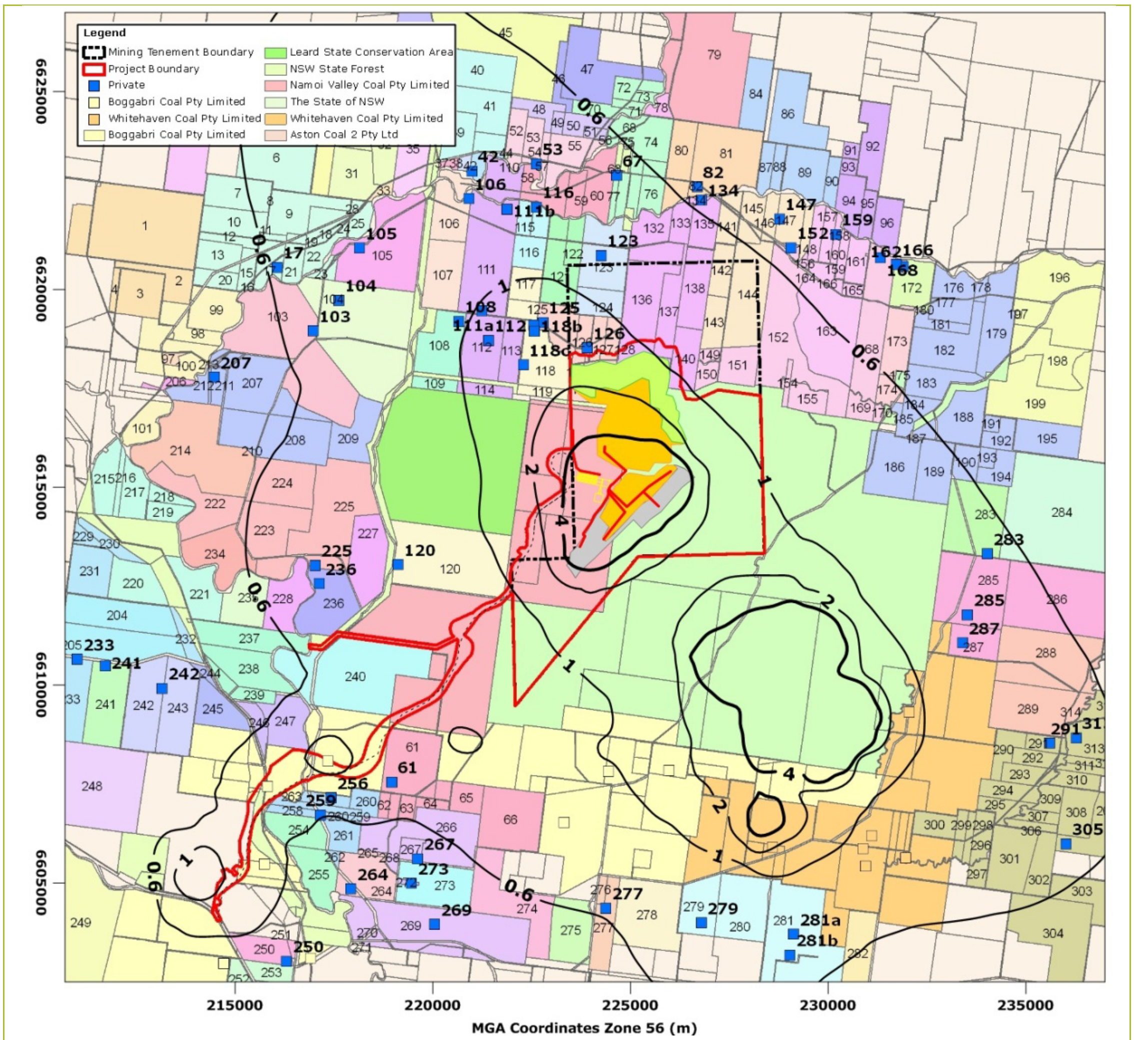
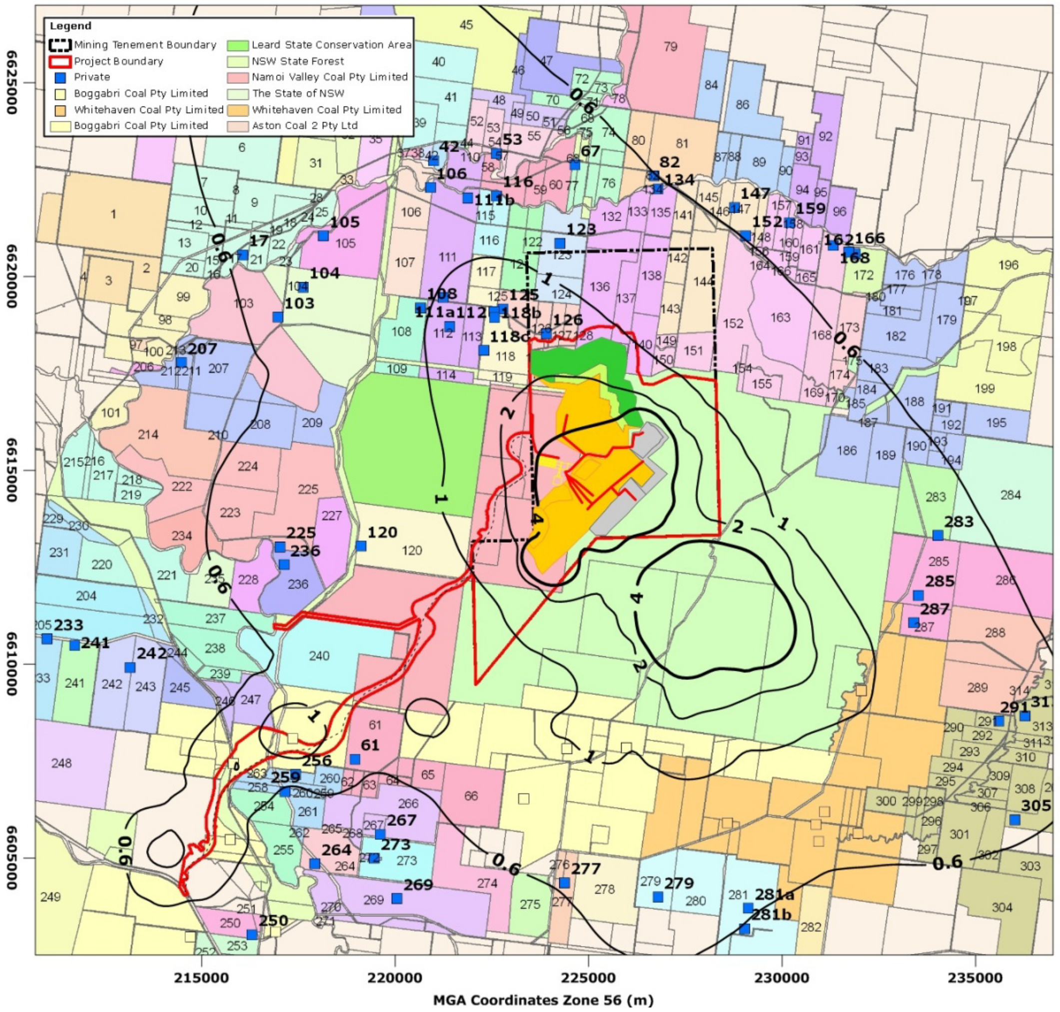


Species:	Location:	Scenario:	Percentile:	Averaging Time:
Dust Deposition	Maules Creek	Year 5	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	g/m^2/month	4	CALMET	J. Beaney

Figure 8.25: Model predictions for annual average dust deposition:

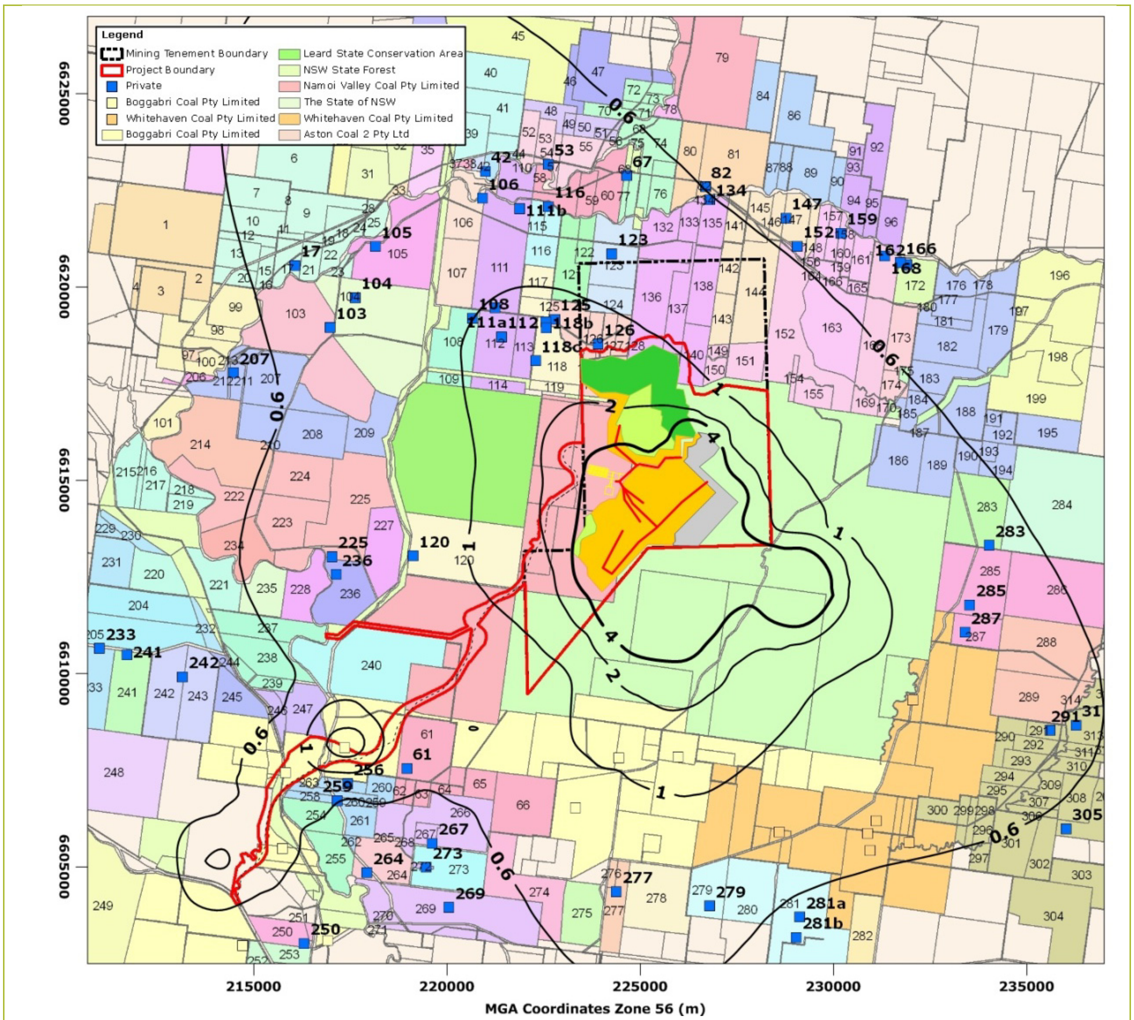
Year 5 – Cumulative



Species:	Location:	Scenario:	Percentile:	Averaging Time:
Dust Deposition	Maules Creek	Year 10	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	$g/m^2/month$	4	CALMET	J. Beaney

Figure 8.26: Model predictions for annual average dust deposition:

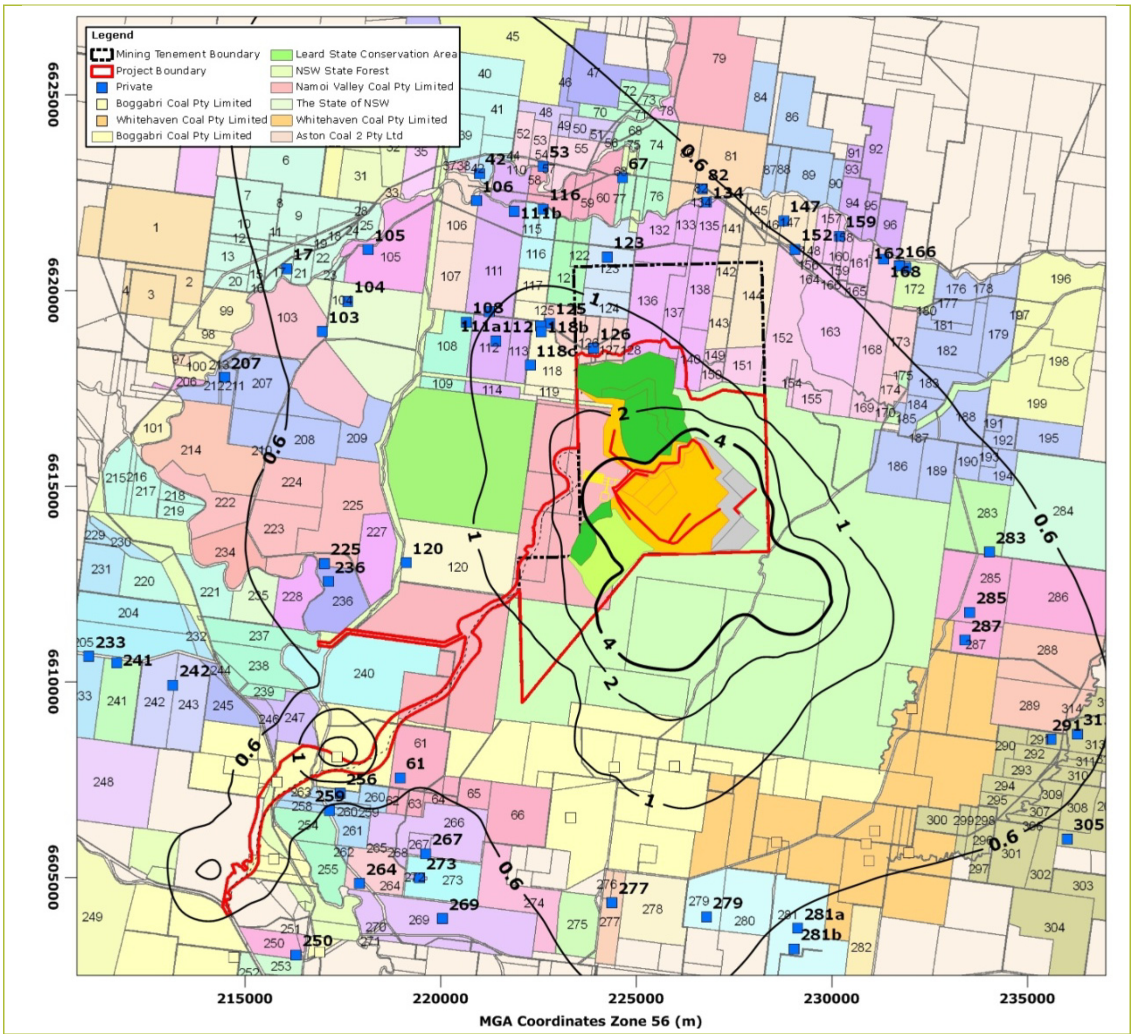
Year 10 - Cumulative



Species:	Location:	Scenario:	Percentile:	Averaging Time:
Dust Deposition	Maules Creek	Year 15	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	g/m^2/month	4	CALMET	J. Beaney

Figure 8.27: Model predictions for annual average dust deposition:

Year 15 – Cumulative



Species:	Location:	Scenario:	Percentile:	Averaging Time:
Dust Deposition	Maules Creek	Year 21	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	$g/m^2/month$	4	CALMET	J. Beaney

Figure 8.28: Model predictions for annual average dust deposition:

Year 21 - Cumulative

Table 8.6: Project alone and cumulative model predictions for annual average dust deposition – g/m²/month

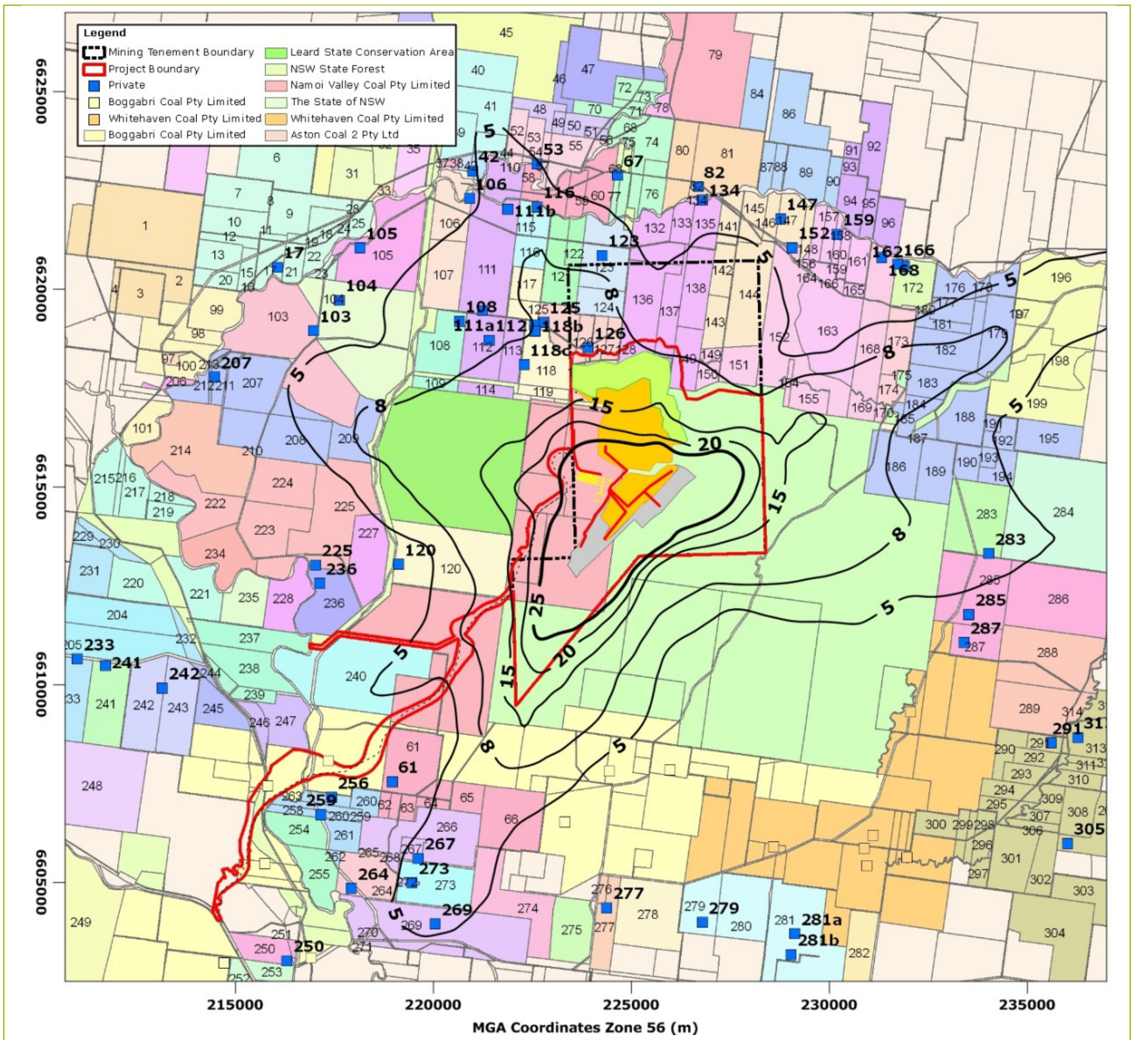
Residence ID	Project alone				Cumulative			
	Year 5	Year 10	Year 15	Year 21	Year 5	Year 10	Year 15	Year 21
Criterion	*Assessment criteria – 2.0 g/m²/month*				*Assessment criteria – 4.0 g/m²/month*			
17	0.1	0.1	0.1	0.1	0.6	0.6	0.6	0.6
42	0.2	0.2	0.2	0.2	0.7	0.8	0.7	0.8
53	0.2	0.2	0.2	0.2	0.7	0.7	0.7	0.7
61	0.0	0.1	0.1	0.0	0.6	0.6	0.6	0.6
67	0.1	0.1	0.1	0.1	0.6	0.7	0.6	0.7
82	0.1	0.1	0.1	0.1	0.6	0.6	0.6	0.6
103	0.1	0.1	0.1	0.1	0.6	0.6	0.7	0.6
104	0.1	0.1	0.1	0.1	0.7	0.7	0.7	0.7
105	0.2	0.2	0.2	0.2	0.7	0.7	0.7	0.7
106	0.2	0.3	0.2	0.2	0.8	0.8	0.8	0.8
108a	0.4	0.4	0.4	0.3	1.0	1.0	1.0	0.9
108b	0.4	0.4	0.4	0.3	0.9	0.9	1.0	0.9
111a	0.5	0.5	0.4	0.4	1.0	1.0	1.0	1.0
111b	0.3	0.3	0.2	0.3	0.8	0.8	0.8	0.8
116	0.2	0.3	0.2	0.2	0.8	0.8	0.8	0.8
118a	0.7	0.7	0.5	0.5	1.3	1.2	1.2	1.2
118b	0.9	0.8	0.7	0.6	1.5	1.4	1.4	1.3
120	0.2	0.2	0.2	0.2	0.7	0.7	0.8	0.8
122	0.2	0.3	0.2	0.3	0.8	0.8	0.8	0.8
123	0.2	0.2	0.2	0.2	0.7	0.8	0.8	0.8
126	0.9	0.8	0.6	0.7	1.5	1.4	1.3	1.3
134	0.1	0.1	0.1	0.1	0.6	0.6	0.6	0.6
147	0.0	0.1	0.1	0.1	0.6	0.6	0.6	0.6
162	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
166	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
168	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
207	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
225	0.1	0.1	0.1	0.1	0.6	0.6	0.7	0.7
233	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
236	0.1	0.1	0.1	0.1	0.6	0.6	0.7	0.7
241	0.0	0.0	0.0	0.0	0.5	0.5	0.6	0.5
242	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
250	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5
256	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
259	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
264	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
267	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
269	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
273	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
277	0.0	0.1	0.1	0.1	0.6	0.6	0.7	0.7
279	0.0	0.0	0.0	0.0	0.7	0.7	0.6	0.7
281a	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
281b	0.0	0.0	0.0	0.0	0.7	0.6	0.6	0.6
283	0.1	0.1	0.1	0.1	0.6	0.6	0.6	0.6
285	0.1	0.1	0.1	0.1	0.7	0.7	0.7	0.7
287	0.1	0.1	0.1	0.1	0.7	0.7	0.7	0.7
291	0.0	0.0	0.0	0.0	0.7	0.7	0.6	0.6
305	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6
313	0.0	0.0	0.0	0.0	0.6	0.6	0.6	0.6

8.4 $PM_{2.5}$

The model predictions for the maximum 24-hour average and annual average $PM_{2.5}$ concentrations are presented in **Figure 8.29** through **Figure 8.32** and **Figure 8.33** through **Figure 8.36**, respectively.

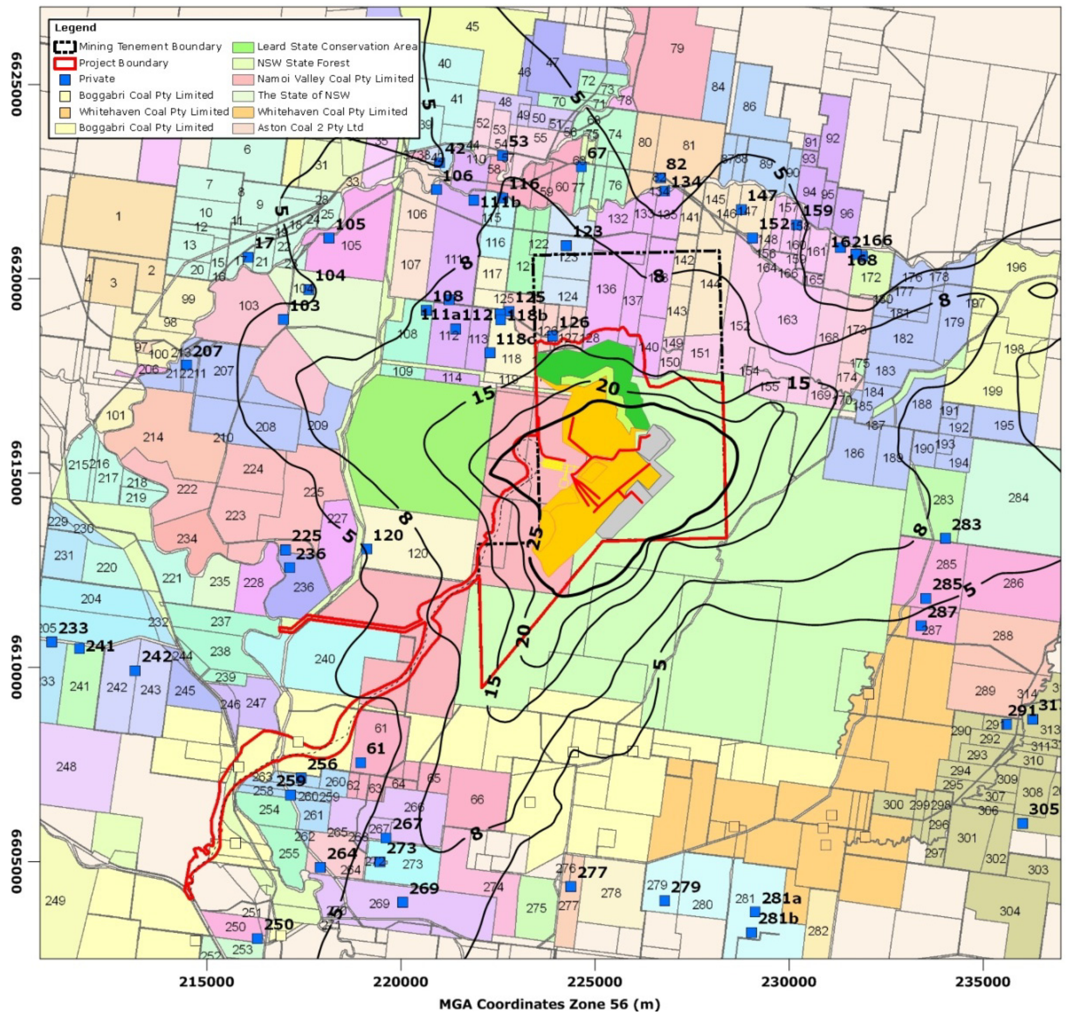
At this stage, the advisory reporting $PM_{2.5}$ standards are not part of the NSW DECCW assessment criteria and while predictions have been made as to the likely contribution that emissions from the Project would make to ambient $PM_{2.5}$ concentrations, these predictions have not been used to assess impacts against the proposed advisory standard.

However there are advisory reporting standards that were released by the NEPC in 2003 (**NEPC, 2003**) and can be used for reference purposes for the potential air quality impacts of the Project. The advisory reporting standards for $PM_{2.5}$ are a maximum 24-hour average of 25 $\mu g/m^3$ and an annual average of 8 $\mu g/m^3$.



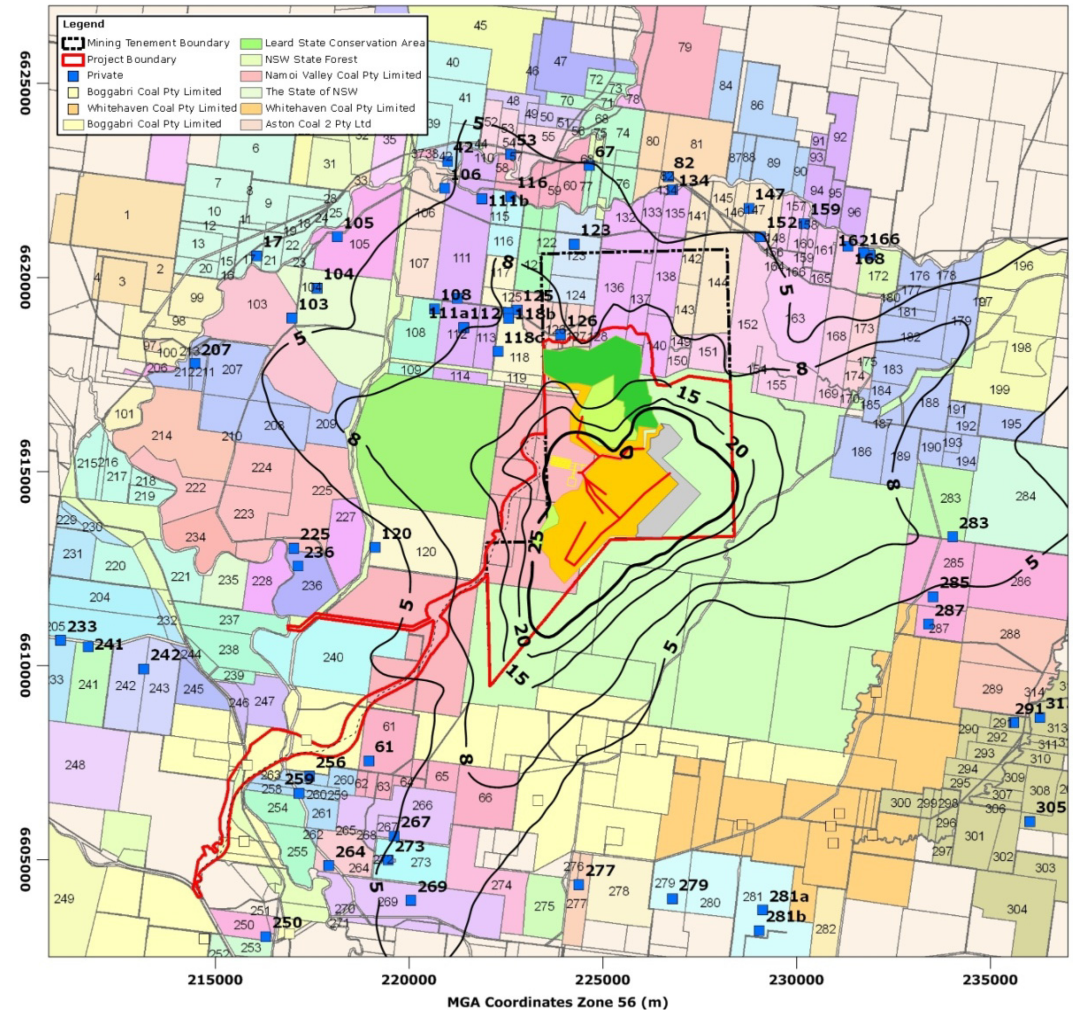
Species:	**Location:**	**Scenario:**	**Percentile:**	**Averaging Time:**
$PM_{2.5}$	Maules Creek	Year 5	-	24 hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m^3	25	CALMET	J. Beaney

Figure 8.29: Model predictions for maximum 24-hour average $PM_{2.5}$ concentrations: Year 5 - Project in isolation



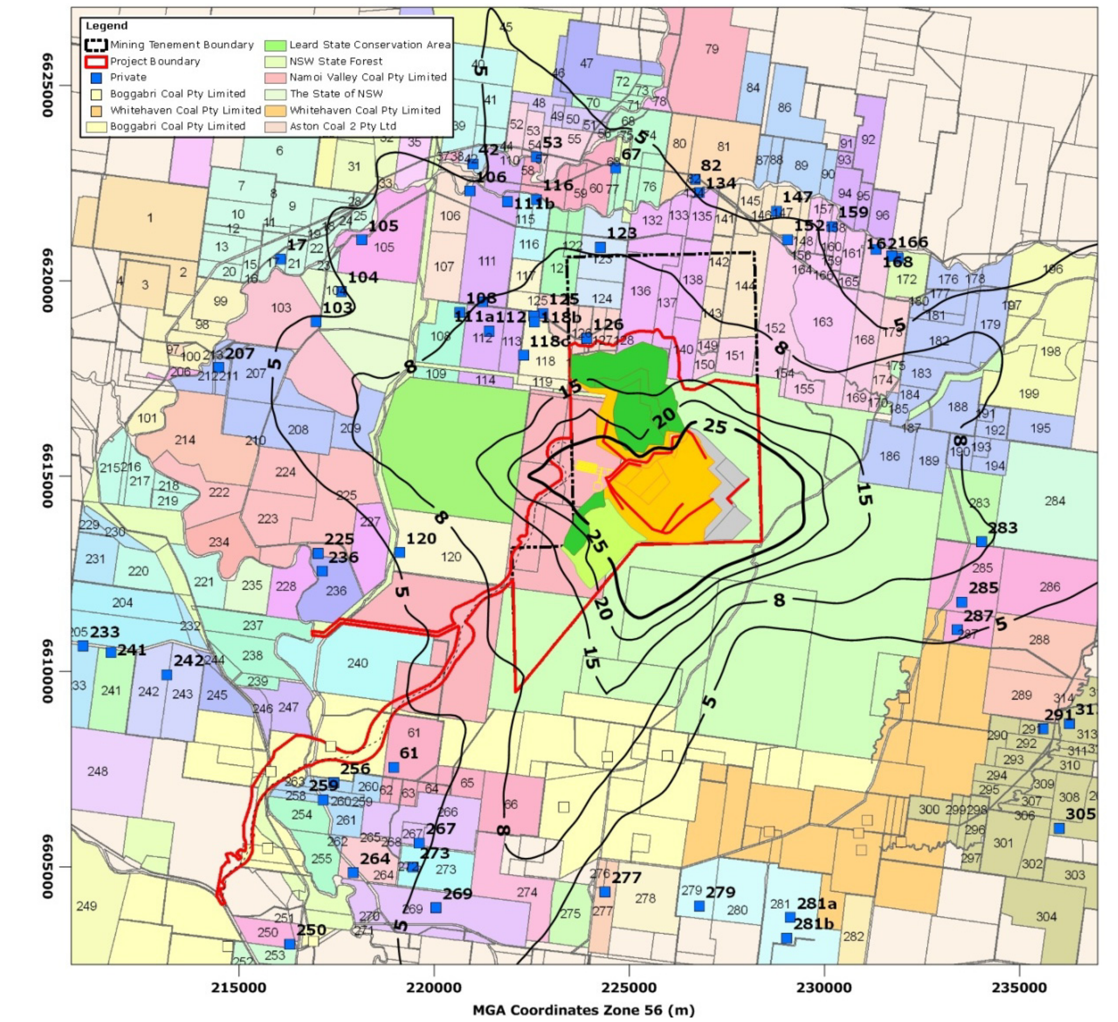
Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Maules Creek	Year 10	-	24 hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m^3	25	CALMET	J. Beaney

Figure 8.30: Model predictions for maximum 24-hour average $PM_{2.5}$ concentrations: Year 10 - Project in isolation



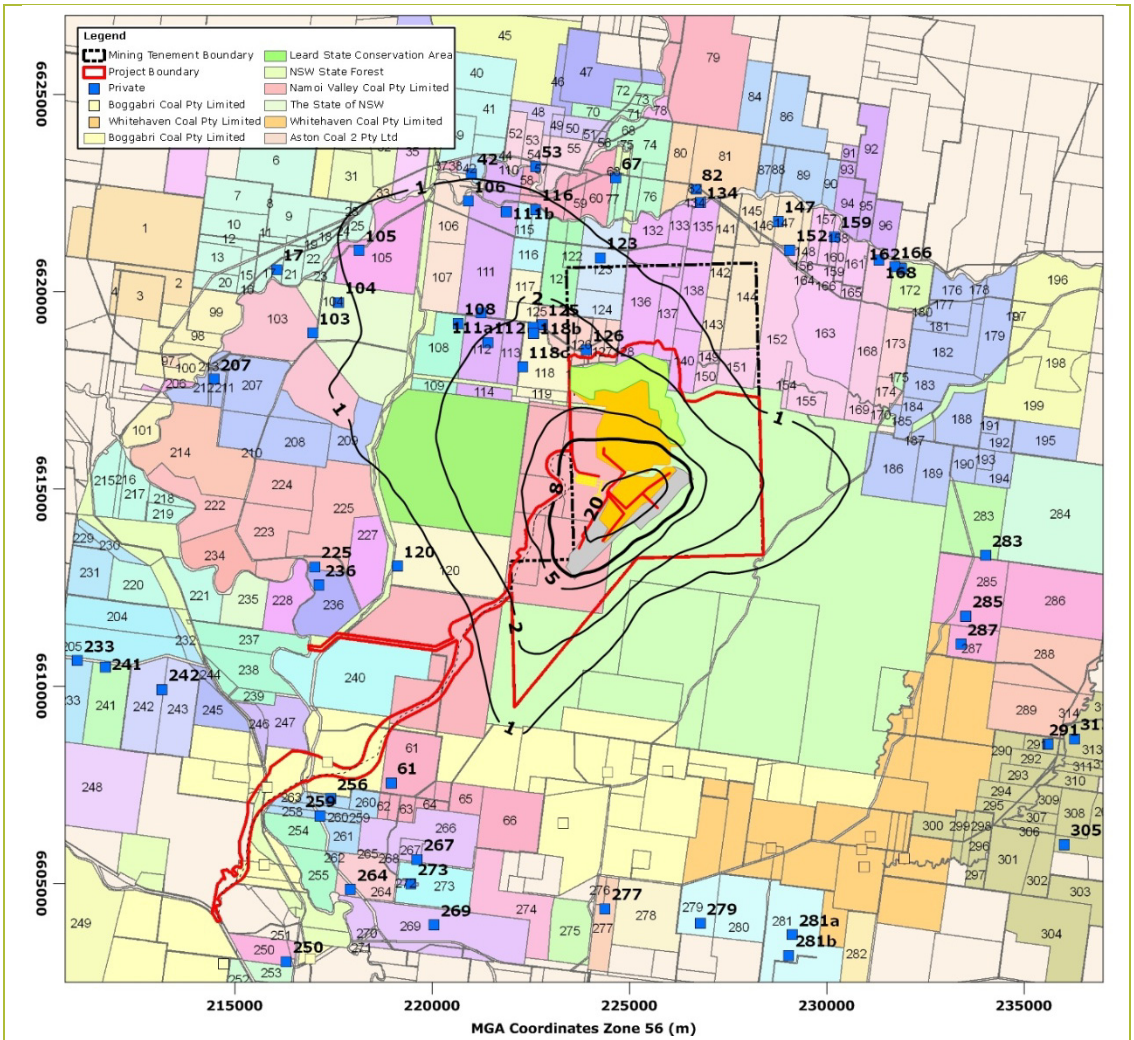
Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Maules Creek	Year 15	-	24 hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m^3	25	CALMET	J. Beaney

Figure 8.31: Model predictions for maximum 24-hour average $PM_{2.5}$ concentrations: Year 15 - Project in isolation



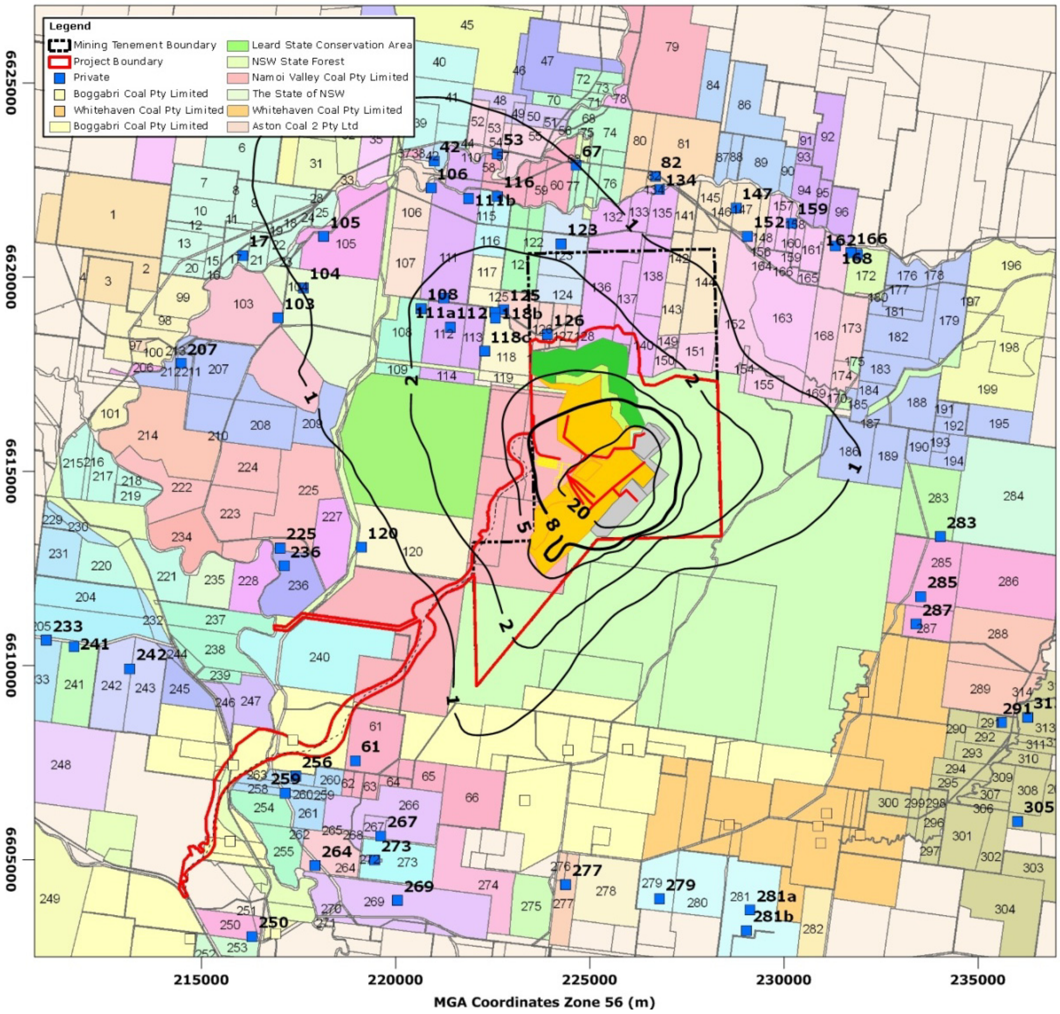
Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Maules Creek	Year 21	-	24 hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	μg/m^3	25	CALMET	J. Beaney

Figure 8.32: Model predictions for maximum 24-hour average $PM_{2.5}$ concentrations: Year 21 - Project in isolation



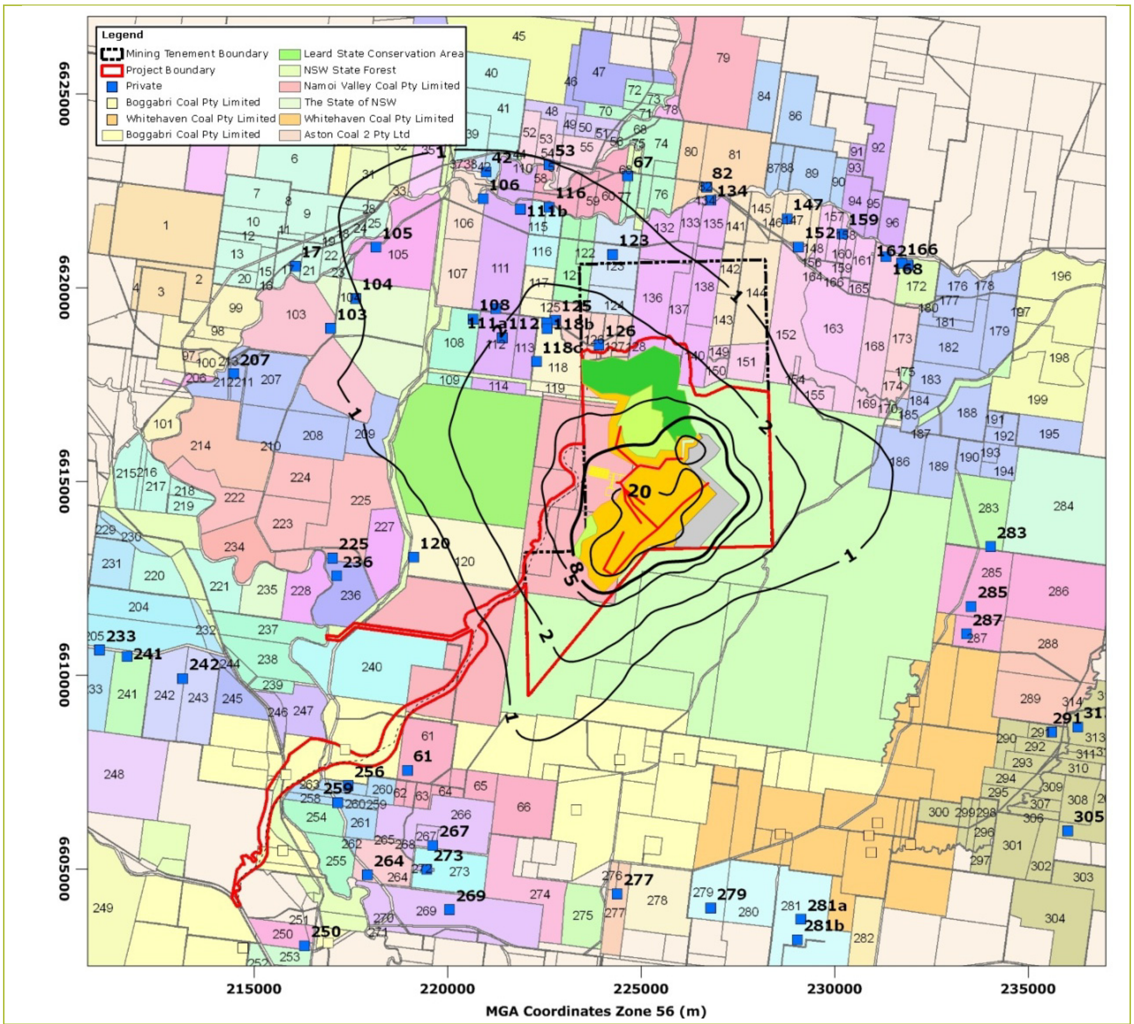
Species:	**Location:**	**Scenario:**	**Percentile:**	**Averaging Time:**
$PM_{2.5}$	Maules Creek	Year 5	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m^3	8	CALMET	J. Beaney

Figure 8.33: Model predictions for annual average $PM_{2.5}$ concentrations: Year 5



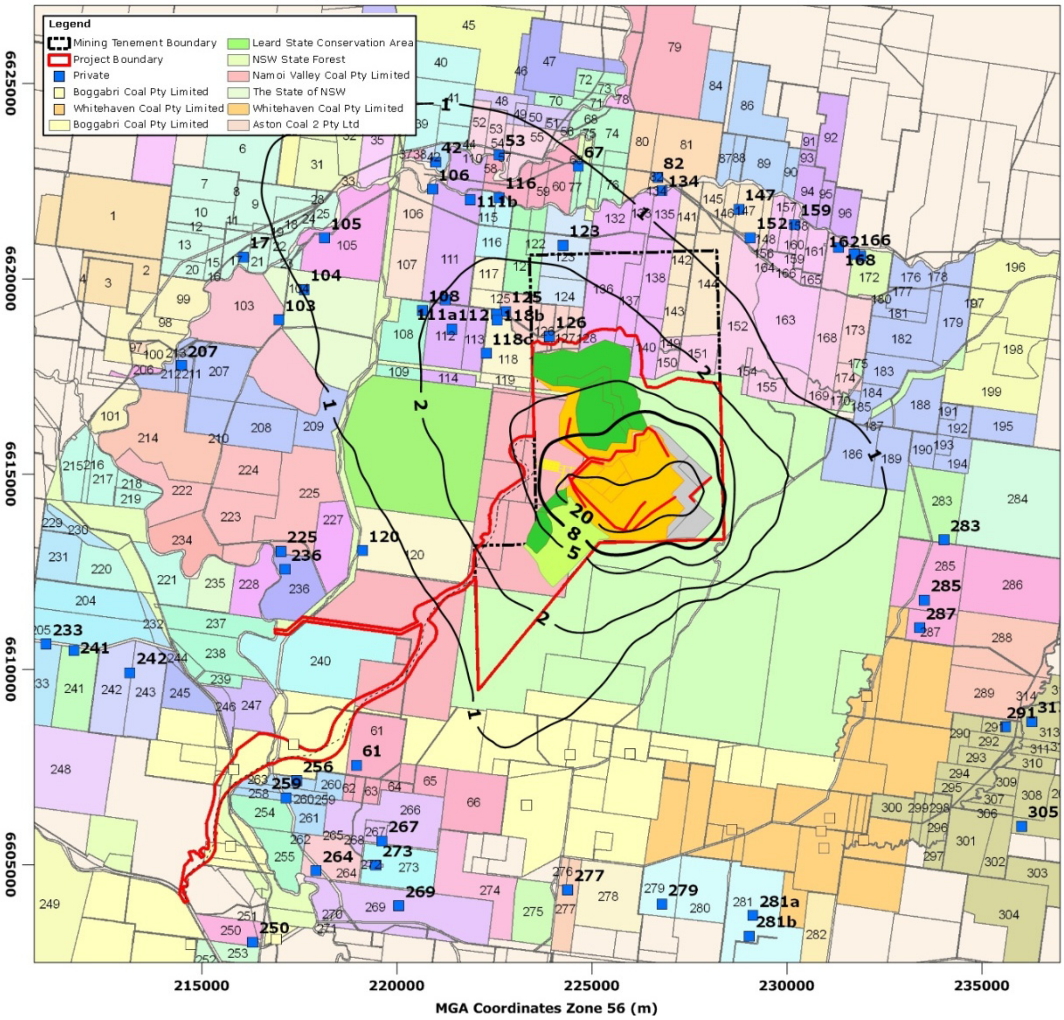
Species:	Location:	Scenario:	Percentile:	Averaging Time:
$PM_{2.5}$	Maules Creek	Year 10	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m^3	8	CALMET	J. Beaney

Figure 8.34: Model predictions for maximum 24-hour average $PM_{2.5}$ concentrations: Year 10



Species:	**Location:**	**Scenario:**	**Percentile:**	**Averaging Time:**
$PM_{2.5}$	Maules Creek	Year 15	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m^3	8	CALMET	J. Beaney

Figure 8.35: Model predictions for maximum 24-hour average $PM_{2.5}$ concentrations: Year 15



Species:	**Location:**	**Scenario:**	**Percentile:**	**Averaging Time:**
$PM_{2.5}$	Maules Creek	Year 21	-	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	$\mu g/m^3$	8	CALMET	J. Beaney

Figure 8.36: Model predictions for maximum 24-hour average $PM_{2.5}$ concentrations: Year 21

8.5 Assessment of Impacts on Privately Owned Land

The DoP requires that projects demonstrate that no additional exceedances of the impact assessment criteria are caused at any residence or on more than 25 percent of privately owned land, including vacant land. **Section 8.1** to **Section 8.4** described in detail the predicted impacts at individual residences.

Additional assessment has been conducted to identify privately-owned land, including vacant land, where more than 25% of the land is predicted to experience dust levels above the relevant DECCW criteria. Blocks of land that have the same owner and are contiguous have been considered as a single area. For reference, the block numbers associated with each owner are provided in **Appendix A**.

Analysis of the contour plots presented in **Section 8.1** to **Section 8.4** shows there are a number of blocks of privately owned land that are predicted to experience impacts above the DECCW criteria on more than 25% of the land area.

The percentage of this privately-owned land that is predicted to be impacted by dust levels above the DECCW criteria is presented in **Table 8.7**.

Table 8.7: Percentage of privately-owned land area predicted to be impacted

Block Number	Year 5 (%)	Year 10 (%)	Year 15 (%)	Year 21 (%)
Cumulative annual average PM_{10} concentration				
DJC Watson	**28**	**98**	**69**	**92**
VA & MA Younger	10	5	**25**	**32**
MJ & ML Nott	**26**	**27**	**35**	**29**
RP & RD McGregor	**35**	9	0	0
Maximum 24-hour average PM_{10} concentration				
DJC Watson	**57**	**57**	**85**	**100**
JR Holmes	**39**	**81**	6	**53**
L & SN Compton	**51**	**72**	**30**	**51**
VA & MA Younger	**31**	**65**	**46**	**58**
CM Morse	1	**34**	7	14
CM & RRF Morse	**37**	**74**	**40**	**66**
MJ & ML Nott	**64**	**58**	**62**	**61**
PF Murphy	**33**	**68**	**27**	**46**
PR Hobden	**57**	**82**	7	1
JM Morris	9	**80**	5	**32**
MJ Brennan	11	**47**	**31**	**46**
PD & LA Finlay	**37**	**40**	**31**	**29**
LA & KA & PD Finlay	**46**	**53**	**40**	**34**
Narrabri Shire Council	**100**	**100**	**100**	**100**
Bank of NSW	0	17	0	**55**

Note: Includes land where private residences exist and are also assessed in previous sections.

It can be seen from **Table 8.7** that there are 15 properties that are predicted to experience dust impacts on more than 25% of their land area for the maximum 24-hour average PM_{10} concentration (project alone) and four for the cumulative annual average PM_{10} concentration.

8.6 Additional cumulative impacts from proposed projects

There is a proposal for an additional extension at the Tarrawonga Coal mine. A Preliminary Environmental Assessment was submitted to DoP in Febraury 2011 and provides a description of the key features of the Tarrawonga Expansion which includes an:

- Increase in the total mine life by approximately 13 years (i.e. 8-10 years to 23 years);
- Increase in the total ROM coal from 16.4 to 55 Mt;
- Increase in the ROM coal production rate from 2 Mtpa to 3 Mtpa;
- Extension of the opencut by approximately 1,500 m and 400 m to the east and north of the ML;
- Increase in total waste rock from 123.3 to 562 Mbcm;

As shown in **Figure 7.2** the Tarrawonga Coal Mine is located approximately 5 - 8 km to the south of the Maules Creek Coal Project. There is no publically available information to enable an assessment of the proposed expansion (Tarrawonga Extension) as part of this air quality assessment. However any increase in emissions as a result of the Tarrawonga Extension has the potential for an increase in impacts. The additional cumulative impacts from the Tarrawonga Extension are expected to be most significant at residences to the east and south of Tarrawonga. At these locations the impacts from the Maules Creek Coal Project are less significant. The additional cumulative impacts at the residential areas that are most affected by the Maules Creek Coal Project (those to the north and northwest) are expected to be minor as a result of the Tarrawonga Extension.

Planning approval may also be sought at some time in the future for the Goonbri Project. At the time of writing, there have been no planning approvals granted and no public documents describing the project are available. All that is known about this proposal is the existence of Exploration Licence 7435, and some media statements. Therefore the extent of the operations and hence the specific potential impacts on air quality) are not known and cannot be considered. Additional cumulative impacts from the Goonbri project are expected to be minor at residences that are predicted to be most affected by the Maules Creek Coal Project.

9 CONSTRUCTION PHASE IMPACTS

9.1 Overview

Construction of the Project is anticipated to occur over a period of approximately 14 months, with on-site activities occurring over a period of 10 months and rail construction taking approximately 12 months.

The activities which would contribute to dust and particulate matter emissions include site clearing, heavy vehicle movements, earthworks, rail loop and haul road construction and material handling. Specific construction tasks include:

- Construction of a CHPP with a throughput of 13 Mtpa ROM coal;
- Construction of a tailings drying area to facilitate the drying of tailings prior to co-disposal within the mining area or reprocessing in the CHPP;
- Construction of a rail spur, rail loop, associated load out facility and connection to the Werris Creek to Mungindi Railway Line;
- Construction of a Mine Access Road;
- Construction and operation of administration, workshop and related facilities construction and operation of a water pipeline, pumping station and associated infrastructure for access to water from the Namoi River;
- Installation of power transmission line and related infrastructure; and
- Installation of communications, water management and reticulation infrastructure.

From an air quality perspective it is important to consider the potential emissions that would occur during construction. While dust emissions from construction activities can have impacts on local air quality, impacts are typically of a short duration (especially when compared to the life of mining operations) and relatively easy to manage through commonly applied dust control measures. Dust emissions from construction sites vary substantially from day to day, depending on the intensity and location of particular activities and it is very difficult to confidently estimate emissions on a day-to-day basis.

Emissions of carbon monoxide (CO), nitrogen dioxide (NO_2), and sulphur dioxide (SO_2) will occur from diesel-powered plant and equipment used on-site and vehicle movements to site. However these emissions are typically minor for projects of this scale and too widely dispersed to give rise to significant off-site concentrations.

Procedures for controlling dust impacts during construction will include, but not necessarily be limited to the following:

9.1.1 Clearing / Excavation

Emissions from vegetation stripping, topsoil clearing and excavation can occur, particularly during dry and windy conditions. Emissions can be effectively controlled by increasing the moisture content of the soil / surface. Other controls that will be undertaken include:

- Modify working practices by limiting excavation during periods of high winds; and
- Limiting the extent of clearing of vegetation and topsoil to the designated footprint required for construction and appropriate staging of any clearing.

9.1.2 Mine Access Road Construction

The use of earth moving equipment can be significant sources of dust, and emissions should be controlled through the use of water sprays during road construction. Where conditions are excessively dusty and windy, and fugitive dust can be seen leaving the site, work practices can be modified by limiting scraper / grader activity, however there are no residences close to the proposed access road construction. The majority of the length of the mine access road is a considerable distance from occupied residential residences, with the closest section of the access route being approximately 500m to the closest occupied residence. Given the temporary nature of the access route construction and implementation of standard dust control measures, dust impacts are expected to be minor.

9.1.3 Haulage and Heavy Plant and Equipment

Vehicles travelling over paved or unpaved surfaces tend to produce wheel generated dust. The following measures should be implemented during construction to minimise dust emissions from these activities:

- All vehicles on-site should be confined to designated routes with speed limits enforced;
- Trips and trip distances should be controlled and reduced where possible, for example by coordinating delivery and removal of materials to avoid unnecessary trips; and
- When conditions are excessively dusty and windy, and dust can be seen leaving the works site the use of a water truck (for water spraying of travel routes) should be used.

9.1.4 Wind Erosion

Wind erosion from exposed surfaces during construction should be controlled as part of the best practice environmental management of the site. Wind erosion from exposed ground should be limited by avoiding unnecessary vegetation clearing and ensuring rehabilitation occurs as quickly as possible. Wind erosion from temporary stockpiles can be limited by minimising the number of stockpiles on-site and minimising the number of work faces on stockpiles.

9.1.5 Railway Construction

The following measures should be implemented during the construction of the rail spur and loop:

- Modify working practices by limiting clearing and excavation during periods of high winds;
- Limiting the extent of clearing of vegetation and topsoil to the designated footprint required for the rail corridor; and
- Use of water sprays during rail construction for dusty activities such as ballast dumping and compacting.

10 FUGITIVE DUST EMISSIONS FROM RAIL TRANSPORT

The Project will involve construction and operation of a rail spur, rail loop, associated load out facility and connection to the Werris Creek to Mungindi Railway Line. Dust emissions from train loading have been included as part of the mining operations. Impacts from the fugitive dust emissions from coal wagons during rail transportation are discussed below.

Fugitive dust from coal wagons, an emerging environmental and community issue, in terms of potential impacts on human health and amenity. Queensland Rail (QR) commissioned an environmental evaluation of coal dust emissions from rolling stock in the Central Queensland Coal Industry (**Connell Hatch, 2008**). The purpose of this study was to determine the extent of the issue and identify, if possible, any potential environmental harm caused by fugitive dust from coal wagons, in the context of nuisance and health impacts and to identify the potential reasonable and feasible measures that could reduce any environmental harm.

In terms of impacts on human health, the QR study concluded that there appears to be minimal risk of adverse impacts due to fugitive coal emissions from trains throughout the network, based on results of monitoring and modelling predictions. In terms of impacts on amenity, the results of monitoring and modelling indicate that nuisance coal dust at the edge of the rail corridor are below levels that are known to cause adverse impacts on amenity.

PAEHolmes has reviewed the QR study to determine if the conclusions presented are applicable to NSW based on, for example, differences in coal volumes, loading practices, train speeds, wagon shapes, coal properties, etc., and it was concluded that many of the observations from the QR study can be applied to the NSW network.

On the basis, the potential for environmental harm caused by the increased coal train movements from the Project is likely to be low, in terms of health and amenity impacts, beyond distances of approximately 15 m from the rail lines. There are no residences along the proposed rail spur located within 15 m of the rail line.

11 PROPOSED MITIGATION AND DUST MANAGEMENT MEASURES

11.1 Introduction

The Project has the potential to generate dust. It is therefore necessary to take reasonable and practicable measures to prevent or minimise dust impacts at sensitive residences.

The modelling results presented above are based on the assumption that the Proponent applies, as a minimum, levels of watering (or other controls) to achieve a minimum of 85% control on estimated haul road dust emissions.

The proponent is committed to leading practice dust management at the site through the use of a real-time and proactive dust management system. This would enable the Proponent to pro-actively manage the short-term impacts of the Project and prevent or minimise dust impacts at sensitive residences to the greatest practical extent. Further details on how this can be achieved are provided in **Section 11.2**.

Other control measures (minimise disturbance, prompt rehabilitation etc.) which have not necessarily been quantified in the modelling but would be undertaken by the Proponent as part of their dust management practices are outlined in **Section 11.3**.

Full details of the dust management measures would be outlined in an Environmental Management Plan and Environnmental Monitoring Program, which would be developed prior to the commencement of construction and mining activities.

11.2 Real-Time Proactive Dust Management

Dispersion modelling for the Project indicates that the most significant source of dust emissions, in terms of short term 24-hour impacts, results from the hauling of overburden and ROM coal. The proposed real-time dust management system is therefore discussed in specific relation to this dust source, however it is equally applicable to controlling excessive dust emissions from any source on-site.

The Proponent would be able to respond to the potential for excessive dust impacts through the use of a network of real-time dust monitors in the vicinity of the site. The real-time monitoring network would continuously log short-term dust concentrations (15min, 30min and 1 hour averages) and report the data via GPS/GRSM modem to a web based recording system. When certain short-term trigger levels are reached / exceeded, a message is delivered to the mine manager alerting him to the high dust levels. The on-site weather station could also report wind conditions at the time, allowing approapriate personnel to determine the origin of the elevated dust levels.

The short-term trigger levels (say 1-hour average) would be derived based on a statistical analysis of appropriate peak to mean ratios and set at a level were a few consecutive readings at these high levels risks a breach of the 24-hour impact assessment criteria. During the life of the Project, should more suitable technology become available, this system may be modified and enhanced.

An additional component of the dust management procedures would be to develop a meteorological and air quality forecasting system, similar to the forecasting system used in the Hunter Valley to manage potential adverse noise and vibration impacts from blasting. The Hunter Valley noise forecast system is used to predict weather conditions for the coming day to schedule the most suitable time for blasting. A similar system could be used for dust emissions to predict, one day in advance, what the meteorological conditions and air quality impact will be. This would allow the appropriate personnel to manage the intensity of activities for that day, increase controls or limit activity to various areas of the site.

11.3 Summary of Dust Management and Control Measures

The term "best practice" is frequently used in pollution control and pollution management. However, what constitutes "best practice" is difficult to define in practical situations. Environment Australia published a series of booklets in the 1990's to assist the mining industry with incorporating best practice environmental management through all phases of mineral production from exploration through construction and eventual closure. In the booklet for Dust Control (**Environment Australia, 1998**) they defined "best practice" as follows:

"Best Practice can be defined as the most practical and effective methodology that is currently in use or otherwise available. Best practice dust management can be achieved by appropriate planning in the case of new or expanding mining operations, and by identifying and controlling dust sources during the active phases of all mining operations."

This document has since been updated by the Department of Energy, Resources and Tourism (DERT) who have published the handbook *Leading Practice Sustainable Development Program for the Mining Industry* (**DERT, 2009**). This new handbook introduces the term "leading practice", in which:

"*...considers the latest and most appropriate technology applied in order to seeking better financial, social and environmental outcomes for present stakeholders and future generations.*"

The implementation of a reactive or proactive dust management system, as described above, is considered best and leading practice and would apply leading technology to achieve the best possible outcomes.

Other procedures proposed for the management of dust emissions from the Project have been considered against those determined to be leading practice in the **DERT (2009)** handbook.

Table 11.1 lists the sources of dust as a result of mine design, the proposed controls and identifies those considered to be leading practice. **Table 11.2** and **Table 11.3** list the different sources of wind-blown and mining-generated dust respectively, the proposed controls, and identify those considered to be leading-practice.

Table 11.1: Leading Practice Control Procedures for Mine Design

Source	Control Procedures	Applied at Maules Creek
Transport of coal	Largest practical truck size. Level 2 watering and additional control when required.	Yes Yes
Overburden dumps	Decreased overburden dump area to allow for increased rehabilitation. Designed to ensure rehabilitation of external faces is completed as soon as practical.	Yes Yes
Revegetation	Complete as soon as practical after disturbance. Apply as widely as practical.	Yes Yes

Table 11.2: Leading Practice Control Procedures for Wind-blown Dust

Source	Control Procedures	Applied at Maules Creek
Areas disturbed by mining	Disturb only the minimum area necessary for mining. Reshape, topsoil and rehabilitate completed overburden emplacement areas as soon as practicable after the completion of overburden tipping.	Yes
Coal handling areas / stockpiles	Automated water spray systems	Yes

Table 11.3: Leading Practice Controls for Mine-generated Dust

Source	Control procedures	Applied at Maules Creek
Haul Roads Within Disturbance Area	All unsealed haul roads will be watered or have a chemical suppressant applied.	Yes
Transportation of Overburden	Haul roads will be watered or chemical suppressant applied.	Yes
Transportation of Product Coal	Haul roads will be watered or chemical suppressant applied.	Yes
Topsoil Stripping	Access tracks used by topsoil stripping equipment during their loading and unloading cycle will be watered or chemical suppressant applied.	Yes
Blasting	Blasting performed during daylight hours.	Yes
Conveyors	All conveyors will have transfer points enclosed. Dust sprays/curtains are to be installed at transition points from transfer station.	Yes

11.4 Monitoring

The locations of the current monitoring stations are shown on **Figure 5.1** and it is envisaged that the monitoring network would be expanded for the operation of the Project. Aston is committed to working cooperatively with adjacent mining operations to develop an extensive regional monitoring network, and cooperative discussions have taken place and a cumulative air quality management plan is currently being drawn up.

While the full details of the regional air quality monitoring network are yet to be finalised, it is envisaged that the monitoring program specific to the Project would incorporate the following as a minimum:

- The current network of three deposition gauges would be expanded to include additional monitoring locations (at least five dust gauges) to monitor dust fallout at the closest private residence to the northwest, north and southwest of the Project Boundary;
- Continuous PM_{10} monitors would be installed as part of the real-time dust management systems at the closest private residence location to the northwest and at the Maules Creek Public School (residence ID 67);
- The existing HVAS may be relocated.

12 GREENHOUSE GAS ASSESSMENT

The Director-General's Environmental Assessment Requirements were received on 6 December 2010 with Greenhouse Gases identified as a key issue. The DGRs for greenhouse gas assessment require:

- Qualitative assessment of the potential scope 1, 2 and 3 greenhouse gas emissions of the project and identification of which emissions would be covered by the Commonwealth Government's proposed Carbon Pollution Reduction Scheme;
- A qualitative assessment of the potential impacts of these emissions on the environment; and
- An assessment of of all reasonable and feasible measures that could be implemented on site to minimise the greenhouse gas emissions of the project and ensure it is energy efficient.

12.1 Introduction

Greenhouse gas emissions have been estimated based upon the methods outlined in the following documents:

- The World Resources Institute/World Business Council for Sustainable Development Greenhouse Gas Protocol (**WBCSD**/**WRI 2004**) ;
- National Greenhouse and Energy Reporting (Measurement) Determination 2008; and
- The Australian Government Department of Climate Change and Energy Efficiency (DCCEE) National Greenhouse Accounts Factors 2010.

The Greenhouse Gas Protocol establishes an international standard for accounting and reporting of greenhouse gas emissions. The Greenhouse Gas Protocol has been adopted by the International Standard Organisation, endorsed by greenhouse gas initiatives (such as the Carbon Disclosure Project) and is compatible with existing greenhouse gas trading schemes.

Three 'scopes' of emissions (scope 1, scope 2 and scope 3) are defined for greenhouse gas accounting and reporting purposes. This terminology has been adopted in Australian greenhouse reporting and measurement methods and has been employed in this assessment. The 'scope' of an emission is relative to the reporting entity, indirect scope 2 and scope 3 emissions will be reportable as direct scope 1 emissions from another facility.

1) Scope 1: Direct Greenhouse Gas Emissions

Direct greenhouse gas emissions are defined as those emissions that occur from sources that are owned or controlled by the reporting entity. Direct greenhouse gas emissions are those emissions that are principally the result of the following types of activities undertaken by an entity:

- Generation of electricity, heat or steam. These emissions result from combustion of fuels in stationary sources, the principal source of greenhouse emissions associated with the operation of the Project;
- Physical or chemical processing. Most of these emissions result from manufacture or processing of chemicals and materials, e.g., the manufacture of cement, aluminium, etc;

- Transportation of materials, products, waste and employees. These emissions result from the combustion of fuels in entity owned/controlled mobile combustion sources (e.g. trucks, trains, ships, aeroplanes, buses and cars); and
- Fugitive emissions. These emissions result from intentional or unintentional releases (e.g. equipment leaks from joints, seals, packing, and gaskets; methane emissions from coal mines and venting); HFC emissions during the use of refrigeration and air conditioning equipment; and methane leakages from gas transport.

2) Scope 2: Energy Product Use Indirect Greenhouse Gas Emissions

Scope 2 emissions are a category of indirect emissions that account for greenhouse gas emissions from the generation of purchased energy products (principally, electricity, steam/heat and reduction materials used for smelting) by the entity.

Scope 2 in relation to the Project covers purchased electricity, defined as electricity that is purchased or otherwise brought into the organisational boundary of the entity. Scope 2 emissions physically occur at the facility where electricity is generated. Entities report the emissions from the generation of purchased electricity that is consumed in its owned or controlled equipment or operations as scope 2.

3) Scope 3: Other Indirect Greenhouse Gas Emissions

Scope 3 emissions are defined as those emissions that are a consequence of the activities of an entity, but which arise from sources not owned or controlled by that entity. Some examples of scope 3 activities provided in the Greenhouse Gas Protocol are extraction and production of purchased materials, transportation of purchased fuels, and use of sold products and services.

In the case of the Project, scope 3 emissions will include emissions associated with fuel cycles and the transport and combustion of product coal.

The Greenhouse Gas Protocol provides that reporting scope 3 emissions is optional. If an organisation believes that scope 3 emissions are a significant component of the total emissions inventory, these can be reported along with scope 1 and scope 2. However, the Greenhouse Gas Protocol notes that reporting scope 3 emissions can result in double counting of emissions and can also make comparisons between organisations and/or products difficult because reporting is voluntary.

Double counting needs to be avoided when compiling national (country) inventories under the Kyoto Protocol. The Greenhouse Gas Protocol also recognises that compliance regimes are more likely to focus on the "point of release" of emissions (i.e. direct emissions) and/or indirect emissions from the purchase of electricity.

12.2 Greenhouse Gas Assessment Policy Summary

12.2.1National Greenhouse and Energy Reporting Act

The *National Greenhouse and Energy Reporting Act 2007 (*NGER Act) was passed in September 2007. The NGER Act establishes a mandatory corporate reporting system for greenhouse gas emissions, energy consumption and production. The NGER scheme consolidates existing greenhouse reporting schemes. The NGER Act is underpinned by a number of legislative instruments that provide greater detail about obligations, which in conjunction with the NGER Act, form the National Greenhouse and Energy Reporting System, as follows:

- The National Greenhouse and Energy Reporting Regulations 2008; and
- The National Greenhouse and Energy Reporting (Measurement) Determination 2008.

NGER is seen as an important first step in the establishment of a domestic emissions trading scheme. Companies must register and report if they emit greenhouse emissions or produce/consume energy at or above the following trigger thresholds:

- If they own facilities that emit greater than 25 kilotonnes (kt) greenhouse emissions (expressed as CO_2-e) or produce consume greater than 100 terajoules (TJ) of energy; and
- If the corporate group emits greater than 125 kt of greenhouse emissions (expressed as CO_2-e) or produce consume greater than 500 TJ of energy.

Scope 1 and Scope 2 greenhouse gas emissions are required to be reported under the NGER Act.

12.2.2Carbon Pollution Reduction Scheme

A green paper detailing Australia's plans to implement a domestic emissions trading scheme was released on the 16 July 2008. A subsequent white paper was released in December 2008 (**DCC, 2008**) with the intent that a Carbon Pollution Reduction Scheme (CPRS) would commence in July 2010. The proposed CPRS is a 'cap and trade' emissions trading mechanism scheme whereby emitters of greenhouse gases greater than 25,000 t carbon dioxide-equivalent (CO_2-e) (Scope 1 only) are required to purchase a permit for every tonne of greenhouse gas that they emit.

Due to the global financial crisis, the proposed start date was deferred to July 2011. Legislation was introduced to Parliament in May 2009, and again in November 2009 but was voted down in the senate. On 27 April 2010, the Prime Minister announced that the Government has decided to delay the implementation of the CPRS until after the end of the current commitment period of the Kyoto Protocol and only when there is greater clarity on the action of other major economies including the US, China and India.

12.3 Greenhouse Gas Emission Estimates

Emissions of CO_2 and CH_4 will be the most significant greenhouse gases for the Project. These gases are formed and released during the combustion of fuels used on site and from fugitive emissions occurring during the mining process, due to the fracturing of coal seams.

Inventories of greenhouse gas emissions can be calculated using published emission factors. Different gases have different greenhouse warming effects (referred to as global warming potentials) and emission factors take into account the global warming potentials of the gases created during combustion. The estimated emissions are referred to in terms of carbon dioxide equivalent or CO_2-equivalent (CO_2-e) emissions by applying the relevant global warming potential.

The greenhouse gas assessment has been conducted using the National Greenhouse Accounts (NGA) Factors, published by the Department of Climate Change and Energy Efficiency (**DCCEE, 2010**). Project-related greenhouse gas sources included in the assessment are as follows:

- Fuel consumption (diesel) during mining operations – Scope 1;
- Release of fugitive CH_4 during mining – Scope 1;
- Indirect emissions resulting from the consumption of purchased electricity - Scope 2;
- Indirect emissions associated with the production and transport of fuels – Scope 3;
- Indirect emissions associated with transmission and distribution losses from electricity supply – Scope 3;
- Emissions from coal transportation – Scope 3; and
- Emissions from the burning of the product coal – Scope 3.

Emissions from the shipping of product coal are not included in this assessment due to the difficulties in emission estimates, including uncertainty in export markets and destination of product into the future and limited data on emission factors and / or fuel consumption for ocean going vessels.

12.3.1On-site Fuel Consumption

Greenhouse gas emissions from diesel consumption were estimated using the following equation:

$$E_{CO_2-e} = \frac{Q \times EF}{1000}$$

where:

E_{CO2-e}	=	Emissions of GHG from diesel combustion	(t CO_2-e)
Q	=	Estimated combustion of diesel	(GJ)[1]
EF	=	Emission factor (Scope 1 or Scope 3)for diesel combustion	(kg CO_2-e/GJ)[2]

[1] GJ = giga joules

[2] kg CO_2-e/GJ = kilograms of carbon dioxide equivalents per gigajoule

The quantity of diesel consumed (kL) in each year has been provided by the proponent. The quantity of diesel consumed (Q) in GJ is then calculated using an energy content factor for diesel of 38.6 gigajoules per kilolitre (GJ/kL).

Greenhouse gas emission factors and energy content for diesel were sourced from the NGA Factors (**DCCEE, 2010**). The estimated annual and project total GHG emissions from diesel usage are presented in **Table 12.1**.

Table 12.1: Estimated CO_2-e (tonnes) for On-site Diesel Consumption

Year	Consumption (kL)	Emission Factor (kg CO2-e/GJ		Energy Content (GJ/kL)	Emissions (t co2-e)		Total
		Scope 1	Scope 3		Scope 1	Scope 3	
1	22,806	69.5	5.3	38.6	61,181	4,666	65,846
2	51,006	69.5	5.3	38.6	136,835	10,435	147,270
3	70,514	69.5	5.3	38.6	189,167	14,426	203,592
4	70,900	69.5	5.3	38.6	190,204	14,505	204,709
5	69,399	69.5	5.3	38.6	186,176	14,198	200,373
6	69,311	69.5	5.3	38.6	185,942	14,180	200,121
7	69,281	69.5	5.3	38.6	185,859	14,173	200,032
8	69,360	69.5	5.3	38.6	186,072	14,190	200,262
9	69,367	69.5	5.3	38.6	186,090	14,191	200,281
10	70,334	69.5	5.3	38.6	188,685	14,389	203,074
11	70,276	69.5	5.3	38.6	188,528	14,377	202,905
12	70,283	69.5	5.3	38.6	188,548	14,379	202,927
13	70,347	69.5	5.3	38.6	188,720	14,392	203,111
14	70,288	69.5	5.3	38.6	188,561	14,379	202,940
15	74,683	69.5	5.3	38.6	200,353	15,279	215,632
16	74,708	69.5	5.3	38.6	200,420	15,284	215,704
17	74,700	69.5	5.3	38.6	200,398	15,282	215,681
18	84,896	69.5	5.3	38.6	227,751	17,368	245,120
19	84,953	69.5	5.3	38.6	227,904	17,380	245,284
20	84,945	69.5	5.3	38.6	227,881	17,378	245,259
21	84,945	69.5	5.3	38.6	227,881	17,378	245,259
Total					**3,963,158**	**302,226**	**4,265,384**

12.3.2Electricity

Greenhouse gas emissions from electricity usage were estimated using the following equation:

$$E_{CO_2-e} = \frac{Q \times EF}{1000}$$

where:

E_{CO2-e}	=	Emissions of greenhouse gases from electricity usage	(tCO_2-e/annum)
Q	=	Estimated electricity usage	(kWh/annum)[1]
EF	=	Emission factor (Scope 2 or Scope 3) for electricity usage	($kgCO_2$-e/kWh)[2]

[1] kWh/annum = kilowatt hours per annum

[2] $kgCO_2$-e/kWh = kilograms of carbon dioxide equivalents per kilowatt hour

An estimate of the quantity of electricity used in years 2013, 2014 and 2015 has been provided by the proponent. This was used to derive an intensity factor based on the ROM coal rate (kWh/Mtpa) and used to estimate the electricity consumptions of all years.

Greenhouse gas emission factors were sourced from the NGA Factors (**DCCEE, 2010**). The estimated annual and project total GHG emissions from electricity usage are presented in **Table 12.2**.

Table 12.2: Estimated CO_2-e (tonnes) for On-site Electricity Use

Year	Electricity Use (kWh/annum)	Emission Factor (kg CO2-e/kWh)		Emissions (t CO2-e)		Total
		Scope 2	Scope 3	Scope 2	Scope 3	
1	18,618,514	0.89	0.18	16,570	3,351	19,922
2	30,870,485	0.89	0.18	27,475	5,557	33,031
3	57,330,900	0.89	0.18	51,025	10,320	61,344
4	57,330,900	0.89	0.18	51,025	10,320	61,344
5	60,760,954	0.89	0.18	54,077	10,937	65,014
6	55,370,869	0.89	0.18	49,280	9,967	59,247
7	55,370,869	0.89	0.18	49,280	9,967	59,247
8	63,701,000	0.89	0.18	56,694	11,466	68,160
9	63,701,000	0.89	0.18	56,694	11,466	68,160
10	62,230,977	0.89	0.18	55,386	11,202	66,587
11	60,270,946	0.89	0.18	53,641	10,849	64,490
12	58,800,923	0.89	0.18	52,333	10,584	62,917
13	60,760,954	0.89	0.18	54,077	10,937	65,014
14	63,701,000	0.89	0.18	56,694	11,466	68,160
15	54,635,858	0.89	0.18	48,626	9,834	58,460
16	56,350,885	0.89	0.18	50,152	10,143	60,295
17	61,740,969	0.89	0.18	54,949	11,113	66,063
18	63,701,000	0.89	0.18	56,694	11,466	68,160
19	59,780,938	0.89	0.18	53,205	10,761	63,966
20	58,800,923	0.89	0.18	52,333	10,584	62,917
21	63,701,000	0.89	0.18	56,694	11,466	68,160
Total				**1,056,903**	**213,756**	**1,270,659**

12.3.3 Fugitive Methane Emissions

Emissions from fugitive CH_4 were estimated based on the using the following equation:

$$E_{co2-e} = Q \times EF$$

where:

E_{CO2-e}	=	Emissions of greenhouse gases from fugitive CH_4	(t CO_2-e/annum)
Q	=	ROM coal extracted during the year	(t)
EF	=	Site Specific Emission Factor	(t CO_2-e/tonne)

A site specific emission factor for fugitive methane has been derived based on measurements of gas content for boreholes samples taken for each coal seam by GeoGas. The measured gas content in m^3/t was converted to t CO2-e / t using the measured % gas composition (reported for CH_4 and CO_2) and using the conversion factors reported in the NGERs Technical Guidelines (**DCC, 2009**) to convert from m3 to CO_2-e tonnes, as follows:

- For methane – $6.784 \times 10^{-4} \times 21$
- For CO_2 – 1.861×10^{-3}

The derived site specific emission factor and estimated annual and project total GHG emissions from fugitive methane are presented in **Table 12.3**.

Table 12.3: Estimated CO_2-e (tonnes) for Fugitive Methane

Year	ROM (Mtpa)	Site Specific EF (t CO2-e/t)	Total Emission (t CO2-e)
1	3.8	0.001	2,224
2	6.3	0.001	3,688
3	11.7	0.001	6,849
4	11.7	0.001	6,849
5	12.4	0.001	7,258
6	11.3	0.001	6,614
7	11.3	0.001	6,614
8	13.0	0.001	7,610
9	13.0	0.001	7,610
10	12.7	0.001	7,434
11	12.3	0.001	7,200
12	12.0	0.001	7,024
13	12.4	0.001	7,258
14	13.0	0.001	7,610
15	11.2	0.001	6,527
16	11.5	0.001	6,732
17	12.6	0.001	7,375
18	13.0	0.001	7,610
19	12.2	0.001	7,141
20	12.0	0.001	7,024
21	13.0	0.001	7,610
Total			**141,859**

12.3.4Explosives

Emissions from explosive usage were estimated based on the using the following equation:

$$E_{co2-e} = Q \times EF$$

where:

E_{CO2-e}	=	Emissions of greenhouse gases from explosives	(tCO_2-e/annum)
Q	=	Quantity of explosive used (assumed ANFO)	(t)
EF	=	Scope 1 emission factor	(tCO_2-e/tonne explosive)

Greenhouse gas emission factors were sourced from the Australian Greenhouse Office (AGO) Factors and Methods Workbook – December 2006. It is noted that the AGO Factors and Methods were replaced by the NGA Factors (**DCCEE, 2010**), however the emission factor for explosives was dropped from the latest version. Emissions from explosives do not have to be reported under NGERS.

The estimated annual and project total GHG emissions from explosive usage are presented in **Table 9.4.**

Table 12.4: Estimated CO_2-e (tonnes) for Explosive Use

Year	ROM (Mtpa)	Scope 1 Emissions (t co2-e)
1	3.8	635
2	6.3	1,052
3	11.7	1,954
4	11.7	1,954
5	12.4	2,071
6	11.3	1,887
7	11.3	1,887
8	13.0	2,171
9	13.0	2,171
10	12.7	2,121
11	12.3	2,054
12	12.0	2,004
13	12.4	2,071
14	13.0	2,171
15	11.2	1,862
16	11.5	1,921
17	12.6	2,104
18	13.0	2,171
19	12.2	2,037
20	12.0	2,004
21	13.0	2,171
Total		**40,472**

12.3.5Other Scope 3 Emissions

12.3.5.1Transportation

Emissions from coal transportation have been estimated based on all product coal being transported via rail to Newcastle for export. Emissions associated with product coal transportation have been estimated based on an emission factor for loaded trains of 12.3 g/net tonne-km (**QR Network Access, 2002**). Emission factors were not available for unloaded trains so the factor for loaded trains is conservatively applied for the return trip. The return rail trip to Newcastle is estimated to be 728 km.

The total estimated GHG emissions from rail transport are provided in **Table 12.5**.

Table 12.5: Estimated CO_2-e (tonnes) for Rail Transportation

Year	Product Coal Mtpa	t CO2-e
1	3.8	34,023
2	6.3	56,413
3	11.7	104,766
4	11.7	104,766
5	12.4	111,035
6	11.3	101,185
7	11.3	101,185
8	13.0	116,407
9	13.0	116,407
10	12.7	113,721
11	12.3	110,139
12	12.0	107,453
13	12.4	111,035
14	13.0	116,407
15	11.2	99,842
16	11.5	102,976
17	12.6	112,825
18	13.0	116,407
19	12.2	109,244
20	12.0	107,453
21	13.0	116,407
Total		**2,170,096**

12.3.5.2Use of Product Coal

The Project would produce approximately 43% thermal coal and 57% coking coal. Greenhouse gas emissions from the use of product coal were estimated using the following equation:

$$E_{CO_2-e} = \frac{Q \times EC \times EF}{1000}$$

Where:

E_{CO2-e}	=	Emissions of GHG from coal combustion	(t CO_2-e)
Q	=	Quantity of product coal burnt	(GJ)
EC	=	Energy Content Factor for black / coking coal	(GJ/t)[1]
EF	=	Emission factor for black / coking coal combustion	(kg CO_2-e/GJ)

[1] GJ/t = gigajoules per tonne

The quantity of thermal coal burnt in Mtpa is converted to GJ using an energy content factor for black coal of 27 GJ/t. The quantity of coking coal burnt in Mtpa is converted to GJ using an energy content factor for coking coal of 30 GJ/t. The greenhouse gas emission factor and energy content for coal were sourced from the NGA Factors (**DCCEE, 2010**).

The emissions associated with burning of the product coal are presented in **Table 12.6**.

Table 12.6: Scope 3 Emissions for Product Coal

Year	Product Coal Mtpa	Scope 3 Emissions (t CO2-e)
1	3.8	9,762,918
2	6.3	16,187,436
3	11.7	30,062,381
4	11.7	30,062,381
5	12.4	31,860,985
6	11.3	29,034,608
7	11.3	29,034,608
8	13.0	33,402,646
9	13.0	33,402,646
10	12.7	32,631,816
11	12.3	31,604,042
12	12.0	30,833,212
13	12.4	31,860,985
14	13.0	33,402,646
15	11.2	28,649,192
16	11.5	29,548,494
17	12.6	32,374,872
18	13.0	33,402,646
19	12.2	31,347,098
20	12.0	30,833,212
21	13.0	33,402,646
Total	**242.3**	**622,701,470**

12.4 Summary of GHG Emissions

A summary of the total GHG emissions associated with the Project are presented in **Table 12.7**. The emissions from the burning the product coal will be much larger than those associated with the extraction and processing of the coal. These are indirect emissions (Scope 3) from sources not owned or controlled by Aston, and therefore measures to minimise or reduce these emissions cannot be made by Aston.

Table 12.7: Summary of GHG Emissions (t CO_2-e)

Emission Source	Scope 1	Scope 2	Scope 3	Total
Average t CO_2-e/annum				
Diesel	188,722		14,392	203,114
Electricity		50,329	10,179	60,508
Explosives	1,927			1,927
Fugitive Methane	6,755			6,755
Coal Transportation			103,338	103,338
Coal Burning			29,652,451	29,652,451
Total – Annual	**197,404**	**50,329**	**29,780,359**	**30,028,092**
Total – 2012 - 2032	**4,145,489**	**1,056,903**	**625,387,548**	**630,589,940**

12.5 Assessment of Potential Impact on Environment

Australia ratified the Kyoto Protocol in December 2007, an international agreement under the United Nations Framework on Climate Change (UNFCC) that was agreed in 1997. The aim of the Protocol is to reduce global greenhouse gas emissions by requiring developed countries to meet national targets for greenhouse gas emissions over the five year period from 2008 to 2012.

A comparison is therefore made with the baseline 1990 Australian emissions, which are reported under the Kyoto Protocol as 547.7 Mt CO_2-e (**DCC, 2009a**). The baseline is used to assign Australian target under the Kyoto Protocol, which is 108% of the 1990 level. Comparing the average annual Scope 1 emissions from the Project against the 1990 baseline indicates that the Project emissions are 0.04% of the 1990 levels.

The relationship between GHG emissions and global warming is not linear and there is no accepted method to determine the contribution that a given emission of GHGs might make to global warming.

The estimated quantity of carbon dioxide stored in the atmosphere now is approximately 3,000 Gigatonnes (Gt). The International Energy Agency estimates that in 2007, global emissions of CO_2 from burning fossil fuels were 28,962 Mt, of which Australia's emissions of CO_2 from burning fossil fuels were 396.3 Mt CO_2 (i.e. approximately 1.4% of the global anthropogenic, or human-related, total) (**IEA, 2009**).

At any point in time, it would be reasonably simple to compare the estimated emission of CO_2-e from the various activities with the 3,000 Gt of CO_2-e currently estimated to be stored in the atmosphere. On this basis, average annual emissions over the lifetime of the proposal from the mining and burning of coal (including mining, transporting the coal to the Port of Newcastle and usage of the coal) are estimated to be 0.001% of the current global CO_2–e atmospheric load. Thus, the proposal could be considered to contribute 0.001% to the increase in global temperatures caused by the increase in GHG emissions as they are currently. This invites the question as to what temperature rise might be attributed to the GHG emissions from the proposal.

Based on the IPPC estimate that a doubling of the CO_2-e concentration in the atmosphere would lead to a 2.5°C increase in global average temperature and that the current global CO_2–e load is approximately 3,000 Gt, it can be estimated that the annual average emissions (Scope 1, 2 and 3) during the life of proposal (including mining, transporting the coal to the Port of Newcastle and overseas and usage of the coal) could lead to an annual increase in global temperature of 0.00003 C (0.001% of 2.5°C). Based on the above, there is not likely to be any measurable environmental effect due to the emissions of GHGs from the proposal, i.e. the contribution of the project to GHG emissions will be negligible. In practice, of course, the effects of global warming and associated climate change are the cumulative effect of many thousands of such sources.

12.6 GHG Emission Reduction Measures

Aston has plans and standards to minimize energy usage and GHG emissions from its operations, including the Maules Creek Project. These plans include objectives, commitments, procedures and responsibilities for:

- researching and promoting low emission coal technologies;
- improving energy use and efficiency and reducing GHG emissions from the mining, processing and use of coal;
- consideration of the use of alternative fuels where economically and practically feasible;
- review of mining practices to minimise double handling of materials and ensuring that coal and overburden haulage is undertaken using the most efficient routes;
- ongoing scheduled and preventative maintenance to ensure that diesel and electrically powered plant operate efficiently; and
- develop targets for greenhouse gas emissions and energy use onsite and monitor and report against these.

13 CONCLUSIONS

This assessment has investigated the potential air quality impacts of the Maules Creek Coal Project with respect to air quality and greenhouse gas emissions.

Dispersion modelling has been used to predict off-site dust concentration and dust deposition levels due to the dust generating activities that would occur as a result the Project. Emissions inventories were developed for Year 5, Year 10, Year 15 and Year 21 of the Project. The dispersion conditions for the area where characterised based on regional and local meteorological data, generated using a diagnostic meteorological modelling system known as CALMET. The annual winds predicted by CALMET correlate well with the windroses presented for the Maules Creek AWS, based on the available data collected to date. The US EPA's ISCMOD model was used to predict the maximum 24-hour PM_{10}, annual average PM_{10}, annual average TSP and annual average dust deposition (insoluble solids).

Constraints analyses identified that wheel generated dust emissions contributed the most to air quality impacts from the Project and additional levels of control were incorporated into the model.

Detailed modelling was conducted to assess whether the proposed mining operations of the Project would adversely impact any privately owned or mine-owned residences located within the vicinity of the Project Boundary. The assessment included predictions of air quality impacts from the Project in isolation as well as the potential cumulative impacts of other neighbouring mines in the region and other sources. The modelling indicates that over the 21 year approval period for the Project there will be some residences that have the potential to experience dust concentrations above the DECCW's air quality assessment criteria. These residences are summarised in **Table 13.1**.

Generally, the predictions presented in this report incorporate a level of conservatism due to worst case assumptions and the nature of dispersion modelling. As a result, it is expected that actual ground level concentrations would be lower during the normal operation of the Project.

Nothwithstanding, it is proposed that the worst case impacts would be managed on a day to day basis using a network of real-time monitoring stations, which will enable mine personnel to repond to high dust levels prior to reaching critical levels and modify activities or increase controls as required.

The potential greenhouse gas emissions that are likely to occur as a result of the operation of the Project have been estimated based on an inventory for each year of the Project's life. On average, Scope 1 emissions from the Project would increase annual emissions by 0.04% of the 1990 baseline Austrlaian levels.

Table 13.1: Residences with potential to experience dust levels above the DECCW criteria

Residence ID	Potential Impact
108	24-hour PM_{10} impacts above 50 µg/m^3 occur but for less than 5 days per year from the Project alone.
111a	24-hour PM_{10} impacts above 50 µg/m^3 occur but for less than 5 days per year from the Project alone.
116	24-hour PM_{10} impacts above 50 µg/m^3 occur but for less than 5 days per year from the Project alone.
118a and b	24-hour PM_{10} impacts above 50 µg/m^3 occur on more than 5 days per year from the Project alone. Cumulative annual average PM_{10} concentrations above 30 µg/m^3 based on conservative worst case assessment.
122	24-hour PM_{10} impacts above 50 µg/m^3 occur but for less than 5 days per year from the Project alone.
126	24-hour PM_{10} impacts above 50 µg/m^3 occur on more than 5 days per year from Project alone. Cumulative annual average PM_{10} concentrations above 30 µg/m^3 based on conservative worst case assessment.

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APPENDIX A

MGA Coordinates for Privately owned residences

Owner	ID	Easting (m)	Northing (m)
IB Norrie	17	216087	6620560
DR & JJ Whan	42	221008	6622989
LD Holmes	53	222640	6623169
KR Druce	61	218978	6607553
Minister for Education	67	224663	6622882
Minister for Education & Training	68	224647	6623045
The Trustees of the Roman Catholic Church for the Diocese of Armidale	82	226710	6622596
GL & LE & AG Hamblin	103	216993	6618950
LA & SL Leitch	104	217645	6619724
DM & MSR Williams	105	218162	6621049
PC Leitch	106	220929	6622297
JM Morris	108a	220674	6619192
JM Morris	108b	220516	6619302
PF Murphy	111a	221259	6619459
PF Murphy	111b	221892	6622027
PR Hobden	116	222636	6622078
MJ & ML Nott	118a	222566	6619098
MJ & ML Nott	118b	222307	6618093
MJ & ML Nott	120	219142	6613044
L & SN Compton	122	223615	6621450
JR Holmes	123	224133	6621384
DJC Watson	126	223924	6618520
VA & MA Younger	134	226813	6622256
CM Morse	147	228786	6621781
Morse Investments Pty Limited	162	231908	6620584
Morse Investments Pty Limited	166	231738	6620627
PD & LA Finlay	168	231337	6620804
Hamblin Pastoral Co Pty Limited	207	214491	6617781
Riverway Boggabri Pty Ltd	225	217042	6613024
FJ Maunder	233	211026	6610655
JA Bastardo	236	216326	6613103
RB & ML Kerr	241	211734	6610487
Glek Pty Limited	242	213174	6609920
DW & AM Keys	250	216316	6603024
RW & A Grover	256	217441	6607153
RW & A Grover	259	217179	6606721
RJ & EJ Browning	264	217945	6604853
RJ Heiler	267	219634	6605613
RJ Heiler	269	220062	6603953
DV & RJ Gillham	273	219478	6604993
HM Lockwood	277	224398	6604361
RP & RD McGregor	279	226807	6603994
DJ Wellwood	281a	229146	6603708
DJ Wellwood	281b	229050	6603181
Bank of NSW	283	234041	6613317
VP & SM McAuliffe	285	233537	6611781
VP & SM McAuliffe	287	233417	6611067
JE & RJ Picton	291	235621	6608536
JE & RJ Picton	305	236034	6605990
JE & RJ Picton	313	236290	6608669

APPENDIX B

CALMET and inputs

CALMET is a meteorological pre-processor that includes a wind field generator containing objective analysis and parameterised treatments of slope flows, terrain effects and terrain blocking effects. The pre-processor produces fields of wind components, air temperature, relative humidity, mixing height and other micro-meteorological variables to produce the three-dimensional meteorological fields that can be utilised to generate meteorological files suitable for dispersion modelling using ISCST3. CALMET uses the meteorological inputs in combination with land use and geophysical information for the modelling domain to predict gridded meteorological fields for the region.

CALMET was initially run for a coarse outer grid domain of 90 km x 90 km, centred near the Project site, with a 2 km resolution. The reason for modelling an outer meteorological domain to feed the inner grid was to allow cloud data from distant Bureau of Meteorology (BoM) monitoring sites to be incorporated, in the absence of any available local data at a finer modelling resolution.

Observed hourly data from the Maules Creek AWS, Boggabri Coal Mine AWS, Tarrawonga Coal Mine AWs, plus the Bureau of Meteorology (BoM) sites located at Narrabri Airport AWS were used as input for CALMET. Cloud amount and cloud heights were sourced from observations at Tamworth Airport AWS. Upper air data were also extracted from TAPM[e] to provide the necessary upper air files.

CALMET outputs from the outer grid were then used as input into the finer resolution inner grid domain of 15 km x 15 km, centred on the Project site. The inner grid modelling was used to create a fine resolution three-dimensional meteorological field for the area around the Project site.

A summary of the inputs, including the seven critical values, is shown in **Table B1**. The performance of the CALMET model is compared with the annual wind roses from Maules Creek. A detailed analysis is provided in **Section 5.1.1**.

[e] The Air Pollution Model, or TAPM, is a three dimensional meteorological and air pollution model developed by the CSIRO Division of Atmospheric Research. A detailed description of the TAPM model and its performance is provided elsewhere, (Hurley, 2002a, 2002b; Hurley *et al*., 2002a, 2002b; Hibberd *et al*., 2003; Luhar & Hurley, 2003). TAPM was set up with 4 domains, with a resolution of 30 km, 10 km, 3 km and 1 km respectively. To improve model accuracy, observed wind conditions from Appin Power Station , Camden Airport AWS, Campbelltown Airport AWS and Bellambi AWS were used to improve the TAPM solution.

Table B1: Meteorological Parameters used for TAPM and CALMET

TAPM (v 4.0)		
Number of grids (spacing)	4 (30 km, 10 km, 3 km, 1 km)	
Number of grid points	25 x 25 x 25	
Year of analysis	1/1/2010 to 31/12/2010	
Centre of analysis	Maules Creek Mine (30°32.5' S, 150°17 E)	
CALMET (v. 6.4.0.05) - Outer Grid		
Meteorological grid domain	90 km x 90 km	
Meteorological grid resolution	2 km	
Grid origin	178.405 km 6566.296 km (UTM Zone 56)	
Surface meteorological stations	Maules Creek AWS Boggabri Coal Mine AWS Tarrawonga Coal Mine AWS Narrabri Airport AWS TAPM with no observations Tamworth Airport AWS	
Upper air	Data extracted from TAPM	
Seven critical values	TERRAD RMAX1 RMAX2 R1 R2 1EXTRP BIAS 1 2 3 4 5 6 7	10 km 2 km 4 km 1 km 2 km -4 -1 -1 -0.5 0 0 0 0
CALMET (v. 6.4.0.05) - Inner Grid		
Meteorological grid domain	15 km x 15 km	
Meteorological grid resolution	0.3 km	
Grid origin	215.663 km 6609.058 km (UTM Zone 56)	
Surface meteorological stations	Maules Creek AWS Boggabri Coal Mine AWS Tarrawonga Coal Mine AWS TAPM with Boggabri Coal Mine AWS observations	
Upper air	Data extracted from TAPM	
Seven critical values	TERRAD RMAX1 RMAX2 R1 R2 1EXTRP BIAS 1 2 3 4 5 6 7	3 km 0.1 km 0.5 km 0.1 km 0.1 km -4 -1 0 0 0 0 0 0

APPENDIX C

Wind speed and stability class stable for CALMET

STATISTICS FOR FILE: C:\Jobs\3768_MaulesCreek\met\CALMET_2010.isc
MONTHS: All
HOURS : All
OPTION: Counts

PASQUILL STABILITY CLASS 'A'

Wind Speed Class (m/s)

WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	00000001	00000001	00000000	00000000	00000000	00000000	00000000	00000000	00000002
NE	00000004	00000007	00000000	00000000	00000000	00000000	00000000	00000000	00000011
ENE	00000004	00000012	00000000	00000000	00000000	00000000	00000000	00000000	00000016
E	00000006	00000031	00000000	00000000	00000000	00000000	00000000	00000000	00000037
ESE	00000019	00000017	00000000	00000000	00000000	00000000	00000000	00000000	00000036
SE	00000016	00000023	00000000	00000000	00000000	00000000	00000000	00000000	00000039
SSE	00000019	00000016	00000000	00000000	00000000	00000000	00000000	00000000	00000035
S	00000008	00000017	00000000	00000000	00000000	00000000	00000000	00000000	00000025
SSW	00000008	00000027	00000000	00000000	00000000	00000000	00000000	00000000	00000035
SW	00000007	00000034	00000000	00000000	00000000	00000000	00000000	00000000	00000041
WSW	00000008	00000019	00000000	00000000	00000000	00000000	00000000	00000000	00000027
W	00000005	00000012	00000000	00000000	00000000	00000000	00000000	00000000	00000017
WNW	00000004	00000011	00000000	00000000	00000000	00000000	00000000	00000000	00000015
NW	00000000	00000006	00000000	00000000	00000000	00000000	00000000	00000000	00000006
NNW	00000001	00000002	00000000	00000000	00000000	00000000	00000000	00000000	00000003
N	00000002	00000003	00000000	00000000	00000000	00000000	00000000	00000000	00000005
CALM									00000060
TOTAL	00000112	00000238	00000000	00000000	00000000	00000000	00000000	00000000	00000410

MEAN WIND SPEED (m/s) = 1.61
NUMBER OF OBSERVATIONS = 410

PASQUILL STABILITY CLASS 'B'

Wind Speed Class (m/s)

WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	00000012	00000007	00000004	00000001	00000000	00000000	00000000	00000000	00000024
NE	00000023	00000021	00000026	00000002	00000000	00000000	00000000	00000000	00000072
ENE	00000038	00000044	00000022	00000001	00000000	00000000	00000000	00000000	00000105
E	00000043	00000046	00000011	00000000	00000000	00000000	00000000	00000000	00000100
ESE	00000039	00000038	00000008	00000002	00000000	00000000	00000000	00000000	00000087
SE	00000072	00000076	00000034	00000000	00000000	00000000	00000000	00000000	00000182
SSE	00000045	00000073	00000035	00000000	00000000	00000000	00000000	00000000	00000153
S	00000043	00000065	00000019	00000000	00000000	00000000	00000000	00000000	00000127
SSW	00000043	00000065	00000020	00000000	00000000	00000000	00000000	00000000	00000128
SW	00000048	00000071	00000029	00000000	00000000	00000000	00000000	00000000	00000148
WSW	00000020	00000038	00000021	00000001	00000000	00000000	00000000	00000000	00000080
W	00000035	00000057	00000042	00000000	00000000	00000000	00000000	00000000	00000134
WNW	00000047	00000062	00000052	00000000	00000000	00000000	00000000	00000000	00000161
NW	00000010	00000019	00000008	00000000	00000000	00000000	00000000	00000000	00000037
NNW	00000003	00000009	00000005	00000002	00000000	00000000	00000000	00000000	00000019
N	00000010	00000008	00000011	00000000	00000000	00000000	00000000	00000000	00000029
CALM									00000175
TOTAL	00000531	00000699	00000347	00000009	00000000	00000000	00000000	00000000	00001761

MEAN WIND SPEED (m/s) = 2.00
NUMBER OF OBSERVATIONS = 1761

PASQUILL STABILITY CLASS 'C'

Wind Speed Class (m/s)

WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	00000005	00000005	00000005	00000006	00000000	00000000	00000000	00000000	00000021
NE	00000015	00000017	00000007	00000017	00000007	00000000	00000000	00000000	00000063
ENE	00000014	00000027	00000023	00000009	00000000	00000000	00000000	00000000	00000073
E	00000013	00000023	00000018	00000002	00000000	00000000	00000000	00000000	00000056
ESE	00000011	00000025	00000012	00000013	00000001	00000000	00000000	00000000	00000062
SE	00000035	00000086	00000068	00000013	00000004	00000001	00000000	00000000	00000207
SSE	00000013	00000071	00000047	00000019	00000004	00000001	00000000	00000000	00000155
S	00000022	00000048	00000030	00000005	00000000	00000000	00000000	00000000	00000105
SSW	00000015	00000046	00000012	00000001	00000000	00000000	00000000	00000000	00000074
SW	00000015	00000026	00000030	00000008	00000000	00000000	00000000	00000000	00000079
WSW	00000011	00000015	00000014	00000009	00000003	00000000	00000000	00000000	00000052
W	00000020	00000036	00000028	00000017	00000001	00000000	00000000	00000000	00000102
WNW	00000008	00000042	00000071	00000046	00000002	00000000	00000000	00000000	00000169
NW	00000005	00000012	00000014	00000006	00000000	00000000	00000000	00000000	00000037
NNW	00000001	00000007	00000004	00000005	00000001	00000000	00000000	00000000	00000018
N	00000003	00000002	00000010	00000010	00000005	00000001	00000000	00000000	00000031
CALM									00000147
TOTAL	00000206	00000488	00000393	00000186	00000028	00000003	00000000	00000000	00001451

MEAN WIND SPEED (m/s) = 2.83
NUMBER OF OBSERVATIONS = 1451

PASQUILL STABILITY CLASS 'D'

Wind Speed Class (m/s)

WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	00000000	00000003	00000006	00000010	00000023	00000009	00000002	00000000	00000053
NE	00000000	00000014	00000004	00000011	00000010	00000000	00000000	00000000	00000039
ENE	00000000	00000018	00000007	00000010	00000009	00000000	00000001	00000000	00000045
E	00000001	00000018	00000006	00000005	00000004	00000000	00000000	00000000	00000034
ESE	00000000	00000013	00000005	00000002	00000000	00000001	00000000	00000000	00000021
SE	00000001	00000051	00000023	00000042	00000039	00000010	00000000	00000000	00000166
SSE	00000001	00000036	00000015	00000040	00000057	00000004	00000002	00000000	00000155
S	00000001	00000016	00000006	00000013	00000006	00000000	00000000	00000000	00000042
SSW	00000001	00000013	00000006	00000000	00000001	00000000	00000000	00000000	00000021
SW	00000000	00000012	00000011	00000006	00000002	00000001	00000000	00000000	00000032
WSW	00000001	00000012	00000012	00000010	00000003	00000001	00000000	00000000	00000039
W	00000002	00000017	00000022	00000015	00000005	00000002	00000000	00000000	00000063
WNW	00000000	00000025	00000023	00000025	00000014	00000002	00000000	00000000	00000089
NW	00000000	00000008	00000006	00000003	00000001	00000001	00000000	00000000	00000019
NNW	00000000	00000008	00000002	00000006	00000004	00000000	00000000	00000000	00000020
N	00000000	00000003	00000007	00000033	00000055	00000028	00000012	00000000	00000138
CALM									00000005
TOTAL	00000008	00000267	00000161	00000231	00000233	00000059	00000017	00000000	00000981

MEAN WIND SPEED (m/s) = 4.79

NUMBER OF OBSERVATIONS = 981

PASQUILL STABILITY CLASS 'E'

Wind Speed Class (m/s)

WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	00000000	00000002	00000006	00000005	00000000	00000000	00000000	00000000	00000013
NE	00000000	00000000	00000018	00000008	00000000	00000000	00000000	00000000	00000026
ENE	00000000	00000000	00000030	00000007	00000000	00000000	00000000	00000000	00000037
E	00000000	00000000	00000066	00000001	00000000	00000000	00000000	00000000	00000067
ESE	00000000	00000001	00000011	00000002	00000000	00000000	00000000	00000000	00000014
SE	00000000	00000003	00000069	00000049	00000000	00000000	00000000	00000000	00000121
SSE	00000000	00000001	00000058	00000044	00000000	00000000	00000000	00000000	00000103
S	00000000	00000004	00000023	00000005	00000000	00000000	00000000	00000000	00000032
SSW	00000000	00000001	00000008	00000002	00000000	00000000	00000000	00000000	00000011
SW	00000000	00000000	00000011	00000004	00000000	00000000	00000000	00000000	00000015
WSW	00000000	00000001	00000008	00000002	00000000	00000000	00000000	00000000	00000011
W	00000000	00000001	00000013	00000005	00000000	00000000	00000000	00000000	00000019
WNW	00000000	00000010	00000021	00000009	00000000	00000000	00000000	00000000	00000040
NW	00000000	00000002	00000004	00000003	00000000	00000000	00000000	00000000	00000009
NNW	00000000	00000000	00000006	00000001	00000000	00000000	00000000	00000000	00000007
N	00000000	00000002	00000029	00000007	00000000	00000000	00000000	00000000	00000038
CALM									00000000
TOTAL	00000000	00000028	00000381	00000154	00000000	00000000	00000000	00000000	00000563

MEAN WIND SPEED (m/s) = 4.12
NUMBER OF OBSERVATIONS = 563

PASQUILL STABILITY CLASS 'F'

Wind Speed Class (m/s)

WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	00000057	00000020	00000006	00000000	00000000	00000000	00000000	00000000	00000083
NE	00000066	00000069	00000007	00000000	00000000	00000000	00000000	00000000	00000142
ENE	00000061	00000061	00000012	00000000	00000000	00000000	00000000	00000000	00000134
E	00000060	00000097	00000009	00000000	00000000	00000000	00000000	00000000	00000166
ESE	00000096	00000091	00000012	00000000	00000000	00000000	00000000	00000000	00000199
SE	00000206	00000288	00000048	00000000	00000000	00000000	00000000	00000000	00000542
SSE	00000140	00000178	00000049	00000000	00000000	00000000	00000000	00000000	00000367
S	00000083	00000104	00000019	00000000	00000000	00000000	00000000	00000000	00000206
SSW	00000069	00000053	00000002	00000000	00000000	00000000	00000000	00000000	00000124
SW	00000050	00000022	00000004	00000000	00000000	00000000	00000000	00000000	00000076
WSW	00000081	00000061	00000001	00000000	00000000	00000000	00000000	00000000	00000143
W	00000090	00000090	00000006	00000000	00000000	00000000	00000000	00000000	00000186
WNW	00000039	00000033	00000005	00000000	00000000	00000000	00000000	00000000	00000077
NW	00000010	00000010	00000001	00000000	00000000	00000000	00000000	00000000	00000021
NNW	00000003	00000010	00000001	00000000	00000000	00000000	00000000	00000000	00000014
N	00000002	00000014	00000003	00000000	00000000	00000000	00000000	00000000	00000019
CALM									00001093
TOTAL	00001113	00001201	00000185	00000000	00000000	00000000	00000000	00000000	00003592

MEAN WIND SPEED (m/s) = 1.39
NUMBER OF OBSERVATIONS = 3592

ALL PASQUILL STABILITY CLASSES

Wind Speed Class (m/s)

WIND SECTOR	0.50 TO 1.50	1.50 TO 3.00	3.00 TO 4.50	4.50 TO 6.00	6.00 TO 7.50	7.50 TO 9.00	9.00 TO 10.50	GREATER THAN 10.50	TOTAL
NNE	00000075	00000038	00000027	00000022	00000023	00000009	00000002	00000000	00000196
NE	00000108	00000128	00000062	00000038	00000017	00000000	00000000	00000000	00000353
ENE	00000117	00000162	00000094	00000027	00000009	00000000	00000001	00000000	00000410
E	00000123	00000215	00000110	00000008	00000004	00000000	00000000	00000000	00000460
ESE	00000165	00000185	00000048	00000019	00000001	00000001	00000000	00000000	00000419
SE	00000330	00000527	00000242	00000104	00000043	00000011	00000000	00000000	00001257
SSE	00000218	00000375	00000204	00000103	00000061	00000005	00000002	00000000	00000968
S	00000157	00000254	00000097	00000023	00000006	00000000	00000000	00000000	00000537
SSW	00000136	00000205	00000048	00000003	00000001	00000000	00000000	00000000	00000393
SW	00000120	00000165	00000085	00000018	00000002	00000001	00000000	00000000	00000391
WSW	00000121	00000146	00000056	00000022	00000006	00000001	00000000	00000000	00000352
W	00000152	00000213	00000111	00000037	00000006	00000002	00000000	00000000	00000521
WNW	00000098	00000183	00000172	00000080	00000016	00000002	00000000	00000000	00000551
NW	00000025	00000057	00000033	00000012	00000001	00000001	00000000	00000000	00000129
NNW	00000008	00000036	00000018	00000014	00000005	00000000	00000000	00000000	00000081
N	00000017	00000032	00000060	00000050	00000060	00000029	00000012	00000000	00000260
CALM									00001480
TOTAL	00001970	00002921	00001467	00000580	00000261	00000062	00000017	00000000	00008758

MEAN WIND SPEED (m/s) = 2.32
NUMBER OF OBSERVATIONS = 8758

FREQUENCY OF OCCURENCE OF STABILITY CLASSES

A : 4.7%
B : 20.1%
C : 16.6%
D : 11.2%
E : 6.4%
F : 41.0%

STABILITY CLASS BY HOUR OF DAY

Hour	A	B	C	D	E	F
01	0000	0000	0000	0023	0045	0297
02	0000	0000	0000	0026	0033	0306
03	0000	0000	0000	0025	0044	0296
04	0000	0000	0000	0029	0040	0296
05	0000	0000	0066	0071	0027	0201
06	0000	0050	0117	0082	0009	0107
07	0000	0097	0173	0092	0000	0003
08	0014	0214	0098	0038	0000	0001
09	0010	0234	0092	0029	0000	0000
10	0099	0169	0082	0015	0000	0000
11	0110	0192	0053	0010	0000	0000
12	0099	0195	0057	0014	0000	0000
13	0072	0185	0089	0019	0000	0000
14	0004	0199	0132	0030	0000	0000
15	0002	0156	0175	0032	0000	0000
16	0000	0045	0193	0127	0000	0000
17	0000	0025	0096	0131	0016	0097
18	0000	0000	0028	0086	0032	0219

19	0000	0000	0000	0017	0043	0305
20	0000	0000	0000	0014	0060	0291
21	0000	0000	0000	0016	0065	0284
22	0000	0000	0000	0014	0059	0292
23	0000	0000	0000	0017	0047	0300
24	0000	0000	0000	0024	0043	0297

STABILITY CLASS BY MIXING HEIGHT

Mixing height	A	B	C	D	E	F
<=500 m	0000	0250	0446	0294	0449	3592
<=1000 m	0038	0414	0233	0256	0114	0000
<=1500 m	0108	0423	0302	0219	0000	0000
<=2000 m	0164	0357	0244	0139	0000	0000
<=3000 m	0100	0317	0226	0073	0000	0000
>3000 m	0000	0000	0000	0000	0000	0000

MIXING HEIGHT BY HOUR OF DAY

Hour	0000 to 0100	0100 to 0200	0200 to 0400	0400 to 0800	0800 to 1600	1600 to 3200	Greater than 3200
01	0239	0049	0042	0020	0015	0000	0000
02	0260	0040	0029	0019	0016	0001	0000
03	0247	0041	0036	0025	0014	0002	0000
04	0254	0035	0032	0026	0017	0001	0000
05	0251	0043	0021	0028	0021	0001	0000
06	0158	0044	0078	0063	0020	0002	0000
07	0072	0031	0085	0128	0048	0001	0000
08	0001	0018	0084	0164	0097	0001	0000
09	0000	0000	0026	0143	0194	0002	0000
10	0000	0000	0000	0091	0234	0040	0000
11	0000	0000	0000	0023	0215	0127	0000
12	0000	0000	0000	0005	0162	0198	0000
13	0000	0000	0000	0001	0148	0216	0000
14	0000	0000	0000	0000	0138	0227	0000
15	0000	0000	0000	0000	0134	0231	0000
16	0039	0007	0006	0003	0099	0211	0000
17	0114	0031	0028	0023	0025	0144	0000
18	0205	0061	0042	0032	0006	0019	0000
19	0238	0042	0053	0024	0008	0000	0000
20	0219	0054	0064	0021	0006	0001	0000
21	0239	0033	0055	0032	0006	0000	0000
22	0241	0035	0058	0023	0007	0001	0000
23	0241	0048	0034	0030	0011	0000	0000
24	0238	0046	0040	0022	0018	0000	0000

APPENDIX D

PM_{10} monitoring data

Date	Boggabri Coal Mine HVAS	Tarrawonga Coal Mine HVAS
28/04/2007	8	
5/05/2007		49
11/05/2007		14
17/05/2007		11
22/05/2007	8	
23/05/2007		9
28/05/2007	5	
29/05/2007		17
3/06/2007	5	
4/06/2007		4
9/06/2007	4	
10/06/2007		2
15/06/2007	5	
16/06/2007		1
21/06/2007	5	
22/06/2007		0
27/06/2007	11	
28/06/2007		0
4/07/2007	6	4
10/07/2007	7	3
15/07/2007	10	
16/07/2007		7
21/07/2007	9	
22/07/2007		5
28/07/2007	4	6
3/08/2007		5
9/08/2007		14
15/08/2007		18
21/08/2007	15	2
26/08/2007	16	
27/08/2007		3
1/09/2007	12	
2/09/2007		12
7/09/2007	11	
8/09/2007		3
14/09/2007	28	27
19/09/2007	38	
20/09/2007		32
25/09/2007	31	
26/09/2007		30
1/10/2007	22	
2/10/2007		33
7/10/2007	26	
8/10/2007		25
14/10/2007		20
19/10/2007	28	
20/10/2007		29
25/10/2007	14	
26/10/2007		29
31/10/2007	18	
1/11/2007		13
6/11/2007	5	

Date	Boggabri Coal Mine HVAS	Tarrawonga Coal Mine HVAS
7/11/2007		3
12/11/2007	26	
13/11/2007		11
18/11/2007	11	
19/11/2007		12
24/11/2007	16	
25/11/2007		8
30/11/2007	9	
1/12/2007		4
6/12/2007	15	
7/12/2007		10
12/12/2007	11	
13/12/2007		9
18/12/2007	21	
19/12/2007		10
25/12/2007		12
25/12/2007		12
30/12/2007	7	
31/12/2007		15
5/01/2008	12	
6/01/2008		17
11/01/2008	2	
12/01/2008		25
17/01/2008	15	
18/01/2008		17
23/01/2008	9	
24/01/2008		21
29/01/2008	8	
30/01/2008		32
4/02/2008	7	
5/02/2008		9
10/02/2008	2	
11/02/2008		12
16/02/2008	20	
17/02/2008		6
22/02/2008	6	
23/02/2008		42
28/02/2008	2	
29/02/2008		5
5/03/2008	11	
6/03/2008		27
11/03/2008	5	
12/03/2008		32
18/03/2008	15	22
23/03/2008	0	
24/03/2008		24
29/03/2008	19	
30/03/2008		18
5/04/2008	8	18
11/04/2008		11
17/04/2008		11
22/04/2008	5	

Date	Boggabri Coal Mine HVAS	Tarrawonga Coal Mine HVAS
23/04/2008		1
28/04/2008	6	
29/04/2008		3
4/05/2008	1	
5/05/2008		26
11/05/2008		8
16/05/2008	5	
17/05/2008		15
22/05/2008	2	
23/05/2008		4
28/05/2008	1	
29/05/2008		13
3/06/2008	3	
4/06/2008		2
9/06/2008	6	
10/06/2008		4
15/06/2008	2	
16/06/2008		1
21/06/2008	3	
22/06/2008		1
28/06/2008		9
3/07/2008	9	
4/07/2008		4
9/07/2008	3	
10/07/2008		1
15/07/2008	5	
16/07/2008		3
21/07/2008	7	
22/07/2008		9
27/07/2008	8	
28/07/2008		1
2/08/2008	5	
3/08/2008		1
8/08/2008	9	
9/08/2008		3
14/08/2008	11	
15/08/2008		5
20/08/2008	8	
21/08/2008		10
26/08/2008	11	
27/08/2008		18
1/09/2008	34	
2/09/2008		4
7/09/2008	18	
8/09/2008		4
13/09/2008	26	
14/09/2008		11
19/09/2008	20	
20/09/2008		32
25/09/2008	30	
26/09/2008		6
1/10/2008	10	

Date	Boggabri Coal Mine HVAS	Tarrawonga Coal Mine HVAS
2/10/2008		31
7/10/2008	10	
8/10/2008		9
13/10/2008	12	
14/10/2008		9
19/10/2008	7	
20/10/2008		25
25/10/2008	14	
26/10/2008		14
1/11/2008		25
6/11/2008	17	
7/11/2008		18
12/11/2008	21	
13/11/2008		22
18/11/2008	25	
19/11/2008		2
24/11/2008	11	
25/11/2008		9
30/11/2008	14	
1/12/2008		13
6/12/2008	19	
7/12/2008		13
12/12/2008	28	
13/12/2008		13
18/12/2008	18	
19/12/2008		13
24/12/2008	28	
25/12/2008		13
30/12/2008	20	
31/12/2008		13
6/01/2009		15
12/01/2009		13
18/01/2009		14
24/01/2009		14
30/01/2009		14
5/02/2009		18
11/02/2009		22
17/02/2009	9	2
23/02/2009	21	20
1/03/2009	15	24
7/03/2009	18	26
13/03/2009	19	22
19/03/2009	25	40
25/03/2009	14	45
31/03/2009	8	6
6/04/2009	14	6
12/04/2009	8	3
18/04/2009	30	23
24/04/2009	17	13
30/04/2009	25	17
6/05/2009	14	37
12/05/2009	27	36

Date	Boggabri Coal Mine HVAS	Tarrawonga Coal Mine HVAS
18/05/2009		24
19/05/2009	8	
24/05/2009		12
25/05/2009	9	
30/05/2009		6
31/05/2009	11	
5/06/2009		2
6/06/2009	9	
11/06/2009		9
12/06/2009	10	
17/06/2009		1
18/06/2009	10	
23/06/2009		1
24/06/2009	10	
29/06/2009		4
30/06/2009	15	
5/07/2009		2
6/07/2009	15	
11/07/2009		11
12/07/2009	8	
17/07/2009		3
18/07/2009	15	
23/07/2009		14
24/07/2009	9	
29/07/2009		1
30/07/2009	18	
4/08/2009		6
5/08/2009	14	
10/08/2009		23
16/08/2009		30
17/08/2009	16	
22/08/2009		27
23/08/2009	17	
28/08/2009		24
29/08/2009	9	
3/09/2009		25
4/09/2009	26	
9/09/2009		4
10/09/2009	33	
15/09/2009		32
16/09/2009	18	
21/09/2009		20
24/09/2009	22	
27/09/2009		**54**
30/09/2009	17	
3/10/2009		36
6/10/2009	19	
9/10/2009		14
13/10/2009	35	
15/10/2009		39
19/10/2009	27	
21/10/2009		40

Date	Boggabri Coal Mine HVAS	Tarrawonga Coal Mine HVAS
25/10/2009	16	
27/10/2009		4
31/10/2009	11	
2/11/2009		21
6/11/2009	0	
8/11/2009		8
12/11/2009	27	
14/11/2009		20
19/11/2009	**87**	
20/11/2009		**54**
25/11/2009	37	
26/11/2009		33
1/12/2009	0	
2/12/2009		14
7/12/2009	50	
8/12/2009		**97**
13/12/2009	44	
14/12/2009		**68**
20/12/2009	26	20
26/12/2009	28	17
1/01/2010		9
7/01/2010		23
9/01/2010	29	
9/01/2010	29	
13/01/2010		35
15/01/2010	18	
19/01/2010		32
21/01/2010	8	
25/01/2010		37
27/01/2010	11	
31/01/2010		11
2/02/2010	28	
6/02/2010		12
8/02/2010	17	
12/02/2010		7
14/02/2010	17	
18/02/2010		18
20/02/2010	24	
2/03/2010	13	
8/03/2010	8	18
14/03/2010	10	8
20/03/2010	7	27
26/03/2010	16	**91**
1/04/2010	16	5
7/04/2010	21	5
13/04/2010	19	13
19/04/2010	17	11
25/04/2010	16	6

APPENDIX E

Details of dust emissions estimates

Maules Creek Mine Project

The dust emission inventories have been prepared using the operational description of the proposed mining activities provided by Hansen Bailey on behalf of the Proponent. Estimated emissions are presented for all significant dust generating activities associated with the operations.

The relevant emission factors used for the study are described below.

Stripping topsoil

For a scraper clearing and stripping topsoil a TSP emission rate of 1.64 kg/VKT has been used (**NPI EET for Mining v2.3**).

Drilling overburden and coal

The emission factor used for drilling has been taken to be 0.59 kg/hole (US EPA, 1985 and updates).

Blasting overburden and coal

TSP emissions from blasting were estimated using the **US EPA (1985 and updates)** emission factor equation given in Equation 1.

Equation 1

$$E_{TSP} = 0.00022 \times A^{1.5} \quad \text{kg/blast}$$

where,

A = area to be blasted in m^2

Loading material / dumping overburden

Each tonne of material loaded will generate a quantity of TSP that will depend on the wind speed and the moisture content. Equation 2 shows the relationship between these variables.

Equation 2

$$E_{TSP} = k \times 0.0016 \times \left(\frac{\left(\frac{U}{2.2}\right)^{1.3}}{\left(\frac{M}{2}\right)^{1.4}} \right) \quad kg/t$$

where,

$E_{TSP} = TSP$ *emissions*

$k = 0.74$

U = *wind speed (m/s)*

M = *moisture content (%)*

[where $0.25 \le M \le 4.8$]

Hauling material / product on unsealed surfaces

The latest wheel generated dust equation made available from the **NPI EET for Mining v2.3** require information on the surface material silt content and surface material moisture content.

As this information is not available the default emissions factor of 4.0 kg/VKT **(SPCC, 1983)** has been used in combination with the control measures described in **Section** 9 to achieve 75% control for day to day operations. On days when it is anticipated that weather conditions will result in high TSP emission from the haulage by trucks additional measures would be in place to achieve 85% control.

Dozers working on overburden
Emissions from dozers on overburden have been calculated using the US EPA emission factor equation (**US EPA, 1985 and updates**). The equation is as follows:
Equation 4

$$E_{TSP} = 2.6 \times \frac{s^{1.2}}{M^{1.3}} \quad \text{kg/hour}$$

where,

$E_{TSP} = TSP\ emissions$

s = silt content (%), and

M = moisture (%)

Dozers working on coal
The **US EPA (1985 and updates)** emission factor equation has been used. It is given below in Equation 5.

Equation 5

$$E_{TSP} = 35.6 \times \frac{s^{1.2}}{m^{1.4}} \quad kg/hour¶$$

Where,
s = silt content (%), and
M = moisture (%)

Loading/unloading coal
The **US EPA (1985 and updates)** emission factor equation has been used. It is given below in Equation 6.
Equation 6

$$E_{TSP} = \frac{0.580}{M^{1.2}} \quad \text{kg/t}$$

where,

$E_{TSP} = TSP\ emissions$

M = moisture (%)

Sorting of coal in sizer
The estimated TSP emissions that would arise as a result of sorting ROM coal by the sizer has used the default emissions factors of 0.01kg/tonne as per the **NPI EET for Mining v2.3**.

Loading / unloading / transfer of coal
See equation 3.

Wind erosion
The latest wind erosion equation made available from the **US EPA (1985 and updates)** require information on the threshold frictional velocity for the surface of the exposed area.

As this information is not available the default emission factor of 0.4 kg/ha/h **(SPCC, 1983)** has been used to estimate TSP emissions for wind erosion.

It has been assumed that any inactive dump areas that have not yet been rehabilitated would be reduced by 40%. A control measure of 30% for wind breaks has also been accounted for at the product stockpiles.

Grading roads
Estimates of TSP emissions from grading roads have been made using the **US EPA (1985 and updates)** emission factor equation (Equation 8).
Equation 8

$$E_{TSP} = 0.0034 \times S^{2.5} \qquad \text{kg/VKT}$$

where,
S = speed of the grader in km/h (taken to be 8 km/h)

The following tables present the calculated emissions for Year 5, year 10, Year 15 and Year 21 which correspond to the sources allocations as represented in **Figure 6.1**.

The abbreviations used in the tables are as follows:

- OB - overburden related activities
- CL - coal related activities
- WE - wind erosion emissions

Estimated emissions of TSP for Year 5

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units
Topsoil Removal- Scraper clearing and striping	35,424	21,600	VKT	1.6	kg/vkt						
OB - Drilling	28,044	47,533	holes/y	0.59	kg/hole						
OB - Blasting	131,788	158	blasts/y	834	kg/blast	24314	Area of blast in square metres	301	holes/blast		
OB - D10 Dozers removing OB	283,831	16,960	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - Excavator loading OB to haul truck	237,546	170,894,600	t/y	0.001	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Hauling to OOP Dump	3,402,356	124,753,058	t/y	0.027	kg/t	330	t/truck load	9.0	km/return trip	1.0	kg/VKT
OB - Hauling to Inpit Dump	559,291	46,141,542	t/y	0.012	kg/t	330	t/truck load	4.0	km/return trip	1.0	kg/VKT
OB - Emplacing at OOP Dump	173,409	124,753,058	t/y	0.001	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Emplacing at Inpit dump	64,137	46,141,542	t/y	0.001	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - D10 Dozers on OB in OOP Dump	51,799	3,095	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB in Inpit Dump	19,159	1,145	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB working on rehabilitation	8,368	500	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
CL - D11 Dozers ripping/pushing/clean-up	220,958	19,500	h/y	11.3	kg/h	5	silt content in %	9	moisture content in %		
CL - Loading ROM coal to trucks with excavator	514,942	12,400,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Hauling open pit coal to ROM hopper	326,316	12,400,000	t/y	0.026	kg/t	190	t/load	5.0	km/return trip	1.0	kg/VKT
CL - Unloading ROM to hopper	514,942	12,400,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Sizer	124,000	12,400,000	t/y	0.01	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 55% to Processing Circuit (CHPP)	1,154	6,820,000	t/y	0.0002	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 45% to Bypass Circuit	944	5,580,000	t/y	0.0002	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from bypass)	944	5,580,000	t/y	0.0002	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from CHPP)	776	6,069,800	t/y	0.0001	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL- Cat 854 Dozers at Product stockpiles	49,624	5,800	h/y	8.6	kg/h	5	silt content in %	11	moisture content in %		
CL - Loading product coal to trains	1,489	11,649,800	t/y	0.0001	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Loading Trucks with Coarse Rejects	81	637,670	t/y	0.0001	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Hauling rejects from Rejects Bin to dump	20,137	637,670	t/y	0.03	kg/t	190.0	t/truck load	6.0	km/return trip	1.0	
CL - Unloading Coarse Rejects	81	637,670	t/y	0.0001	kg/t	1.174	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
WE - OOP OB dump area	699,153	199.5	ha	0.4	kg/ha/h	8,760	h/y				
WE - Inpit OB dump area	285,716	81.5	ha	0.4	kg/ha/h	8,760	h/y				
WE - Open pit	420,410	171.4	ha	0.4	kg/ha/h	8,760	h/y	0.7	% Control		
WE - Product stockpiles	26,280	7.5	ha	0.4	kg/ha/h	8,760	h/y				
Grading roads	104,383	169,600	km	0.62	kg/km	8	speed of graders in km/h	21200	grader hours		
Total TSP emissions for Yr 15 (kg/yr)	**8,307,485**										
Tarrawonga Coal Mine	828,600										
Boggabri Coal Mine	7,218,763										

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DUST EMISSION CALCULATIONS V2

Output emissions file : C:\Jobs\3768_MaulesCreek\2010_met\Year5\Y5_emiss.dat
Meteorological file : C:\Jobs\3768_MaulesCreek\met\CALMET_2010.isc
Number of dust sources : 68
Number of activities : 31
No-blast conditions : None
Wind sensitive factor : 1.174 (1.174 adjusted for activity hours)
Wind erosion factor : 37.634

-----ACTIVITY SUMMARY-----
ACTIVITY NAME : Topsoil Removal- Scraper clearing and striping
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 35424 kg/y
FROM SOURCES : 9
1 2 3 4 5 6 7 8 9
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - Drilling
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 28044 kg/y
FROM SOURCES : 10
1 2 3 4 5 6 7 8 9 29
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - Blasting
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 131788 kg/y
FROM SOURCES : 10
1 2 3 4 5 6 7 8 9 29
HOURS OF DAY :
0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0

ACTIVITY NAME : OB - D10 Dozers removing OB
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 283831 kg/y
FROM SOURCES : 18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 29
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - Excavator loading OB to haul truck
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 237546 kg/y
FROM SOURCES : 18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 29
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - Hauling to OOP Dump
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 2041414 kg/y
FROM SOURCES : 20
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - Hauling to Inpit Dump
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 335575 kg/y
FROM SOURCES : 12
17 18 19 20 21 22 23 24 25 26 27 28
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - Emplacing at OOP Dump
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 173409 kg/y
FROM SOURCES : 18
35 36 37 38 39 40 44 45 46 47 48 49 50 51 52 53 54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - Emplacing at Inpit dump
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 64137 kg/y
FROM SOURCES : 13
18 19 20 21 23 24 25 26 27 28 41 42 43
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - D10 Dozers on OB in OOP Dump
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 51799 kg/y
FROM SOURCES : 18
35 36 37 38 39 40 44 45 46 47 48 49 50 51 52 53 54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - D10 Dozers on OB in Inpit Dump
ACTIVITY TYPE : Wind insensitive

DUST EMISSION : 19159 kg/y
FROM SOURCES : 13
18 19 20 21 23 24 25 26 27 28 41 42 43
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - D10 Dozers on OB working on rehabilitation
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 8368 kg/y
FROM SOURCES : 9
56 57 58 59 60 61 62 63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - D11 Dozers ripping/pushing/clean-up
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 220958 kg/y
FROM SOURCES : 18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 29
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading ROM coal to trucks with excavator
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 514942 kg/y
FROM SOURCES : 18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 29
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling open pit coal to ROM hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 195789 kg/y
FROM SOURCES : 13
17 18 19 20 21 22 26 27 28 29 30 31 32
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading ROM to hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 514942 kg/y
FROM SOURCES : 1
65
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Sizer
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 124000 kg/y
FROM SOURCES : 1
65
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 55% to Processing Circuit (CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1154 kg/y
FROM SOURCES : 1
65
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 45% to Bypass Circuit
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 944 kg/y
FROM SOURCES : 1
65
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from bypass)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 944 kg/y
FROM SOURCES : 2
66 67
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 776 kg/y
FROM SOURCES : 2
66 67
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL- Cat 854 Dozers at Product stockpiles
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 49624 kg/y
FROM SOURCES : 2
66 67
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading product coal to trains

ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1489 kg/y
FROM SOURCES : 1
68
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading Trucks with Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 81 kg/y
FROM SOURCES : 1
65
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling rejects from Rejects Bin to dump
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 12082 kg/y
FROM SOURCES : 15
18 19 20 21 22 23 24 25 26 27 33 34 35 36 37
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 81 kg/y
FROM SOURCES : 32
18 19 20 21 22 23 24 25 26 27 28 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - OOP OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 699153 kg/y
FROM SOURCES : 18
35 36 37 38 39 40 44 45 46 47 48 49 50 51 52 53 54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Inpit OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 285716 kg/y
FROM SOURCES : 14
18 19 20 21 22 23 24 25 26 27 28 41 42 43
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Open pit
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 420410 kg/y
FROM SOURCES : 18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 29
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Product stockpiles
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 26280 kg/y
FROM SOURCES : 2
66 67
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : Grading roads
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 104383 kg/y
FROM SOURCES : 64
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
54 55 56 57 58 59 60 61 62 63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Pit retention sources: 18
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 29

Estimated emissions of TSP for Year 10

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units
Topsoil Removal- Scarper clearing and striping	35,424	21,600	VKT	1.6	kg/vkt						
OB - Drilling	27,998	47,454	holes/y	0.59	kg/hole						
OB - Blasting	131,477	158	blasts/y	832	kg/blast	24276	Area of blast in square metres	300	holes/blast		
OB - D10 Dozers removing OB	283,831	16,960	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - Excavator loading OB to haul truck	268,099	170,894,600	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Hauling to OOP Dump	774,722	29,052,082	t/y	0.027	kg/t	330	t/truck load	8.8	km/return trip	1.0	kg/VKT
OB - Hauling to Inpit Dump	4,298,258	141,842,518	t/y	0.030	kg/t	330	t/truck load	10.0	km/return trip	1.0	kg/VKT
OB - Emplacing at OOP Dump	45,577	29,052,082	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Emplacing at Inpit dump	222,523	141,842,518	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - D10 Dozers on OB in OOP Dump	12,063	721	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB in Inpit Dump	58,895	3,519	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB working on rehabilitation	8,368	500	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
CL - D11 Dozers ripping/pushing/clean-up	220,958	19,500	h/y	11.3	kg/h	5	silt content in %	9	moisture content in %		
CL - Loading ROM coal to trucks with excavator	527,401	12,700,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Hauling open pit coal to ROM hopper	481,263	12,700,000	t/y	0.038	kg/t	190	t/load	7.2	km/return trip	1.0	kg/VKT
CL - Unloading ROM to hopper	527,401	12,700,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Sizer	127,000	12,700,000	t/y	0.01	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 55% to Processing Circuit (CHPP)	1,334	6,985,000	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 45% to Bypass Circuit	1,092	5,715,000	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from bypass)	1,092	5,715,000	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from CHPP)	897	6,216,650	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL- Cat 854 Dozers at Product stockpiles	49,624	5,800	h/y	8.6	kg/h	5	silt content in %	11	moisture content in %		
CL - Loading product coal to trains	1,721	11,931,650	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Loading Trucks with Coarse Rejects	89	614,680	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Hauling rejects from Rejects Bin to dump	20,058	614,680	t/y	0.03	kg/t	190.0	t/truck load	6.2	km/return trip	1.0	
CL - Unloading Coarse Rejects	89	614,680	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
WE - OOP OB dump area	549,567	156.8	ha	0.4	kg/ha/h	8,760	h/y				
WE - Inpit OB dump area	933,886	266.5	ha	0.4	kg/ha/h	8,760	h/y				
WE - Open pit	417,467	170.2	ha	0.4	kg/ha/h	8,760	h/y	0.7	30% Control		
WE - Product stockpiles	26,280	7.5	ha	0.4	kg/ha/h	8,760	h/y				
Grading roads	104,383	169,600	km	0.62	kg/km	8	speed of graders in km/h	21200	grader hours		
Total TSP emissions for Yr 15 (kg/yr)	**10,158,835**										
Tarrawonga Coal Mine	N/A										
Boggabri Coal Mine	7,512,014										

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 DUST EMISSION CALCULATIONS V2
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 Output emissions file  : C:\Jobs\3768_MaulesCreek\2010_met\Year10\Y10_emiss.dat
 Meteorological file    : C:\Jobs\3768_MaulesCreek\met\CALMET_2010.isc
 Number of dust sources : 65
 Number of activities   : 31
 No-blast conditions    : None
 Wind sensitive factor  : 1.174 (1.174 adjusted for activity hours)
 Wind erosion factor    : 37.634

  -----ACTIVITY SUMMARY-----
 ACTIVITY NAME : Topsoil Removal- Scarper clearing and striping
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 35424 kg/y
 FROM SOURCES  : 8
1 2 3 4 5 6 7 8
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Drilling
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 27998 kg/y
 FROM SOURCES  : 8
1 2 3 4 5 6 7 8
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Blasting
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 131477 kg/y
 FROM SOURCES  : 8
1 2 3 4 5 6 7 8
 HOURS OF DAY  :
0 0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0

 ACTIVITY NAME : OB - D10 Dozers removing OB
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 283831 kg/y
 FROM SOURCES  : 14
1 2 3 4 5 6 7 8 9 19 20 54 55 56
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Excavator loading OB to haul truck
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 237546 kg/y
 FROM SOURCES  : 14
1 2 3 4 5 6 7 8 9 19 20 54 55 56
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Hauling to OOP Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 464833 kg/y
 FROM SOURCES  : 20
9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Hauling to Inpit Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 2578955 kg/y
 FROM SOURCES  : 8
9 10 11 12 13 16 17 18
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Emplacing at OOP Dump
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 40383 kg/y
 FROM SOURCES  : 12
26 27 28 29 30 31 32 33 34 35 36 37
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Emplacing at Inpit dump
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 197163 kg/y
 FROM SOURCES  : 23
10 11 12 13 16 17 18 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - D10 Dozers on OB in OOP Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 7096 kg/y
 FROM SOURCES  : 12
26 27 28 29 30 31 32 33 34 35 36 37
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - D10 Dozers on OB in Inpit Dump
 ACTIVITY TYPE : Wind insensitive
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DUST EMISSION : 58895 kg/y
FROM SOURCES : 19
16 17 18 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - D10 Dozers on OB working on rehabilitation
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 8368 kg/y
FROM SOURCES : 5
57 58 59 60 61
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - D11 Dozers ripping/pushing/clean-up
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 220958 kg/y
FROM SOURCES : 11
1 2 3 4 5 6 7 8 54 55 56
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading ROM coal to trucks with excavator
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 527401 kg/y
FROM SOURCES : 11
1 2 3 4 5 6 7 8 54 55 56
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling open pit coal to ROM hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 288758 kg/y
FROM SOURCES : 17
9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading ROM to hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 527401 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Sizer
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 127000 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 55% to Processing Circuit (CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1182 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 45% to Bypass Circuit
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 967 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from bypass)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 967 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 794 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL- Cat 854 Dozers at Product stockpiles
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 49624 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading product coal to trains

ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1525 kg/y
FROM SOURCES : 1
65
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading Trucks with Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 79 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling rejects from Rejects Bin to dump
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 12035 kg/y
FROM SOURCES : 12
11 12 13 14 15 17 18 24 25 26 27 28
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 79 kg/y
FROM SOURCES : 34
11 12 13 14 17 18 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - OOP OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 549567 kg/y
FROM SOURCES : 12
26 27 28 29 30 31 32 33 34 35 36 37
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Inpit OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 933886 kg/y
FROM SOURCES : 24
10 11 12 13 14 16 17 18 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Open pit
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 417467 kg/y
FROM SOURCES : 14
1 2 3 4 5 6 7 8 9 19 20 54 55 56
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Product stockpiles
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 26280 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : Grading roads
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 104383 kg/y
FROM SOURCES : 61
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
54 55 56 57 58 59 60 61
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Pit retention sources: 14
1 2 3 4 5 6 7 8 9 19 20 54 55 56

Estimated emissions of TSP for Year 15

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units
Topsoil Removal- Scarper clearing and striping	35,424	21,600	VKT	1.6	kg/vkt						
OB - Drilling	27,727	46,995	holes/y	0.59	kg/hole						
OB - Blasting	130,022	157		828	kg/blast	24199	Area of blast in square metres	299	holes/blast		
OB - D10 Dozers removing OB	283,831	16,960	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - Excavator loading OB to haul truck	268,078	170,880,800	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Hauling to OOP Dump	-	-	t/y	0.000	kg/t	330	t/truck load	0.0	km/return trip	1.0	kg/VKT
OB - Hauling to Inpit Dump	4,971,078	170,880,800	t/y	0.029	kg/t	330	t/truck load	9.6	km/return trip	1.0	kg/VKT
OB - Emplacing at OOP Dump	-	-	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Emplacing at Inpit dump	268,078	170,880,800	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - D10 Dozers on OB in OOP Dump	-	-	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB in Inpit Dump	70,958	4,240	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB working on rehabilitation	8,368	500	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
CL - D11 Dozers ripping/pushing/clean-up	220,958	19,500	h/y	11.3	kg/h	5	silt content in %	9	moisture content in %		
CL - Loading ROM coal to trucks with excavator	463,033	11,150,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Hauling open pit coal to ROM hopper	598,579	11,150,000	t/y	0.054	kg/t	190	t/load	10.2	km/return trip	1.0	kg/VKT
CL - Unloading ROM to hopper	463,033	11,150,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Sizer	111,500	11,150,000	t/y	0.01	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 55% to Processing Circuit (CHPP)	1,171	6,132,500	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 45% to Bypass Circuit	958	5,017,500	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from bypass)	958	5,017,500	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from CHPP)	787	5,457,925	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL- Cat 854 Dozers at Product stockpiles	49,624	5,800	h/y	8.6	kg/h	5	silt content in %	11	moisture content in %		
CL - Loading product coal to trains	1,511	10,475,425	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Loading Trucks with Coarse Rejects	78	539,660	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Hauling rejects from Rejects Bin to dump	23,291	539,660	t/y	0.04	kg/t	190.0	t/truck load	8.2	km/return trip	1.0	
CL - Unloading Coarse Rejects	78	539,660	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
WE - OOP OB dump area	72,042	20.6	ha	0.4	kg/ha/h	8,760	h/y				
WE - Inpit OB dump area	1,263,963	360.7	ha	0.4	kg/ha/h	8,760	h/y				
WE - Open pit	422,617	172.3	ha	0.4	kg/ha/h	8,760	h/y	0.7	30% Control		
WE - Product stockpiles	26,280	7.5	ha	0.4	kg/ha/h	8,760	h/y				
Grading roads	104,383	169,600	km	0.62	kg/km	8	speed of graders in km/h	21200	grader hours		
Total TSP emissions for Yr 15 (kg/yr)	**9,888,408**										
Tarrawonga Coal Mine	N/A										
Boggabri Coal Mine	7,395,716										

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 DUST EMISSION CALCULATIONS V2
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 Output emissions file  : C:\Jobs\3768_MaulesCreek\2010_met\Year15\Y15_emiss.dat
 Meteorological file    : C:\Jobs\3768_MaulesCreek\met\CALMET_2010.isc
 Number of dust sources : 56
 Number of activities   : 31
 No-blast conditions    : None
 Wind sensitive factor  : 1.174 (1.174 adjusted for activity hours)
 Wind erosion factor    : 37.634

 -----ACTIVITY SUMMARY-----
 ACTIVITY NAME : Topsoil Removal- Scarper clearing and striping
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 35424 kg/y
 FROM SOURCES  : 5
17 18 19 23 24
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Drilling
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 27727 kg/y
 FROM SOURCES  : 10
17 18 19 20 21 22 23 24 25 26
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Blasting
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 130022 kg/y
 FROM SOURCES  : 10
17 18 19 20 21 22 23 24 25 26
 HOURS OF DAY  :
0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0

 ACTIVITY NAME : OB - D10 Dozers removing OB
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 283831 kg/y
 FROM SOURCES  : 10
17 18 19 20 21 22 23 24 25 26
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Excavator loading OB to haul truck
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 237527 kg/y
 FROM SOURCES  : 10
17 18 19 20 21 22 23 24 25 26
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Hauling to OOP Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 0 kg/y
 FROM SOURCES  : 11
1 2 3 4 5 6 12 13 14 15 16
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Hauling to Inpit Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 2982647 kg/y
 FROM SOURCES  : 11
1 2 3 4 5 6 7 8 9 10 11
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Emplacing at OOP Dump
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 0 kg/y
 FROM SOURCES  : 6
15 16 41 42 43 44
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Emplacing at Inpit dump
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 237527 kg/y
 FROM SOURCES  : 24
2 3 4 5 6 7 8 9 10 11 27 28 29 30 31 32 33 34 35 36 37 38 39 40
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - D10 Dozers on OB in OOP Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 0 kg/y
 FROM SOURCES  : 6
15 16 41 42 43 44
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - D10 Dozers on OB in Inpit Dump
 ACTIVITY TYPE : Wind insensitive
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DUST EMISSION : 70958 kg/y
FROM SOURCES : 24
2 3 4 5 6 7 8 9 10 11 27 28 29 30 31 32 33 34 35 36 37 38 39 40
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - D10 Dozers on OB working on rehabilitation
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 8368 kg/y
FROM SOURCES : 8
45 46 47 48 49 50 51 52
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - D11 Dozers ripping/pushing/clean-up
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 220958 kg/y
FROM SOURCES : 10
17 18 19 20 21 22 23 24 25 26
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading ROM coal to trucks with excavator
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 463033 kg/y
FROM SOURCES : 10
17 18 19 20 21 22 23 24 25 26
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling open pit coal to ROM hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 359147 kg/y
FROM SOURCES : 9
1 2 3 4 5 6 12 13 14
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading ROM to hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 463033 kg/y
FROM SOURCES : 1
53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Sizer
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 111500 kg/y
FROM SOURCES : 1
53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 55% to Processing Circuit (CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1038 kg/y
FROM SOURCES : 1
53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 45% to Bypass Circuit
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 849 kg/y
FROM SOURCES : 1
53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from bypass)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 849 kg/y
FROM SOURCES : 2
54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 697 kg/y
FROM SOURCES : 2
54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL- Cat 854 Dozers at Product stockpiles
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 49624 kg/y
FROM SOURCES : 2
54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading product coal to trains

ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1339 kg/y
FROM SOURCES : 1
56
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading Trucks with Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 69 kg/y
FROM SOURCES : 1
53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling rejects from Rejects Bin to dump
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 13974 kg/y
FROM SOURCES : 11
1 2 3 4 5 6 7 8 9 10 11
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 69 kg/y
FROM SOURCES : 24
2 3 4 5 6 7 8 9 10 11 27 28 29 30 31 32 33 34 35 36 37 38 39 40
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - OOP OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 72042 kg/y
FROM SOURCES : 6
15 16 41 42 43 44
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Inpit OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 1263963 kg/y
FROM SOURCES : 24
2 3 4 5 6 7 8 9 10 11 27 28 29 30 31 32 33 34 35 36 37 38 39 40
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Open pit
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 422617 kg/y
FROM SOURCES : 10
17 18 19 20 21 22 23 24 25 26
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Product stockpiles
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 26280 kg/y
FROM SOURCES : 2
54 55
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : Grading roads
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 104383 kg/y
FROM SOURCES : 53
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Pit retention sources: 10
17 18 19 20 21 22 23 24 25 26

Estimated emissions of TSP for Year 21

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units
Topsoil Removal- Scarper clearing and striping	35,424	21,600	VKT	1.6	kg/vkt						
OB - Drilling	32,177	54,537	holes/y	0.59	kg/hole						
OB - Blasting	150,957	182	blasts/y	829	kg/blast	24224	Area of blast in square metres	300	holes/blast		
OB - D10 Dozers removing OB	283,831	16,960	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - Excavator loading OB to haul truck	308,227	196,472,900	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Hauling to OOP Dump	-	-	t/y	0.000	kg/t	330	t/truck load	0.0	km/return trip	1.0	kg/VKT
OB - Hauling to Inpit Dump	4,762,979	196,472,900	t/y	0.024	kg/t	330	t/truck load	8.0	km/return trip	1.0	kg/VKT
OB - Emplacing at OOP Dump	-	-	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - Emplacing at Inpit dump	308,227	196,472,900	t/y	0.002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %		
OB - D10 Dozers on OB in OOP Dump	-	-	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB in Inpit Dump	70,958	4,240	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
OB - D10 Dozers on OB working on rehabilitation	8,368	500	h/y	16.7	kg/h	10	silt content in %	2	moisture content in %		
CL - D11 Dozers ripping/pushing/clean-up	220,958	19,500	h/y	11.3	kg/h	5	silt content in %	9	moisture content in %		
CL - Loading ROM coal to trucks with excavator	539,859	13,000,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Hauling open pit coal to ROM hopper	684,211	13,000,000	t/y	0.053	kg/t	190	t/load	10.0	km/return trip	1.0	kg/VKT
CL - Unloading ROM to hopper	539,859	13,000,000	t/y	0.042	kg/t	9	moisture content in %				
CL - Sizer	130,000	13,000,000	t/y	0.01	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 55% to Processing Circuit (CHPP)	1,366	7,150,000	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Transfer 45% to Bypass Circuit	1,117	5,850,000	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from bypass)	1,117	5,850,000	t/y	0.0002	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	9	moisture content in %		
CL - Unloading to product stockpile (from CHPP)	918	6,363,500	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL- Cat 854 Dozers at Product stockpiles	49,624	5,800	h/y	8.6	kg/h	5	silt content in %	11	moisture content in %		
CL - Loading product coal to trains	1,762	12,213,500	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Loading Trucks with Coarse Rejects	91	629,200	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
CL - Hauling rejects from Rejects Bin to dump	24,506	629,200	t/y	0.04	kg/t	190.0	t/truck load	7.4	km/return trip	1.0	
CL - Unloading Coarse Rejects	91	629,200	t/y	0.0001	kg/t	1.325	average of (wind speed/2.2)^1.3 in m/s	11	moisture content in %		
WE - OOP OB dump area	80,452	23.0	ha	0.4	kg/ha/h	8,760	h/y				
WE - Inpit OB dump area	1,138,239	324.8	ha	0.4	kg/ha/h	8,760	h/y				
WE - Open pit	409,372	166.9	ha	0.4	kg/ha/h	8,760	h/y	0.7	30% Control		
WE - Product stockpiles	26,280	7.5	ha	0.4	kg/ha/h	8,760	h/y				
Grading roads	104,383	169,600	km	0.62	kg/km	8	speed of graders in km/h	21200	grader hours		
Total TSP emissions for Yr 15 (kg/yr)	**9,915,351**										
Tarrawonga Coal Mine	N/A										
Boggabri Coal Mine	7,395,716										

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 DUST EMISSION CALCULATIONS V2
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 Output emissions file  : C:\Jobs\3768_MaulesCreek\2010_met\Year21\Y21_emiss.dat
 Meteorological file    : C:\Jobs\3768_MaulesCreek\met\CALMET_2010.isc
 Number of dust sources : 70
 Number of activities   : 31
 No-blast conditions    : None
 Wind sensitive factor  : 1.174 (1.174 adjusted for activity hours)
 Wind erosion factor    : 37.634

 -----ACTIVITY SUMMARY-----
 ACTIVITY NAME : Topsoil Removal- Scarper clearing and striping
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 35424 kg/y
 FROM SOURCES  : 9
1 2 5 6 7 8 9 10 11
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Drilling
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 32177 kg/y
 FROM SOURCES  : 11
1 2 3 4 5 6 7 8 9 10 11
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Blasting
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 150957 kg/y
 FROM SOURCES  : 11
1 2 3 4 5 6 7 8 9 10 11
 HOURS OF DAY  :
0 0 0 0 0 0 1 1 1 1 1 1 1 1 1 1 1 1 0 0 0 0 0 0

 ACTIVITY NAME : OB - D10 Dozers removing OB
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 283831 kg/y
 FROM SOURCES  : 11
1 2 3 4 5 6 7 8 9 10 11
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Excavator loading OB to haul truck
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 273100 kg/y
 FROM SOURCES  : 11
1 2 3 4 5 6 7 8 9 10 11
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Hauling to OOP Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 0 kg/y
 FROM SOURCES  : 1
1
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Hauling to Inpit Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 2857788 kg/y
 FROM SOURCES  : 9
13 35 36 37 38 39 40 41 42
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Emplacing at OOP Dump
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 0 kg/y
 FROM SOURCES  : 1
1
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - Emplacing at Inpit dump
 ACTIVITY TYPE : Wind sensitive
 DUST EMISSION : 273100 kg/y
 FROM SOURCES  : 29
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 35 36 37 38 39 40 42
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - D10 Dozers on OB in OOP Dump
 ACTIVITY TYPE : Wind insensitive
 DUST EMISSION : 0 kg/y
 FROM SOURCES  : 1
1
 HOURS OF DAY  :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

 ACTIVITY NAME : OB - D10 Dozers on OB in Inpit Dump
 ACTIVITY TYPE : Wind insensitive
```

DUST EMISSION : 70958 kg/y
FROM SOURCES : 29
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 35 36 37 38 39 40 42
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : OB - D10 Dozers on OB working on rehabilitation
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 8368 kg/y
FROM SOURCES : 10
52 53 54 55 56 57 58 59 60 61
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - D11 Dozers ripping/pushing/clean-up
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 220958 kg/y
FROM SOURCES : 11
1 2 3 4 5 6 7 8 9 10 11
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading ROM coal to trucks with excavator
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 539859 kg/y
FROM SOURCES : 11
1 2 3 4 5 6 7 8 9 10 11
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling open pit coal to ROM hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 410526 kg/y
FROM SOURCES : 16
34 35 36 37 38 39 40 41 43 44 45 46 47 48 49 50
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading ROM to hopper
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 539859 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Sizer
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 130000 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 55% to Processing Circuit (CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1210 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Transfer 45% to Bypass Circuit
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 990 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from bypass)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 990 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading to product stockpile (from CHPP)
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 813 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL- Cat 854 Dozers at Product stockpiles
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 49624 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading product coal to trains

ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 1561 kg/y
FROM SOURCES : 1
65
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Loading Trucks with Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 80 kg/y
FROM SOURCES : 1
62
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Hauling rejects from Rejects Bin to dump
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 14703 kg/y
FROM SOURCES : 8
34 35 36 37 38 39 40 42
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : CL - Unloading Coarse Rejects
ACTIVITY TYPE : Wind sensitive
DUST EMISSION : 80 kg/y
FROM SOURCES : 29
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 35 36 37 38 39 40 42
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - OOP OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 80452 kg/y
FROM SOURCES : 5
66 67 68 69 70
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Inpit OB dump area
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 1138239 kg/y
FROM SOURCES : 29
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 35 36 37 38 39 40 42
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Open pit
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 409372 kg/y
FROM SOURCES : 11
1 2 3 4 5 6 7 8 9 10 11
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : WE - Product stockpiles
ACTIVITY TYPE : Wind erosion
DUST EMISSION : 26280 kg/y
FROM SOURCES : 2
63 64
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

ACTIVITY NAME : Grading roads
ACTIVITY TYPE : Wind insensitive
DUST EMISSION : 104383 kg/y
FROM SOURCES : 67
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53
54 55 56 57 58 59 60 61 62 66 67 68 69 70
HOURS OF DAY :
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

Pit retention sources: 11
1 2 3 4 5 6 7 8 9 10 11

APPENDIX F

Example of ISC input file

```
**  ISCST3 model input runstream : Dust
CO STARTING
   TITLEONE ISCST3 Dust Model Run
   MODELOPT RURAL CONC DDEP DRYDPLT
   AVERTIME 24 PERIOD
   POLLUTID TSP
   ERRORFIL error.log
   TERRHGTS ELEV
   RUNORNOT RUN
CO FINISHED

SO STARTING
   LOCATION  POINT1  VOLUME  227525 6613564 346.0
   LOCATION  POINT2  VOLUME  227824 6613900 354.0
   LOCATION  POINT3  VOLUME  227208 6613658 328.0
   LOCATION  POINT4  VOLUME  227488 6613994 334.0
   LOCATION  POINT5  VOLUME  227478 6614311 243.0
   LOCATION  POINT6  VOLUME  227432 6614638 131.0
   LOCATION  POINT7  VOLUME  227870 6614880 314.0
   LOCATION  POINT8  VOLUME  227600 6615198 256.0
   LOCATION  POINT9  VOLUME  227264 6615179 247.0
   LOCATION  POINT10  VOLUME  227133 6615627 200.0
   LOCATION  POINT11  VOLUME  226909 6615954 297.0
   LOCATION  POINT12  VOLUME  226629 6613555 168.0
   LOCATION  POINT13  VOLUME  226069 6613555 196.0
   LOCATION  POINT14  VOLUME  225416 6613583 324.0
   LOCATION  POINT15  VOLUME  224921 6613994 365.0
   LOCATION  POINT16  VOLUME  224557 6614451 364.0
   LOCATION  POINT17  VOLUME  224799 6614722 387.0
   LOCATION  POINT18  VOLUME  225275 6614395 437.0
   LOCATION  POINT19  VOLUME  225789 6614059 431.0
   LOCATION  POINT20  VOLUME  226788 6614414 209.0
   LOCATION  POINT21  VOLUME  227096 6614068 187.0
   LOCATION  POINT22  VOLUME  227058 6614927 208.0
   LOCATION  POINT23  VOLUME  226424 6614862 437.0
   LOCATION  POINT24  VOLUME  226144 6614544 437.0
   LOCATION  POINT25  VOLUME  225686 6614694 434.0
   LOCATION  POINT26  VOLUME  225210 6614908 430.0
   LOCATION  POINT27  VOLUME  225023 6615216 438.0
   LOCATION  POINT28  VOLUME  225649 6615226 438.0
   LOCATION  POINT29  VOLUME  226078 6615030 438.0
   LOCATION  POINT30  VOLUME  226088 6615422 435.0
   LOCATION  POINT31  VOLUME  226517 6615282 281.0
   LOCATION  POINT32  VOLUME  226946 6615254 191.0
   LOCATION  POINT33  VOLUME  226526 6615730 237.0
   LOCATION  POINT34  VOLUME  224398 6614946 343.0
   LOCATION  POINT35  VOLUME  224687 6614535 300.0
   LOCATION  POINT36  VOLUME  224949 6614283 274.0
   LOCATION  POINT37  VOLUME  225294 6613919 243.0
   LOCATION  POINT38  VOLUME  225761 6613583 216.0
   LOCATION  POINT39  VOLUME  226377 6613882 164.0
   LOCATION  POINT40  VOLUME  226834 6614199 124.0
   LOCATION  POINT41  VOLUME  227170 6614414 99.0
   LOCATION  POINT42  VOLUME  226241 6614161 267.0
   LOCATION  POINT43  VOLUME  226946 6615487 197.0
   LOCATION  POINT44  VOLUME  226685 6615944 158.0
   LOCATION  POINT45  VOLUME  226442 6616150 314.0
   LOCATION  POINT46  VOLUME  226106 6615804 321.0
   LOCATION  POINT47  VOLUME  225686 6615599 326.0
   LOCATION  POINT48  VOLUME  225350 6615366 355.0
   LOCATION  POINT49  VOLUME  224930 6615412 343.0
   LOCATION  POINT50  VOLUME  224678 6615151 326.0
   LOCATION  POINT51  VOLUME  224183 6614740 394.0
   LOCATION  POINT52  VOLUME  224473 6614143 437.0
   LOCATION  POINT53  VOLUME  224725 6613695 439.0
   LOCATION  POINT54  VOLUME  224977 6613294 409.0
   LOCATION  POINT55  VOLUME  224137 6613872 438.0
   LOCATION  POINT56  VOLUME  224361 6613368 436.0
   LOCATION  POINT57  VOLUME  224519 6612920 432.0
   LOCATION  POINT58  VOLUME  223997 6613079 431.0
   LOCATION  POINT59  VOLUME  224099 6612678 436.0
   LOCATION  POINT60  VOLUME  223997 6612258 428.0
   LOCATION  POINT61  VOLUME  223651 6612855 434.0
   LOCATION  POINT62  VOLUME  224174 6614731 395.0
   LOCATION  POINT63  VOLUME  224071 6615198 320.0
   LOCATION  POINT64  VOLUME  223819 6615272 315.0
   LOCATION  POINT65  VOLUME  223539 6615282 334.0
   LOCATION  POINT66  VOLUME  224105 6617187 333.0
   LOCATION  POINT67  VOLUME  224435 6616619 417.0
   LOCATION  POINT68  VOLUME  224490 6615904 428.0
   LOCATION  POINT69  VOLUME  225123 6615528 364.0
   LOCATION  POINT70  VOLUME  225847 6615748 395.0
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   LOCATION  POINT72  VOLUME  227824 6613900 354.0
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   LOCATION  POINT74  VOLUME  227488 6613994 334.0
   LOCATION  POINT75  VOLUME  227478 6614311 243.0
   LOCATION  POINT76  VOLUME  227432 6614638 131.0
   LOCATION  POINT77  VOLUME  227870 6614880 314.0
   LOCATION  POINT78  VOLUME  227600 6615198 256.0
   LOCATION  POINT79  VOLUME  227264 6615179 247.0
   LOCATION  POINT80  VOLUME  227133 6615627 200.0
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   LOCATION  POINT82  VOLUME  226629 6613555 168.0
   LOCATION  POINT83  VOLUME  226069 6613555 196.0
   LOCATION  POINT84  VOLUME  225416 6613583 324.0
   LOCATION  POINT85  VOLUME  224921 6613994 365.0
   LOCATION  POINT86  VOLUME  224557 6614451 364.0
   LOCATION  POINT87  VOLUME  224799 6614722 387.0
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   LOCATION  POINT89  VOLUME  225789 6614059 431.0
   LOCATION  POINT90  VOLUME  226788 6614414 209.0
   LOCATION  POINT91  VOLUME  227096 6614068 187.0
   LOCATION  POINT92  VOLUME  227058 6614927 208.0
   LOCATION  POINT93  VOLUME  226424 6614862 437.0
   LOCATION  POINT94  VOLUME  226144 6614544 437.0
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LOCATION  POINT95  VOLUME  225686 6614694 434.0
LOCATION  POINT96  VOLUME  225210 6614908 430.0
LOCATION  POINT97  VOLUME  225023 6615216 438.0
LOCATION  POINT98  VOLUME  225649 6615226 438.0
LOCATION  POINT99  VOLUME  226078 6615030 438.0
LOCATION  POINT100  VOLUME  226088 6615422 435.0
LOCATION  POINT101  VOLUME  226517 6615282 281.0
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LOCATION  POINT112  VOLUME  226241 6614161 267.0
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LOCATION  POINT114  VOLUME  226685 6615944 158.0
LOCATION  POINT115  VOLUME  226442 6616150 314.0
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LOCATION  POINT118  VOLUME  225350 6615366 355.0
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LOCATION  POINT192  VOLUME  224473 6614143 437.0
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LOCATION  POINT197  VOLUME  224519 6612920 432.0
LOCATION  POINT198  VOLUME  223997 6613079 431.0
LOCATION  POINT199  VOLUME  224099 6612678 436.0
LOCATION  POINT200  VOLUME  223997 6612258 428.0
```

```
   LOCATION  POINT201  VOLUME  223651 6612855 434.0
   LOCATION  POINT202  VOLUME  224174 6614731 395.0
   LOCATION  POINT203  VOLUME  224071 6615198 320.0
   LOCATION  POINT204  VOLUME  223819 6615272 315.0
   LOCATION  POINT205  VOLUME  223539 6615282 334.0
   LOCATION  POINT206  VOLUME  224105 6617187 333.0
   LOCATION  POINT207  VOLUME  224435 6616619 417.0
   LOCATION  POINT208  VOLUME  224490 6615904 428.0
   LOCATION  POINT209  VOLUME  225123 6615528 364.0
   LOCATION  POINT210  VOLUME  225847 6615748 395.0
** Point Source       QS   RH  IL   IV
** Parameters        ----  --- ---  ---
   HOUREMIS  C:\Jobs\3768_MaulesCreek\2010_met\Year21\Y21_emiss.dat POINT1-POINT210
   SRCPARAM  POINT1  1.0 2.0 10.0 2.0
   SRCPARAM  POINT2  1.0 2.0 10.0 2.0
   SRCPARAM  POINT3  1.0 2.0 10.0 2.0
   SRCPARAM  POINT4  1.0 2.0 10.0 2.0
   SRCPARAM  POINT5  1.0 2.0 10.0 2.0
   SRCPARAM  POINT6  1.0 2.0 10.0 2.0
   SRCPARAM  POINT7  1.0 2.0 10.0 2.0
   SRCPARAM  POINT8  1.0 2.0 10.0 2.0
   SRCPARAM  POINT9  1.0 2.0 10.0 2.0
   SRCPARAM  POINT10  1.0 2.0 10.0 2.0
   SRCPARAM  POINT11  1.0 2.0 10.0 2.0
   SRCPARAM  POINT12  1.0 2.0 10.0 2.0
   SRCPARAM  POINT13  1.0 2.0 10.0 2.0
   SRCPARAM  POINT14  1.0 2.0 10.0 2.0
   SRCPARAM  POINT15  1.0 2.0 10.0 2.0
   SRCPARAM  POINT16  1.0 2.0 10.0 2.0
   SRCPARAM  POINT17  1.0 2.0 10.0 2.0
   SRCPARAM  POINT18  1.0 2.0 10.0 2.0
   SRCPARAM  POINT19  1.0 2.0 10.0 2.0
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   SRCPARAM  POINT24  1.0 2.0 10.0 2.0
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   SRCPARAM  POINT26  1.0 2.0 10.0 2.0
   SRCPARAM  POINT27  1.0 2.0 10.0 2.0
   SRCPARAM  POINT28  1.0 2.0 10.0 2.0
   SRCPARAM  POINT29  1.0 2.0 10.0 2.0
   SRCPARAM  POINT30  1.0 2.0 10.0 2.0
   SRCPARAM  POINT31  1.0 2.0 10.0 2.0
   SRCPARAM  POINT32  1.0 2.0 10.0 2.0
   SRCPARAM  POINT33  1.0 2.0 10.0 2.0
   SRCPARAM  POINT34  1.0 2.0 10.0 2.0
   SRCPARAM  POINT35  1.0 2.0 10.0 2.0
   SRCPARAM  POINT36  1.0 2.0 10.0 2.0
   SRCPARAM  POINT37  1.0 2.0 10.0 2.0
   SRCPARAM  POINT38  1.0 2.0 10.0 2.0
   SRCPARAM  POINT39  1.0 2.0 10.0 2.0
   SRCPARAM  POINT40  1.0 2.0 10.0 2.0
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   SRCPARAM  POINT42  1.0 2.0 10.0 2.0
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   SRCPARAM  POINT44  1.0 2.0 10.0 2.0
   SRCPARAM  POINT45  1.0 2.0 10.0 2.0
   SRCPARAM  POINT46  1.0 2.0 10.0 2.0
   SRCPARAM  POINT47  1.0 2.0 10.0 2.0
   SRCPARAM  POINT48  1.0 2.0 10.0 2.0
   SRCPARAM  POINT49  1.0 2.0 10.0 2.0
   SRCPARAM  POINT50  1.0 2.0 10.0 2.0
   SRCPARAM  POINT51  1.0 2.0 10.0 2.0
   SRCPARAM  POINT52  1.0 2.0 10.0 2.0
   SRCPARAM  POINT53  1.0 2.0 10.0 2.0
   SRCPARAM  POINT54  1.0 2.0 10.0 2.0
   SRCPARAM  POINT55  1.0 2.0 10.0 2.0
   SRCPARAM  POINT56  1.0 2.0 10.0 2.0
   SRCPARAM  POINT57  1.0 2.0 10.0 2.0
   SRCPARAM  POINT58  1.0 2.0 10.0 2.0
   SRCPARAM  POINT59  1.0 2.0 10.0 2.0
   SRCPARAM  POINT60  1.0 2.0 10.0 2.0
   SRCPARAM  POINT61  1.0 2.0 10.0 2.0
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