2	17	19.6	17.1	13	24.7	26.1	16.1	15.9	14.0	25.7	56.1	59.8	50	30	90
01-Jun-11	58		27.2	52		20.3	50		28.4	7.7		13.5	95		63.2	50	30	90
07-Jun-11	62		30.2	56		23.2	80		33.1	9		13.1	256		80.8	50	30	90
13-Jun-11	49		31.6	48		25.1	47		34.3	5.4		12.5			80.8	50	30	90
19-Jun-11	7		29.8	8		23.9	7		32.2	5.5		12.0	155		87.0	50	30	90
25-Jun-11	18	38.7	29.0	13	35.2	23.2	14	39.5	30.9	13.1	8.1	12.1	25	132.5	82.1	50	30	90
01-Jul-11	11		27.9	8		22.2	4		29.1	4		11.6	10.1		77.0	50	30	90
07-Jul-11	10		26.8	4		21.1	35		29.5	5		11.2	105		78.9	50	30	90
13-Jul-11	15		26.2	15		20.8	19		28.8	25		12.0	47.5		76.9	50	30	90
19-Jul-11	8		25.2	4		19.9	14		28.0	4		11.6	44.3		75.0	50	30	90
25-Jul-11	8	10.3	24.3	8	7.8	19.3	10	16.3	27.0	19	11.5	11.9	16.9	44.8	71.8	50	30	90
31-Jul-11	9		23.6	11		18.9	10		26.2	15		12.1	24.5		69.3	50	30	90
06-Aug-11	9		23.0	10		18.5	12		25.5	20		12.5	31.3		67.4	50	30	90
12-Aug-11	21		22.9	12		18.2	17		25.1	7		12.2	38.7		66.0	50	30	90
18-Aug-11	5		22.1	2		17.5	13		24.6	3		11.8	46.8		65.1	50	30	90
24-Aug-11	25	13.7	22.2	11	9.2	17.3	13	13.1	24.1	5	10.0	11.6	47.8	37.8	64.4	50	30	90
30-Aug-11	30		22.5	21		17.4	22		24.0	13		11.6	47		63.7	50	30	90
05-Sep-11	15		22.2	12		17.2	32		24.4	15		11.8	65		63.7	50	30	90
11-Sep-11	5		21.6	5		16.8	6		23.7	5		11.5	14		61.8	50	30	90
17-Sep-11	12		21.2	18		16.8	15		23.4	17		11.7	37		60.9	50	30	90
23-Sep-11	41	20.3	21.9	32	17.6	17.3	46	24.2	24.1	36	17.2	12.5	91	50.8	62.0	50	30	90
29-Sep-11	8		21.5	7		17.0	8		23.6	7		12.3	16		60.4	50	30	90
05-Oct-11	27		21.8	17		17.0	16		23.3	10		12.2	36		59.6	50	30	90
11-Oct-11	22		21.6	11		16.8	32		23.6	7		12.1	67		59.8	50	30	90
17-Oct-11	15		21.4	12		16.7	10		23.2	11		12.0	19		58.5	50	30	90
23-Oct-11	16	17.5	21.3	21	13.5	16.8	18	16.8	23.1	16	10.0	12.1	44	36.3	58.1	50	30	90
29-Oct-11	7		20.9	9		16.6	8		22.6	16		12.3	29		57.2	50	30	90
04-Nov-11	16		20.7	15		16.5	14		22.4	13		12.3	47		56.9	50	30	90
10-Nov-11	24		20.8	20		16.6	22		22.4	24		12.6	41		56.5	50	30	90
16-Nov-11	21		20.8	21		16.7	20		22.3	22		12.8	28		55.7	50	30	90
22-Nov-11	18	17.0	20.7	19	16.6	16.8	16	15.8	22.1	28	20.4	13.2	35	35.8	55.1	50	30	90
28-Nov-11	8		20.4	8		16.5	14		21.9	10		13.1	30		54.5	50	30	90
04-Dec-11	6		20.1	4		16.2	10		21.6	5		12.9	30		53.9	50	30	90
10-Dec-11	15		20.0	10		16.1	4		21.2	13		12.9	8		52.8	50	30	90
16-Dec-11	8		19.7	6		15.9	9		20.9	5		12.7	19		52.0	50	30	90
22-Dec-11	15	10.3	19.6	12	8.1	15.8	7	8.8	20.6	11	8.6	12.7	16	20.7	51.1	50	30	90
28-Dec-11	1		19.2	1		15.5	10		20.4	16		12.8	16		50.3	50	30	90
03-Jan-12			19.2			15.5			20.4	15		12.8	50		50.3	50	30	90
09-Jan-12	16		19.1	15		15.5	25		20.5	13		12.8	71		50.8	50	30	90
15-Jan-12	8		18.9	17		15.5	16		20.4	8		12.7	34		50.4	50	30	90
21-Jan-12	12	9.3	18.7	12	11.3	15.4	11	15.3	20.2	9	12.3	12.6	22	38.4	49.8	50	30	90
27-Jan-12	5		18.5	4		15.2	3		19.8	4		12.5	9		49.0	50	30	90
02-Feb-12	5		18.2	3		15.0	2		19.5	3		12.3	9		48.2	50	30	90
08-Feb-12	7		18.0	8		14.8	5		19.2	5		12.1	11		47.5	50	30	90
14-Feb-12	10		17.8	10		14.7	7		18.9	6		12.0	16		46.9	50	30	90
20-Feb-12	6	6.7	17.6	7	6.2	14.6	6	4.6	18.7	9	5.4	12.0	13	11.6	46.2	50	30	90
26-Feb-12	6		17.4	7		14.4	6	6	18.5	6		11.9	13		45.6	50	30	90
04-Mar-12	4		17.2	4		14.2	5	5	18.2	5		11.8	8		44.9	50	30	90
10-Mar-12	8		17.0	11		14.2	20	20	18.2	10		11.7	46		44.9	50	30	90
16-Mar-12	13		16.9	11		14.1	7	7	18.0	17		11.8	14		44.4	50	30	90
22-Mar-12	17		16.9	8		14.0	13	13	17.9	6		11.7	28		44.1	50	30	90
28-Mar-12		9.5	16.9		8.2	14.0		9.9	17.9		8.8	11.7		21.6	44.1	50	30	90

Site	2.5TEOM92			10TEOM92	EPL#30		HVP20	EPL#1	Rolling	HVP98	EPL#28	Rolling	HVP1		Rolling	HVT11	EPL#29	Rolling	HVT98		Rolling	PM10	PM10	TSP
Date	Werris Creek	Monthly Summary	Annual Average	Werris Creek	Monthly Summary	Annual Average	Tonsley Park	Monthly Summary	Annual Average	Kyooma	Monthly Summary	Annual Average	Escott	Monthly Summary	Annual Average	Glenara	Monthly Summary	Annual Average	Kyooma	Monthly Summary	Annual Average	24hr Limit	Annual Average	Annual Average
02-Apr-12				22	6.2		19	7.5	19.0	29	12.2	28.6	18	8.2	17.6	18	8.2	17.6	66	22.0	66.4	50	30	90
08-Apr-12				12	**15.9**	15.9	16	**15.3**	17.6	23.2	**22.6**	25.9	20	**15.1**	18.8	20	**15.1**	18.8	53	**55.3**	59.6	50	30	90
14-Apr-12				6	17.2		8	17.4	14.2	12	24.8	21.3	8	16.0	15.3	8	16.0	15.3	22	59.6	47.0	50	30	90
20-Apr-12				23	23.0		19	19.0	15.3	26	28.6	22.6	14	20.0	15.1	14	20.0	15.1	80	79.9	55.3	50	30	90
26-Apr-12				12			13		14.9	17		21.5	13		14.7	13		14.7	54		55.0	50	30	90
02-May-12				11	11.4		13	12.6	14.5	8	8.4	19.4	14	11.8	14.6	14	11.8	14.6	27.5	27.5	50.4	50	30	90
08-May-12				26	**15.3**	15.6	20	**17.9**	15.3	49	**19.9**	23.6	18	**14.2**	15.0	18	**14.2**	15.0	114	**51.3**	59.5	50	30	90
14-May-12				15	12.4		27	17.1	16.7	12	12.8	22.2	15	14.0	15.0	15	14.0	15.0	33	33.0	56.2	50	30	90
20-May-12				12	25.8		17	26.7	16.8	13	48.8	21.1	12	17.7	14.6	12	17.7	14.6	28	114.0	53.0	50	30	90
26-May-12				4			5		15.6	4		19.4	3		13.5	3		13.5	6		48.3	50	30	90
01-Jun-12				19			12		15.2	8		18.4	4		12.6	4		12.6	20		45.7	50	30	90
07-Jun-12				12	3.7		7	4.8	14.5	3	3.3	17.1	3	3.2	11.8	3	3.2	11.8	7	5.5	42.5	50	30	90
13-Jun-12				11	**12.1**	14.4	9	**9.4**	14.1	5	**10.8**	16.2	6	**7.0**	11.4	6	**7.0**	11.4	16	**24.5**	40.5	50	30	90
19-Jun-12				10	11.8		9	9.1	13.7	13	6.6	16.0	8	5.2	11.2	8	5.2	11.2	31	18.3	39.8	50	30	90
25-Jun-12				17	18.7		15	15.4	13.8	31	31.2	17.0	17	17.4	11.6	17	17.4	11.6	67	66.6	41.6	50	30	90
01-Jul-12				10			9		13.5	4		16.2	5		11.2	5		11.2	7		39.5	50	30	90
07-Jul-12				8	6.3		8	6.3	13.2	5	3.0	15.5	7	4.8	10.9	14	5.2	11.4	5	4.8	37.5	50	30	90
13-Jul-12				8	**8.6**	13.0	8	**8.5**	12.9	5	**4.5**	14.9	5	**6.6**	10.6	6	**8.4**	11.0	5	**6.1**	35.6	50	30	90
19-Jul-12				11	8.3		11	8.3	12.8	6	4.5	14.4	5	5.2	10.3	9	7.9	10.9	8	5.2	34.2	50	30	90
25-Jul-12				6	10.7		6	10.7	12.5	3	5.8	13.9	10	10.4	10.3	8	14.2	10.8	5	8.2	32.7	50	30	90
31-Jul-12				17			18		12.8	11		13.7	15		10.5	16		11.0	15		31.9	50	30	90
06-Aug-12				10	7.1		10	7.1	12.6	6	5.3	13.4	7	4.8	10.4	9	8.6	10.9	13	10.7	31.0	50	30	90
12-Aug-12				9	**10.4**	12.5	10	**10.9**	12.5	10	**8.6**	13.2	9	**9.6**	10.3	11	**12.0**	10.9	15	**13.9**	30.3	50	30	90
18-Aug-12				7	9.0		7	9.8	12.3	5	10.1	12.9	5	9.0	10.1	11	10.8	10.9	11	14.6	29.5	50	30	90
24-Aug-12				9	17.0		10	17.8	12.2	11	10.6	12.8	12	15.0	10.2	14	16.3	11.0	16	16.3	29.0	50	30	90
30-Aug-12							17		12.4	20		13.1	15		10.4	19		11.3	30		29.0	50	30	90
05-Sep-12		3.1			7.3		23	10.8	12.8	19	10.8	13.3	30	6.9	11.1	29	9.1	12.0	30	17.3	29.1	50	30	90
11-Sep-12		**8.9**	8.9		**15.3**	13.0	29	**20.5**	13.4	23	**18.0**	13.6	26	**18.8**	11.6	28	**20.5**	12.6	36	**28.5**	29.3	50	30	90
17-Sep-12		8.1			14.6		22	21.9	13.6	17	19.1	13.8	16	16.4	11.8	17	19.2	12.7	29	30.0	29.3	50	30	90
23-Sep-12		16.4			26.5		11	29.2	13.6	11	23.1	13.7	7	29.8	11.6	9	29.2	12.6	17	35.8	28.9	50	30	90
29-Sep-12							14		13.6	8		13.5	15		11.7	13		12.6	16		28.5	50	30	90
05-Oct-12		2.3			4.6		17	7.3	13.7	12	5.6	13.5	19	11.2	11.9	20	9.7	12.9	21	14.4	28.2	50	30	90
11-Oct-12		**10.7**	9.8		**18.1**	13.7	7	**14.6**	13.5	6	**11.6**	13.2	11	**15.7**	11.9	10	**15.8**	12.8	14	**23.2**	27.8	50	30	90
17-Oct-12		10.1			17.7		22	14.4	13.8	23	9.1	13.5	18	15.3	12.1	25	13.2	13.1	47	17.8	28.4	50	30	90
23-Oct-12		29.1			41.4		12	22.0	13.7	9	22.6	13.4	15	19.2	12.2	11	24.9	13.1	18	46.9	28.1	50	30	90
29-Oct-12							27		14.1	19		13.5	16		12.3	15		13.1	28		28.1	50	30	90
04-Nov-12		0.0			2.7		23	8.9	14.3	19	5.7	13.7	23	8.7	12.6	25	7.7	13.4	27	10.4	28.0	50	30	90
10-Nov-12		**6.8**	8.8		**14.3**	13.8	9	**24.1**	14.2	6	**15.3**	13.4	9	**21.7**	12.5	8	**18.5**	13.3	10	**24.0**	27.6	50	30	90
16-Nov-12		6.6			14.2		25	25.1	14.5	13	18.6	13.4	27	23.3	12.9	20	20.3	13.4	24	26.9	27.5	50	30	90
22-Nov-12		20.5			33.8		36	36.0	15.0	21	20.5	13.6	33	33.0	13.4	26	25.6	13.7	32	31.7	27.6	50	30	90
28-Nov-12							11		14.9	13		13.6	14		13.4	20		13.9	15		27.3	50	30	90
04-Dec-12		0.8			2.3		5	4.7	14.7		3.1	13.6	8	5.5	13.3	10	3.2	13.8		8.6	27.3	50	30	90
10-Dec-12		**6.5**	8.2		**13.1**	13.7	15	**9.2**	14.7	3	**7.4**	13.3	6	**8.9**	13.1	3	**13.8**	13.5	10	**13.0**	26.8	50	30	90
16-Dec-12		5.5			13.5		9	9.2	14.5	9	6.9	13.2	9	8.4	13.0	26	9.9	13.8	19	12.4	26.7	50	30	90
22-Dec-12		17.9			28.3		7	14.9	14.4	5	12.6	13.0	8	13.8	12.9	10	26.3	13.7	9	18.7	26.2	50	30	90
28-Dec-12							20		14.5	5		12.9	7		12.8	9		13.6	10		25.9	50	30	90
03-Jan-13		0.0			0.1		13	13.3	14.5	10	4.5	12.8	12	6.7	12.7	16	9.0	13.7	16	9.6	25.7	50	30	90
09-Jan-13		**7.8**	8.1		**14.2**	13.7	30	**21.0**	14.8	23	**10.3**	13.0	22	**11.9**	12.9	34	**16.2**	14.1	41	**19.7**	26.0	50	30	90
15-Jan-13		6.8			13.9			19.9	14.8	6	7.8	12.9	11	11.3	12.9	12	12.3	14.1	17	15.8	25.8	50	30	90
21-Jan-13		23.0			36.1			29.8	14.8	8	22.6	12.8	7	22.3	12.8	10	34.2	14.0	14	41.4	25.6	50	30	90
27-Jan-13							6		14.6	4		12.6	4		12.6	5		13.8	10		25.3	50	30	90
02-Feb-13		2.1			3.6		5	4.8	14.4	3	3.1	12.4	4	3.9	12.4	3	3.2	13.6	6	6.0	24.9	50	30	90
08-Feb-13		**4.7**	7.6		**8.3**	13.2	14	**8.7**	14.4	13	**5.7**	12.4	9	**6.0**	12.4	34	**12.2**	14.0	21	**11.0**	24.8	50	30	90
14-Feb-13		4.4			8.1		12	7.2	14.3	5	4.5	12.2	7	6.0	12.3	9	8.6	13.9	8	9.9	24.5	50	30	90
20-Feb-13		8.4			15.2		7	13.9	14.2	5	12.7	12.1	6	8.7	12.2	10	34.3	13.8	10	21.2	24.2	50	30	90
26-Feb-13							5		14.0	2		11.9			12.2	4		13.6	6		23.9	50	30	90
04-Mar-13							5		13.9	6		11.8	6		12.0	7		13.5	11		23.7	50	30	90
10-Mar-13		1.5			2.7		12	5.1	13.8	6	2.4	11.7	7	5.7	12.0	12	3.7	13.5	13	5.5	23.5	50	30	90
16-Mar-13		**5.4**	7.3		**10.3**	13.0	14	**9.1**	13.8	18	**7.1**	11.8	14	**9.3**	12.0	8	**9.5**	13.4	45	**16.9**	23.8	50	30	90
22-Mar-13		4.5			9.2		9	9.4	13.8	5	5.6	11.7	11	8.9	12.0	9	8.8	13.3	12	12.7	23.6	50	30	90
28-Mar-13		16.9			25.9		10	13.7	13.7	6	17.7	11.6	9	13.5	11.9	17	17.2	13.4	15	44.8	23.5	50	30	90
Min		**0.0**			**0.1**		**4.7**			**2.4**			**3.2**			**3.2**			**4.8**					
Max		**29.1**			**41.4**		**36.0**			**48.8**			**33.0**			**34.3**			**114.0**					
Capture							**97%**			**98%**			**98%**			**100%**			**98%**					

APPENDIX D – Air Quality Risk Assessments

Environmental Risk Assessment from LOM Project

Risk Source	Potential Consequence	Receptor	Potential Impact	Risk Rating	
				Unmitigated	Mitigated
Excessive dust generation from construction, mining, transport and processing activities.	Nuisance/amenity impacts from dust deposition on window sills, cars, surfaces etc. Adverse health impacts. Reduced water quality in rainwater tanks. Reduced ability for evapotranspiration in vegetation. Community complaints. Reduced reputation within the local community.	Local air-shed. Residents, landowners and leaseholders of properties on and surrounding the Mine Site. Vegetation communities surrounding the Mine Site.	Increased deposited dust levels and suspended particulate matter concentration.	**E**	**M**
Spontaneous combustion outbreak.	Community complaints. Reduced reputation within the local community. Reduced amenity. Minor health impacts.	Residents, landowners and leaseholders of properties on and surrounding the Mine Site.	The release of sulphur dioxide and associated odour relating to a spontaneous combustion outbreak.	**M**	**L**
The production of a large amount of nitrogen oxide from blasting operations	Community complaints. Increased contribution to the greenhouse effect.	Residents, landowners and leaseholders of properties on and surrounding the Mine Site. Local air-shed Global air-shed	Reduced local amenity due to the production of nitrogen oxide from blasting operations.	**M**	**L**
			Greenhouse and other gas emissions.	**E**	**H**
			Minor health impacts associated with emissions of sulphur dioxide and nitrogen oxide.	**M**	**NA**

Whitehaven Coal Broadbrush Environmental Risk Assessment for WCC

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
Airborne dust	Neighbours complaint	Dust generated on mine roadways Dust off coal stockpiles Dust from excavators Dust from coal production Dust from scrapers Dust from waste stockpiles Dust from tipping operations Dry, windy conditions Portable crushing Dust from coal bins Conveyors Dust from gravel roads	Water carts Meteorological monitoring (wind) and forecasting Visually monitor dust and take appropriate action Effective road maintenance Network of PM_{10} dust and deposited dust monitoring stations Water cart services raw coal stockpiles when required Water sprays on each conveyor and crushing plant Complaints procedure Community liaison officer	3	B	H	Monitor current trials in progress for the use of surfactants at Tarrawonga Ensure dust monitors are to Australian Standards Implementation of real time air quality monitoring and investigate predictive modelling Environmental awareness for site personnel Investigate access to water to protect against droughts Review of water carts onsite Review and upgrade stand pipe capacity for water cart filling	3	C	H
Airborne dust	Airborne dust exceeds development consent conditions	Airborne dust exceeds development consent conditions	General mine operations Wind events Failure of watering system	3	D	M	Monitor current trials in progress for the use of surfactants at Tarrawonga Ensure dust monitors are to Australian Standards Implementation of real time air quality monitoring and investigate predictive modelling	tbc	tbc	tbc

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
							Environmental awareness for site personnel Investigate access to water to protect against droughts Review of water carts onsite Review and upgrade stand pipe capacity for water cart filling Consider visiting other coal mines to investigate additional control measures for dust Report on best practice dust management as per EPL condition – Pollution Reduction Plan			
Deposited dust	Neighbour complaint and deposited dust exceeds development consent conditions		Network of deposited dust stations as agreed with EPL			na		tbc	tbc	tbc
Diesel Emissions	LTA NGERS reporting	LTA record keeping of diesel and hydrocarbon use	Fuel reconciliation	4	E	M	Finalise formalisation of reporting protocol	tbc	tbc	tbc

APPENDIX E – EEO Public Reports

APPENDIX F - Procedures

Deposited Dust Sample Collection and Changeover Procedure

Sample collection, changeover and analysis is undertaken by a specialist contractor, Australian Laboratory Services (ALS) based in Gunnedah and involves the following steps:

1. Wash any deposited matter adhering to the inside of the funnel into the deposit gauge bottle.
2. Remove the funnel and seal the bottle with a lid. Identify the date and time of removal on the bottle on the laboratory supplied field sheet (as shown in **Figure F1**)
3. Insert the clean funnel into a fresh bottle containing algaecide (added by supplying laboratory), mark date and time on the bottle and insert bottle into the holder for the next sampling period. Ensure the funnel aperture is horizontal.
4. Following collection of the bottles from all sites, return the bottles removed from the holders to the laboratory for analysis following completion of all relevant details on the Field Sheet. “Sampled by” and “Released by” sections of the form are to be signed and dated by the relevant person(s). Note: During any storage period prior to transport to the laboratory, the bottles are to be kept in a cool, dark environment to prevent the growth of algae, fungi and other micro-organisms.

FIELD SAMPLING SHEET - DUST DEPOSITION

CLIENT:	QUOTATION No:
ADDRESS/OFFICE:	ACIRL LABORATORY:
PROJECT ID:	
SAMPLER NAME:	INSTALLATION DATE:
SITE:	REMOVAL DATE:

Report this line / Analyse	Sample ID Information			Field Observations						
	DUST GAUGE ID	DATE	TIME	APPEARANCE	ODOUR	COLOUR	INSECTS	BIRD DROPPINGS	PLANT MATERIAL	APPROX VOLUME

SPECIAL COMMENTS:

Sheet: of

Figure F1: Deposited Dust Field Sheet

HVAS Sample Collection and Changeover Procedure

Sample collection, changeover and analysis is undertaken by a specialist contractor, Australian Laboratory Services (ALS) based in Gunnedah. Sampler set up, operation and filter installation and change out are undertaken in accordance with AS 3580.9.6:2003 as described below.

Initial Set-up:

1. Set up sampler in accordance with the manufacturer's instruction. Note: set-up to be undertaken by supplier, including pre-programming of 6-day sampling cycle.
2. Ensure filter holder and surrounding area are clean before installing filter.
3. Remove pre-weighed (tared) filter from its container and place in filter holder, ensuring filter identification number is face down on the holder. Clamp down carefully.
4. Replace size-selective inlet.
5. Set sampler flow rate, operate sampler until stable air flow occurs and record "start flow rate" from sampler flow rate indicator on field sheet.

Sample Change out:

1. Return to collect the exposed filter as soon as practicable after the sampling period is complete. Before removing the filter, operate the sampler until stable air flow occurs and record final flow rate on the field sheet (field sheet provided in **Figure F2**). Note: if final flow rate differs from initial flow rate by more than 10% discard the sample.
2. Record all relevant details on field sheet for each site including:
   (a) Date sample was taken (in "Date of Operation" column);
   (b) Date sample collected (and new filter installed) (in "Date of Operation" column);
   (c) Filter paper number;
   (d) Site identification number;
   (e) Total run time, i.e. elapsed time;
   (f) Verification that sampler time is correct to within 15 minutes of actual time;
   (g) Verification that high volume sampler check time was in correct sample sequence;
   (h) Operator identification;
   (i) Relevant comments, e.g. meteorological conditions, local activities, fires/dust storms which may affect PM_{10} or TSP.
3. Remove filter from holder touching outer edges only. Note: Reject sample if there is evidence of misalignment, blockage or breakthrough.
4. Remove large debris or insects carefully using clean tweezers.
5. Fold filter so that only surfaces with collected particulate matter are in contact.
6. Place filters in labelled dust proof container.
7. Install new filter in accordance with the procedure detailed above in "Initial set-up".

8. Send used filter to the laboratory for analysis, together with completed HVAS field recording sheet.

Note: a) Avoid changing filters during windy or rainy conditions. If unavoidable, remove filter holder to protected location first.

b) Prior to returning samples to laboratory, do not expose to extremes of temperature which could result in loss of semi-volatiles.

c) The rubber seals of each sampler should be inspected before each use.

d) Units are to be calibrated each two months, calibration will include cleaning and regrease of impaction shim, and cleaning of acceleration nozzle, inlet and sampler.

Client:

Site:

Month:

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES
ENVIRONMENTAL SERVICES

Date of Operation	Sampler Location and Number		Paper Number	Start		Stop		Total Run Time (min)	Field Staff Initial, Date and Time	Comments- Descriptions of problems or Dusty activities around monitor
				Flow (m^3/hr)	Run Time reading	Flow (m^3/hr)	Run Time reading			

Month:

Date of Operation	Sampler Location and Number		Paper Number	Start		Stop		Total Run Time (min)	Field Staff Initial, Date and Time	Comments- Descriptions of problems or Dusty activities around monitor
				Flow (m^3/hr)	Run Time reading	Flow (m^3/hr)	Run Time reading			
Bi monthly maintenance: Clean and regrease impactor shim (PM^{10} only), cleaning of impaction nozzle (PM^{10} only), Clean Inlet and Sampler **Conducted by:** **Staff Initials:**						**Bi monthly flow rate calibration:** **Conducted by:** **Staff Initials:**				

Figure F2: HVAS Sheet

APPENDIX G - Inspection Proforma

None

APPENDIX H - Review Proforma

Period of Review: **Date:** **Name:** **Signed:**

AQGHGMP Section	Clause	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 dust levels within predicted dust impact levels			
6.0	Based on actual performance/results, does the risk assessment need to be revised			
7.1	Compliance with dust criteria in Table 18			
7.2	Objectives and targets are reviewed monthly and revised annually			
8.1.1	Changes to private agreements or property acquisition.			
8.1.2	Actual Rehabilitation Performance vs Rehabilitation Targets			
8.1.3	Clearing and Soil Stripping minimize dust generation			
8.1.4	Dust Suppression – Water Carts • Water carts used to actively control dust emissions • Watering level of 2L/m2/hr achieved for haul roads			
8.1.5	Real Time Dust Monitoring Undertaken			
8.1.6	All operators trained and certified as competent to operate equipment and minimize trafficable dust			
8.1.7	Unsealed haul roads minimize dust generation and routinely sheeted with local gravel. Sealed roads routinely sweeped			

8.1.8	Drilling • Water cart used to spray the surface of the drill site • Drill rigs utilise curtains, vacuum extraction and water sprays during operation			
8.1.9	Water carts used at excavator loading faces and dump sites. Dumping undertaken in pit during high winds or operations suspended.			
8.1.10	Blasting minimises dust emissions			
8.1.11	Water sprays at conveyor transfer points			
8.1.12	Conveyors fitted with cleaning and collection devices and are enclosed by a roof			
8.1.13	Off-site Coal Transportation • Loaded train wagons sprayed with water • Trucks not filled above gunnel level and loads covered			
8.1.14	Preventative maintenance undertaken on earthmoving equipment and trucks			
8.1.15	Acoustic and Visual Amenity Bund constructed			
8.1.16	Pollution Reduction Program Monitoring Programs implemented			
8.1.17	Coal Stockpiles • Water carts used to spray coal stockpiles when needed • SAIL coal stockpile at Rail-Load-Out Facility covered with a tarp			
8.1.18	Air Quality Mine Planning			
8.2	Spontaneous Combustion managed			
8.3	EEO Annual Report			

9	Air Quality Monitoring Program • HVAS • WCC Dust Gauges • Quirindi Train Dust Gauges • TEOM • Meteorology			
10.1	OCE Inspections undertaken every shift of mining operations			
10.2	Visual Inspections undertaken			
10.3	Routine inspections and maintenance of air quality monitoring network undertaken			
11	Staff appropriately trained as per Table 27			
12	Reports completed in accordance with the frequency, distribution and timing requirements listed in Table 28			
13.1	Management Plan Review • AQGHGMP review protocol completed annually • Outcomes of the review incorporated into the AEMR			
13.2	Air Quality Performance Review • Air quality performance review completed annually • Outcomes of the review incorporated into the AEMR			
13.3	Independent Environmental Audit • IEA undertaken every three years			
13.4	Revision of AQGHGMP • AQGHGMP revised in 2015, or earlier if required			
14	Contingency Plan • Unpredicted impacts managed in accordance with contingency plan			