Peabody ENERGY

APPENDIX B

AIR QUALITY AND GREENHOUSE GAS ASSESSMENT

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WILPINJONG EXTENSION PROJECT

Wilpinjong Coal Pty Ltd

20 November 2015

Job Number 14060333

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Air Quality and Greenhouse Gas Assessment Wilpinjong Extension Project

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EXECUTIVE SUMMARY

This assessment investigates the potential air quality effects and calculates the greenhouse gas emissions that may arise as a result of the proposed extension of the Wilpinjong Coal Mine (WCM), known as the Wilpinjong Extension Project (the Project). The WCM is located in the Western Coalfields of New South Wales in an area mostly comprising agricultural land, other coal mining operations and National Parks.

The Project seeks to spatially extend the mining footprint to gain access to additional run-of-mine coal reserves and in turn extend the approved life of the mine. This assessment is prepared in accordance with the applicable regulatory requirements and guidelines and forms part of the environmental impact statement prepared for the development application.

The existing meteorological conditions in the area surrounding the WCM are governed by the local terrain features with the overall prevailing wind flows being directed along valleys and ridges that are characteristic of the area. The ambient air quality levels that are monitored at various locations surrounding the mining operation indicate that air quality in the area is generally good and is typically below the relevant New South Wales Environment Protection Authority goals.

To assess the potential for air quality impacts associated with the Project, five indicative mine plan years were selected to represent a range of potential impacts over the life of the proposed mining operation. The mine plan years were selected with reference to the location of activities occurring at the operations which would likely contribute to the highest dust levels at sensitive receptor locations in each year. Air dispersion modelling with the CALPUFF modelling suite is utilised in conjunction with estimated emission rates for the air pollutants generated by the various mining activities. Best practice mitigation and management measures are considered to ameliorate any potential adverse air quality impacts and to address government and community concerns regarding the contribution to air quality due to the mining activity.

The assessment predicts potential dust impacts to occur only at mine-owned sensitive receptor locations, with some potential for short-term cumulative dust impacts at nearby privately-owned sensitive receptor locations in Wollar. The assessment identifies that these short-term cumulative dust impacts can be ameliorated through the continued application of the reactive dust management strategies already in use at the mining operations.

Overall, the assessment indicates that whilst adverse air quality impacts may arise at a small number of sensitive locations due to the Project, these can be managed and mitigated effectively.

A conservative estimate of annual average greenhouse gas emissions over the life of the Project is 0.13 million tonnes of carbon dioxide equivalent (Mt CO_2-e) material (Scope 1 and 2), which is approximately 0.02 per cent (%) of the Australian greenhouse emissions for the 2013 to 2014 period. When compared to a number of mining operations in New South Wales, the Project would have a relatively low greenhouse gas emission rate per tonne of run-of-mine coal extracted, producing approximately 0.01 tonnes of carbon dioxide equivalent material per tonne of run-of-mine coal (t CO_2-e/t ROM).

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1 INTRODUCTION

Todoroski Air Sciences has prepared this report for Wilpinjong Coal Pty Ltd (hereafter referred to as WCPL). It provides an assessment of the potential air quality impacts associated with the proposed extension to the Wilpinjong Coal Mine (WCM) (hereafter referred to as the Project).

The Project essentially seeks to spatially extend the mining footprint to gain access to additional run-of-mine (ROM) coal reserves and in turn extend the approved life of the mine by approximately seven years.

To assess the potential air quality impacts associated with the proposed Project, this report incorporates the following aspects:

- A background to the WCM and description of the Project;
- A review of the existing meteorological and air quality environment surrounding the WCM;
- A description of the dispersion modelling approach used to assess potential air quality impacts;
- Presentation of the predicted results and discussion of the potential air quality impacts and associated mitigation and management measures; and
- An assessment of the potential greenhouse gas (GHG) emissions associated with the Project.

2 LOCAL SETTING

The WCM is located in the Western Coalfields of New South Wales (NSW), approximately 40 kilometres (km) northeast of Mudgee and approximately 2.5km west-northwest of Wollar (see **Figure 2-1**). National Parks and reserves, agricultural activities and coal mining operations dominate the land use in the surrounding area. The mine is bounded by the Goulburn River National Park to the north, the Munghorn Gap Nature Reserve to the southwest and Moolarben Coal Complex to the west. To the east and southeast of the mine, the land is predominantly zoned for agricultural use, along with areas of Crown Land.

Figure 2-1 also presents the location of the WCM in relation to privately-owned and mine-owned sensitive receptors of relevance to this assessment. **Appendix A** provides a detailed list of all the privately-owned sensitive receptors assessed in this report.

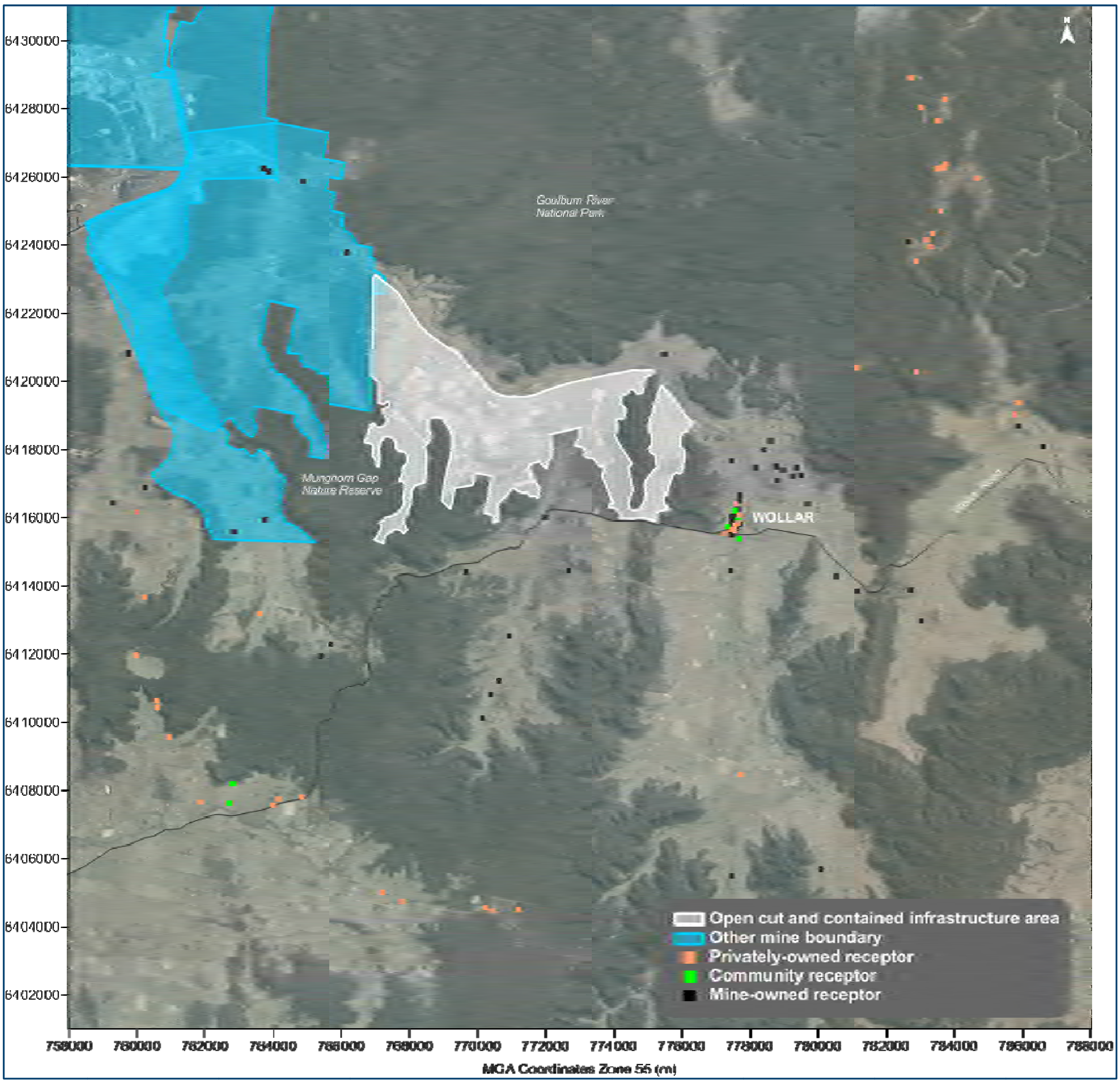


Figure 2-1: WCM location

Figure 2-2 presents a pseudo three-dimensional (3D) visualisation of the topography in the general vicinity of the WCM area. The area can be characterised as complex hilly terrain with the majority of the elevated areas forming the Goulburn River National Park and the Munghorn Gap Nature Reserve. To the east and southeast of the site, steep sided but generally shallow valleys open to flat agricultural land. Notable ridgelines separate the mine from sensitive receptors in Wollar. The complex local terrain in this area has a significant effect on wind patterns and dispersion of dust.

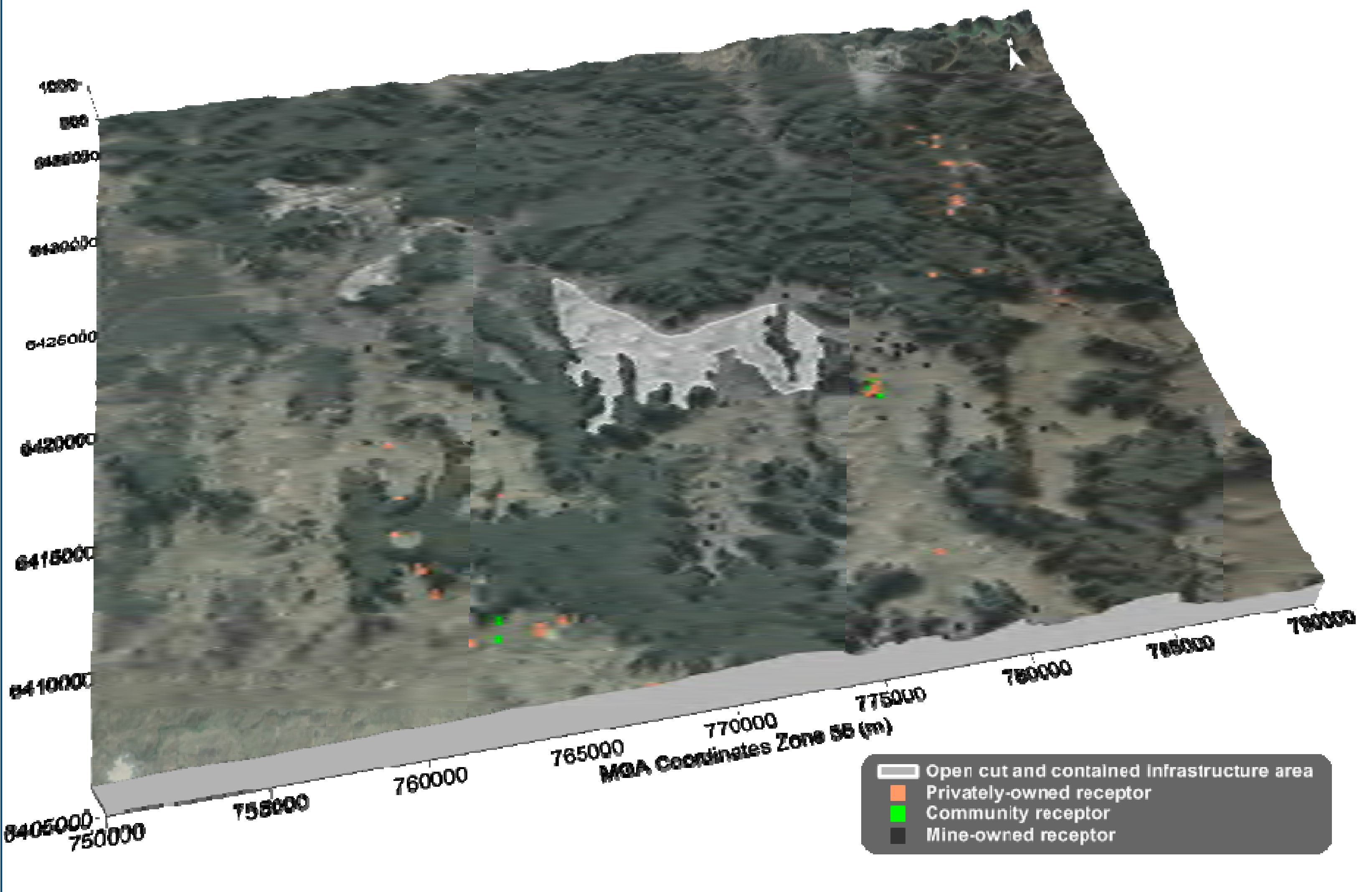


Figure 2-2: Topography of the WCM location

3 EXISTING OPERATIONS AND PROPOSED PROJECT DESCRIPTION

3.1 Existing operations

Mining at the WCM commenced in September 2006 and comprises an approved open cut coal mining operation consisting of six open cuts and associated contained infrastructure area, comprising an area of approximately 1,990 hectares (ha). The mining operation utilises a combination of bulk push dozers and hydraulic excavators to mine overburden and coal in a strip mine configuration. ROM coal is mined 24 hours per day, seven days per week, at an approved rate of up to 16 million tonnes per annum (Mtpa). The WCM currently produces up to 12.6Mtpa of washed and unwashed (i.e. bypass) coal products.

The Coal Handling and Preparation Plant (CHPP) at the WCM operates up to 24 hours per day, seven days per week. A proportion of the ROM coal is bypassed (i.e. crushed only). ROM coal stockpiles have a capacity of over 1.5 million tonnes (Mt) and product coal stockpiles have a combined capacity of approximately 500,000 tonnes for washed and unwashed coal products.

Tailings produced from the CHPP consist of fine rejects and slimes from the thickener. CHPP tailings are de-watered in the Tailings Filter Press and co-disposed with coarse rejects. CHPP coal reject material is hauled back to the mining operation and deposited in the mined-out voids.

A train loading facility is located at the head of the rail loop within the mine infrastructure area and is capable of loading coal at a rate of 4,000 tonnes per hour. Product coal is reclaimed from two alternative product feed conveyors that run along the length of the product coal stockpiles. Product coal is loaded onto trains 24 hours per day, seven days per week. Up to 12.5Mtpa of thermal product coal is railed east to domestic power generation customers and the Port of Newcastle for export. An average of six trains are loaded each day and a maximum of 10 trains per day are loaded during peak coal transport periods. No coal is railed west of the WCM.

3.2 Proposed project

WCPL is seeking approval from the NSW Minister for Planning for a Development Consent under Division 4.1 of Part 4 of the *Environmental Planning and Assessment Act, 1979* for the Project.

The Project is a proposed extension of open cut operations at the WCM for an additional operational life of approximately seven years and would include the following activities:

- Open cut mining of ROM coal from the Ulan Coal Seam and Moolarben Coal Member in Mining Lease (ML) 1573 and in new Mining Lease Application areas in Exploration Licence (EL) 6169 and EL 7091;
- Approximately 800ha of open cut extensions including:
    - approximately 500ha of incremental extensions to the existing open cut pits in areas of ML 1573 and EL 6169; and
    - development of a new open cut pit of approximately 300ha in EL 7091 (Pit 8);
- Continued production of up to 16 Mtpa of ROM coal;
- Continued use of the WCM CHPP and general coal handling and rail loading facilities and other existing and approved supporting mine infrastructure;
- Rail transport of approximately 13Mtpa of thermal product coal to domestic and export customers (within existing maximum and annual average daily rail limits);

- Relocation of a section of the TransGrid Wollar to Wellington 330 kilovolt electricity transmission line (ETL) to facilitate mining in Pit 8;
- Various local infrastructure relocations to facilitate the mining extensions (e.g. realignment of Ulan-Wollar Road and associated rail level crossing, relocation of local ETLs and services);
- Construction and operation of additional mine access roads to service new mining facilities located in Pits 5 and 8;
- Construction and operation of new ancillary infrastructure in support of mining including: mine infrastructure areas, ROM pads, haul roads, electricity supply, communications installations, light vehicle roads, access tracks, remote crib huts, up-catchment diversions, dams, pipelines and other water management structures;
- Extension of the approved mine life by approximately seven years (i.e. from approximately 2026 to 2033);
- A peak operational workforce of approximately 625 people;
- Ongoing exploration activities; and
- Other associated minor infrastructure, plant and activities.

4 STUDY REQUIREMENTS

The purpose of this report is to provide an assessment of the maximum likely effects on air quality that may arise over the life of the Project. The assessment presented in this report addresses planning and regulatory agency requirements, as set out below.

4.1 Secretary's Environmental Assessment Requirements

In preparing this Air Quality and Greenhouse Gas Assessment, the Secretary's Environmental Assessment Requirements issued for the Project (SSD 6764) on 9 December 2014 have been addressed and the key matters raised for consideration in the Air Quality and Greenhouse Gas Assessment are outlined in **Table 4-1** along with a reference to where the requirements are addressed in the report.

Table 4-1: Secretary's Environmental Assessment Requirements (SSD 6764)

Specific issue	General requirements	Section
Air quality – including:	An assessment of the likely air quality impacts of the development, in accordance with the *Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in NSW* and having regard to the EPA's additional requirements; and	This report
	An assessment of the likely greenhouse gas impacts of the development, having regard to the EPA's requirements.	10

4.2 NSW Environment Protection Authority

This Air Quality and Greenhouse Gas Assessment has been prepared in accordance with the NSW Environment Protection Authority (EPA) document *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW Department of Environment and Conservation [DEC], 2005**) and the comments outlined in **Table 4-2** which provides a reference to where each relevant aspect is addressed in the report.

Table 4-2: NSW EPA agency comments for air quality (SSD 6764)

Air issues – air quality	Section
1. Assess the risk associated with potential discharges of fugitive and point source emissions for all stages of the proposal. Assessment of risk relates to environmental harm, risk to human health and amenity.	8
2. Justify the level of assessment undertaken on the basis of risk factors, including but not limited to: a. proposal location; b. characteristics of the receiving environment; and c. type and quantity of pollutants emitted.	5, 7
3. Describe the receiving environment in detail. The proposal must be contextualised within the receiving environment (local, regional and inter-regional as appropriate). The description must include but need not be limited to: a. meteorology and climate – a minimum of 12 months data obtained from the meteorological station located at the Mine must be provided; b. topography; c. surrounding land-use; receptors; and d. ambient air quality.	6
4. Include a detailed description of the proposal. All processes that could result in air emissions must be identified and described. Sufficient detail to accurately communicate the characteristics and quantity of all emissions must be provided. Include a detailed process diagram/flowchart of the proposal specifying all air inputs, air outputs and air discharge points.	7.3 App. C
5. Identification and location information of all fixed and mobile sources of dust/air emissions from the development, including rehabilitation, needs to be provided. The location of all emissions sources should be clearly marked on a plan for key years of the mine development. The EIS needs to identify all pollutants of concern and estimate emissions by quantity (and size of particles), source(s) and discharge point(s).	7.3 App. C

Air issues – air quality	Section
Note: emissions can be classed as either: a. point (e.g. emissions from stack or vent), or b. fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, crushing/screening, conveyors, storage facilities, plant and yard operation, vehicle movements [dust from road, exhaust, loss from load], land clearing and construction works). Fugitive emissions include coal dust emissions and leaks and spills of coal during rail transport to port facilities (as influenced by management methods and procedures employed by the proposal).	
6. Include air dispersion modelling where there is a risk of adverse air quality impacts, or where there is sufficient uncertainty to warrant a rigorous numerical impact assessment. Air dispersion modelling must be conducted in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (2005). This assessment should include the following parameters: a. dust deposition; b. total suspended particles; c. PM_{10} and $PM_{2.5}$ particulate matter.	8 App. D
7. Demonstrate the projects ability to comply with the relevant regulatory framework, specifically the *Protection of the Environment Operations Act 1997* and the *Protection of the Environment Operations (Clean Air) Regulation 2002.*	5.5
8. Provide an assessment of the project in terms of the priorities and targets adopted under the NSW State Plan 2010 and its implementation plan Action for Air.	5.6
9. Detail air emission control techniques/practices that will be employed by the proposal. a. All emission control techniques/practices must be benchmarked against best practice process design and emission control. For coal mines this must be assessed by applying the procedure outlined in the *Coal Mine Particulate Matter Control Best Practice – Site-specific determination guideline* (November 2011). b. Nominated controls must be explicitly linked to calculated emission reductions adopted in the air quality impact assessment emissions inventory, with all assumptions documented and justified.	7.3.3 App. C
10. Detail emission control techniques/practices that will be employed by the proposal, including the development of real-time monitoring/management procedures, response (adverse weather) trigger levels and predictive meteorological monitoring/modelling for dust management.	9
11. Assess the potential for spontaneous combustion of coal stockpiles, and any other stockpiles, and provide the management measures that will be implemented should it be determined that there is a propensity for combustion of stockpiled materials.	6.4
12. Include a consideration of 'worst case' emission scenarios and impacts at proposed emission limits.	8
13. Account for cumulative impacts associated with existing emission sources as well as any currently approved developments linked to the receiving environment.	8

4.3 Mid-Western Regional Council

This Air Quality and Greenhouse Gas Assessment has been prepared in accordance with the agency comments from the Mid-Western Regional Council (MWRC) outlined in **Table 4-3**.

Table 4-3: MWRC agency comments for air quality (SSD 6674)

Specific issue	General requirements	Comments
Air Quality	There have been a number of concerns raised from residents in the locality regarding the adequacy of the current measures used to mitigate impacts from coal dust. The SEARs should include a requirement that independent monitoring be undertaken by the EPA and revised mitigation measures be implemented to reduce the impact of the proposed extensions.	Noted.
Spontaneous Combustion	Due to previous issues with spontaneous combustion and the adverse impact this has on air quality, Council requests that the SEARs include a requirement for a test-work programme to be undertaken to ascertain the risks associated with the proposal and include mitigation measures to prevent and reduce the impacts from such events.	Spontaneous Combustion has been addressed in Section 6.4

5 AIR QUALITY ASSESSMENT CRITERIA

5.1 Preamble

Air quality criteria are benchmarks set to protect the general health and amenity of the community in relation to air quality. The sections below identify the potential air emissions generated by the Project and the applicable air quality criteria.

5.2 Particulate matter

Particulate matter consists of dust particles of varying size and composition. Air quality goals refer to measures of the total mass of all particles suspended in air defined as the Total Suspended Particulate matter (TSP). The upper size range for TSP is nominally taken to be 30 micrometres (µm) as in practice particles larger than 30 to 50µm will settle out of the atmosphere too quickly to be regarded as air pollutants.

Two sub-classes of TSP are also included in the air quality goals, namely PM_{10}, particulate matter with equivalent aerodynamic diameters of 10µm or less, and $PM_{2.5}$, particulate matter with equivalent aerodynamic diameters of 2.5µm or less.

Mining activities generate particles in all the aforementioned size categories. The great majority of the mass of particles generated is due to the abrasion, or crushing of rock and coal, and general disturbance of dusty material. These particulate emissions will generally be larger than 2.5µm, as sub-2.5µm particles are usually generated through combustion processes or as secondary particles formed from chemical reactions rather than through mechanical processes that dominate emissions on mine sites.

Combustion particulate matter can be more harmful to human health as the particles have the ability to penetrate deep into the human respiratory system, due to their size and can be comprised of acidic and carcinogenic substances.

A study of the particle size distribution from mine dust sources in 1986, conducted by the State Pollution Control Commission (SPCC), of 120 samples found that $PM_{2.5}$ comprised approximately 4.7 per cent (%) of the TSP, and PM_{10} comprised approximately 39.1% of the TSP in the samples (**SPCC, 1986**). The emissions of $PM_{2.5}$ occurring from mining activities are small in comparison to the total dust emissions and in practice, the concentrations of $PM_{2.5}$ in the vicinity of mining dust sources are likely to be low.

Particulate matter, typically in the upper size range, that settles from the atmosphere and deposit on surfaces is characterised as deposited dust. The deposition of dust on surfaces is considered a nuisance and can adversely affect the amenity of an area by soiling property in the vicinity.

5.2.1 New South Wales Environment Protection Authority impact assessment criteria

Table 5-1 summarises the air quality goals that are relevant to this study as outlined in the NSW EPA document *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (**NSW DEC, 2005**).

The air quality goals for total impacts relate to the total dust burden in the air and not just the dust from the Project. Consideration of background dust levels needs to be made when using these goals to assess potential impacts.

Table 5-1: NSW EPA air quality impact assessment criteria

Pollutant	Averaging period	Impact	Criteria
TSP	Annual	Total	90µg/m³
PM_{10}	Annual	Total	30µg/m³

Pollutant	Averaging period	Impact	Criteria
	24 hour	Total	50µg/m³
Deposited dust	Annual	Incremental	2g/m²/month
		Total	4g/m²/month

Source: NSW DEC, 2005
µg/m³ = micrograms per cubic metre
g/m²/month = grams per square metre per month

5.2.2 National Environment Protection (Ambient Air Quality) Measure

The National Environment Protection Council (NEPC) Act 1994 and subsequent amendments define the National Environment Protection Measures (NEPMs) as instruments for setting environmental objectives in Australia.

The Ambient Air Quality NEPM specifies national ambient air quality standards and goals for air pollutants including PM_{10} and $PM_{2.5}$. The standard for PM_{10} is outlined in **Table 5-2**. It is noted that the NEPM permits five days annually above the 24 hour average PM_{10} criterion to allow for bush fires and similar events.

Table 5-2: Standard for PM_{10} concentrations

Pollutant	Averaging period	Maximum concentration	Maximum allowable exceedences
PM_{10}	24 hour	50µg/m³	5 days a year

Source: NEPC, 2003

The NSW EPA currently do not have impact assessment criteria for $PM_{2.5}$ concentrations. The Ambient Air Quality NEPM applies advisory reporting standards for $PM_{2.5}$ to gather sufficient data nationally to facilitate a review. The advisory reporting standards for $PM_{2.5}$ are outlined in **Table 5-3**.

As with each of the NEPM goals, these apply to the average, or general exposure of a population, rather than to "hot spot" locations.

Table 5-3: Advisory reporting standards for $PM_{2.5}$ concentrations

Pollutant	Averaging period	Advisory reporting standard
$PM_{2.5}$	24 hour	25µg/m³
	Annual	8µg/m³

Source: NEPC, 2003

5.2.3 World Health Organization Air Quality Guidelines

The World Health Organization (WHO) publishes air quality guidelines that aim to avert potential health impacts associated with air pollution. The guidelines are based on expert evaluation of scientific evidence and include research from low and middle income countries where air pollution levels are at their highest. The guidelines are predominantly based on $PM_{2.5}$ data from large urban cities.

Table 5-4 outlines the WHO air quality guidelines for particulate matter.

Table 5-4: WHO air quality guidelines

Pollutant	Averaging period	Guideline level
PM_{10}	24 hour (99th percentile)	50µg/m³ *
	Annual	20µg/m³ *
$PM_{2.5}$	24 hour (99th percentile)	25µg/m³
	Annual	10µg/m³

Source: WHO, 2005 * Default level

The WHO notes that its air quality guidelines are for $PM_{2.5}$, and that the PM_{10} guideline is only provided as a surrogate offering the same level of protection as the $PM_{2.5}$ guideline. This is done because PM_{10} is more commonly measured and there is often no $PM_{2.5}$ data available. The WHO sets the surrogate PM_{10} level at double the $PM_{2.5}$ guideline level because in most large urban cities the PM_{10} level is in fact approximately 1.25 to 2.00 times the $PM_{2.5}$ level (**WHO, 2005**).

It is expected that the area around the Project would be similar to the Upper Hunter Valley region of NSW which shows that PM_{10} levels are, on average, three times higher than the $PM_{2.5}$ levels (when considering all data on record for Camberwell and Singleton from 2011 to 2014). These data can be sourced from the NSW Office of Environment and Heritage website: http://www.environment.nsw.gov.au/AQMS/search.htm.

The WHO guidelines state that in areas where the fraction of $PM_{2.5}$ and PM_{10} is known, the PM_{10} level can be set to offer the same level of protection as the $PM_{2.5}$ guideline. Therefore, in this situation, the WHO guideline for PM_{10} for the area would be set as an annual average of 30µg/m^3.

The WHO guideline levels apply at the 99th percentile for short term, 24 hour average levels, (i.e. the fourth highest day of a year) permitting three days above the guideline level.

It is noted that the WHO guidelines which could apply in this area are generally equivalent to or less stringent than the NSW guidelines.

5.2.4 NSW Voluntary Land Acquisition and Mitigation Policy

Part of the NSW Voluntary Land Acquisition and Mitigation Policy dated 15 December 2014 and gazetted on 19 December 2014 describes the NSW Government's policy for voluntary mitigation and land acquisition to address particulate matter impacts from state significant mining, petroleum and extractive industry developments.

Voluntary mitigation rights may apply where, even with best practice management, the development contributes to exceedances of the criteria in **Table 5-5** at any residence or workplace [1].

[1] Applies where any exceedance would be unreasonably detrimental to workers health or carrying out of the business.

Table 5-5: Particulate matter mitigation criteria

Pollutant	Averaging period	Mitigation criteria		Impact type
PM_{10}	Annual	30µg/m³*		Human health
PM_{10}	24 hour	50µg/m³**		Human health
TSP	Annual	90µg/m³*		Amenity
Deposited dust	Annual	2g/m²/month**	4g/m²/month*	Amenity

Source: NSW Government (2014)
*Cumulative impact (i.e. increase in concentration due to the development plus background concentrations due to all other sources).
**Incremental impact (i.e. increase in concentrations due to the development alone), with zero allowable exceedances of the criteria over the life of the development.

Voluntary acquisition rights may apply where, even with best practice management, the development contributes to exceedances of the criteria in **Table 5-6** at any residence, workplace or on more than 25% of any privately owned land where there is an existing dwelling or where a dwelling could be built under existing planning controls (vacant land).

Table 5-6: Particulate matter acquisition criteria

Pollutant	Averaging period	Acquisition criteria		Impact type
PM_{10}	Annual	30µg/m³*		Human health
PM_{10}	24 hour	50µg/m³**		Human health
TSP	Annual	90µg/m³*		Amenity
Deposited dust	Annual	2g/m²/month**	4g/m²/month*	Amenity

Source: NSW Government (2014)
*Cumulative impact (i.e. increase in concentration due to the development plus background concentrations due to all other sources).
**Incremental impact (i.e. increase in concentrations due to the development alone), with up to 5 allowable exceedances of the criteria over the life of the development.

5.3 Other air pollutants

Emissions of carbon monoxide (CO), nitrogen dioxide (NO_2) and other pollutants, such as sulfur dioxide (SO_2), will also arise due to the mining activities from the diesel powered equipment.

CO is colourless, odourless and tasteless and is generated from the incomplete combustion of fuels when carbon molecules are only partially oxidised. It can reduce the capacity of blood to transport oxygen in humans resulting in symptoms of headache, nausea and fatigue.

NO_2 is reddish-brown in colour (at high concentrations) with a characteristic odour and can irritate the lungs and lower resistance to respiratory infections such as influenza. NO_2 belongs to a family of reactive gases called oxides of nitrogen (NO_X). These gases form when fuel is burned at high temperatures, mainly from motor vehicles, power generators and industrial boilers (**US EPA, 2011**). NO_X may also be generated by blasting activities. It is important to note that when formed, NO_2 (the potentially harmful component of NO_x) is generally a small fraction of the total NO_X generated.

Sulphur dioxide (SO_2) is a colourless, toxic gas with a pungent and irritating smell. It commonly arises in industrial emissions due to the sulfur content of the fuel. SO_2 can have impacts upon human health and the habitability of the environment for flora and fauna. SO_2 emissions are a precursor to acid rain, which can be an issue in the northern hemisphere; however it is not known to have any widespread impact in NSW, and is generally only associated with large industrial activities. Due to its potential to impact on human health, sulfur is actively removed from fuel to prevent the release and formation of SO_2. The sulfur content of Australian diesel is controlled to a low level (10 parts per million) by national fuel standards.

Overall, these emissions associated with diesel powered equipment are generally considered too low to generate any significant off-site concentrations and have not been assessed in detail in this report. The potential NO_X and CO emissions associated with blasting activity have been assessed qualitatively in **Section 6.5**.

5.4 Odour

In NSW, odour impact assessment criteria apply to proposed and modified projects with potential to lead to significant odour impacts. For mining projects, odour from spontaneous coal combustion has the potential to be detected off-site.

NSW legislation prohibits emissions that cause offensive odour to occur at any off-site receptor. Offensive odour is evaluated in the field by authorised officers, who are obliged to consider the odour in the context of its receiving environment, frequency, duration, character and so on and to determine whether the odour would unreasonably interfere with the comfort and repose a normal person would experience. In this context, the concept of offensive odour is applied to operational facilities and relates to actual emissions in the air.

The range of a person's ability to detect odour varies greatly in the population, as does their sensitivity to the type of odour. The wide ranging response in how any particular odour is perceived by any individual poses specific challenges in the assessment of odour impacts and the application of specific air quality goals related to odour. The *Technical Framework - Assessment and management of odour from stationary sources in NSW* (**NSW DEC, 2006**) sets out a framework specifically to deal with such issues.

The NSW odour goals are based on the risk of odour impact within the general population of a given area. In sparsely populated rural areas, the criteria assume there is a lower risk that some individuals within the community would find the odour unacceptable, hence higher criteria apply.

5.5 Protection of the Environment Operations Act 1997

In accordance with the Environment Protection Licence (No. 12425) issued by the NSW EPA, the general obligations of the *Protection of the Environment Operations Act, 1997* and the Regulations made under the Act (namely the *Protection of the Environment Operations (Clean Air) Regulation, 2010*) are followed at the WCM. The Project would continue to operate in accordance with the relevant regulatory framework for air quality to ensure compliance with this legislation.

5.6 NSW State Plan and Action for Air

NSW 2021 replaces the State Plan and is a 10 year plan to rebuild the economy, provide quality services, renovate infrastructure, restore government accountability and strengthen local environment and communities (**NSW Government, 2011**). The goals in *NSW 2021* related to air quality include increasing the number of air quality monitoring stations to provide further information on local air quality, to reduce dust emissions at NSW coal mines and reduce GHG emissions.

Action for Air began in 1998 and is the NSW Government's 25-year air quality management plan for Sydney, Wollongong and the Lower Hunter (**NSW DECCW, 2009**). Aims of *Action for Air* include reducing emissions such that compliance of the national air quality standards in the Ambient Air Quality NEPM is achieved and, in turn, reducing population exposure to air pollution.

The Project would include continual improvement of operations at the WCM to minimise dust and GHG emissions through various means and would also provide regular updates of the local air quality from the network of air quality monitoring stations operated in the area to gauge the performance of the operation.

6 EXISTING ENVIRONMENT AND AIR QUALITY MANAGEMENT

This section describes the existing environment including the climate and ambient air quality in the general area surrounding the WCM.

6.1 Local climate

Long-term climatic data from the closest Bureau of Meteorology (BoM) weather station at Gulgong Post Office (Site No. 062013) were analysed to characterise the local climate in the proximity of the WCM. The Gulgong Post Office weather station is located approximately 30km west of WCM.

Table 6-1 and **Figure 6-1** present a summary of data from the Gulgong Post Office weather station collected over a 23 to 134-year period for the various meteorological parameters.

The data indicate that January is the hottest month with a mean maximum temperature of 31.0 degrees Celsius (ºC) and July is the coldest month with a mean minimum temperature of 2.6ºC.

Rainfall peaks during the months of spring and summer and declines during winter, with an annual average rainfall of 651.1 millimetres (mm) over 62.6 days. The data indicate that January is the wettest month with an average rainfall of 70.3mm over 5.1 days and April is the driest month with an average rainfall of 44.3mm over 3.9 days.

Relative humidity exhibits variability and seasonal flux across the year. Mean 9am relative humidity ranges from 61% in October to 84% in June and July. Mean 3pm relative humidity levels range from 36% in December to 57% in June.

Wind speeds during the colder months have a greater spread between the 9am and 3pm conditions compared to the warmer months. Mean 9am wind speeds range from 4.4 kilometres per hour (km/h) in June to 9.1km/h in October and November. Mean 3pm wind speeds range from 7.8km/h in April to 11.7km/h in August.

Table 6-1: Monthly climate statistics summary - Gulgong Post Office

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temperature												
Mean max. temperature (°C)	31.0	29.8	27.3	23.4	19.1	15.5	14.7	16.5	19.8	23.6	26.8	29.7
Mean min. temperature (°C)	16.7	16.3	13.7	9.8	6.3	3.6	2.6	3.4	6.1	9.2	12.3	14.9
Rainfall												
Rainfall (mm)	70.3	61.9	54.8	44.3	45.1	50.8	49.1	46.0	46.3	55.6	59.6	67.5
Mean No. of rain days (≥1mm)	5.1	4.8	4.5	3.9	4.7	6.0	6.1	5.7	5.2	5.6	5.5	5.5
9am conditions												
Mean temperature (°C)	21.7	20.6	18.9	15.8	11.3	7.7	6.7	8.5	12.6	16.5	18.3	20.8
Mean relative humidity (%)	64	71	71	70	79	84	84	76	70	61	63	62
Mean wind speed (km/h)	8.2	6.7	6.2	5.9	5.0	4.4	4.9	6.1	7.7	9.1	9.1	8.9
3pm conditions												
Mean temperature (°C)	29.5	28.4	26.2	22.3	18.0	14.3	13.5	15.3	18.5	22.1	25.1	28.2
Mean relative humidity (%)	37	42	41	42	49	57	54	46	44	40	39	36
Mean wind speed (km/h)	9.6	8.5	7.9	7.8	9.0	8.8	9.9	11.7	11.4	11.5	11.4	11.2

Source: **Bureau of Meteorology, 2015 (2 October 2015)**

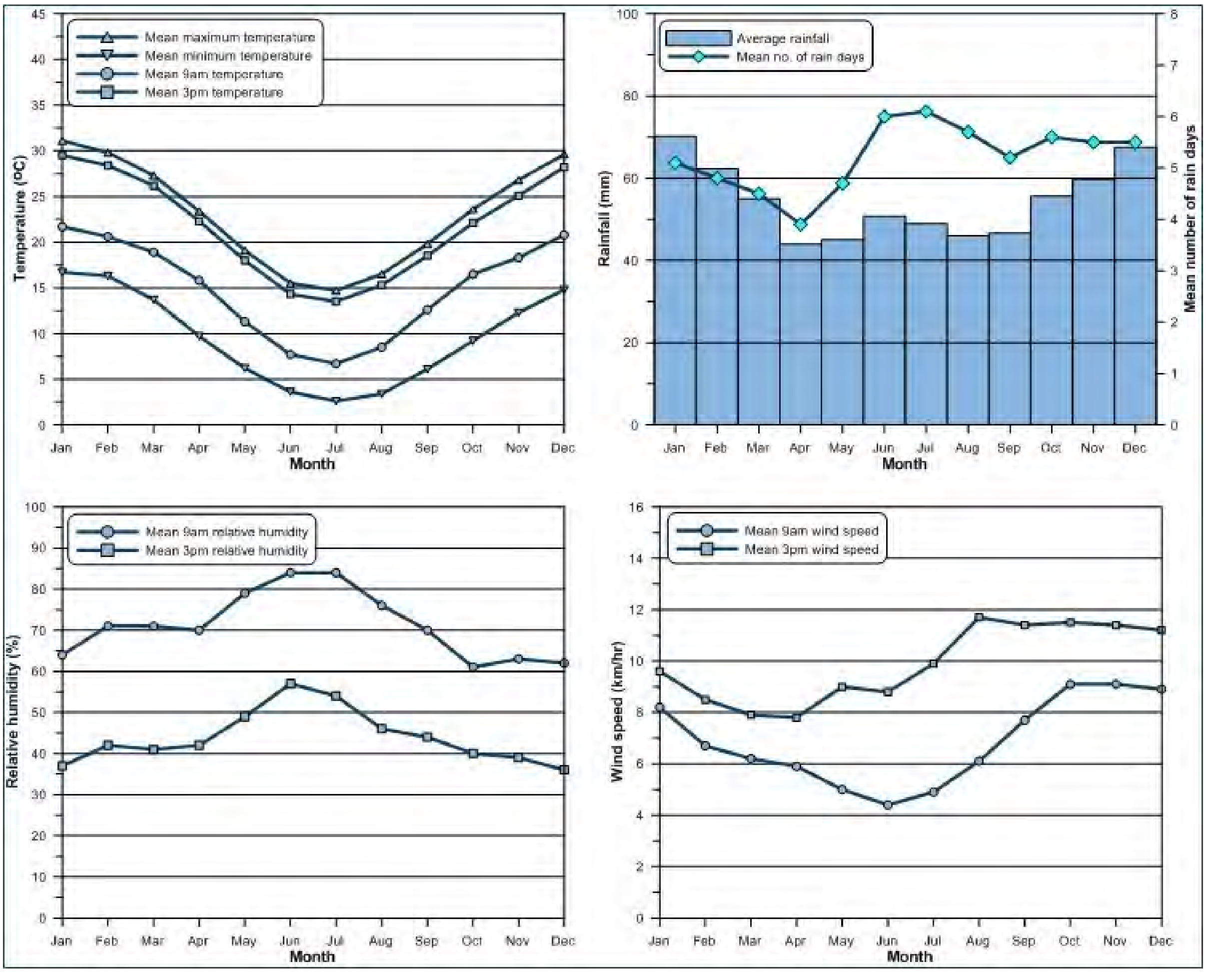


Figure 6-1: Monthly climate statistics summary - Gulgong Post Office

6.2 Local meteorological conditions

WCM operates a 10 metre (m) weather station to assist with the environmental management of site operations. The location of this station is shown in **Figure 6-2**. In addition, WCPL also operates a 60m temperature inversion tower to monitor temperature lapse rates (co-located with the 10m weather station).

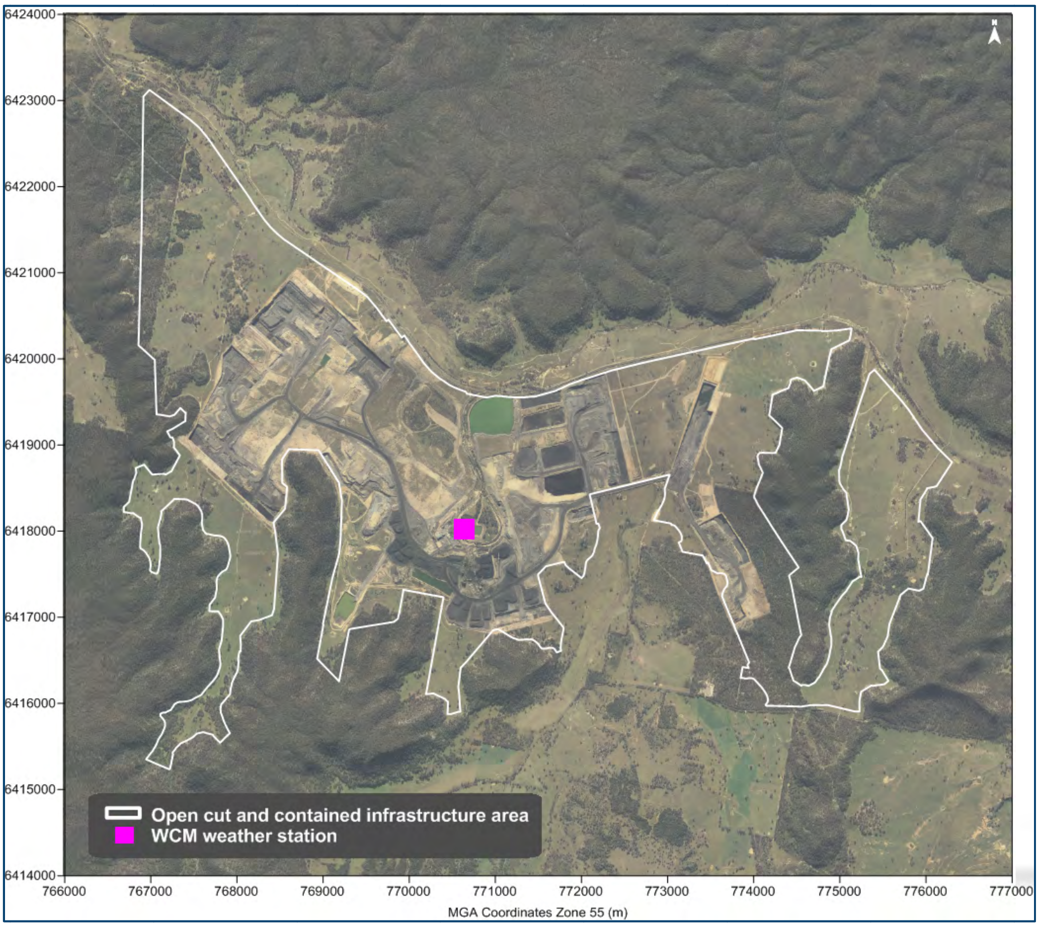


Figure 6-2: WCM weather station location

Annual and seasonal windroses prepared from data collected during the 2013 calendar period are presented in **Figure 6-3**.

Analysis of the windroses shows the most common winds on an annual basis are from the east-southeast and east with a lesser portion of winds from the northwest quadrant. Very few winds originate from the northeast and southwest sectors. This wind distribution pattern is as expected of the local area considering the location of the station in relation to the terrain features.

In summer the winds predominately occur from the east-southeast and east. During winter, winds are most frequent from the west-northwest and northwest sectors. The autumn wind distribution shows dominant winds from the east-southeast. The spring windrose shares similar wind distribution patterns to the annual distribution with winds from the west-northwest and east.

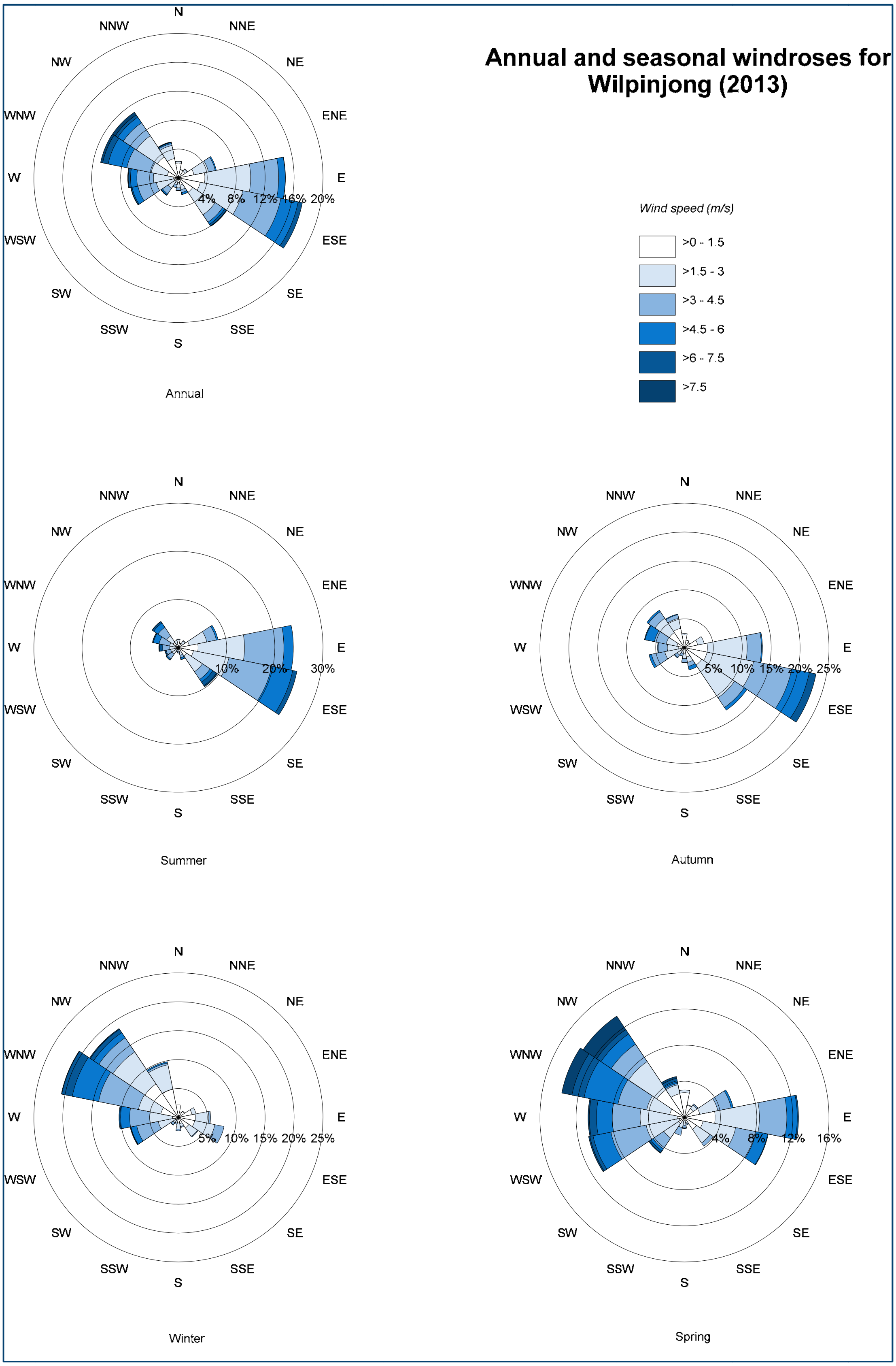


Figure 6-3: Annual and seasonal windroses for Wilpinjong (2013)

6.3 Local air quality monitoring

The main sources of particulate matter in the wider area of the WCM include active mining, quarries, agricultural activities, emissions from local anthropogenic activities (such as motor vehicle exhaust, dust from dirt roads, and domestic wood heaters) and various other rural activities. This section reviews the available ambient monitoring data collected from the WCM ambient air quality monitoring program between 2012 and 2014 to characterise the existing background levels of the surrounding area.

6.3.1 Existing air quality monitoring network description

The air quality monitors operating in the WCM's air quality monitoring network include three Tapered Element Oscillating Microbalances (TEOMs), four High Volume Air Samplers (HVAS) (measuring either TSP or PM_{10}), and nine dust deposition gauges and are shown in **Figure 6-4**. It is noted that some monitoring locations have changed over the life of the WCM to reflect operational and land ownership changes (e.g. by moving monitors closer to the nearest private receivers).

Additional ambient air monitoring stations reviewed include a TEOM located at Merriwa operated by the NSW EPA and two HVAS measuring PM_{10} operated by the Moolarben Coal Complex.

Table 6-2 lists the monitoring stations reviewed in this section and **Appendix B** provides a summary of selected monitoring data reviewed in this assessment.

Table 6-2: Summary of ambient monitoring stations

Monitoring site ID	Type	Monitoring data analysed
TEOM 1 (Slate Gully)	TEOM – PM_{10}	January 2012 – December 2014
TEOM 2 (Mittaville)	TEOM – PM_{10}	January 2012 – December 2012*
TEOM 3 (Wollar)	TEOM – PM_{10}	January 2013 – December 2014
TEOM 4 (Araluen Road)	TEOM – PM_{10}	January 2013 – December 2014
Merriwa (NSW EPA)	TEOM – PM_{10}	February 2012 – December 2014
HV1 (Wollar)	HVAS – PM_{10}	January 2012 – December 2014
HV2 (Reids)	HVAS – PM_{10}	January 2012 – January 2013*
HV3 (Mahers)	HVAS – TSP	January 2012 – December 2014
HV4 (Robinsons)	HVAS – PM_{10}	January 2012 – December 2014
HV5 (Araluen Drive)	HVAS – PM_{10}	January 2013 – December 2014
PM01 (Moolarben)	HVAS – PM_{10}	January 2012 – December 2014
PM02 (Moolarben)	HVAS – PM_{10}	January 2012 – December 2014
DG4	Dust gauge	January 2012 – December 2014
DG5	Dust gauge	January 2012 – December 2014
DG7	Dust gauge	January 2012 – December 2012*
DG8	Dust gauge	January 2012 – December 2014
DG10	Dust gauge	January 2012 – December 2014
DG11	Dust gauge	January 2012 – December 2014
DG12	Dust gauge	January 2012 – December 2014
DG13	Dust gauge	January 2012 – December 2014
DG14	Dust gauge	January 2012 – December 2014
DG15	Dust gauge	January 2013 – December 2014

* Decommissioned

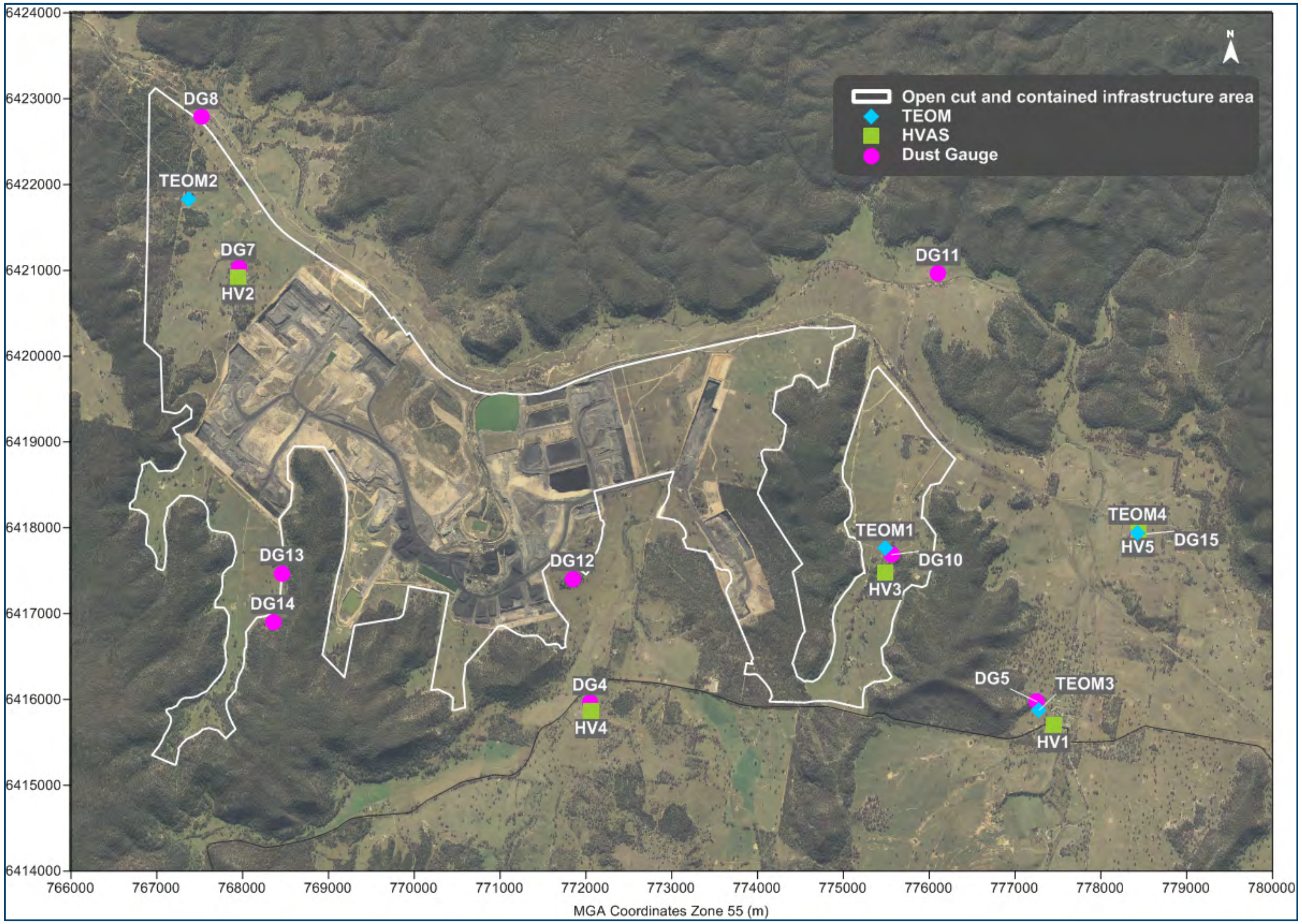


Figure 6-4: Ambient WCM air monitoring locations

6.3.2 PM_{10} monitoring

Ambient PM_{10} monitoring using TEOMs is currently conducted for the WCM at three locations; TEOM 1, TEOM 3 and TEOM 4 (**Figure 6-4**). A fourth location, TEOM 2, was used in the past.

TEOM 3 is located close to privately-owned receptors and is used to assess compliance levels. A summary of the data from these monitoring stations collected between 2012 and 2014 is presented in **Table 6-3** and **Figure 6-5**. The available data from the NSW EPA monitoring station at Merriwa have also been included to allow for comparison with ambient measurements and seasonal trends.

TEOM 1 and TEOM 4, were previously compliance points, however, following purchase of all nearby privately-owned properties, these TEOMs are used for management purposes only (i.e. as they are no longer representative of air quality levels at privately-owned receiver locations).

A review of **Table 6-3** indicates that the annual average PM_{10} concentrations for each monitoring station were below the criterion of 30µg/m³ for all relevant years, indicating that overall, air quality in the area is good in relation to PM_{10} dust levels.

Table 6-3: PM_{10} levels from TEOM monitoring (µg/m³)

Year	Annual average						Maximum 24 hour average					
	TEOM 1	TEOM 2[(1)]	TEOM 3[(2)]	TEOM 4[(2)]	Merriwa[(3)]	Criterion	TEOM 1	TEOM 2[(1)]	TEOM 3[(2)]	TEOM 4[(2)]	Merriwa[(3)]	Criterion
2012	13.3	11.5	-	-	14.2	30	60.3	50.8	-	-	50.4	50
2013	17.9	-	13.6	17.2	14.9	30	80.1	-	51.7	71.6	43.3	50
2014	17.4	-	13.4	13.5	15.2	30	69.2	-	59.8	54.4	55.2	50

[(1)]Data available till December 2012
[(2)]Data available from January 2013
[(3)]Data available from February 2012

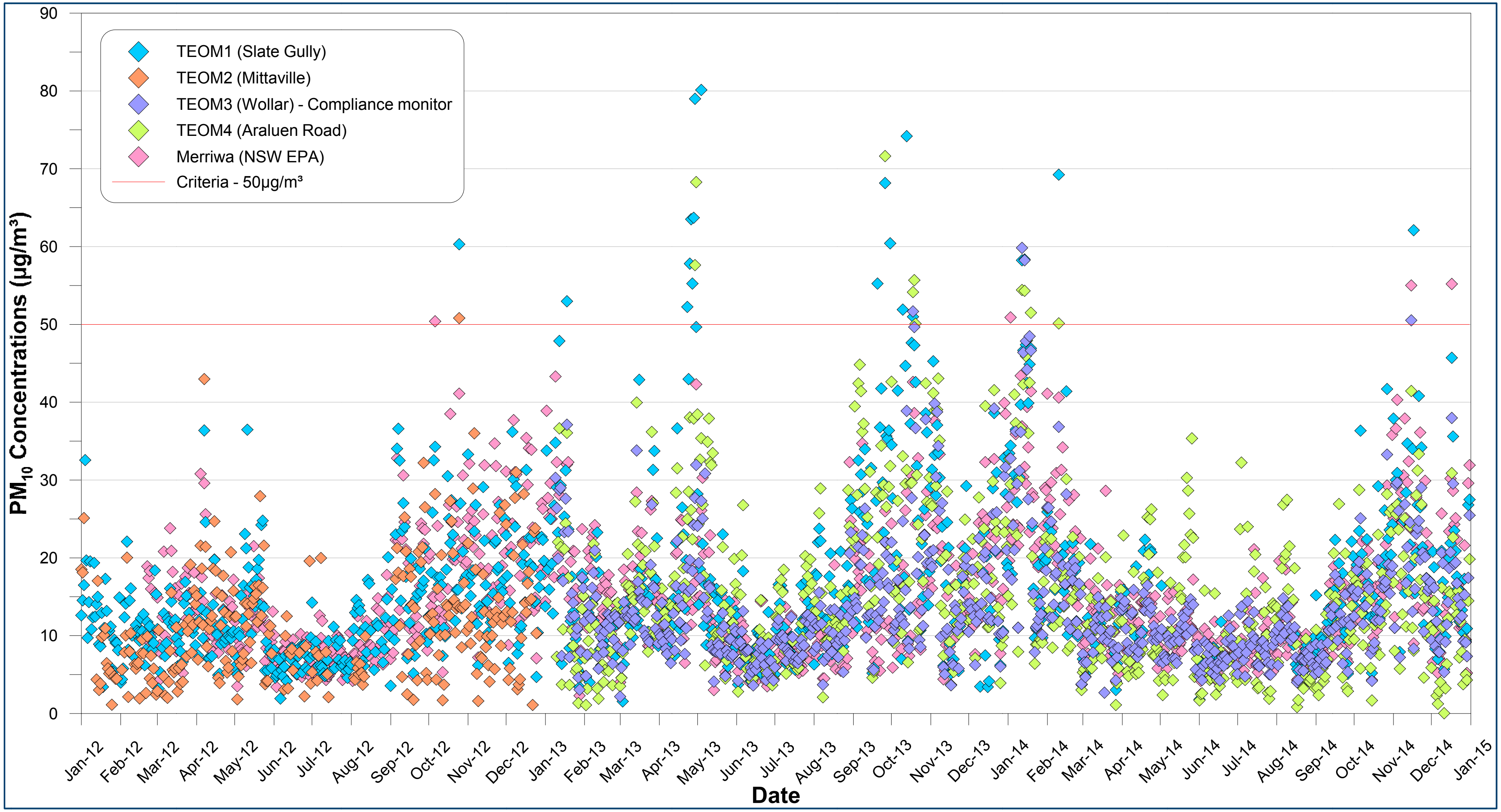


Figure 6-5: TEOM 24 hour average PM_{10} concentrations

With respect to short-term concentrations, there was one day during 2012 when the maximum 24 hour average PM_{10} concentration recorded was above the 50µg/m³ criterion at the TEOM 1 and TEOM 2 station (**Table 6-3** and **Figure 6-5**). The recorded exceedance on this day was investigated and actions were undertaken to reduce dust emissions from the WCM (e.g. apart from one dozer and the water carts, all equipment was shut down). However, as the cessation of mining activities did not significantly affect monitored dust levels, it is considered that the elevated dust concentrations were caused by a regional dust event. It is noted that the majority of dust monitors in the Hunter Valley also recorded similarly elevated levels on this day, indicating the possibility of a widespread dust event. The Merriwa station also recorded elevated levels on that day but the levels did not exceed the criterion.

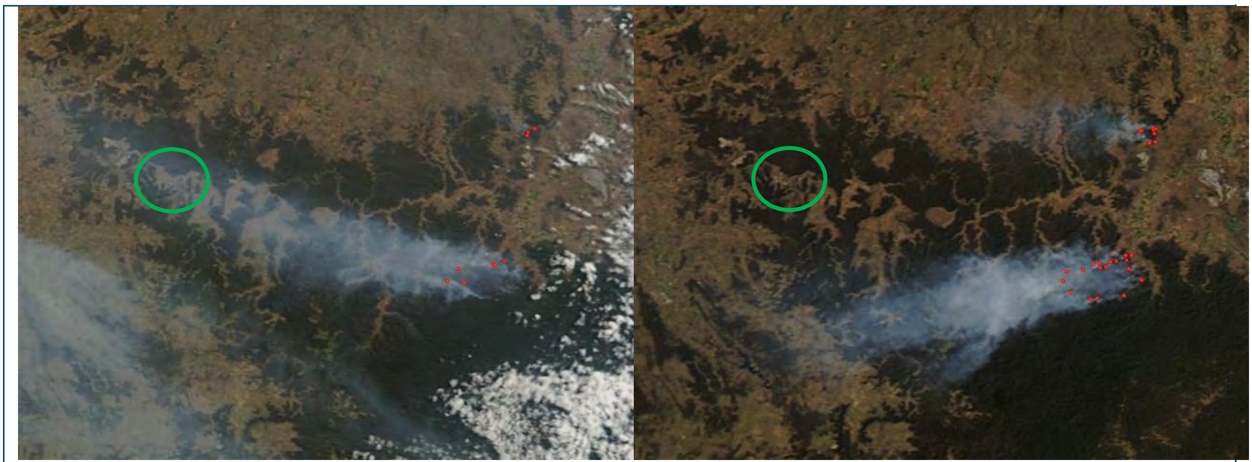
There were six days of elevated 24 hour PM_{10} levels recorded at compliance monitors in 2013 (**Figure 6-5**). Three of these days were related to bushfire events, and on the remaining three days local dust sources and WCM activities may have contributed to the total levels that were recorded. Further detail is provided below.

- TEOM 4 recorded two days above the criterion on 29 and 30 April. An analysis of prevailing winds on these days indicates that the wind speeds were relatively low and wind directions were varied with a predominance of winds from the south-southwest. Due to the varied wind conditions on these days, it is difficult to identify the potential source(s) of the dust. Local dust sources, including activities at WCM and dust generated from the unsealed Araluen Road may have contributed to these readings.

- TEOM 4 recorded one day above the criterion on 26 September. An analysis of wind direction on this day indicates that the predominant wind directions occurred from the west and would indicate that local activities, including activities at WCM and dust generated from the unsealed Araluen Road may have contributed to the reading.

- TEOM 4 recorded three days above the criterion on 18 to 20 October and TEOM 3 recorded one day above the criterion on 18 October. The investigations conducted indicate that on 18 to 20 October, widespread bushfire events occurred in the Blue Mountains and upper Hunter Valley regions and are the likely cause of the elevated levels at all monitors in October. Notably the wind also blew in a direction from the monitors towards WCM. The bushfire smoke and wind direction is evident in the available satellite imagery presented in **Figure 6-6**, noting that the red patches in the images indicate the position of the active fire.

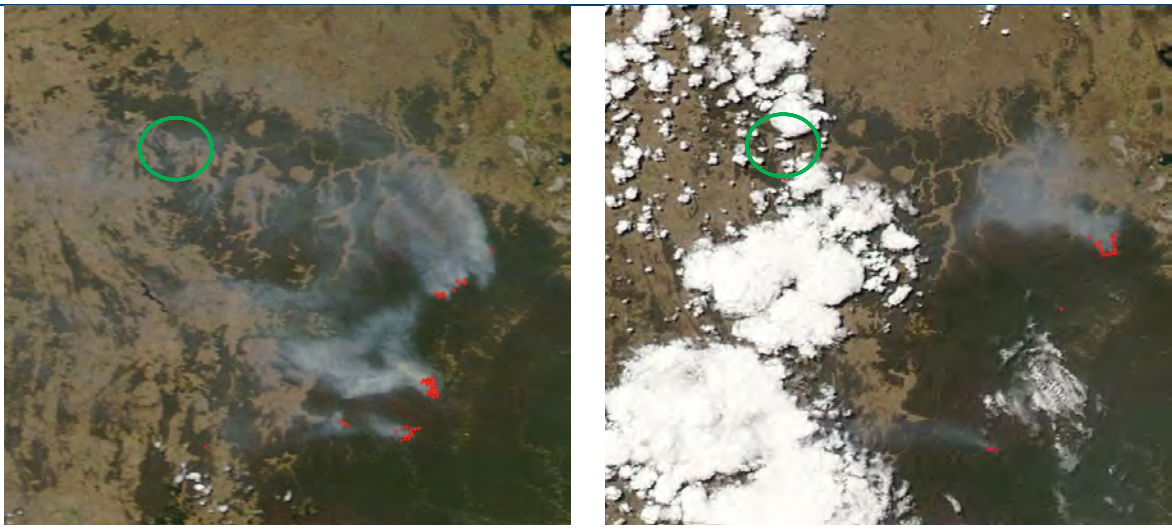
Each of the exceedances of the 24 hour average PM_{10} criterion were reported to the NSW Department of Planning & Environment (DP&E) and NSW EPA, along with the outcomes of the investigations of the exceedances, in accordance with the requirements of the Project Approval (**WCPL, 2014a**).



Source: **NASA, 2015**

Figure 6-6: Satellite imagery of the area around WCM during bushfires on 18 and 19 October 2013

During 2014, there were four days of elevated 24 hour PM_{10} levels recorded at the compliance monitor. On 12 and 14 January, TEOM 1, 3 and 4 all recorded PM_{10} levels above the criterion. TEOM 4 also recorded levels above the criterion on 19 January. During this period there were extensive bushfires occurring in the region, which are the likely cause of the elevated levels at the monitors. **Figure 6-7** presents satellite imagery of the area showing bushfire smoke on 12 and 19 January 2014.



Source: **NASA, 2015**

Figure 6-7: Satellite imagery of the area around WCM during bushfires on 12 and 19 January 2014

TEOM 1 recorded elevated PM_{10} levels above the criterion on 10 February 2014. On this day elevated levels were also recorded at TEOM 4 and would tend to indicate that local dust sources and WCM activities may have contributed to the total levels that were recorded.

TEOM 3 recorded elevated levels on 15 November 2014 and coincides with an elevated level at Merriwa and high level at TEOM 4. This would tend to suggest a regional event affecting dust levels in the area.

On 17 November 2014, TEOM 1 recorded an elevated level above the criterion and well above the levels recorded at the surrounding stations. The differences in the readings indicate that a localised source close to the monitoring station was affecting the measurement.

A summary of the results from the HVAS monitoring stations operated by WCM and Moolarben Coal Complex available during 2012 to 2014 is presented in **Table 6-4** and **Figure 6-8**. The monitoring results in **Table 6-4** indicate that annual average PM_{10} levels at these monitors are below the criterion of 30µg/m³ and are comparable to the annual average TEOM monitoring results for the same periods.

Figure 6-8 indicates that there was only one period in 2013 when the recorded levels were above the 24-hour average PM_{10} criterion level. This occurred on 18 October 2013 at the HV4 and PM01 stations. This event corresponds with the elevated levels recorded at the TEOM monitors that were due to bushfires.

In 2014, the PM01 monitor recorded levels above the 24-hour average PM_{10} criterion on 16 January, corresponding with elevated levels recorded at the TEOM monitors attributable to bushfires.

Table 6-4: PM_{10} levels from HVAS monitoring (µg/m³)

Year	Annual average							Maximum 24 hour average						
	HV1	HV2(1)	HV4	HV5(2)	PM01	PM02	Criterion	HV1	HV2(1)	HV4	HV5(2)	PM01	PM02	Criterion
2012	9.0	13.6	9.8	-	11.8	9.6	30	21.7	47.6	21.8	-	28.1	24.3	50
2013	10.8	-	12.8	15.7	12.2	10.0	30	43.7	22.0	55.1	49.8	51.0	50.0	50
2014	10.9	-	11.7	14.6	13.8	11.7	30	41.2	-	37.7	47.8	51.0	47.0	50

(1)Data available till January 2013
(2)Data available from January 2013

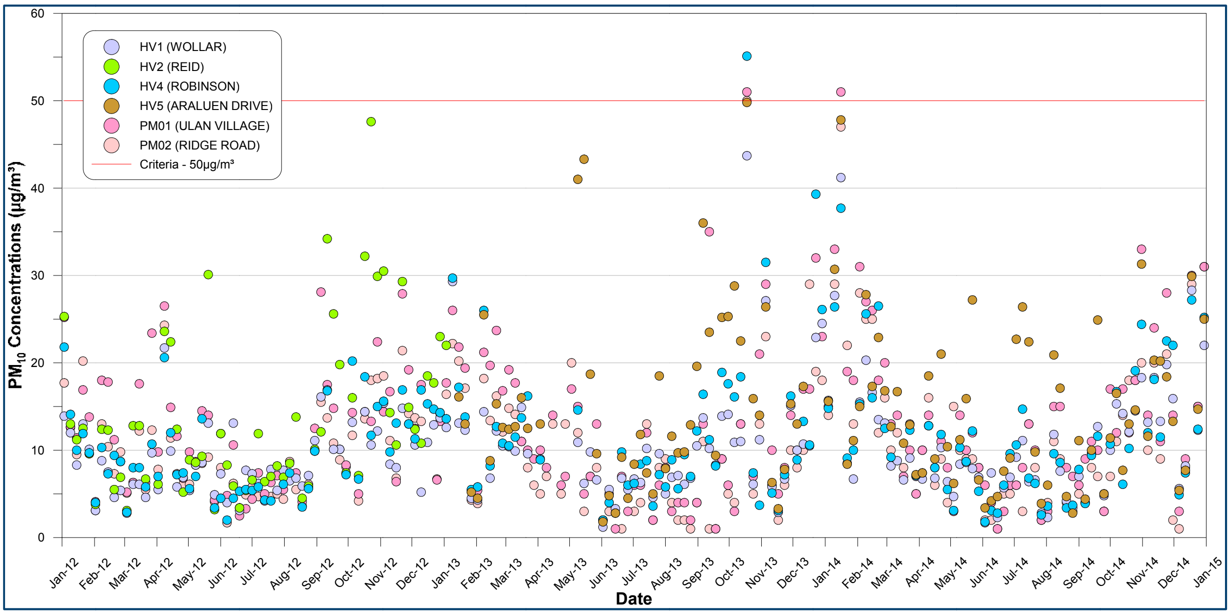


Figure 6-8: HVAS 24 hour average PM_{10} concentrations

6.3.3 TSP monitoring

TSP monitoring data are collected by WCM using one HVAS monitor. The available monitoring data collected between 2012 and 2014 are summarised in **Table 6-5** and **Figure 6-9.**

The monitoring data summarised in **Table 6-5** indicate that the annual average TSP concentrations for the HV3 monitoring station were well below the criterion of 90µg/m³. **Figure 6-9** shows that the 24-hour average concentrations are low and are typically less than half of the respective annual average criterion.

Table 6-5: TSP levels from HVAS monitoring (µg/m³)

Year	Annual average	Criterion (annual Average)
	HV3	
2012	18.9	90
2013	27.5	90
2014	22.7	90

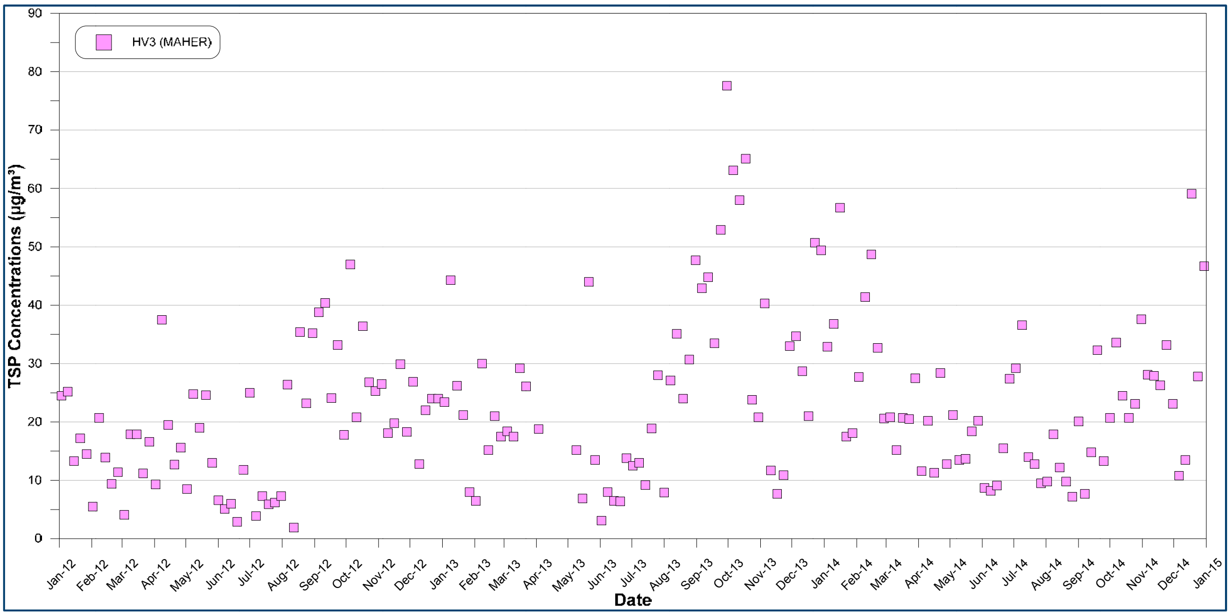


Figure 6-9: HVAS 24 hour average TSP concentrations

6.3.4 Dust deposition monitoring

Figure 6-4 shows the location of the dust deposition gauge monitoring network. It is observed that many of the gauges are generally located in close proximity to the mine or receptor locations. These locations are likely to show the highest levels of deposited dust in the area due to their close proximity to dust sources such as mining activity and traffic on unsealed roads and driveways.

Table 6-6 shows the annual average dust deposition levels at each gauge between 2012 and 2014. The majority of dust gauges recorded annual average insoluble solids deposition levels below the criterion of 4g/m²/month, with the exception of DG12 during 2012, which is located within the mining lease area (**Figure 6-4**).

Table 6-6: Annual average dust deposition (g/m²/month)

Year	Annual average										
	DG4	DG5	DG7	DG8	DG10	DG11	DG12	DG13	DG14	DG15	Criterion
2012	1.1	0.7	1.5	1.0	1.2	1.4	6.5	2.4	2.2	-	4
2013	0.9	0.6	-	1.4	2.0	2.0	3.3	1.9	1.0	0.9	4
2014	1.7	0.8	-	1.5	3.3	1.3	3.3	2.8	1.4	0.9	4

DG5 is the dust gauge located in closest proximity to receivers in Wollar (and is located between the mine and Wollar). This gauge shows low levels of deposited dust, which are below the applicable criteria in all years.

6.4 Odour management

The spontaneous combustion of carbonaceous material at the WCM is perceived to be the source of offensive odours affecting the surrounding area.

The WCM has experienced spontaneous combustion incidents in the past and is working to actively reduce the potential for these incidents to occur. This includes management of the current coal stockpiles through a risk identification system, whereby stockpiles that have a higher propensity to spontaneously combust are monitored and prioritised for washing in the CHPP prior to these stockpiles reaching a designated storage time on-site.

Out-of-pit waste dumps that were constructed at the commencement of mining and included carbonaceous waste material are progressively encapsulated or further rehandled and placed at the bottom of available mine voids, and covered with inert material to prevent ongoing spontaneous combustion.

WCPL is also conducting further test work on the coal seams to further refine the understanding of the propensity for spontaneous combustion to manage the material accordingly.

6.4.1 History of complaints

The WCM has been operating since 2006 and has maintained a complaints register as part of its Project Approval requirements. **Figure 6-10** presents a summary of the number of air quality related complaints between 2006 and 2014.

Between 2010 and 2013 the number of complaints received regarding odour increased, from two complaints in 2008 and 2009 to 35 in 2013. The increase in odour complaints in 2013 can be attributed to the progressive rehandling of the out-of-pit waste dumps to address the ongoing spontaneous combustion propensity of these stockpiles. The number of odour complaints received in 2014 has since reduced to 30 and is understood to be as a result of ongoing management of spontaneous combustion incidents.

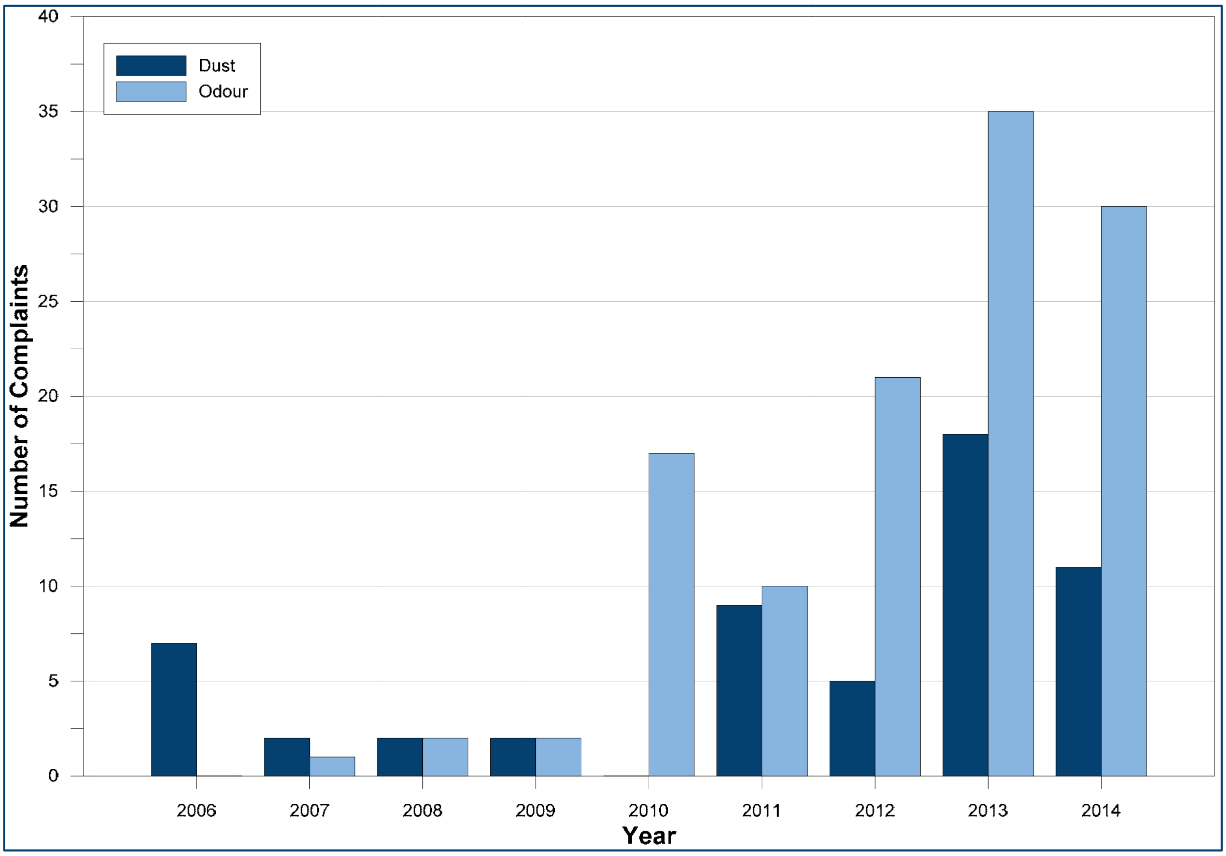


Figure 6-10: Summary of air quality related complaints

6.4.2 Monitoring for odour

In response to community complaints of odour levels in the area surrounding the WCM, WCPL implemented a monitoring program to measure the ambient concentrations of a range of pollutants between March 2013 and July 2014 at Wollar and Cooks Gap (**Pacific Environment Limited, 2014**). The air quality monitoring programme examined the following pollutants:

- Oxides of nitrogen;
- Sulfur dioxide;
- Hydrogen sulphide;
- Polycyclic aromatic hydrocarbons; and
- Volatile Organic Compounds.

The monitoring programme found that for all the measured pollutants, the concentrations at Wollar and Cooks Gap during the monitoring period were significantly below the relevant air quality criteria and odour thresholds. Correlation between the odour complaints received and measured levels during the monitoring period indicate that spontaneous combustion at WCM is unlikely to be the primary source of odour impacts, and that the source appears to be upwind of Wollar and the mine (i.e. to the east).

WCPL will continue to identify the potential sources of odour at the mining and emplacement areas and manage operations to ensure the occurrence of odour is low. Any odour complaint received would continue to be investigated to determine the likely source and action would be taken if it may be from the site.

6.5 Blast fume emissions

The proposed operations of the Project require the use of blasting activities to assist with the extraction of the resource. Blasting activities have the potential to generate noxious gases such as NO_2 and CO. Blast fume emissions from each blast event can vary greatly depending on a number of factors but largely on the tendency of a particular blast (or holes within the shot) to generate significant NO_2 emissions.

To ensure potential air quality impacts associated with the blasting activity of the Project are minimised, it is recommended that good blast practices and appropriate blast management measures are applied during each event. Good blast practices would include understanding the size of each blast, the residence time of each blast (how long the explosive has been in the ground before detonation), the nature of the stemming material, the proximity to roads and nearby sensitive receptors, and the weather and dispersion conditions during each blast. The decision to blast in each instance is based on operator judgement of the actual prevailing weather conditions, forecast weather conditions and the expected nature of potential plume travel towards the nearest assessment locations.

The blast management measures outlined in the Blast Management Plan (**WCPL, 2014b**) for the WCM outline various measures to minimise the potential for adverse dust and fume impacting on the nearby receptors. The Blast Management Plan includes consideration of a blast protocol to ensure that blasts are postponed during adverse weather conditions and is based on experience gained from early blasts and understanding of local weather patterns. The protocol would consider the weather conditions at the time as well as variables such as depth and size of blast, loading design and rock strength and competency.

On this basis, with the implementation of good blast practices and blast management measures, potential impacts from blast fume emissions can be readily managed and adverse impacts in the surrounding environment can be minimised.

7 DISPERSION MODELLING APPROACH

7.1 Introduction

The following sections are included to provide the reader with an understanding of the model and modelling approach.

For this assessment the CALPUFF modelling suite is applied to dispersion modelling. The CALPUFF model is an advanced "puff" model that can deal with the effects of complex local terrain on the dispersion meteorology over the entire modelling domain in a three dimensional, hourly varying time step. CALPUFF is an air dispersion model approved by NSW EPA for use in air quality impact assessments. The model setup used is in general accordance with methods provided in the NSW EPA document *Generic Guidance and Optimum Model Setting for the CALPUFF Modeling System for Inclusion into the 'Approved Methods for the Modeling and Assessments of Air Pollutants in NSW, Australia'* (**TRC Environmental Corporation**, **2011**).

7.2 Modelling methodology

Modelling was undertaken using a combination of The Air Pollution Model (TAPM) and the CALPUFF Modelling System. The CALPUFF Modelling System includes three main components: CALMET, CALPUFF and CALPOST and a large set of pre-processing programs designed to interface the model to standard, routinely available meteorological and geophysical datasets.

TAPM is a prognostic air model used to simulate the upper air data for CALMET input. The meteorological component of TAPM is an incompressible, non-hydrostatic, primitive equation model with a terrain-following vertical coordinate for 3D simulations. The model predicts the flows important to local scale air pollution, such as sea breezes and terrain induced flows, against a background of larger scale meteorology provided by synoptic analysis.

CALMET is a meteorological model that uses the geophysical information and observed/simulated surface and upper air data as inputs and develops wind and temperature fields on a 3D gridded modelling domain.

CALPUFF is a transport and dispersion model that advects "puffs" of material emitted from modelled sources, simulating dispersion processes along the way. It typically uses the 3D meteorological field generated by CALMET.

CALPOST is a post processor used to process the output of the CALPUFF model and produce tabulations that summarise the results of the simulation.

7.2.1 Meteorological modelling

TAPM was applied to the available data to generate a 3D upper air data file for use in CALMET. The centre of analysis for TAPM was 32deg20min south and 149deg52.5min east (770772mE, 6418737mN). The simulation involved an outer grid of 30km, with three nested grids of 10km, 3km and 1km with 35 vertical grid levels.

CALMET modelling used a nested approach where the 3D wind field from the coarser grid outer domain is used as the initial guess (or starting) field for the finer grid inner domain. This approach has several advantages over modelling a single domain. Observed surface wind field data from the near field as well as from far field monitoring sites can be included in the model to generate a more representative 3D wind field for the modelled area. Off domain terrain features for the finer grid domain can be allowed to take effect within the finer domain, as would occur in reality. Also, the coarse scale wind flow fields give a better set of starting conditions with which to operate the finer grid run.

The CALMET initial domain was run on a 75 x 75km area with a 1.5km grid resolution and refined for a second domain on a 30 x 30km area with a 0.3km grid resolution.

The 2013 calendar year was selected as the meteorological year for the dispersion modelling based on analysis of long-term data trends in meteorological data recorded for the area. The year is considered representative of the site and also corresponds to relatively high measured dust concentrations (i.e. likely to be conservative for cumulative impact analysis). 2013 was also used in the recent Modification 6 air quality assessment for the mine, allowing for easy comparison between dispersion modelling results. The available meteorological data for the 2013 calendar year from four surrounding meteorological monitoring sites were included in this run. **Table 7-1** outlines the parameters used from each station.

Table 7-1: Surface observation stations

Weather stations	Parameters						
	WS	WD	CH	CC	T	RH	SLP
WCM Weather Station	✓	✓			✓	✓	
Merriwa (Roscommon) Automatic Weather Station (BoM) (Station No. 061287)	✓	✓	✓	✓	✓	✓	✓
Mudgee Airport Automatic Weather Station (BoM) (Station No. 062101)	✓	✓			✓	✓	✓
Nullo Mountain Automatic Weather Station (BoM) (Station No. 062100)	✓	✓			✓	✓	

WS = wind speed, WD = wind direction, CH = cloud height, CC = cloud cover, T = temperature, RH = relative humidity, SLP = station level pressure

Local land use and detailed topographical information including local mine topography was included in the simulation to produce realistic fine scale flow fields (such as terrain forced flows) in surrounding areas (**Figure 7-1**).

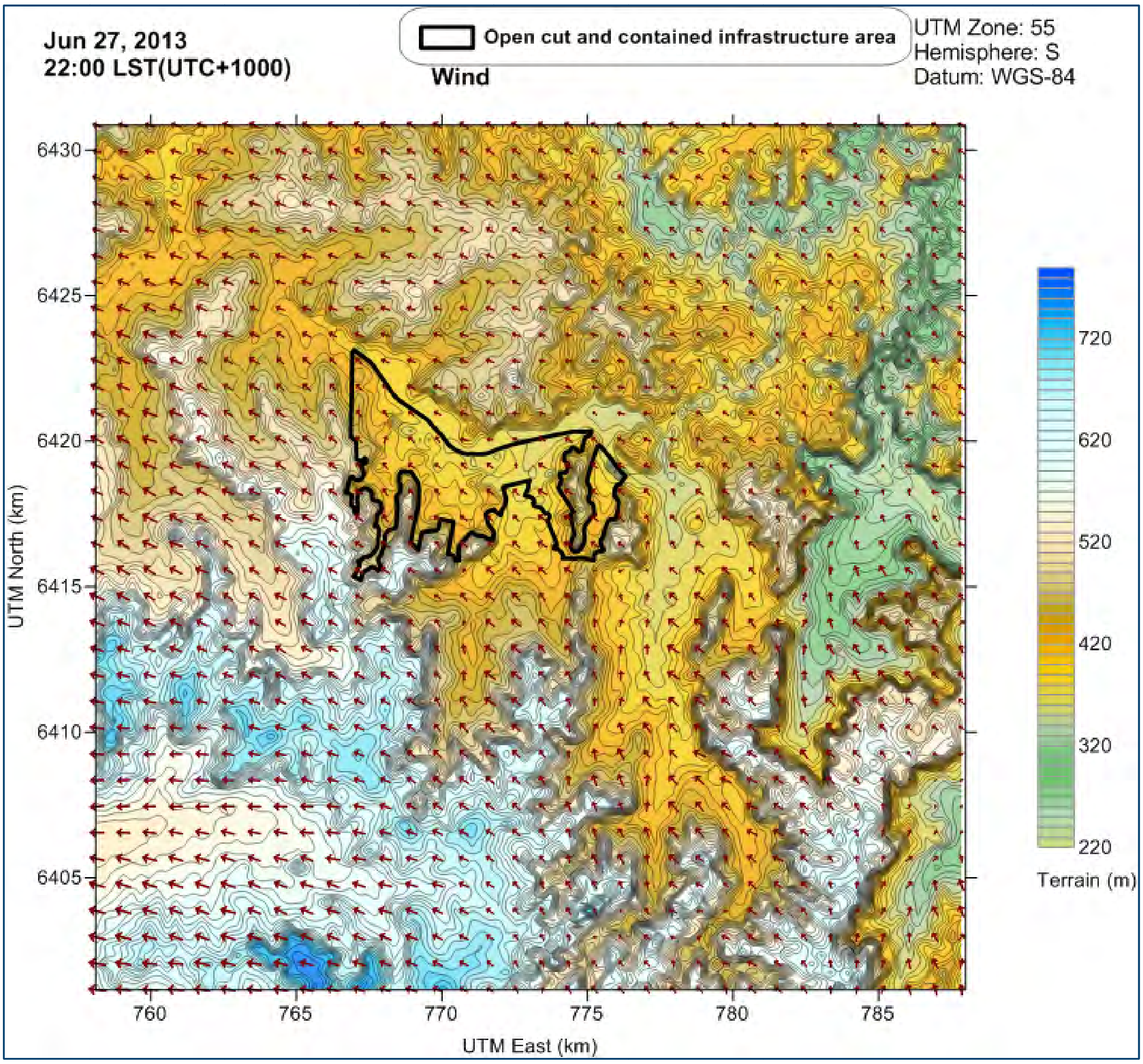


Figure 7-1: Representative snapshot of modelling wind field (at 10m height) for WCM

CALMET generated meteorological data were extracted from a point within the CALMET domain and are graphically represented in **Figure 7-2** and **Figure 7-3**.

Figure 7-2 presents the annual and seasonal windroses from the CALMET data. On an annual basis, winds from the east-southeast are most frequent followed by winds from the west-southwest and the west-northwest. During summer, winds from the east-southeast dominate with a lesser portion of wind from the east. Autumn winds are predominately from the southeast quadrant with a lesser proportion originating from the west-southwest. In winter, west-southwest and west-northwest winds dominate the wind distribution with a lesser portion of winds from the west and northwest sectors. Winds during spring predominantly occur from the west-southwest to the northwest.

Overall, the windroses generated in the CALMET modelling reflect the expected wind distribution patterns of the area as determined based on the available measured data and the expected terrain effects on the prevailing winds. **Figure 7-3** includes graphs of the temperature, wind speed, mixing height and stability classification over the modelling period and show sensible trends considered to be representative of the area.

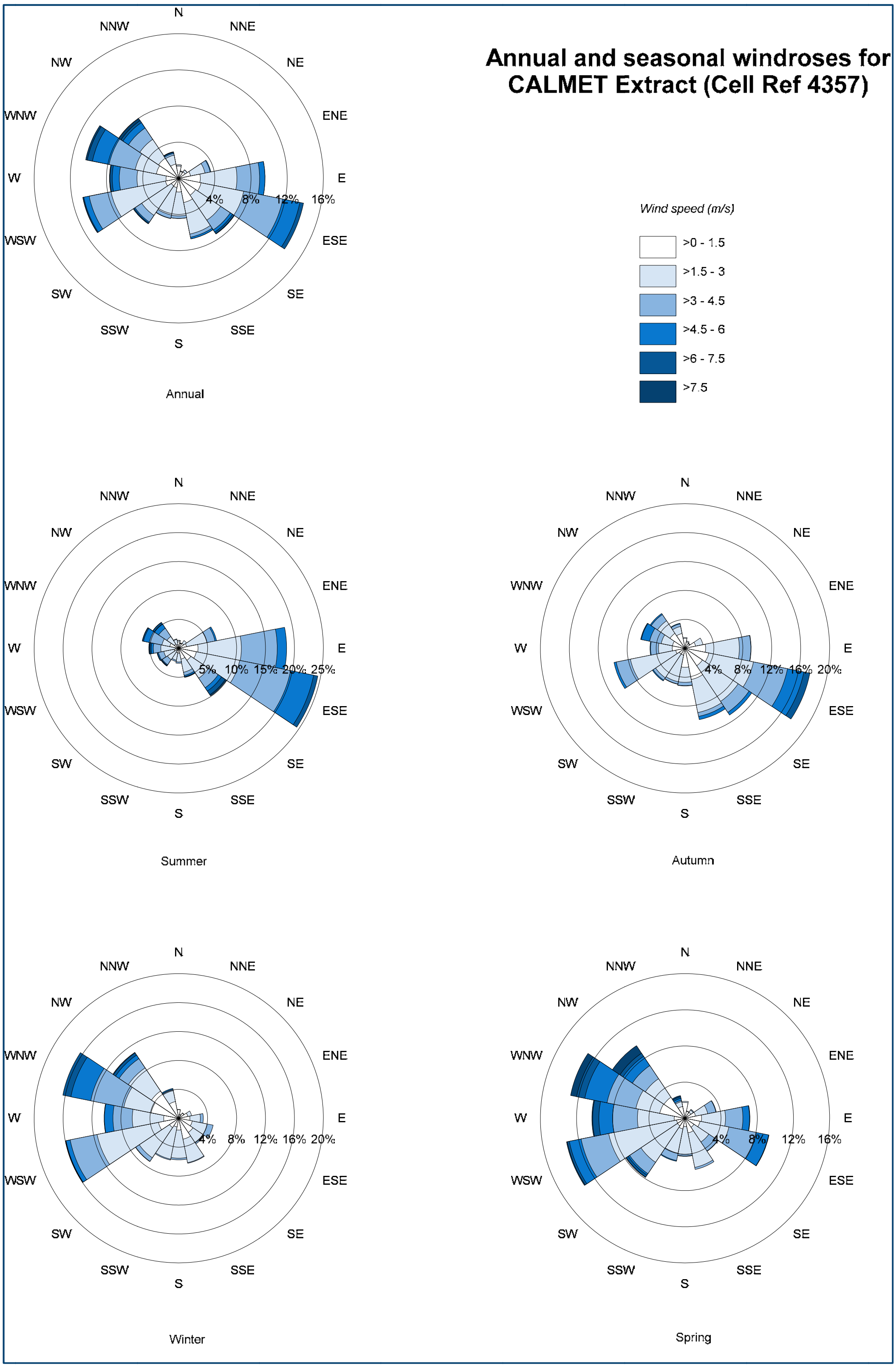


Figure 7-2: Windroses from CALMET extract at 10m height (Cell Ref 4357)

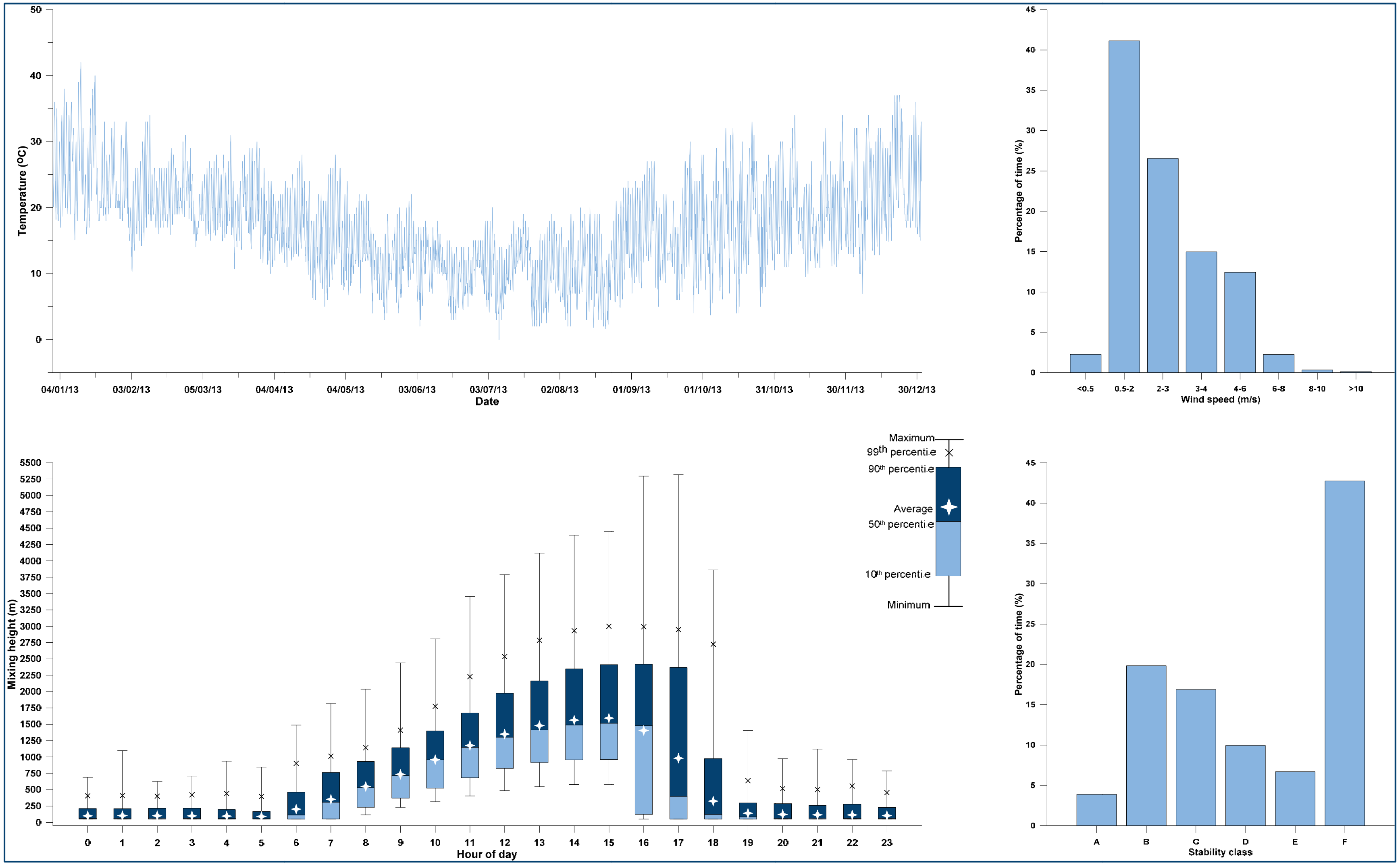


Figure 7-3: Meteorological analyses of CALMET extract (Cell Ref 4357)

7.2.2 Dispersion modelling

CALPUFF modelling is based on the application of three particle size categories; fine particulate, coarse matter and rest. The distribution of particles for each particle size category was derived from measurements in the **SPCC (1986)** study and is presented in **Table 7-2**.

Table 7-2: Distribution of particles

Particle category	Size range	Distribution
Fine particulates	0 to 2.5µm	4.68% of TSP
Coarse matter	2.5 to 10µm	34.4% of TSP
Rest	10 to 30µm	60.92% of TSP

(1)Particle distribution sources from **SPCC (1986)**

Emissions from each activity were represented by a series of volume sources and were included in the CALPUFF model via an hourly varying emission file. Meteorological conditions associated with dust generation (such as wind speed) and levels of dust generating activity were considered in calculating the hourly varying emission rate for each source. It should be noted that as a conservative measure, the effect of the precipitation rate (rainfall) in reducing dust emissions has not been considered in this assessment.

Each particle size category is modelled separately and later combined to predict short-term and long-term average concentrations for $PM_{2.5}$, PM_{10}, and TSP. Dust deposition was predicted using the proven dry deposition algorithm within the CALPUFF model. Particle deposition is expressed in terms of atmospheric resistance through the surface layer, deposition layer resistance and gravitational settling (**Slinn and Slinn, 1980** and **Pleim *et al.,* 1984**). Gravitational settling is a function of the particle size and density, simulated for spheres by the Stokes equation (**Gregory, 1973**).

CALPUFF is capable of tracking the mass balance of particles emitted into the modelling domain. For each hour CALPUFF tracks the mass emitted, the amount deposited, the amounts remaining in the surface mixed layer or the air above the mixed layer and the amount advected out of the modelling domain. The versatility to address both dispersion and deposition algorithms in CALPUFF, combined with the 3D meteorological and land use field, generally results in a more accurate model prediction compared to other Gaussian plume models (**Pfender *et al*., 2006**).

7.3 Modelling Scenarios

The assessment considers five mine plan years (scenarios) to represent the Project. The scenarios selected were chosen to represent potential worst-case impacts in regard to the quantity of material extracted in each year, the location of the operations and the potential to generate dust at sensitive receptors.

Mining operations at the WCM consist of truck, shovel and bulk bulldozer push operations to remove overburden material and extract the coal resources. Overburden emplacement typically occurs behind the progression of the mine extraction with rehabilitation of emplacement areas progressing as they are completed. The active mining areas and exposed areas are kept to a minimum for the efficiency of the operation and this also has a positive effect in minimising the potential amount of dust levels generated from the operations.

The five scenarios nominally represent the proposed activity in future years 2018, 2020, 2024, 2028 and 2031. Indicative mine plans for each of the selected years are presented in **Figure 7-4** and **Appendix C**.

The indicative mine plan years show the general progression of the mining operations with active extraction occurring in the new extension area to the east (Pit 8). The selected scenarios represent the key stages over the life of the Project with regard to activity in Pit 8 and its progression to the south, as activity in this location is most likely to effect the sensitive receptor locations situated in Wollar.

The modelled year 2018 scenario represents a potential worst-case scenario with regard to dust generation with the proposed maximum amount of ROM coal extracted reaching 16Mtpa and active mining occurring in all pits at the WCM during this period. ROM coal extraction gradually reduces in the following years with the exhaustion of reserves in some pits and the rehabilitation of these areas.

Impacts associated with construction activities are typically of a short duration and can be managed through commonly applied mitigation measures such as water sprays. As such emissions associated with construction activities are generally considered too low to generate any significant off-site concentrations and have not been assessed in detail in this report.

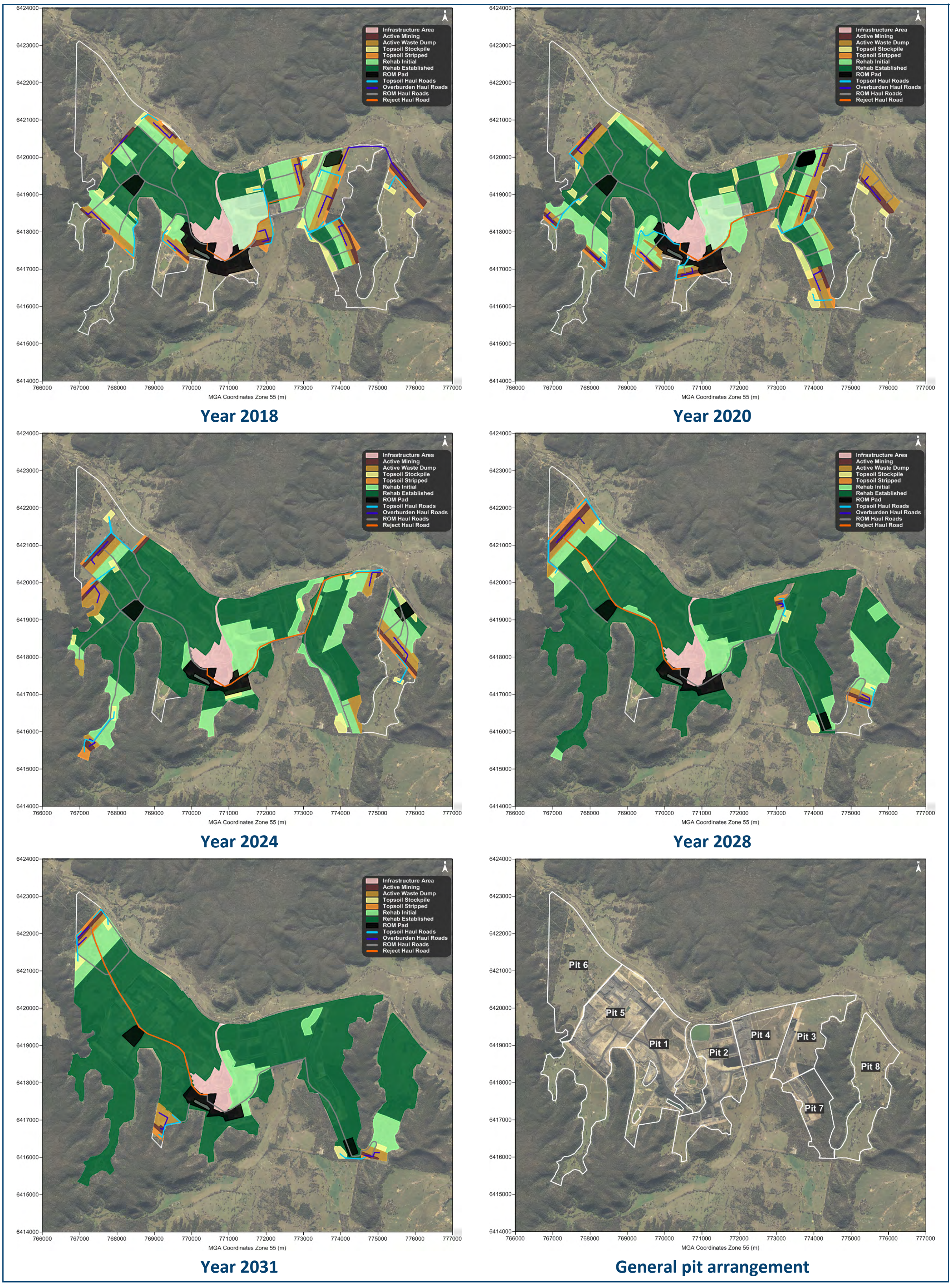


Figure 7-4: Indicative mine plans for the Project

7.3.1 Emission estimation

For each of the chosen modelling scenarios, dust emission estimates have been calculated by analysing the various types of dust generating activities taking place and utilising suitable emission factors.

The emission factors applied are considered the most applicable and representative for determining dust generation rates for the proposed activities. The emission factors were sourced from both locally developed and United States EPA (US EPA) developed documentation. Total dust emissions from all significant dust generating activities for the WCM incorporating the Project are summarised in **Table 7-3**. Detailed emission inventories and emission estimation calculations are presented in **Appendix C**.

The dust emissions presented in **Table 7-3** are commensurate with a best practice mining operation utilising reasonable and feasible best practice dust mitigation applied where applicable. Further details on the dust control measures applied for the Project are outlined in **Section 7.3.3**.

It should be noted that the emissions in **Table 7-3** are inclusive of the approved operations at the WCM as the operations are integrated, whereas the incremental increase in the TSP emissions for the Project only would be significantly less than shown in the table for Years 2018, 2020 and 2024.

The table also shows TSP to ROM coal ratios of approximately 0.5 kilograms (kg) of TSP per tonne of ROM coal. This is at the low end of the range that is typical for open cut coal mines, indicating relatively low amounts of dust for the quantity of coal extracted. This would largely be due to the low quantity of overburden that needs to be moved to access the coal, but also good dust management practices.

Table 7-3: Estimated emissions for the WCM incorporating the Project (kg of TSP)

Activity	Year 2018	Year 2020	Year 2024	Year 2028	Year 2031
Topsoil removal - Pit 1	5,052	5,931	-	-	8,341
Topsoil removal - Pit 2	8,486	7,332	-	-	-
Topsoil removal - Pit 3	6,893	7,496	683	-	-
Topsoil removal - Pit 4	1,515	-	-	4,021	-
Topsoil removal - Pit 5	7,585	8,267	8,175	-	-
Topsoil removal - Pit 6	-	3,841	14,657	22,899	11,604
Topsoil removal - Pit 7	5,937	2,834	-	-	-
Topsoil removal - Pit 8	7,763	-	11,180	6,468	2,246
Drill & Blast activity - Pit 1	12,206	9,936	-	-	7,356
Drill & Blast activity - Pit 2	13,150	29,002	-	-	-
Drill & Blast activity - Pit 3	32,796	31,900	13,271	-	-
Drill & Blast activity - Pit 4	24,242	-	-	22,178	-
Drill & Blast activity - Pit 5	45,199	27,788	20,610	-	-
Drill & Blast activity - Pit 6	14,367	30,438	68,944	55,773	48,089
Drill & Blast activity - Pit 7	29,244	23,789	-	-	-
Drill & Blast activity - Pit 8	22,902	28,743	49,795	28,798	18,610
Overburden activity - Pit 1	6,885	7,309	-	-	10,837
Overburden activity - Pit 2	6,849	24,983	-	-	-
Overburden activity - Pit 3	35,746	36,033	24,630	-	-
Overburden activity - Pit 4	18,593	-	-	13,299	-
Overburden activity - Pit 5	31,194	20,620	29,428	-	-
Overburden activity - Pit 6	18,740	35,203	85,147	82,621	74,022
Overburden activity - Pit 7	29,506	28,234	-	-	-
Overburden activity - Pit 8	49,306	36,553	67,504	39,364	26,076
Overburden hauling - Pit 1	17,516	17,345	-	-	38,446
Overburden hauling - Pit 2	20,916	51,516	-	-	-
Overburden hauling - Pit 3	137,471	137,715	73,709	-	-
Overburden hauling - Pit 4	58,850	-	-	16,048	-
Overburden hauling - Pit 5	120,226	41,169	53,004	-	-

Activity	Year 2018	Year 2020	Year 2024	Year 2028	Year 2031
Overburden hauling - Pit 6	65,114	163,450	353,314	485,595	361,352
Overburden hauling - Pit 7	100,237	97,588	-	-	-
Overburden hauling - Pit 8	725,381	156,567	271,935	119,303	59,068
Dozer activity on overburden - Pit 1	64,346	33,073	-	-	-
Dozer activity on overburden - Pit 2	68,225	127,984	-	-	-
Dozer activity on overburden - Pit 3	172,666	131,635	63,426	-	-
Dozer activity on overburden - Pit 4	124,116	-	-	99,365	-
Dozer activity on overburden - Pit 5	197,469	134,819	134,039	-	-
Dozer activity on overburden - Pit 6	57,070	120,183	296,294	269,216	298,888
Dozer activity on overburden - Pit 7	185,268	136,675	-	-	-
Dozer activity on overburden - Pit 8	-	122,707	313,318	190,165	197,775
Dozer activity on coal - Pit 1	12,495	13,009	-	-	16,166
Dozer activity on coal - Pit 2	13,404	36,634	-	-	-
Dozer activity on coal - Pit 3	29,988	37,681	16,483	-	-
Dozer activity on coal - Pit 4	23,741	-	-	45,579	-
Dozer activity on coal - Pit 5	45,891	35,887	28,256	-	-
Dozer activity on coal - Pit 6	12,381	35,438	104,586	89,108	93,158
Dozer activity on coal - Pit 7	26,580	26,167	-	-	-
Dozer activity on coal - Pit 8	16,698	32,597	68,089	46,491	35,619
ROM coal activity - Pit 1	75,900	60,030	-	-	40,710
ROM coal activity - Pit 2	81,420	169,049	-	-	-
ROM coal activity - Pit 3	182,159	173,879	57,960	-	-
ROM coal activity - Pit 4	144,209	-	-	137,999	-
ROM coal activity - Pit 5	362,387	215,279	129,168	-	-
ROM coal activity - Pit 6	97,773	212,588	478,099	350,726	304,979
ROM coal activity - Pit 7	161,459	120,750	-	-	-
ROM coal activity - Pit 8	131,858	195,545	311,258	182,987	116,610
ROM coal hauling - Pit 1	46,723	21,499	-	-	19,249
ROM coal hauling - Pit 2	34,667	40,081	-	-	-
ROM coal hauling - Pit 3	185,944	211,991	87,238	-	-
ROM coal hauling - Pit 4	146,194	-	-	139,649	-
ROM coal hauling - Pit 5	280,672	180,354	150,855	-	-
ROM coal hauling - Pit 6	65,678	150,316	391,856	360,275	333,221
ROM coal hauling - Pit 7	203,132	165,219	-	-	-
ROM coal hauling - Pit 8	167,926	277,449	491,678	294,788	161,697
CHPP activity	1,192,120	1,121,436	838,316	632,172	454,052
Wind erosion active areas	902,676	1,024,095	728,294	398,310	306,999
Wind erosion stockpiles (ROM & Product)	35,515	32,490	27,388	26,698	23,026
Grading Roads	25,879	25,879	25,879	19,409	12,940
TOTAL	**7,254,499**	**6,494,003**	**5,888,466**	**4,179,306**	**3,081,133**
Kg of TSP per tonne of ROM coal	**0.45**	**0.45**	**0.53**	**0.53**	**0.58**

Note: Totals may vary slightly due to rounding.

7.3.2 Emissions from other mines

In addition to the estimated dust emissions from the WCM, all nearby mining operations were included in the modelling to assess potential cumulative dust effects. The operations include:

- Moolarben Coal Complex (as amended – i.e. including predictions for Stage 1 and Stage 2);
- Ulan Mine Complex Continued Operations.

Emission estimates from these sources were derived from information provided in the most up to date air quality assessments available in the public domain at the time of modelling, as shown in **Table 7-4**. These estimates are likely to be conservative as in many cases mines do not operate at the maximum extraction rates assessed. **Table 7-4** summarises the emissions adopted in this assessment for each of the nearby mining operations.

Two applications for modifications to the Moolarben Coal Complex have been lodged with the NSW DP&E since the time of modelling (OC4 South-West Modification and UG1 Optimisation Modification). The air quality assessments associated with the proposed Modifications have not been taken into consideration for this assessment as they reduce the total dust emissions from the Moolarben Coal Complex. In this situation the emissions estimated for the Moolarben Coal Complex used in this assessment (see **Table 7-4**) would be conservative if the proposed Modifications were approved. It is therefore considered that the cumulative assessment completed for the Project would still be reasonably representative of potential cumulative impacts in the future.

Table 7-4: Estimated emissions for nearby mining operations (kg of TSP)

Mining operation	Year 2018	Year 2020	Year 2024	Year 2028	Year 2031
Moolarben Coal Complex(1)	5,930,324	5,930,324	5,879,163	6,472,532	6,472,532
Moolarben Coal Complex – proposed South-West Modification(2)	-	4,370,856	-	-	-
Moolarben Coal Complex – proposed UG1 Optimisation Modification(3)	-	4,256,468	-	-	-
Ulan Mine Complex(4)	2,842,032	1,802,947	1,281,527	1,280,276	1,280,276

(1) **Todoroski Air Sciences (2013a)**
(2) **Todoroski Air Sciences (2015a)**
(3) **Todoroski Air Sciences (2015b)**
(4) **PAEHolmes (2009)**

Based on the distance from the WCM (approximately 15km east-southeast), it is expected that the nearest proposed mine, the Bylong Coal Project, would have negligible cumulative interactions with receivers relevant to the WCM.

The nearest assessed year in the Moolarben Coal Complex air quality impact assessment (**Todoroski Air Sciences, 2013a**) is applied in each of the cumulative modelling scenarios. The emission estimates for the Ulan Mine Complex have been interpolated based on the assessed years in the latest air quality impact assessment (**PAEHolmes, 2009**).

Emissions from nearby mining operations would contribute to the background level of dust in the area surrounding the WCM, and these emissions are explicitly included in the modelling. Additionally, there would be numerous smaller or very distant sources that contribute to the total background dust level. Modelling these non-mining sources explicitly is impractical, however the residual level of dust due to all other such non-modelled sources (as estimated in **Section 7.4**) has been included in the cumulative results, as discussed in **Section 8**.

7.3.3 Best practice operational dust mitigation measures

WCPL has carefully considered the possible range of air quality mitigation measures that are feasible and can be applied to achieve a standard of mine operation consistent with current best practice for the control of dust emissions from coal mines in NSW, as outlined in the recent NSW EPA document, *NSW Coal Mining Benchmarking Study: International Best Practice Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining*, prepared by Katestone Environmental (**Katestone Environmental, 2010**).

The NSW EPA has also implemented a Pollution Reduction Program (PRP) at the WCM, which requires identification and assessment of the practicability of implementing further best practice measures. The identified best practice controls based on the PRP have been reviewed and were considered in this assessment.

A summary of the key current dust controls, which would continue to be applied for the Project, is shown in **Table 7-5**. Where applicable these controls have been applied in the dust emission estimates shown in **Table 7-3**. Further detail on the level of control applied is set out in **Appendix C**.

Reactive operational dust mitigation strategies and management measures are implemented at the WCM to minimise potential for dust impacts during mining operations in the surrounding environment.

Reactive dust mitigation strategies include high dust concentration alarms to alert staff of the potential for dust impacts occurring. High dust concentration alarms trigger the implementation of dust management plans that appropriately modify activities depending on weather conditions, such as temporarily ceasing the on-site operations, which are causing the measured levels at dust monitors to reach the criterion level or ceasing operations that are likely to have a significant off-site impact due to adverse weather conditions.

Table 7-5: Best practice dust mitigation measures

Activity	Dust control
Scrapers on topsoil and bulldozers on overburden and rehabilitation	✦ Manage according to dust alarms
Hauling on unsealed roads	✦ Watering roads ✦ Impose speed limits ✦ Use the largest practical truck size ✦ Road edges to be clearly defined with marker post or equivalent to control locations ✦ Obsolete roads will be ripped and re-vegetated as soon as practical
Drilling (overburden and coal)	✦ Water curtains
Blasting (overburden and coal)	✦ Meteorological conditions assessed prior to blasting ✦ Adequate stemming
Bulldozers on coal	✦ Manage according to dust alarms
Loading/unloading coal	✦ Water sprays on ROM bin
Conveyor transfers (CHPP)	✦ Water sprays ✦ Belt cleaning and spillage minimisation ✦ Enclosures
Wind erosion on stockpiles and exposed surfaces	✦ Profiling of surfaces to reduce surface speed ✦ Contouring of dump shape where practical to avoid strong wind flows and smooth gradients to reduce turbulence at surface ✦ Rehabilitation as soon as practical ✦ Topsoil stockpiles not regularly used to be re-vegetated
Road grading	✦ Watering grader routes

The dust alarms inform relevant operational staff of actual conditions in semi real-time. This allows the operators to react accordingly and modify activities to reduce the quantity of dust generation during these periods. Multiple real-time dust monitors are established in the surrounding environment near sensitive receptor locations with upwind and downwind positioned monitors to indicate the potential contribution to total dust levels as a result of mining operations by the Project.

7.3.4 Potential coal dust emissions from train wagons

As coal produced by the Project would be transported off-site via rail (both to the Port of Newcastle for export and to domestic customers), there is potential to generate coal dust emissions from train wagons during transportation. The scale of the potential emissions would depend on various factors including the material properties of the product coal, meteorological factors and train/wagon specific factors.

As described in **Section 3.2**, product coal would be transported off-site within existing maximum and annual average daily rail limits. Given that the trains used to transport the product coal and the train loading/coal treatment methods would not change for the Project, it is therefore likely that there would be no change in particulate matter concentrations along the railway associated with the Project in comparison to approved operations.

The extension of the mine life by approximately seven years would mean that particulate emissions along the railway associated with WCM would continue accordingly during the extension to the mine life.

Due to the relatively small impacts associated with rail transport (a maximum 24 hour PM_{10} concentration of 1.7µg/m³ 50m from the rail centreline [**Appendix D**]), the potential for any adverse air quality impacts associated with coal dust generated during rail transport (including cumulative impacts) would likely be low and would not make any appreciable difference to existing air quality levels. More detail regarding coal dust emissions from train wagons is provided in **Appendix D**.

7.4 Accounting for background dust levels

All significant dust generating operations in the vicinity of the WCM (i.e. estimated emissions from the Ulan Mine Complex and Moolarben Coal Complex) were included in the dispersion model to assess the total potential dust impact.

Other, non-mining sources of particulate matter in the wider area would also contribute to existing ambient dust levels. These sources have not been individually accounted for in the dispersion modelling as it is impractical to do so; however an allowance for their contribution to total dust levels is required to fully assess the total potential impact.

For annual average predictions, the contribution to the prevailing background dust level of other non-modelled dust sources was estimated by modelling the past (known) mining activities (including Moolarben Coal Complex and Ulan Mine Complex) during January 2013 to December 2013 and comparing the model predictions with the actual measured data from the monitoring stations. The average difference between the measured and predicted PM_{10}, TSP and deposited dust levels from each of the monitoring points was considered to be the contribution from other non-modelled dust sources, and was added to the future predicted values to account for the background dust levels (not explicitly in the model which would be due to the numerous small or distant, non-modelled dust sources).

This approach is preferable to modelling WCM alone and adding a single constant background level at all points across the modelling domain to estimate cumulative impacts. This is because the approach includes modelling of other major sources (i.e. mines) that more reliably represent the higher dust levels near such sources, and also accounts for the seasonal and time varying changes in the background levels that arise from these major dust sources. In addition, to account for any underestimation from not including every source (as it is not possible to reasonably do so), the relatively smaller contribution arising from the other non-modelled dust sources, as determined above, was added to the results to obtain the most accurate predictions of future cumulative impacts across the modelled domain.

Using the approach described above, the estimated annual average contribution from other non-modelled dust sources is presented in **Table 7-6**.

Table 7-6: Estimated contribution from other non-modelled dust sources

Pollutant	Averaging period	Unit	Estimated contribution
TSP	Annual	µg/m³	20.2
PM_{10}	Annual	µg/m³	11.9
Dust deposition	Annual	g/m²/month	1.1

It is important that the above values are not confused with measured background levels, background levels excluding only the proposal, or the change in existing levels as a result of the proposal. The values above are not background levels in that sense, but are the residual amount of the background dust that is not accounted for directly in the air dispersion modelling.

To account for background levels when assessing total (cumulative) 24 hour average PM_{10} concentration impacts, the 24 hour average project only incremental levels are added to the total measured 24 hour average ambient dust levels (as per the NSW EPA guidelines).

As there is no readily available ambient monitoring for $PM_{2.5}$ in the vicinity of the WCM, a conservative estimate of background levels was calculated based on the assumption that an annual average $PM_{2.5}$ concentration of 8µg/m³ is equivalent to an annual average PM_{10} concentration of 30µg/m³.

Per this assumption, the calculated $PM_{2.5}$ level to account for the non-modelled sources that has been applied in this assessment is 3.2µg/m³.

8 DISPERSION MODELLING RESULTS

The dispersion model predictions for each of the assessed scenarios are presented in this section. The results presented are for the operation in isolation (incremental impact) and operating with other sources (total [cumulative] impact) and show the estimated:

- Maximum 24 hour average $PM_{2.5}$ and PM_{10} concentrations;
- Annual average $PM_{2.5}$ and PM_{10} concentrations;
- Annual average TSP concentrations; and
- Annual average dust (insoluble solids) deposition rates.

It is important to note that when assessing impacts per the maximum 24 hour average PM_{10} criterion the predictions show the highest predicted 24 hour average concentrations that were modelled at each point within the modelling domain for the worst day (a 24 hour period) in the one year long modelling period. When assessing the total (cumulative) 24 hour average impacts based on model predictions, challenges arise with identification and quantification of emissions from non-modelled sources over the 24 hour period. Due to these factors, the 24 hour average impacts need to be calculated differently to annual averages and as such, the predicted total (cumulative) impacts for maximum 24 hour average PM_{10} concentrations have been addressed specifically in **Section 8.4**.

Each of the sensitive receptors (residences) shown in **Figure 2-1** and detailed in **Appendix A** were assessed individually as discrete receptors with the predicted results presented in tabular form for each of the assessed years in **Appendix E**.

Associated isopleth diagrams of the dispersion modelling results are presented in **Appendix F**.

To account for sources not explicitly included in the model, and to fully account for all cumulative dust levels, the unaccounted fractions of background dust levels (which arise from the other non-modelled sources), were added to the annual average model predictions as described in **Section 7.4**.

8.1 Comparison of modelling predictions

The Project proposes to extend the WCM outside of the existing approved activity footprint, which would bring operations closer to the privately-owned receptors located in Wollar. To show the effect of the proposed changes relative to the approved operations, the key results (maximum 24 hour average PM_{10} and annual average $PM_{2.5}$) have been overlayed on the results of the most recent modification for the WCM (**Todoroski Air Sciences, 2014a**) in **Figure 8-1** and **Figure 8-2**.

The results show that dust levels are predicted to increase in areas to the east of the mine, as would be expected due to activities associated with the development of Pit 8. The predictions show that the local terrain features appear to influence the dispersion patterns of dust generated from the Project. This is most notable when activity would occur in the northern areas of Pit 8. The results show that the ridge positioned between Pit 8 and Wollar has a noticeable effect in reducing modelled potential dust effects in Wollar.

In areas to the northwest and southwest where impacts are predicted to extend beyond the previously assessed extents, these effects are largely due to the position of mining activity occurring being modelled near the pit boundary for the entire year.

In regard to potential impacts at privately owned receptors, the results indicate that the overall effect of the proposed Project would increase in areas to the east of the mine and north of Wollar. The results show that development of Pit 8 would increase dust levels in Wollar, however it is expected that the levels would be within acceptable criteria, through the application of appropriate dust controls and the use of reactive management strategies.

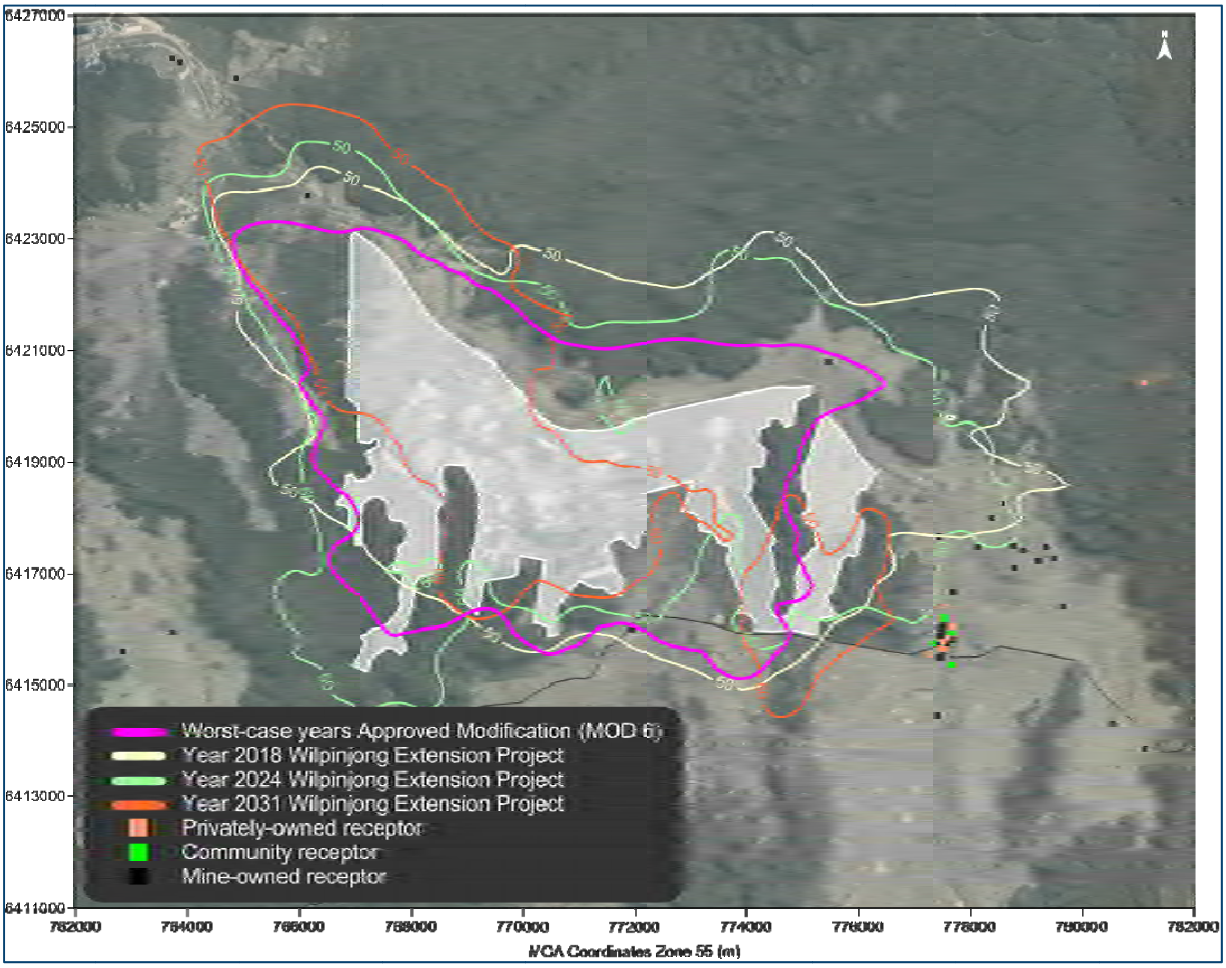


Figure 8-1: Comparison of approved and proposed maximum incremental 24 hour average PM_{10} concentrations (µg/m³)

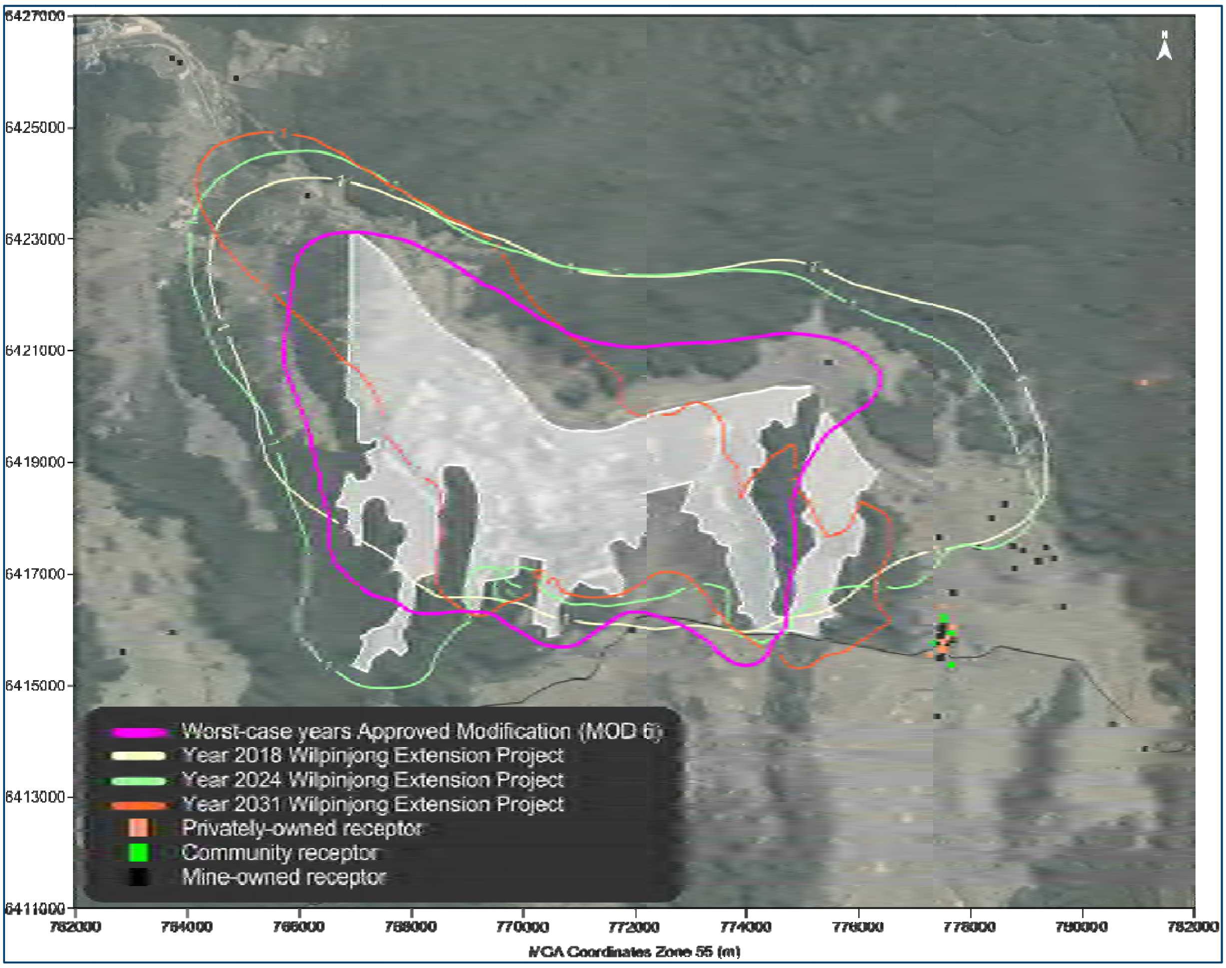


Figure 8-2: Comparison of approved and proposed incremental annual average $PM_{2.5}$ concentrations (µg/m³)

8.2 Analysis of impacts on vacant land

An analysis of the relevant air quality contours and land tenure information indicates that there would be no impacts associated with the Project on vacant land that would lead to the application of voluntary acquisition rights. Any land that exceeds the relevant acquisition criteria is either mine-owned or Crown Land.

8.3 Summary of modelling predictions

Table 8-1 summarises the assessed receptor locations where impacts are predicted to exceed relevant assessment criteria. The receptor locations highlighted in grey are identified as mine-owned receptor locations. Predicted results for each of the assessed dust metrics at each individual receptor location assessed is presented in detail in **Appendix E**.

As shown in **Table 8-1**, all receptor locations where predicted impacts exceed the assessment criteria are mine-owned properties.

There are no privately-owned receptor locations predicted to experience levels above the applied assessment criteria.

Table 8-1: Summary of modelled predictions where predicted impacts exceed assessment criteria

Receptor ID[1]	PM_{10}		$PM_{2.5}$	TSP	Dust deposition	
	Incremental 24 hour average	Total annual average	Total annual average	Total annual average	Incremental annual average	Total annual average
	Criterion 50µg/m³	Criterion 30µg/m³	Advisory[2] 8µg/m³	Criterion 90µg/m³	Criterion 2g/m²/month	Criterion 4g/m²/month
	Year of impact (level of impact - µg/m³ / g/m²/month)					
1_28C	2020 (75.2) 2024 (56.5)					
1_45	2018 (173.7) 2020 (129.5) 2024 (146.6)	2018 (68.1) 2020 (51.7) 2024 (45.0)	2018 (10.4) 2020 (8.3)	2018 (115.8)		
1_83	2018 (54.5)					
1_129	2020 (52.9)					
1_130	2018 (60.2) 2020 (57.5) 2024 (57.4)					
1_164	2018 (71.5) 2020 (74.6)					
32_12		2018 (48.2) 2020 (47.0)				
32_13		2018 (46.0) 2020 (44.9)				
32_14		2018 (32.1) 2020 (31.2)				
32_32C	2018 (54.1) 2024 (59.5) 2028 (83.5) 2031 (135.5)	2018 (33.6) 2020 (33.3) 2024 (119.1) 2028 (129.4) 2031 (143.4)	2024 (16.8) 2028 (18.1) 2031 (19.9)	2024 (216.3) 2028 (234.0) 2031 (258.2)		2024 (4.5) 2031 (4.3)

(1) Refer to Appendix A for sensitive receptor locations
(2) Advisory NEPM reporting standard applicable to monitoring locations representative of the underlying population exposure.

8.4 Assessment of total (cumulative) 24 hour average PM_{10} concentrations

The NSW EPA contemporaneous assessment method was applied to examine the potential maximum total (cumulative) 24 hour average PM_{10} impacts arising from the WCM incorporating the Project.

This analysis has focused on the privately-owned sensitive receptor locations in Wollar and the privately-owned sensitive receptor locations to the northeast of Wollar that would be the most likely to experience maximum cumulative impacts due to the Project.

Figure 8-3 shows the locations for the contemporaneous impact assessment.

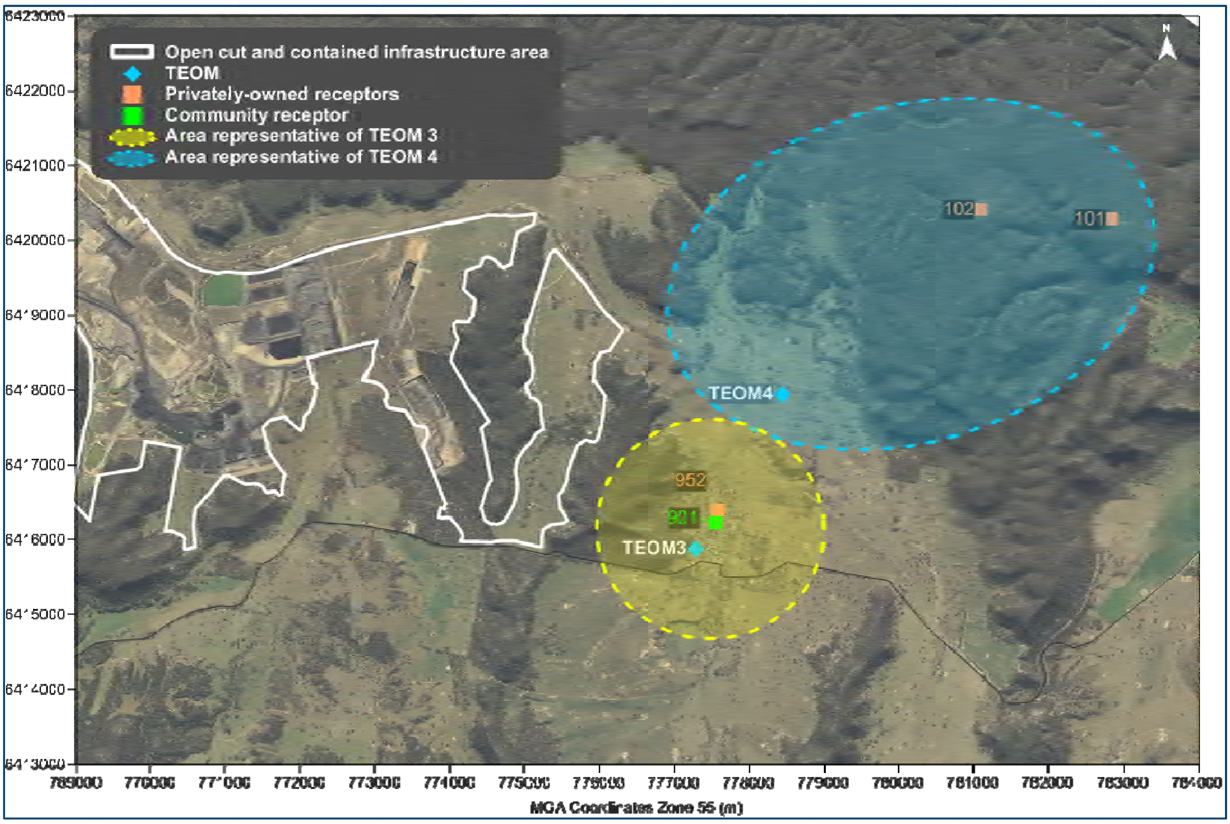


Figure 8-3: Locations for contemporaneous impact assessment

An assessment of cumulative 24 hour average PM_{10} impacts was undertaken in accordance with methods outlined in section 11.2 of the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**NSW DEC, 2005**). The "Level 2 assessment – Contemporaneous impact and background approach" was applied to assess potential impacts at private receptors near monitoring locations.

As shown in **Section 6**, maximum background levels have in the past reached levels above the 24 hour average PM_{10} criterion level (depending on the monitoring location and time). As a result, the screening Level 1 NSW EPA approach of adding maximum background levels to maximum predicted Project only levels would show levels above the criterion.

In such situations, (where a Level 1 assessment indicates that an impact may be possible) the NSW EPA approach requires a more thorough Level 2 assessment whereby the measured background level on a given day is added contemporaneously with the corresponding Project-only level predicted using the same day's weather data. This method factors into the assessment the spatial and temporal variation in background levels affected by the weather and existing sources of dust in the area on a given day. However, even with a detailed Level 2 approach, any air dispersion modelling has limitations (as described in **Section 7.4**) in predicting short term impacts which may arise many years into the future, and these limitations need to be understood when interpreting the results.

Ambient (background) dust concentration data for January 2013 to December 2013 from the TEOM stations have been applied in the Level 2 contemporaneous 24 hour average PM_{10} assessment and represent the prevailing measured background levels in the vicinity of the WCM and surrounding sensitive receptor locations.

As the existing mine and other nearby mining operations (Moolarben Coal Complex and Ulan Mine Complex) were operational during 2013, they would have contributed to the measured levels of dust in the area on some occasions. Due to this it is important to account for these existing activities in the cumulative assessment. Modelling of the actual mining scenario for the 2013 period (in which the weather and background dust data were collected) was conducted to estimate the existing contribution to the measured levels of dust. The results were applied in the cumulative assessment to minimise potential double counting of existing mine emissions and other nearby mining operations (as they would occur in both the measured data and in the predicted levels), and thus results in a more reliable prediction of the likely cumulative total dust level.

Table 8-2 provides a summary of the findings of the contemporaneous assessment at each assessed receptor location. The results in **Table 8-2** indicate that it is unlikely that systemic cumulative impacts would arise at assessed receptor locations during the assessed years.

Detailed tables of the full assessment results are provided in **Appendix E**.

Table 8-2: NSW EPA contemporaneous assessment – maximum number of additional days above 24 hour average criterion depending on background level at monitoring sites

Location	Year 2018	Year 2020	Year 2024	Year 2028	Year 2031
101	**1**	0	0	0	0
102	**1**	0	0	0	0
901	0	0	**2**	0	0
952	0	0	**2**	0	0

The contemporaneous assessment indicates only low potential for any cumulative 24 hour average PM_{10} impacts to occur at the assessed sensitive receptor locations. The sensitive receptor locations are considered to represent areas where the highest cumulative impacts are most likely to occur. Given these locations show little potential for any significant impact to occur, it can be inferred that there would also be little prospect of any significant impact to occur at all other sensitive receptor locations.

To demonstrate the effectiveness of the implementation of reactive measures at WCM, the dispersion modelling was re-run to consider the effects of temporarily pausing activities in Pit 8 during the periods of elevated dust predicted to occur at the most affected sensitive receptor locations in each TEOM representative area; Receptors 102 and 952. Only the activities that can be controlled by WCPL are ceased in the model, and dust from other sources such as wind erosion still occurs in the modelling.

The effect of this measure is demonstrated in the times series plots in **Figure 8-4** and **Figure 8-5**.

The yellow bars in the figures show the predicted additional levels due to the Project above background levels (i.e. the yellow sections of the bars indicate the amount of increased dust predicted for 2018 and 2024 using the 2013 meteorology). The blue bars show the existing background levels as measured by the TEOM monitors in 2013. The orange bars indicate the predicted amount of decreased dust levels due to the Project. The top of the bars indicate the predicted cumulative level associated with the Project and background combined, except where decreased levels are present.

The results in the figures indicate that with the implementation of temporary pausing of activities in Pit 8, the predicted exceedances of air quality criteria could be averted at these locations.

The effectiveness of these measures can be further enhanced on a case-by-case basis if required. Enhancements include a more comprehensive active real-time or predictive management system for dust that would permit some pre-planning of any temporary cessation of activities, increased watering or re-scheduling of certain activities. Through such measures, the potential impacts in the surrounding environment can be minimised further.

However, the results indicate that even without such enhanced measures, the Project can operate within the applicable criteria.

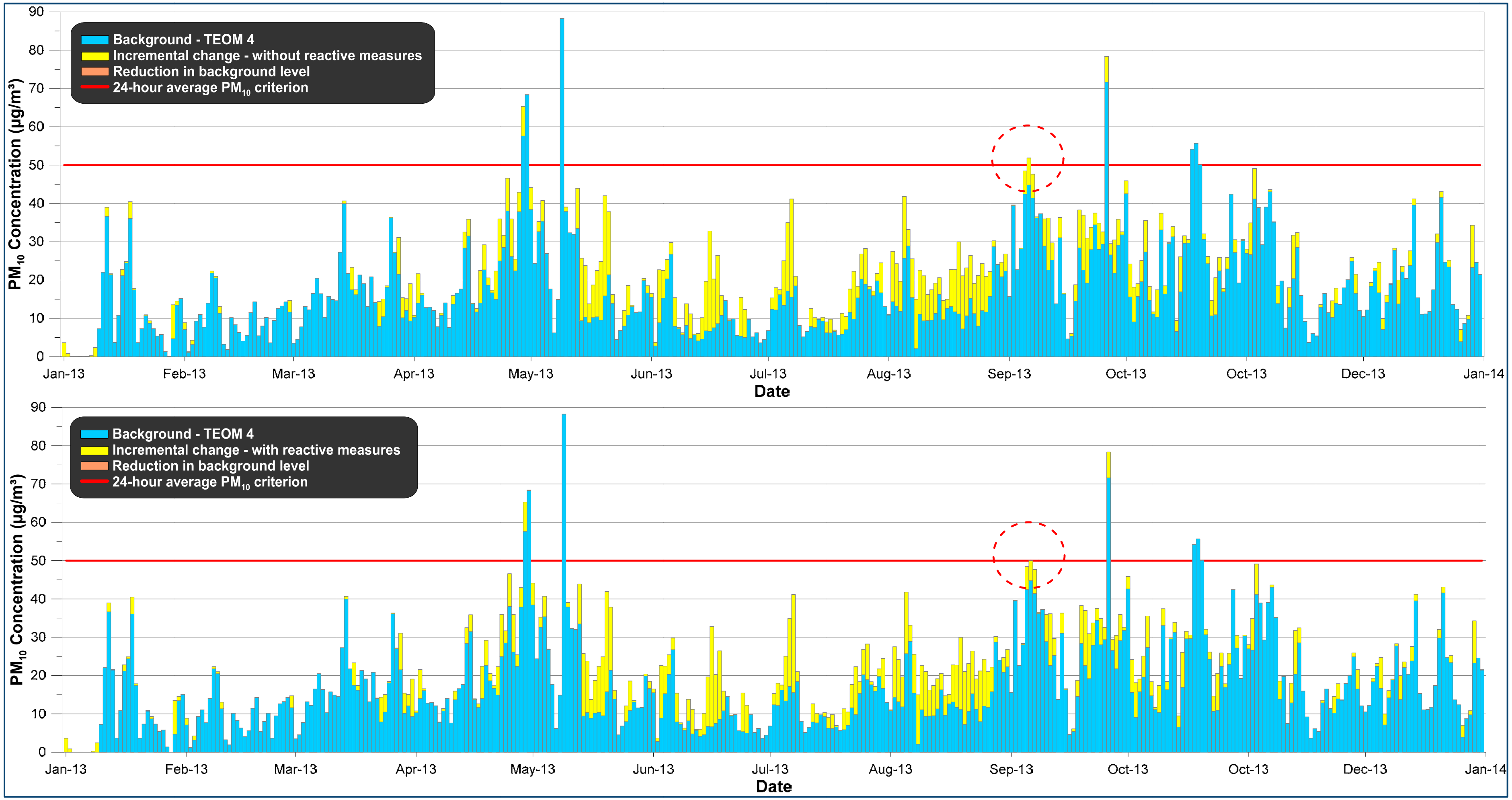


Figure 8-4: Time series plots comparing predicted impacts at Receptor 102 with and without reactive measures for Pit 8 during 2018

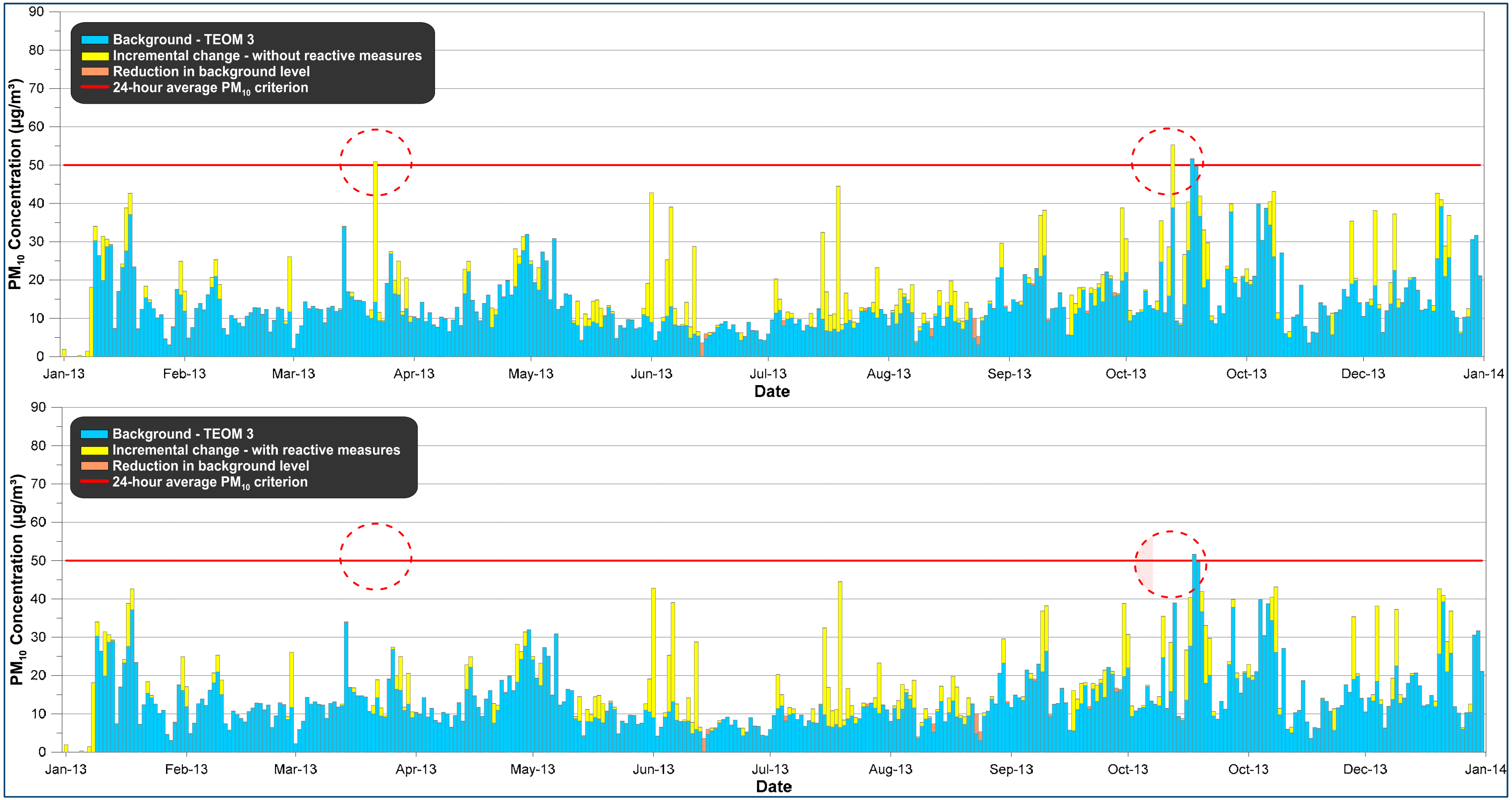


Figure 8-5: Time series plots comparing predicted impacts at Receptor 952 with and without reactive measures for Pit 8 during 2024

9 DUST MITIGATION AND MANAGEMENT

The existing operations at WCM implement dust mitigation measures, including real-time controls, in accordance with the existing Air Quality Management Plan (AQMP).

In addition to the AQMP, a recent PRP implemented at the WCM identified best practice dust mitigation measures for the WCM. These best practice dust mitigation measures were incorporated in the emission estimates for this assessment, where relevant. This assessment has applied conservative assumptions in the estimation of dust levels.

The monitoring data presented in **Section 6.3** indicate that WCM has been generally in compliance with NSW EPA air quality criteria. Where exceedances have occurred, these have typically been associated with regional events and not WCM activities.

Relative to the existing operations, the Project would lead to an increase in dust levels, however the increase would not be significant at any privately-owned receptors.

This is supported by the air quality assessment for the Project, which predicts that there would be no exceedances of EPA air quality criteria at any privately-owned receptor due to the WCM incorporating the Project and background sources (including other mining operations).

Given this situation and the demonstrated performance of existing operations, it is considered that the continued implementation of the AQMP management measures (as updated in the current plan revisions), including real-time controls with implementation of the best practice mitigation measures identified in the PRP, would be suitable to manage potential air quality impacts from the Project.

10 GREENHOUSE GAS ASSESSMENT

10.1 Introduction

Dynamic interactions between the atmosphere and surface of the earth create the unique climate that enables life on earth. Solar radiation from the sun provides the heat energy necessary for this interaction to take place, with the atmosphere acting to regulate the complex equilibrium. A large part of this atmospheric regulation occurs from the "greenhouse effect" with the absorption and reflection of the solar radiation dependent on the composition of specific GHG in the atmosphere.

Over the last century, the composition and concentration of GHG in the atmosphere has increased due to increased anthropogenic activity. Climatic observations indicate that the average pattern of global weather is changing as a result. The measured increase in global average surface temperatures indicates an unfavourable and unknown outcome if the rate of release of GHG emissions remain at the current rate.

This assessment aims to estimate the predicted emissions of GHG to the atmosphere due to the Project and to provide a comparison of the direct emissions from the Project at the state and national level.

10.2 Greenhouse gas inventory

The National Greenhouse Accounts (NGA) Factors document published by the Department of the Environment defines three scopes (Scope 1, 2 and 3) for different emission categories based on whether the emissions generated are from "direct" or "indirect" sources.

Scope 1 emissions encompass the direct sources from the Project defined as:

"...from sources within the boundary of an organisation as a result of that organisation's activities" (**Department of the Environment, 2014a**).

Scope 2 and 3 emissions occur due to the indirect sources from the Project as:

"...emissions generated in the wider economy as a consequence of an organisation's activities (particularly from its demand for goods and services), but which are physically produced by the activities of another organisation" (**Department of the Environment, 2014a**).

For the purpose of this assessment, emissions generated in all three scopes defined above provide a suitable approximation of the total GHG emissions generated from the Project.

Scope 3 emissions can be a significant component of the total GHG emissions associated with a project; however, these emissions are usually not directly controlled by the Project and are considered as Scope 1 emissions from other organisations. The primary Scope 3 emissions related to the Project arise from off-site transportation of the product coal and the end use of the product coal. These emissions have been estimated in this study.

Other, less significant, Scope 3 emissions may also arise from a large range of other sources associated with the Project. Scope 3 emissions may include all of the emissions from the upstream and downstream activities associated with the Project (e.g. emissions due to commuting staff or electricity consumed by computers etc). These emissions cannot be reasonably quantified due to the large diversity of sources and the relatively minor individual contributions.

10.2.1 Emission sources

Scope 1 and 2 GHG emission sources identified from the operation of the Project are the on-site combustion of diesel fuel, petrol fuel, petroleum based greases and oils, explosives, emissions of methane from the exposed coal seams, gaseous fuels and on-site consumption of electricity.

Scope 3 emissions have been identified as resulting from the consumption of diesel, petroleum based greases and oils, electricity for use on-site, the transport of product to its final destination and the final use of the product. It is conservatively assumed that all on-site fuel usage is diesel.

Estimated quantities of materials that have the potential to emit GHG emissions associated with Scope 1 and 2 emissions for the Project are summarised in **Table 10-1**. These estimates are based on a conservative upper limit of the assumed maximum resource extraction throughout the life of the Project. The assessment provides a reasonable worst-case approximation of the potential GHG emissions for the purpose of this assessment.

It should be noted that **Table 10-1** and associated analysis are conservative as they include the quantities of materials required for the currently approved operations of the WCM as well as quantities required for the Project. For simplicity, these totals have been used to estimate GHG emissions for the Project, rather than estimating an incremental increase in emissions associated with the Project in comparison to the approved operations.

Table 10-1: Summary of quantities of materials estimated for the Project

Year	ROM coal (Mt)	Diesel (kL)	Electricity (MWh)	Explosives (tonnes)	Petroleum based grease/oil (kL)
2017	15.5	45,241	25,911	11,840	2,784
2018	15.95	49,811	26,664	13,036	3,065
2019	15.28	49,835	25,544	13,042	3,066
2020	14.53	49,153	24,290	12,864	3,024
2021	12.44	48,260	20,796	12,630	2,970
2022	12.44	46,526	20,796	12,176	2,863
2023	10.8	46,104	18,054	12,066	2,837
2024	11.08	46,540	18,522	12,180	2,864
2025	10.77	41,864	18,004	10,956	2,576
2026	8.58	33,218	14,343	8,693	2,044
2027	8.38	29,169	14,009	7,634	1,795
2028	7.95	31,813	13,290	8,326	1,958
2029	6.86	29,170	11,468	7,634	1,795
2030	5.49	25,703	9,178	6,727	1,582
2031	5.29	23,024	8,843	6,026	1,417
2032	5.3	28,424	8,860	7,439	1,749
2033	1.74	4,250	2,909	1,112	261
TOTAL	**168.4**	**628,105**	**281,481**	**164,381**	**38,650**

Mt = million tonnes, kL = kilolitre, MWh = megawatt hour

Scope 3 emissions for the transport and final use of the coal may have the potential to vary in the future depending on the market situation at the time. These assumptions include emission factors for the transport modes of rail and shipping and the associated average weighted distance travelled for the export coal.

10.2.2 Emission factors

To quantify the amount of carbon dioxide equivalent (CO_2-e) material generated from the Project, emission factors obtained from the NGA Factors (**Department of the Environment, 2014a**) and other sources as required are summarised in **Table 10-2**.

Table 10-2: Summary of emission factors

Type	Energy content factor	Emission factor			Units	Scope
		CO_2	CH_4	N_2O		
Diesel	38.6	69.2	0.2	0.5	kg CO_2-e/GJ	1

Type	Energy content factor	Emission factor			Units	Scope
		CO_2	CH_4	N_2O		
		5.3	-	-		3
Grease and oils	38.8	27.9	-	-	kg CO_2-e/GJ	1
		5.3	-	-		3
Electricity	-	0.86	-	-	kg CO_2-e/kWh	2
		0.13	-	-		3
Explosives	-	0.17	-	-	t CO_2-e/tonne	1
Fugitive emissions[1]	-	1.2	-	-	kg CO_2-e/tonne ROM	1
Rail[2]	-	16.6	-	-	t CO_2-e/Mt-km	3
Ship[2]	-	3.7	-	-	t CO_2-e/Mt-km	3
Thermal coal[3]	29	88.2	0.03	0.2	kg CO_2-e/GJ	3

CO_2 = carbon dioxide, CO_2-e = carbon dioxide equivalent, CH_4 = methane, N_2O = nitrous oxide, GJ = gigajoule, kWh = kilowatt hour

[1] PAEHolmes (2010)

[2] Todoroski Air Sciences (2014b)

[3] Assumes type of coal is anthracite

The emission factor based on the release of methane from the coal seams at the WCM is taken to be 1.2 kg of CO_2-e per tonne of ROM coal. This emission factor has been calculated based on actual testing of methane gas from coal seams at the WCM (**PAEHolmes, 2010**). This emission factor is lower than the default factor provided in the NGA Factors document and compares with other mining operations in the area.

To be conservative, all product coal is assumed to be transported to the Port of Newcastle by rail and then transferred to coal loaders before being shipped to its final destination. The approximate rail distance is taken to be 500km (return distance) to the Port of Newcastle. The approximate shipping distance to its final destination is taken to be 16,000km (return distance), which is based predominately on destinations in the Asian market.

The emissions generated from the end use of coal produced by the Project have assumed that all product coal is consumed as thermal coal in power generation. As it is difficult to estimate emissions from power stations in other countries, this assessment has assumed the emissions generated would be equivalent to those generated in NSW or Australian power stations.

10.3 Summary of greenhouse gas emissions

Table 10-3 summarises the estimated annual CO_2-e emissions due to the operation of the Project.

Table 10-3: Summary of CO_2-e emissions for the Project (t CO_2-e)

Year	Fugitive Emissions	Diesel		Grease / oils		Electricity		Explosives	Transport (RAIL)	Transport (SHIP)	Final use (Thermal)
	Scope 1	Scope 1	Scope 3	Scope 1	Scope 3	Scope 2	Scope 3	Scope 1	Scope 3	Scope 3	Scope 3
2017	18,600	122,067	9,255	3,014	573	22,283	3,368	2,013	104,580	737,251	32,312,322
2018	19,140	134,397	10,190	3,318	630	22,931	3,466	2,216	107,485	757,730	33,209,887
2019	18,336	134,462	10,195	3,319	630	21,968	3,321	2,217	103,750	731,400	32,055,875
2020	17,436	132,622	10,056	3,274	622	20,889	3,158	2,187	93,790	661,186	28,978,511
2021	14,928	130,212	9,873	3,215	611	17,885	2,703	2,147	84,660	596,822	26,157,594
2022	14,928	125,534	9,518	3,099	589	17,885	2,703	2,070	81,340	573,418	25,131,806
2023	12,960	124,395	9,432	3,071	583	15,526	2,347	2,051	72,210	509,054	22,310,889
2024	13,296	125,571	9,521	3,100	589	15,929	2,408	2,071	71,380	503,203	22,054,442
2025	12,924	112,955	8,565	2,789	530	15,483	2,341	1,863	71,380	503,203	22,054,442
2026	10,296	89,627	6,796	2,213	420	12,335	1,865	1,478	51,460	362,774	15,899,714
2027	10,056	78,702	5,967	1,943	369	12,048	1,821	1,298	51,958	366,285	16,053,582
2028	9,540	85,836	6,508	2,120	403	11,429	1,728	1,415	49,966	352,242	15,438,109
2029	8,232	78,705	5,968	1,943	369	9,862	1,491	1,298	42,994	303,092	13,283,955
2030	6,588	69,350	5,258	1,713	325	7,893	1,193	1,144	32,370	228,197	10,001,433
2031	6,348	62,122	4,710	1,534	291	7,605	1,150	1,024	32,370	228,197	10,001,433
2032	6,360	76,692	5,815	1,893	360	7,620	1,152	1,265	32,370	228,197	10,001,433
2033	2,088	11,467	869	283	54	2,502	378	189	7,885	55,586	2,436,247
Total	**202,056**	**1,694,715**	**128,498**	**41,839**	**7,948**	**242,074**	**36,593**	**27,945**	**1,091,948**	**7,697,839**	**337,381,673**

10.4 Contribution of greenhouse gas emissions

Table 10-4 summarises the emissions associated with the Project based on Scopes 1, 2 and 3.

Table 10-4: Summary of CO_2-e emissions per scope (t CO_2-e)

Year	Scope 1	Scope 2	Scope 3	Scope 1+2
2017	145,693	22,283	33,167,350	167,977
2018	159,071	22,931	34,089,389	182,002
2019	158,334	21,968	32,905,171	180,302
2020	155,518	20,889	29,747,322	176,407
2021	150,502	17,885	26,852,264	168,387
2022	145,631	17,885	25,799,374	163,515
2023	142,477	15,526	22,904,516	158,004
2024	144,038	15,929	22,641,543	159,967
2025	130,530	15,483	22,640,460	146,013
2026	103,613	12,335	16,323,029	115,948
2027	91,999	12,048	16,479,983	104,047
2028	98,911	11,429	15,848,956	110,340
2029	90,178	9,862	13,637,868	100,040
2030	78,794	7,893	10,268,777	86,688
2031	71,028	7,605	10,268,151	78,633
2032	86,210	7,620	10,269,326	93,829
2033	14,027	2,502	2,501,019	16,528
Total	**1,966,555**	**242,074**	**346,344,498**	**2,208,629**

The estimated annual GHG emissions for Australia for the 2013 to 2014 period were 542.6Mt CO_2-e (**Department of the Environment, 2014b**). In comparison, the conservative estimated annual average GHG emissions over the life of the Project is 0.13Mt CO_2-e (Scope 1 and 2). Therefore, the annual contribution of GHG emissions from the Project in comparison to the Australian GHG emissions for the 2013 to 2014 period is conservatively estimated to be approximately 0.02%.

At a state level, the estimated GHG emissions for NSW in the 2011-12 period were 154.7Mt CO_2-e (**Department of the Environment, 2014c**). The annual contribution of GHG emissions from the Project in comparison to the NSW GHG emissions for the 2011-12 period is conservatively estimated to be approximately 0.08%.

The estimated GHG emissions generated in all three scopes are based on approximated maximum quantities of materials. Therefore the estimated emissions for the Project are considered conservative.

A comparison of the annual ROM coal production and estimated CO_2-e emissions (Scope 1 and 2) from various mining operations in NSW is presented in **Table 10-5**. The comparison indicates that in terms of the tonnes of CO_2-e generated per tonne of ROM coal produced, the WCM is one of the most efficient mining operations, producing approximately 0.01t CO_2-e/t ROM coal.

Table 10-5: Comparison of CO_2-e emissions

Mine	Annual ROM extraction (Mt)	Annual average GHG emissions (Scope 1 and 2) (Mt)	t CO_2-e/t ROM coal
WCM	9.9	0.13	0.01
Moolarben Coal Complex(1)	15.2	0.16	0.01
Ulan Mine Complex(2)	10.7	0.24	0.02
Mangoola(3)	13.5	0.2	0.01
Mount Thorley Warkworth(4)	10	0.47	0.05
Bengalla(5)	15	0.77	0.05
Mt Arthur(6)	32	2.2	0.07

(1)Todoroski Air Sciences (2013a)
(2)SEE Sustainability Consulting (2009)
(3)Todoroski Air Sciences (2013b)
(4)Todoroski Air Sciences (2014b)
(5)Todoroski Air Sciences (2013c)
(6)PAEHolmes (2013)

10.5 Greenhouse gas management

The Project will utilise various mitigation measures to minimise the overall generation of GHG emissions. These measures would include developing a basis for identifying and implementing energy efficiency opportunities and mitigation measures for various activities.

Examples of various mitigation and energy management measures to reduce GHG emissions are as follows:

- Monitor the consumption of fuel and regularly maintain diesel powered equipment to ensure operational efficiency;
- Monitor the total site electricity consumption and investigate avenues to minimise the requirement;
- Conduct a review of alternative renewable energy sources;
- Provide energy awareness programs for staff and contractors; and
- Minimise the production of waste generated on-site.

11 SUMMARY AND CONCLUSIONS

This study has examined potential air quality (i.e. dust) and GHG impacts that may arise from the Project.

Conservative emission estimation (i.e. using maximum mine schedule) and dispersion modelling (i.e. not including the effect of rainfall) has been completed for this assessment.

The results indicate that the Project would lead to an increase in dust levels relative to the current operations, including at receptors in Wollar, however the resulting dust levels at all privately owned receptors would remain within acceptable criteria.

With the application of the existing dust mitigation strategy, it is anticipated that actual dust levels would be lower than the levels predicted.

A modelling scenario with WCPL's existing reactive dust management strategy (i.e. shutting down equipment in Pit 8 during a small number of periods with adverse weather conditions) indicated that the reactive dust management strategy of responding to changes in dust levels and weather conditions would ensure dust levels are kept below the levels predicted in this assessment, and therefore within acceptable criteria.

The conservative estimated annual average greenhouse emission over the life of the Project is 0.13Mt CO_2-e (Scope 1 and 2), approximately 0.02% of the Australian greenhouse emissions for the 2013 to 2014 period. When compared to a number of mining operations in NSW, the Project would have a relatively low GHG emission rate per tonne of ROM coal extracted, producing approximately 0.01t CO_2-e/t ROM.

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Appendix A
Sensitive Receptors

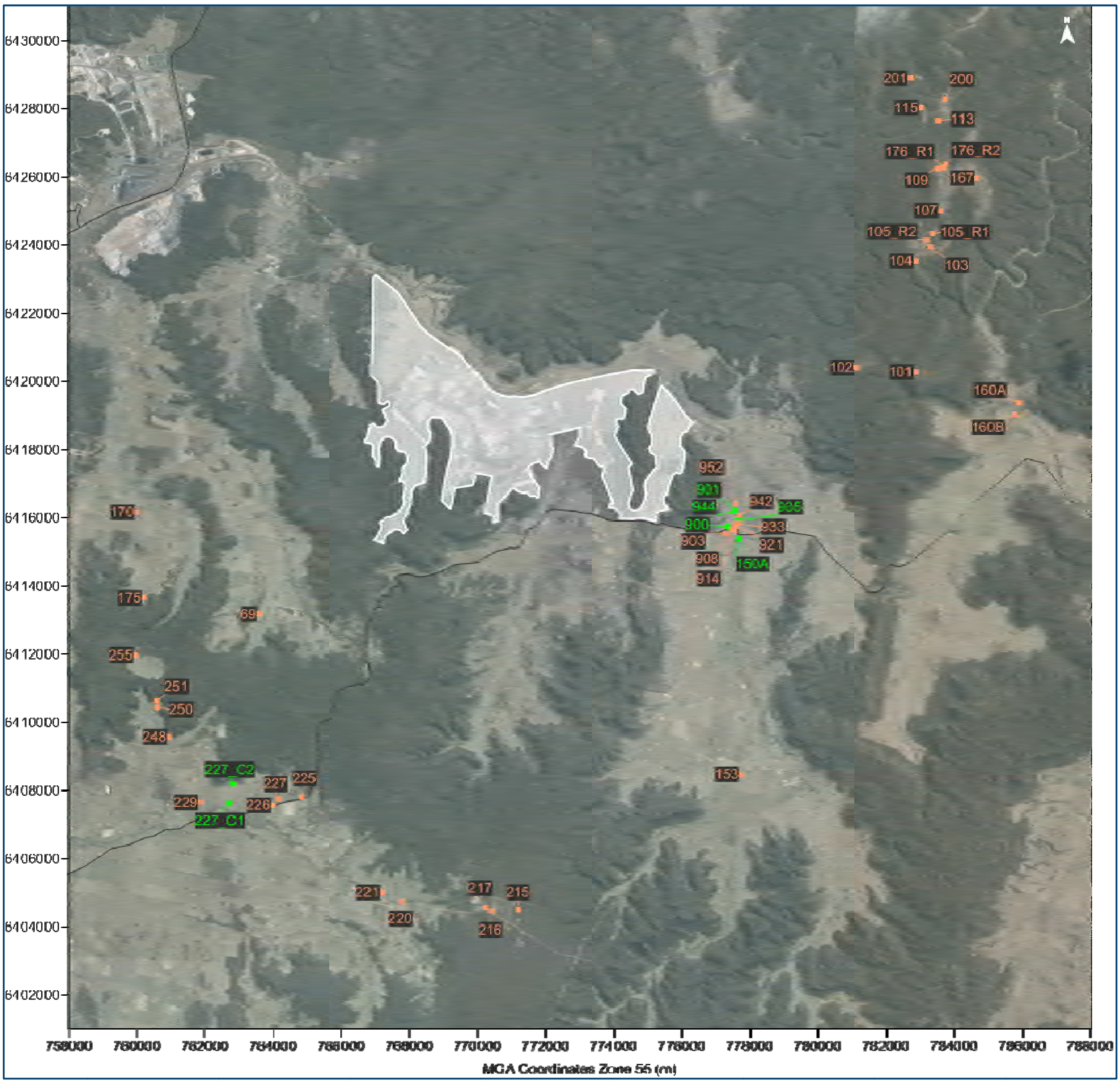


Figure A-1: Privately-owned receptors

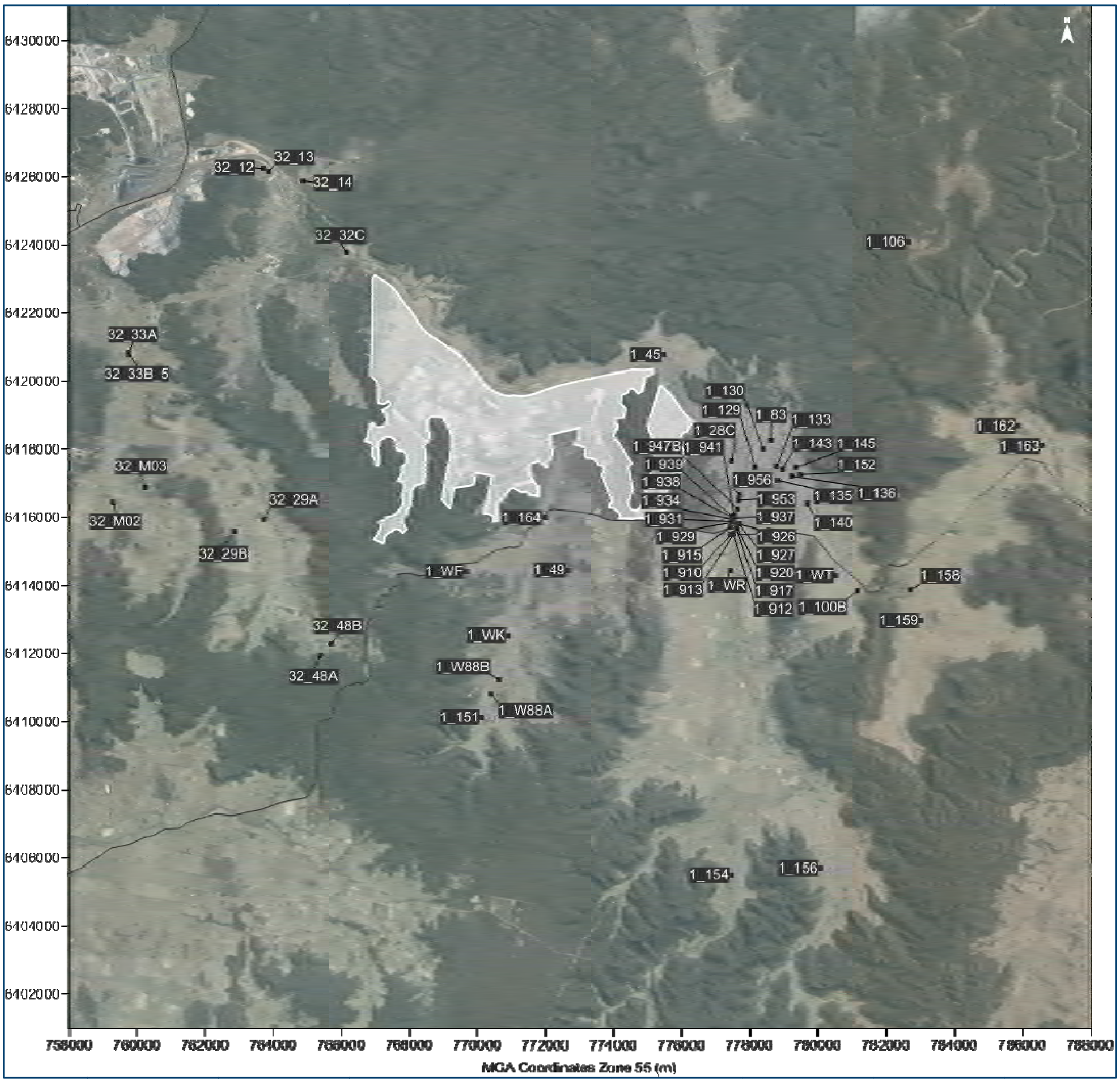


Figure A-2: Mine owned receptors

Table A-1: List of sensitive receptors assessed in the study

ID	Easting (m)	Northing (m)	Ownership	ID	Easting (m)	Northing (m)	Ownership
69	763579	6413175	Private	1_129	778134	6417466	Peabody Energy
101	782836	6420282	Private	1_130	778369	6417986	Peabody Energy
102	781087	6420412	Private	1_133	778761	6417492	Peabody Energy
103	783283	6423923	Private	1_135	778787	6417102	Peabody Energy
104	782838	6423538	Private	1_136	779222	6417219	Peabody Energy
105_R1	783340	6424343	Private	1_140	779656	6416414	Peabody Energy
105_R2	783156	6424166	Private	1_143	778924	6417412	Peabody Energy
107	783566	6425013	Private	1_145	779348	6417464	Peabody Energy
109	783497	6426262	Private	1_151	770124	6410133	Peabody Energy
113	783505	6427658	Private	1_152	779484	6417262	Peabody Energy
115	782993	6428026	Private	1_154	777451	6405506	Peabody Energy
150A	777654	6415365	Community	1_156	780057	6405697	Peabody Energy
153	777729	6408478	Private	1_158	782693	6413867	Peabody Energy
160A	785872	6419380	Private	1_159	783017	6412974	Peabody Energy
160B	785768	6419042	Private	1_162	785864	6418687	Peabody Energy
167	784627	6425975	Private	1_163	786574	6418088	Peabody Energy
170	759985	6416165	Private	1_164	771950	6415993	Peabody Energy
175	760200	6413649	Private	1_910	777418	6415491	Peabody Energy
176_R1	783663	6426284	Private	1_912	777486	6415527	Peabody Energy
176_R2	783724	6426379	Private	1_913	777483	6415485	Peabody Energy
200	783701	6428281	Private	1_915	777410	6415720	Peabody Energy
201	782679	6428891	Private	1_917	777584	6415700	Peabody Energy
215	771176	6404501	Private	1_920	777608	6415735	Peabody Energy
216	770408	6404459	Private	1_926	777626	6415817	Peabody Energy
217	770220	6404576	Private	1_927	777674	6415806	Peabody Energy
220	767756	6404742	Private	1_929	777490	6415863	Peabody Energy
221	767187	6405009	Private	1_931	777422	6415880	Peabody Energy
225	764847	6407816	Private	1_934	777509	6415939	Peabody Energy
226	763986	6407567	Private	1_937	777510	6415979	Peabody Energy
227	764163	6407745	Private	1_938	777439	6416006	Peabody Energy
227_C1	762708	6407641	Community	1_939	777435	6416041	Peabody Energy
227_C2	762815	6408199	Community	1_941	777517	6416064	Peabody Energy
229	761855	6407651	Private	1_947B	777628	6416245	Private
248	760942	6409573	Private	1_953	777660	6416492	Private
250	760581	6410453	Private	1_956	777684	6416665	Peabody Energy
251	760536	6410625	Private	1_W88A	770376	6410814	Peabody Energy
255	759945	6411972	Private	1_W88B	770611	6411217	Peabody Energy
900	777326	6415738	Community	1_WF	769652	6414414	Peabody Energy
901	777547	6416227	Community	1_WK	770890	6412538	Peabody Energy
903	777235	6415547	Private	1_WR	777395	6414444	Peabody Energy
908	777444	6415660	Private	1_WT	780517	6414297	Peabody Energy
914	777544	6415640	Private	32_12	763719	6426239	Moolarben
921	777533	6415777	Private	32_13	763859	6426158	Moolarben
933	777611	6415840	Private	32_14	764861	6425876	Moolarben
935	777633	6415922	Community	32_29A	763746	6415947	Moolarben
942	777658	6416052	Private	32_29B	762841	6415592	Moolarben
944	777543	6416175	Community	32_32C	766154	6423779	Moolarben
952	777578	6416399	Private	32_33A	759734	6420774	Moolarben
1_28C	777447	6417650	Peabody Energy	32_33B_5	759740	6420835	Moolarben
1_45	775463	6420780	Peabody Energy	32_48A	765370	6411929	Moolarben

ID	Easting (m)	Northing (m)	Ownership	ID	Easting (m)	Northing (m)	Ownership
1_49	772652	6414452	Peabody Energy	32_48B	765680	6412292	Moolarben
1_83	778608	6418243	Peabody Energy	32_M02	759312	6416444	Moolarben
1_100B	781139	6413853	Peabody Energy	32_M03	760245	6416890	Moolarben
1_106	782625	6424094	Peabody Energy				

Appendix B
Monitoring Data

Table B-1: TEOM monitoring data

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
1/01/2012	12.6	18.5	-	-	-
2/01/2012	14.5	18.1	-	-	-
3/01/2012	16.5	25.1	-	-	-
4/01/2012	32.6	-	-	-	-
5/01/2012	19.7	-	-	-	-
6/01/2012	9.7	-	-	-	-
7/01/2012	14.3	-	-	-	-
8/01/2012	19.5	-	-	-	-
9/01/2012	10.8	-	-	-	-
10/01/2012	12.4	-	-	-	-
11/01/2012	19.4	-	-	-	-
12/01/2012	12.5	-	-	-	-
13/01/2012	14.0	4.4	-	-	-
14/01/2012	15.0	17.0	-	-	-
15/01/2012	8.9	3.0	-	-	-
16/01/2012	8.6	3.8	-	-	-
17/01/2012	12.9	9.8	-	-	-
18/01/2012	3.4	-	-	-	-
19/01/2012	11.0	10.1	-	-	-
20/01/2012	17.3	10.9	-	-	-
21/01/2012	13.2	6.5	-	-	-
22/01/2012	10.4	5.8	-	-	-
23/01/2012	10.6	5.1	-	-	-
24/01/2012	11.2	5.3	-	-	-
25/01/2012	5.8	1.1	-	-	-
26/01/2012	5.4	-	-	-	-
27/01/2012	9.5	4.8	-	-	-
28/01/2012	9.1	4.5	-	-	-
29/01/2012	9.1	4.5	-	-	-
30/01/2012	8.1	-	-	-	-
31/01/2012	14.9	-	-	-	-
1/02/2012	4.0	-	-	-	-
2/02/2012	4.4	5.6	-	-	-
3/02/2012	5.8	-	-	-	-
4/02/2012	12.4	7.9	-	-	-
5/02/2012	14.1	10.0	-	-	-
6/02/2012	22.1	20.0	-	-	-
7/02/2012	8.2	2.1	-	-	-
8/02/2012	14.5	8.0	-	-	-
9/02/2012	16.1	10.3	-	-	-
10/02/2012	10.0	-	-	-	-
11/02/2012	7.4	-	-	-	-
12/02/2012	10.4	6.3	-	-	-
13/02/2012	11.4	5.7	-	-	-
14/02/2012	10.6	6.3	-	-	-
15/02/2012	10.4	6.5	-	-	-
16/02/2012	9.3	1.9	-	-	-
17/02/2012	12.2	7.7	-	-	-
18/02/2012	10.6	9.5	-	-	-
19/02/2012	12.8	7.7	-	-	-

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
20/02/2012	6.2	-	-	-	-
21/02/2012	8.2	2.6	-	-	9.6
22/02/2012	11.8	9.9	-	-	18.9
23/02/2012	10.4	-	-	-	17.4
24/02/2012	11.2	4.5	-	-	18.3
25/02/2012	9.8	7.4	-	-	16
26/02/2012	8.3	3.9	-	-	10.5
27/02/2012	9.0	5.8	-	-	8.9
28/02/2012	18.4	-	-	-	15.5
29/02/2012	15.3	2.4	-	-	15.3
1/03/2012	10.8	2.9	-	-	14.9
2/03/2012	3.2	10.7	-	-	4.2
3/03/2012	5.3	-	-	-	8.8
4/03/2012	-	-	-	-	7.7
5/03/2012	8.4	-	-	-	12.4
6/03/2012	12.9	4.8	-	-	20.8
7/03/2012	7.4	2.3	-	-	10
8/03/2012	9.0	-	-	-	-
9/03/2012	12.2	2.0	-	-	9.2
10/03/2012	11.8	4.1	-	-	12.4
11/03/2012	16.1	8.1	-	-	23.8
12/03/2012	14.4	15.5	-	-	20.9
13/03/2012	11.1	5.6	-	-	18.2
14/03/2012	11.8	5.3	-	-	15.3
15/03/2012	12.1	5.8	-	-	16.1
16/03/2012	9.7	11.1	-	-	8
17/03/2012	6.1	2.8	-	-	8.2
18/03/2012	9.0	5.8	-	-	15.2
19/03/2012	8.0	3.8	-	-	10.5
20/03/2012	10.7	6.3	-	-	16.7
21/03/2012	6.6	4.1	-	-	5.2
22/03/2012	14.2	-	-	-	14.7
23/03/2012	16.9	11.4	-	-	17.6
24/03/2012	15.1	7.3	-	-	12.2
25/03/2012	11.5	10.6	-	-	18.7
26/03/2012	12.9	12.1	-	-	15.5
27/03/2012	11.8	19.1	-	-	15.4
28/03/2012	10.4	7.8	-	-	13
29/03/2012	10.3	11.4	-	-	13
30/03/2012	11.0	15.8	-	-	18.1
31/03/2012	8.8	14.1	-	-	13.3
1/04/2012	15.2	15.1	-	-	15.5
2/04/2012	7.5	6.9	-	-	13.3
3/04/2012	12.0	11.7	-	-	14.2
4/04/2012	15.5	21.6	-	-	30.8
5/04/2012	13.4	18.6	-	-	17.5
6/04/2012	9.7	11.3	-	-	14.4
7/04/2012	36.4	43.0	-	-	29.6
8/04/2012	24.6	21.4	-	-	25.6
9/04/2012	12.9	8.6	-	-	13.1
10/04/2012	7.1	6.1	-	-	10

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
11/04/2012	7.1	10.9	-	-	10.2
12/04/2012	11.5	11.9	-	-	12.6
13/04/2012	7.4	12.5	-	-	10
14/04/2012	14.0	18.6	-	-	7.9
15/04/2012	19.8	24.7	-	-	19.8
16/04/2012	10.7	18.3	-	-	15.4
17/04/2012	10.1	15.6	-	-	9
18/04/2012	4.9	4.6	-	-	7.8
19/04/2012	5.1	3.9	-	-	9.6
20/04/2012	8.9	11.3	-	-	9.8
21/04/2012	11.7	15.1	-	-	15.2
22/04/2012	13.3	17.7	-	-	13.4
23/04/2012	9.2	13.0	-	-	9.1
24/04/2012	9.6	6.8	-	-	9.3
25/04/2012	10.6	5.3	-	-	9.3
26/04/2012	10.0	5.9	-	-	8.2
27/04/2012	9.8	12.5	-	-	14.4
28/04/2012	9.6	20.7	-	-	10.3
29/04/2012	10.4	8.0	-	-	13.7
30/04/2012	10.6	15.8	-	-	17.2
1/05/2012	6.0	12.4	-	-	11.8
2/05/2012	7.4	12.5	-	-	9.7
3/05/2012	5.0	1.8	-	-	3.5
4/05/2012	10.5	4.7	-	-	6.2
5/05/2012	10.0	6.6	-	-	8.7
6/05/2012	15.1	6.2	-	-	8.2
7/05/2012	12.1	6.9	-	-	7.8
8/05/2012	16.5	7.7	-	-	6.7
9/05/2012	23.1	14.2	-	-	10.5
10/05/2012	21.2	11.2	-	-	6.1
11/05/2012	36.5	14.1	-	-	8.2
12/05/2012	18.8	12.8	-	-	15.4
13/05/2012	16.2	9.2	-	-	13.5
14/05/2012	10.2	6.5	-	-	12.6
15/05/2012	16.6	14.1	-	-	13.1
16/05/2012	15.1	14.7	-	-	21.5
17/05/2012	13.7	16.3	-	-	11.1
18/05/2012	17.2	15.4	-	-	16.5
19/05/2012	18.6	11.8	-	-	11.1
20/05/2012	19.7	16.5	-	-	17.4
21/05/2012	14.0	27.9	-	-	12
22/05/2012	24.2	12.6	-	-	14.1
23/05/2012	24.8	16.2	-	-	12.4
24/05/2012	13.7	21.6	-	-	11
25/05/2012	5.5	3.8	-	-	6.7
26/05/2012	9.2	4.2	-	-	8.4
27/05/2012	5.5	4.2	-	-	-
28/05/2012	7.9	10.2	-	-	11.4
29/05/2012	8.3	11.2	-	-	7.4
30/05/2012	5.8	7.7	-	-	9.2
31/05/2012	7.2	-	-	-	13.1

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
1/06/2012	8.2	-	-	-	10.1
2/06/2012	4.6	-	-	-	6.8
3/06/2012	4.9	-	-	-	3.4
4/06/2012	5.2	-	-	-	5.6
5/06/2012	7.0	-	-	-	5.4
6/06/2012	1.9	-	-	-	7.1
7/06/2012	5.5	-	-	-	8
8/06/2012	4.8	-	-	-	8
9/06/2012	6.0	3.1	-	-	8
10/06/2012	7.4	10.0	-	-	9.2
11/06/2012	4.2	12.5	-	-	4.2
12/06/2012	-	3.2	-	-	7.4
13/06/2012	7.6	7.9	-	-	7.9
14/06/2012	7.0	7.6	-	-	7.5
15/06/2012	8.5	8.3	-	-	8.1
16/06/2012	8.4	5.6	-	-	9.5
17/06/2012	7.7	-	-	-	6.9
18/06/2012	6.1	-	-	-	5.9
19/06/2012	5.1	-	-	-	5
20/06/2012	7.4	-	-	-	5.1
21/06/2012	8.5	7.8	-	-	7.6
22/06/2012	8.6	-	-	-	10.2
23/06/2012	5.3	-	-	-	4.7
24/06/2012	8.7	-	-	-	5.6
25/06/2012	8.8	2.2	-	-	5.2
26/06/2012	5.9	8.6	-	-	9.2
27/06/2012	7.4	-	-	-	9.8
28/06/2012	5.6	-	-	-	9
29/06/2012	7.1	19.6	-	-	6.6
30/06/2012	9.8	3.8	-	-	4.7
1/07/2012	14.2	5.3	-	-	8.8
2/07/2012	7.5	-	-	-	5.3
3/07/2012	8.5	-	-	-	5.3
4/07/2012	9.2	7.9	-	-	5.9
5/07/2012	7.5	4.2	-	-	7.9
6/07/2012	6.1	7.4	-	-	9
7/07/2012	5.3	-	-	-	12.6
8/07/2012	6.1	20.0	-	-	9.7
9/07/2012	5.9	-	-	-	11.9
10/07/2012	5.1	-	-	-	8.5
11/07/2012	4.8	-	-	-	5
12/07/2012	4.9	7.9	-	-	4.3
13/07/2012	6.9	5.0	-	-	4.8
14/07/2012	9.3	2.1	-	-	4.8
15/07/2012	5.3	-	-	-	5.1
16/07/2012	-	-	-	-	7.4
17/07/2012	-	-	-	-	8.1
18/07/2012	11.2	-	-	-	6.2
19/07/2012	5.8	-	-	-	6.2
20/07/2012	9.4	-	-	-	7.1
21/07/2012	8.7	-	-	-	10

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
22/07/2012	6.9	-	-	-	9.7
23/07/2012	9.4	-	-	-	8.3
24/07/2012	6.0	-	-	-	7.8
25/07/2012	6.5	-	-	-	4.3
26/07/2012	6.1	-	-	-	7.2
27/07/2012	6.8	-	-	-	7.2
28/07/2012	5.4	-	-	-	4.9
29/07/2012	4.6	-	-	-	4.8
30/07/2012	5.7	-	-	-	7
31/07/2012	6.6	-	-	-	10.4
1/08/2012	6.3	-	-	-	7.3
2/08/2012	9.3	-	-	-	4.2
3/08/2012	10.9	4.6	-	-	7.7
4/08/2012	13.0	4.3	-	-	7.6
5/08/2012	14.6	6.6	-	-	6.8
6/08/2012	13.6	5.8	-	-	12.5
7/08/2012	13.9	5.0	-	-	8.8
8/08/2012	13.2	6.4	-	-	8.8
9/08/2012	10.4	5.2	-	-	10.6
10/08/2012	6.8	3.7	-	-	7.8
11/08/2012	6.1	4.7	-	-	8.2
12/08/2012	11.1	9.9	-	-	10.3
13/08/2012	7.9	-	-	-	11.9
14/08/2012	17.2	-	-	-	7.4
15/08/2012	16.7	-	-	-	8.8
16/08/2012	10.7	-	-	-	8.8
17/08/2012	-	-	-	-	10.8
18/08/2012	-	-	-	-	8.5
19/08/2012	5.6	-	-	-	6.1
20/08/2012	7.9	-	-	-	6.7
21/08/2012	11.6	-	-	-	13.5
22/08/2012	11.2	-	-	-	14.8
23/08/2012	-	-	-	-	13.2
24/08/2012	-	-	-	-	8.8
25/08/2012	9.2	-	-	-	7.7
26/08/2012	6.6	-	-	-	6.3
27/08/2012	8.2	-	-	-	10.9
28/08/2012	12.3	-	-	-	11.8
29/08/2012	14.7	-	-	-	17.8
30/08/2012	20.1	-	-	-	15
31/08/2012	10.0	-	-	-	11.7
1/09/2012	3.6	-	-	-	7
2/09/2012	16.0	-	-	-	10.2
3/09/2012	12.0	-	-	-	7.8
4/09/2012	9.5	-	-	-	10.8
5/09/2012	23.0	17.3	-	-	22.3
6/09/2012	34.0	21.2	-	-	32.8
7/09/2012	36.6	18.1	-	-	22.2
8/09/2012	32.5	11.3	-	-	13.3
9/09/2012	14.5	-	-	-	11.5
10/09/2012	23.5	4.7	-	-	22.4

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
11/09/2012	27.0	17.7	-	-	30.6
12/09/2012	24.0	25.2	-	-	24.6
13/09/2012	17.6	20.8	-	-	21.1
14/09/2012	7.1	2.5	-	-	7.6
15/09/2012	13.5	7.6	-	-	19.3
16/09/2012	11.6	18.6	-	-	10.9
17/09/2012	19.9	17.6	-	-	13.9
18/09/2012	7.7	14.0	-	-	9.3
19/09/2012	5.1	1.8	-	-	4.8
20/09/2012	7.4	13.5	-	-	10.7
21/09/2012	14.8	8.8	-	-	12.5
22/09/2012	15.4	4.3	-	-	9.9
23/09/2012	18.9	20.8	-	-	11.1
24/09/2012	18.6	9.3	-	-	16.4
25/09/2012	15.6	19.5	-	-	24.4
26/09/2012	16.4	21.4	-	-	23.8
27/09/2012	17.1	32.2	-	-	21.8
28/09/2012	21.2	26.5	-	-	23.6
29/09/2012	10.2	5.2	-	-	9.6
30/09/2012	9.2	4.3	-	-	8.1
1/10/2012	12.5	12.4	-	-	19.9
2/10/2012	10.4	10.2	-	-	20.5
3/10/2012	18.1	12.7	-	-	13.8
4/10/2012	25.8	12.8	-	-	15
5/10/2012	32.5	11.7	-	-	14.9
6/10/2012	34.3	28.2	-	-	50.4
7/10/2012	11.1	4.4	-	-	12.7
8/10/2012	17.5	16.0	-	-	24.1
9/10/2012	16.5	7.5	-	-	13.2
10/10/2012	17.5	10.0	-	-	15
11/10/2012	16.5	20.4	-	-	11.9
12/10/2012	7.4	1.7	-	-	5.3
13/10/2012	11.0	3.7	-	-	10.6
14/10/2012	9.9	10.1	-	-	12.7
15/10/2012	18.5	14.0	-	-	11
16/10/2012	30.5	13.7	-	-	16
17/10/2012	25.0	12.6	-	-	26.8
18/10/2012	21.9	27.3	-	-	38.5
19/10/2012	27.4	24.7	-	-	24.6
20/10/2012	23.0	20.6	-	-	19.8
21/10/2012	20.2	14.6	-	-	22.7
22/10/2012	11.9	10.4	-	-	19.7
23/10/2012	15.9	13.5	-	-	26.6
24/10/2012	15.9	13.8	-	-	24.6
25/10/2012	60.3	50.8	-	-	41.1
26/10/2012	27.0	13.6	-	-	20.1
27/10/2012	13.5	8.5	-	-	21.2
28/10/2012	20.8	13.6	-	-	30.6
29/10/2012	17.1	16.8	-	-	22.3
30/10/2012	17.5	14.0	-	-	19.1
31/10/2012	17.8	10.6	-	-	19.5

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
1/11/2012	33.3	21.9	-	-	25.1
2/11/2012	16.7	11.2	-	-	32.1
3/11/2012	15.1	9.0	-	-	23.8
4/11/2012	17.8	12.4	-	-	26.1
5/11/2012	18.4	28.9	-	-	21.4
6/11/2012	23.4	36.0	-	-	24.7
7/11/2012	26.8	18.5	-	-	22.9
8/11/2012	11.5	5.1	-	-	12.7
9/11/2012	6.2	1.6	-	-	7.2
10/11/2012	13.8	10.0	-	-	20.5
11/11/2012	13.2	7.3	-	-	18.7
12/11/2012	12.8	7.1	-	-	13.6
13/11/2012	29.1	17.9	-	-	25.6
14/11/2012	22.2	13.1	-	-	31.9
15/11/2012	16.5	8.5	-	-	18
16/11/2012	14.4	9.9	-	-	14.6
17/11/2012	10.4	6.2	-	-	18.6
18/11/2012	9.5	4.1	-	-	13
19/11/2012	11.7	12.7	-	-	14.9
20/11/2012	12.2	10.0	-	-	22.9
21/11/2012	15.4	11.7	-	-	16.2
22/11/2012	21.9	5.7	-	-	34.7
23/11/2012	22.2	13.1	-	-	31.8
24/11/2012	18.4	12.3	-	-	25.1
25/11/2012	18.8	14.9	-	-	27.2
26/11/2012	26.8	25.8	-	-	16.7
27/11/2012	16.2	8.7	-	-	14.2
28/11/2012	15.6	11.6	-	-	19
29/11/2012	17.2	12.5	-	-	23.4
30/11/2012	25.0	26.8	-	-	20.6
1/12/2012	22.9	24.3	-	-	31.1
2/12/2012	17.7	13.1	-	-	-
3/12/2012	6.5	4.3	-	-	8.8
4/12/2012	14.2	5.8	-	-	15.8
5/12/2012	20.5	11.8	-	-	21.4
6/12/2012	36.2	13.0	-	-	24.4
7/12/2012	30.1	20.3	-	-	37.7
8/12/2012	24.0	27.7	-	-	31
9/12/2012	29.2	31.0	-	-	30.7
10/12/2012	7.7	3.1	-	-	11.6
11/12/2012	8.8	3.7	-	-	11.9
12/12/2012	10.8	4.4	-	-	17.7
13/12/2012	11.3	9.7	-	-	19.5
14/12/2012	19.2	21.7	-	-	22
15/12/2012	20.4	28.2	-	-	22.1
16/12/2012	14.3	14.2	-	-	12.7
17/12/2012	31.3	13.0	-	-	35.4
18/12/2012	17.0	16.7	-	-	29.4
19/12/2012	22.6	18.2	-	-	34.1
20/12/2012	19.2	14.5	-	-	21.9
21/12/2012	22.6	14.7	-	-	33.9

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
22/12/2012	18.8	1.1	-	-	23.9
23/12/2012	14.2	23.3	-	-	13.2
24/12/2012	14.4	23.8	-	-	14.9
25/12/2012	4.7	10.3	-	-	7.1
26/12/2012	10.4	-	-	-	13.9
27/12/2012	16.2	-	-	-	22.4
28/12/2012	17.7	-	-	-	18.5
29/12/2012	22.7	-	-	-	27
30/12/2012	22.3	-	-	-	26.3
31/12/2012	19.6	-	-	-	17.9
1/01/2013	13.8	-	-	-	14.4
2/01/2013	33.8	-	-	-	38.9
3/01/2013	18.6	-	-	-	27.7
4/01/2013	15.9	-	-	-	25.2
5/01/2013	25.0	-	-	-	29.6
6/01/2013	19.2	-	-	-	25
7/01/2013	12.8	-	-	-	26
8/01/2013	26.7	-	-	-	17.5
9/01/2013	34.8	-	30.3	-	43.3
10/01/2013	29.1	-	26.4	7.3	32.3
11/01/2013	23.2	-	19.9	22.0	20.3
12/01/2013	47.9	-	28.7	36.6	28.1
13/01/2013	29.3	-	29.0	21.4	-
14/01/2013	6.4	-	7.4	3.7	17.3
15/01/2013	17.3	-	17.0	10.8	18.3
16/01/2013	25.3	-	23.3	21.1	-
17/01/2013	31.2	-	27.6	24.4	-
18/01/2013	53.0	-	37.1	36.1	32
19/01/2013	23.7	-	23.4	17.4	32.3
20/01/2013	8.4	-	7.2	3.7	14.7
21/01/2013	11.9	-	12.4	7.3	19.5
22/01/2013	17.6	-	15.4	10.7	11
23/01/2013	13.0	-	14.2	8.7	20.9
24/01/2013	12.2	-	12.6	7.3	20.8
25/01/2013	9.6	-	10.1	5.4	16
26/01/2013	10.8	-	10.9	5.8	14.6
27/01/2013	5.5	-	4.6	1.3	5.4
28/01/2013	3.4	-	3.1	-	2.3
29/01/2013	7.0	-	7.9	4.7	8.1
30/01/2013	18.0	-	17.5	13.4	23.7
31/01/2013	17.2	-	16.1	15.1	15
1/02/2013	13.2	-	11.9	7.1	11.7
2/02/2013	4.7	-	4.8	1.1	4.8
3/02/2013	7.6	-	7.6	3.2	11
4/02/2013	12.9	-	12.7	9.3	20.9
5/02/2013	4.0	-	13.9	11.0	20
6/02/2013	-	-	12.2	7.7	18.6
7/02/2013	14.1	-	16.2	14.0	22.6
8/02/2013	12.0	-	18.1	21.8	23.3
9/02/2013	14.8	-	21.0	20.5	24.2
10/02/2013	20.1	-	15.0	11.3	17.9

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
11/02/2013	23.3	-	7.4	3.2	11.8
12/02/2013	18.1	-	5.7	1.9	11.9
13/02/2013	8.3	-	10.7	10.2	15.9
14/02/2013	6.2	-	9.8	8.3	16.2
15/02/2013	10.5	-	8.8	6.3	13.4
16/02/2013	9.3	-	7.9	4.0	12.8
17/02/2013	8.6	-	10.6	5.6	17.1
18/02/2013	8.0	-	11.5	11.5	16.6
19/02/2013	10.8	-	12.8	14.3	15.5
20/02/2013	11.4	-	12.7	5.4	17.8
21/02/2013	12.1	-	11.0	8.0	15.4
22/02/2013	11.2	-	12.3	10.2	15.6
23/02/2013	11.1	-	6.4	3.6	7.2
24/02/2013	12.9	-	9.5	9.5	11
25/02/2013	7.4	-	12.7	12.5	14
26/02/2013	11.5	-	12.4	13.2	-
27/02/2013	12.1	-	8.5	14.2	-
28/02/2013	12.5	-	11.7	11.6	8.7
1/03/2013	8.0	-	2.2	3.5	4
2/03/2013	13.7	-	5.9	4.6	4.6
3/03/2013	1.5	-	8.1	7.8	14.1
4/03/2013	6.3	-	14.3	13.1	18.5
5/03/2013	8.5	-	12.5	12.2	17
6/03/2013	14.4	-	13.1	16.5	14.4
7/03/2013	13.1	-	12.5	20.5	14.3
8/03/2013	12.9	-	12.3	16.4	15.9
9/03/2013	11.3	-	8.9	10.3	14.8
10/03/2013	12.0	-	12.7	15.7	16.3
11/03/2013	9.8	-	13.1	14.9	18.9
12/03/2013	13.0	-	11.8	14.6	15.2
13/03/2013	13.0	-	12.2	27.2	11.7
14/03/2013	11.3	-	33.8	40.0	28.4
15/03/2013	12.0	-	16.9	21.8	23.4
16/03/2013	42.9	-	15.7	17.5	18.5
17/03/2013	18.6	-	14.7	16.2	20.3
18/03/2013	17.3	-	14.7	21.3	23.2
19/03/2013	14.6	-	14.4	19.1	18.5
20/03/2013	16.0	-	10.7	13.1	14.8
21/03/2013	15.3	-	10.0	20.9	14.1
22/03/2013	9.8	-	14.2	14.0	18.7
23/03/2013	10.5	-	9.4	7.9	8.7
24/03/2013	15.0	-	9.2	10.4	8.6
25/03/2013	10.1	-	19.1	18.1	26.2
26/03/2013	10.4	-	26.9	36.2	27.3
27/03/2013	31.3	-	16.4	27.0	17.6
28/03/2013	33.7	-	16.1	21.5	14.6
29/03/2013	17.2	-	10.9	10.2	15.1
30/03/2013	22.5	-	12.5	12.1	14.3
31/03/2013	8.7	-	9.0	9.3	10
1/04/2013	12.7	-	10.2	10.3	16.1
2/04/2013	13.7	-	9.9	14.0	13.5

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
3/04/2013	9.7	-	14.2	16.1	14.8
4/04/2013	10.1	-	9.2	12.8	11.2
5/04/2013	13.9	-	11.5	13.0	13.9
6/04/2013	8.9	-	8.3	12.1	12
7/04/2013	8.6	-	7.7	7.8	9.6
8/04/2013	12.6	-	10.4	10.8	12.8
9/04/2013	9.3	-	9.9	14.0	11.2
10/04/2013	7.2	-	6.5	7.6	11.1
11/04/2013	11.3	-	9.5	13.7	14.3
12/04/2013	14.7	-	12.9	16.5	14.7
13/04/2013	7.5	-	8.1	17.6	13.2
14/04/2013	21.9	-	16.4	28.4	20.5
15/04/2013	36.6	-	22.2	31.5	20.7
16/04/2013	15.9	-	14.7	13.8	16.1
17/04/2013	10.9	-	11.7	11.7	14.4
18/04/2013	11.5	-	9.4	14.0	24.9
19/04/2013	26.5	-	13.9	22.7	24.8
20/04/2013	23.0	-	16.1	18.7	9.6
21/04/2013	13.5	-	7.7	16.7	6.5
22/04/2013	19.7	-	10.9	14.9	14.2
23/04/2013	52.2	-	18.7	25.0	13.3
24/04/2013	43.0	-	15.7	28.5	14.2
25/04/2013	57.8	-	19.7	38.0	19.4
26/04/2013	63.5	-	16.0	26.2	11.4
27/04/2013	55.3	-	18.3	22.4	13.3
28/04/2013	63.7	-	24.2	37.9	16.7
29/04/2013	79.0	-	27.7	57.6	18.2
30/04/2013	49.7	-	31.9	68.3	42.3
1/05/2013	28.2	-	24.1	38.4	14.9
2/05/2013	14.0	-	19.4	24.4	22.1
3/05/2013	18.5	-	17.4	32.6	15.1
4/05/2013	80.1	-	27.3	35.4	26.1
5/05/2013	21.8	-	25.1	26.8	30.3
6/05/2013	11.3	-	14.9	17.7	20.5
7/05/2013	16.6	-	30.8	6.2	14.1
8/05/2013	8.8	-	12.3	14.9	
9/05/2013	12.2	-	13.1	34.9	11.3
10/05/2013	16.6	-	16.4	37.9	20.7
11/05/2013	17.3	-	16.1	32.3	22.9
12/05/2013	10.1	-	8.8	31.9	11.3
13/05/2013	10.7	-	8.1	33.5	12.1
14/05/2013	8.3	-	4.1	9.4	3
15/05/2013	15.3	-	8.0	10.3	6.6
16/05/2013	16.0	-	7.9	8.9	6.9
17/05/2013	14.5	-	9.1	10.2	8.6
18/05/2013	12.2	-	8.7	10.4	8
19/05/2013	11.0	-	7.7	9.5	7.5
20/05/2013	15.6	-	10.5	15.8	8.7
21/05/2013	23.0	-	12.9	21.4	9.8
22/05/2013	13.2	-	11.2	13.9	14.7
23/05/2013	4.9	-	4.8	4.5	5.3

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
24/05/2013	7.1	-	8.1	6.8	9.8
25/05/2013	6.0	-	7.5	8.0	8
26/05/2013	14.4	-	9.5	10.9	6.5
27/05/2013	10.8	-	9.5	13.1	11.1
28/05/2013	7.9	-	7.3	11.5	11.6
29/05/2013	8.2	-	7.6	11.7	7.7
30/05/2013	9.5	-	11.0	19.9	14.3
31/05/2013	13.2	-	10.5	16.6	8.6
1/06/2013	12.8	-	9.0	15.5	8
2/06/2013	3.7	-	4.2	2.8	5.4
3/06/2013	9.4	-	6.5	8.9	6.5
4/06/2013	6.3	-	9.2	15.3	11.9
5/06/2013	-	-	10.6	20.3	9.9
6/06/2013	18.3	-	13.1	26.8	11.3
7/06/2013	8.4	-	8.3	7.9	8.4
8/06/2013	7.6	-	8.0	7.3	9.5
9/06/2013	6.3	-	8.0	5.7	7.6
10/06/2013	8.1	-	8.1	8.2	6.4
11/06/2013	5.5	-	4.9	4.8	4
12/06/2013	4.1	-	5.9	5.7	4.9
13/06/2013	6.2	-	5.4	4.1	4.3
14/06/2013	4.9	-	3.6	4.6	4
15/06/2013	8.3	-	6.0	6.7	5.7
16/06/2013	7.2	-	5.6	6.6	4.1
17/06/2013	10.6	-	6.4	7.6	4.9
18/06/2013	10.2	-	7.7	8.6	5.7
19/06/2013	10.0	-	8.5	10.8	8.1
20/06/2013	10.0	-	9.1	14.6	14.4
21/06/2013	5.0	-	7.1	9.4	14.5
22/06/2013	6.6	-	8.4	9.8	7.2
23/06/2013	6.3	-	6.3	5.6	8.2
24/06/2013	7.1	-	4.3	5.4	4.1
25/06/2013	4.7	-	5.2	5.0	3.5
26/06/2013	13.0	-	9.0	9.8	8.9
27/06/2013	7.6	-	6.8	5.1	6.4
28/06/2013	6.7	-	6.7	6.2	8.9
29/06/2013	5.0	-	4.5	3.6	5.6
30/06/2013	4.8	-	4.2	4.4	4.4
1/07/2013	5.0	-	5.9	6.8	5.9
2/07/2013	10.9	-	9.5	12.4	6.1
3/07/2013	9.5	-	11.4	12.2	7
4/07/2013	16.6	-	12.1	16.2	7.8
5/07/2013	14.1	-	9.4	13.4	9.3
6/07/2013	16.4	-	9.8	17.2	9
7/07/2013	15.8	-	10.1	15.6	7.1
8/07/2013	11.1	-	8.5	18.5	7.7
9/07/2013	9.4	-	9.7	8.1	13.7
10/07/2013	6.4	-	6.8	5.1	10.8
11/07/2013	6.9	-	8.2	6.5	11.8
12/07/2013	8.2	-	7.8	7.9	8.4
13/07/2013	8.0	-	7.6	7.6	9.2

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
14/07/2013	9.9	-	12.4	9.7	12.6
15/07/2013	9.2	-	9.8	9.3	8.5
16/07/2013	6.6	-	6.8	6.3	6.5
17/07/2013	5.6	-	6.6	6.2	7.6
18/07/2013	6.5	-	7.2	6.6	7
19/07/2013	6.1	-	6.5	5.6	6.6
20/07/2013	9.1	-	7.0	5.9	5.2
21/07/2013	10.7	-	8.7	7.0	6.3
22/07/2013	16.5	-	9.5	11.6	6.1
23/07/2013	12.1	-	7.5	9.8	5.5
24/07/2013	10.9	-	8.8	15.4	8.6
25/07/2013	12.2	-	11.9	20.2	14.7
26/07/2013	17.1	-	12.6	18.9	10.5
27/07/2013	14.3	-	12.7	17.6	16
28/07/2013	10.9	-	11.5	16.0	10.9
29/07/2013	11.1	-	10.1	19.8	6.8
30/07/2013	13.6	-	12.2	16.7	7.8
31/07/2013	11.3	-	11.0	13.0	10.4
1/08/2013	6.3	-	8.0	10.8	12.1
2/08/2013	17.9	-	11.5	14.4	10.6
3/08/2013	17.7	-	8.6	13.2	7.3
4/08/2013	22.0	-	11.3	11.9	9
5/08/2013	23.7	-	15.6	25.7	13.8
6/08/2013	22.2	-	13.9	28.9	10
7/08/2013	12.5	-	11.5	15.5	8.7
8/08/2013	7.1	-	3.7	2.1	4.5
9/08/2013	11.6	-	6.8	11.1	4.5
10/08/2013	12.1	-	8.7	9.4	6.9
11/08/2013	12.0	-	8.8	9.4	7
12/08/2013	11.0	-	7.4	9.5	10.3
13/08/2013	17.6	-	10.6	11.3	7.5
14/08/2013	20.6	-	13.3	16.3	6.7
15/08/2013	7.6	-	7.9	9.7	8.8
16/08/2013	11.0	-	10.3	12.6	9.1
17/08/2013	15.5	-	13.4	13.1	19.1
18/08/2013	11.5	-	9.2	11.7	5.7
19/08/2013	12.7	-	8.9	11.2	8.7
20/08/2013	8.1	-	7.2	7.2	7.2
21/08/2013	12.3	-	9.5	10.7	7.8
22/08/2013	20.8	-	12.7	15.2	5.5
23/08/2013	13.2	-	10.1	11.3	8.5
24/08/2013	8.6	-	5.3	8.0	6.1
25/08/2013	13.3	-	9.4	12.0	-
26/08/2013	14.5	-	10.6	11.7	6
27/08/2013	19.0	-	13.9	15.8	7.1
28/08/2013	16.4	-	12.5	28.7	13.1
29/08/2013	16.3	-	20.6	24.1	32.3
30/08/2013	27.4	-	23.3	20.9	24.8
31/08/2013	26.3	-	13.2	22.3	10.3
1/09/2013	15.1	-	11.6	15.6	23.6
2/09/2013	13.4	-	14.9	39.5	19.9

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
3/09/2013	11.8	-	14.2	22.7	20.9
4/09/2013	11.1	-	13.5	28.1	16.1
5/09/2013	32.5	-	21.4	42.4	18.2
6/09/2013	25.9	-	19.1	44.8	17.3
7/09/2013	30.7	-	19.1	41.4	15.8
8/09/2013	28.5	-	22.9	36.2	34.7
9/09/2013	25.3	-	21.0	37.2	22.3
10/09/2013	34.0	-	26.3	28.9	22.6
11/09/2013	17.1	-	9.7	22.6	9.9
12/09/2013	24.4	-	12.5	25.2	10.7
13/09/2013	11.8	-	12.7	13.8	20.5
14/09/2013	17.0	-	16.5	31.1	18.7
15/09/2013	31.6	-	12.9	16.3	16.5
16/09/2013	5.2	-	5.7	4.6	7.9
17/09/2013	5.9	-	5.6	5.4	5.1
18/09/2013	18.0	-	11.2	14.5	6.7
19/09/2013	27.3	-	12.7	28.4	10.9
20/09/2013	55.2	-	17.4	22.6	12.6
21/09/2013	28.4	-	12.0	19.2	6.6
22/09/2013	36.8	-	16.6	27.9	5.5
23/09/2013	41.8	-	13.3	34.4	9.5
24/09/2013	29.7	-	18.0	28.0	23.3
25/09/2013	23.2	-	14.3	29.4	11.6
26/09/2013	68.2	-	22.1	71.6	26
27/09/2013	35.7	-	20.4	26.5	21.8
28/09/2013	35.3	-	16.7	21.8	21.9
29/09/2013	36.4	-	16.1	29.1	11.9
30/09/2013	60.4	-	19.8	31.8	10.9
1/10/2013	34.5	-	22.0	42.6	24.4
2/10/2013	27.7	-	9.4	15.6	5.9
3/10/2013	19.0	-	10.7	9.1	10.7
4/10/2013	15.8	-	11.4	15.8	10.9
5/10/2013	20.3	-	11.7	19.6	9.9
6/10/2013	41.5	-	17.1	27.3	7.5
7/10/2013	10.6	-	13.3	14.7	19
8/10/2013	13.4	-	12.5	11.1	16.7
9/10/2013	7.0	-	12.1	10.3	8.3
10/10/2013	51.9	-	24.7	33.1	19.1
11/10/2013	17.5	-	11.5	16.4	17.8
12/10/2013	44.7	-	15.9	29.5	26.1
13/10/2013	74.2	-	38.9	31.3	28.4
14/10/2013	9.3	-	9.2	6.6	8.9
15/10/2013	13.3	-	8.3	16.9	7.4
16/10/2013	37.2	-	13.6	29.6	10
17/10/2013	47.6	-	27.7	29.7	30.6
18/10/2013	51.0	-	51.7	54.2	42.6
19/10/2013	47.3	-	49.6	55.7	38.6
20/10/2013	42.6	-	36.7	50.1	24.3
21/10/2013	31.8	-	18.0	30.7	14.1
22/10/2013	24.8	-	20.1	24.3	32.8
23/10/2013	17.8	-	9.5	10.7	12.9

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
24/10/2013	10.7	-	8.5	10.9	8.2
25/10/2013	21.8	-	13.3	22.4	14.3
26/10/2013	15.0	-	11.2	17.0	16.6
27/10/2013	26.3	-	22.9	22.9	23
28/10/2013	38.6	-	37.8	42.4	25.5
29/10/2013	36.1	-	19.3	27.2	28.5
30/10/2013	13.9	-	15.4	19.2	18.9
31/10/2013	18.2	-	20.7	30.3	17.1
1/11/2013	29.1	-	19.4	27.0	20.8
2/11/2013	31.3	-	18.8	26.6	16.1
3/11/2013	45.3	-	21.0	41.2	24.2
4/11/2013	33.2	-	39.8	38.9	37.6
5/11/2013	28.0	-	30.4	29.2	29.2
6/11/2013	37.1	-	38.8	39.0	23.8
7/11/2013	33.5	-	34.4	43.0	24.8
8/11/2013	30.3	-	26.1	35.1	33.3
9/11/2013	19.6	-	9.9	13.9	20.9
10/11/2013	24.0	-	27.1	19.8	21.5
11/11/2013	6.1	-	6.0	7.4	4.4
12/11/2013	5.9	-	5.0	12.9	5.5
13/11/2013	16.5	-	10.3	20.4	8.8
14/11/2013	24.6	-	10.9	28.5	15.1
15/11/2013	21.3	-	18.5	15.9	20.3
16/11/2013	8.9	-	7.9	9.2	8.6
17/11/2013	5.1	-	3.6	3.7	5.3
18/11/2013	6.9	-	6.4	6.1	5.4
19/11/2013	7.0	-	6.2	5.4	9.5
20/11/2013	11.7	-	13.9	12.9	16.6
21/11/2013	13.3	-	13.3	16.5	19
22/11/2013	10.6	-	10.6	11.4	11.3
23/11/2013	5.5	-	5.8	10.2	-
24/11/2013	11.2	-	11.5	13.9	11.8
25/11/2013	11.8	-	12.2	13.5	12.8
26/11/2013	17.1	-	17.6	17.9	21.5
27/11/2013	16.4	-	15.6	20.0	18
28/11/2013	21.2	-	19.0	24.9	18.9
29/11/2013	29.2	-	19.9	16.5	15.2
30/11/2013	-	-	14.1	12.0	16.9
1/12/2013	-	-	10.5	10.5	14.9
2/12/2013	-	-	14.2	12.2	13.1
3/12/2013	-	-	13.3	18.4	12.8
4/12/2013	-	-	18.5	22.4	20.5
5/12/2013	-	-	12.5	16.7	11.3
6/12/2013	-	-	6.2	7.1	7.6
7/12/2013	-	-	11.8	14.2	13
8/12/2013	-	-	13.7	18.9	18.1
9/12/2013	-	-	22.5	27.8	24.5
10/12/2013	3.5	-	12.8	13.8	12.2
11/12/2013	-	-	14.2	22.1	13.9
12/12/2013	18.2	-	18.0	20.3	25.6
13/12/2013	23.3	-	20.1	23.8	24.3

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
14/12/2013	7.5	-	20.7	39.5	32.3
15/12/2013	20.2	-	17.3	15.3	24.9
16/12/2013	3.4	-	12.1	11.1	21.3
17/12/2013	4.1	-	12.4	11.1	18.6
18/12/2013	13.3	-	14.8	11.7	23
19/12/2013	11.7	-	11.9	17.4	14.9
20/12/2013	28.9	-	25.6	29.8	16.9
21/12/2013	38.6	-	39.2	41.6	32.7
22/12/2013	20.8	-	21.0	24.6	22.5
23/12/2013	31.0	-	25.8	23.4	23.5
24/12/2013	11.9	-	11.9	13.6	20.5
25/12/2013	9.5	-	10.2	12.4	14.7
26/12/2013	6.2	-	6.0	3.9	7.7
27/12/2013	9.8	-	10.3	8.7	14.5
28/12/2013	10.6	-	10.4	9.8	16
29/12/2013	32.9	-	30.5	23.3	39.9
30/12/2013	28.2	-	31.7	24.6	38.5
31/12/2013	19.3	-	21.0	21.4	26.5
1/01/2014	18.7	-	17.8	15.1	23.3
2/01/2014	33.4	-	27.8	32.7	19.6
3/01/2014	34.4	-	32.8	29.5	50.9
4/01/2014	17.9	-	17.2	14.0	22.4
5/01/2014	29.7	-	24.2	23.6	24.3
6/01/2014	30.7	-	21.0	41.0	28.8
7/01/2014	36.5	-	36.2	37.3	35.9
8/01/2014	27.1	-	29.5	22.9	24.2
9/01/2014	11.0	-	11.0	7.9	21.6
10/01/2014	30.4	-	31.2	30.0	23.8
11/01/2014	39.7	-	36.2	36.7	43.4
12/01/2014	58.3	-	59.8	54.4	36.9
13/01/2014	46.7	-	46.4	42.3	30.4
14/01/2014	58.4	-	58.3	54.3	31.7
15/01/2014	47.4	-	47.8	45.9	29.5
16/01/2014	42.5	-	44.2	47.9	39.4
17/01/2014	39.9	-	27.5	36.0	34.2
18/01/2014	44.9	-	48.5	42.5	23.3
19/01/2014	46.9	-	46.7	51.5	41.4
20/01/2014	24.0	-	24.5	20.2	28.3
21/01/2014	16.1	-	15.4	14.4	27.8
22/01/2014	9.7	-	7.9	6.4	21.2
23/01/2014	11.0	-	11.1	8.9	19.5
24/01/2014	14.9	-	11.3	8.9	10.7
25/01/2014	19.1	-	12.1	11.5	18.8
26/01/2014	13.5	-	14.2	9.5	22
27/01/2014	12.1	-	12.8	9.4	19.4
28/01/2014	9.7	-	10.1	9.1	18.8
29/01/2014	20.1	-	15.6	16.9	24.1
30/01/2014	19.4	-	21.2	22.0	29
31/01/2014	19.7	-	18.4	22.7	28.7
1/02/2014	25.9	-	26.5	26.4	41.1
2/02/2014	24.2	-	26.5	20.7	24.8

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
3/02/2014	13.2	-	12.4	13.3	27.5
4/02/2014	23.3	-	24.7	22.4	29.7
5/02/2014	11.3	-	12.3	8.5	23.8
6/02/2014	12.6	-	14.0	11.2	20.6
7/02/2014	15.9	-	17.7	16.1	21.6
8/02/2014	17.9	-	18.1	17.8	30.9
9/02/2014	-	-	20.0	-	19.3
10/02/2014	69.2	-	36.8	50.1	40.6
11/02/2014	13.6	-	-	11.8	25.6
12/02/2014	20.2	-	-	17.6	31.3
13/02/2014	20.4	-	19.0	18.4	34.2
14/02/2014	15.7	-	13.9	13.7	17.1
15/02/2014	21.6	-	16.6	16.6	20.8
16/02/2014	41.4	-	28.2	30.1	16.6
17/02/2014	10.1	-	11.6	8.1	14.7
18/02/2014	18.4	-	18.9	17.1	27.4
19/02/2014	10.9	-	10.8	8.7	-
20/02/2014	17.3	-	18.0	14.6	-
21/02/2014	21.9	-	17.1	22.7	21.2
22/02/2014	19.9	-	19.5	16.9	28.1
23/02/2014	18.3	-	18.7	15.4	23.4
24/02/2014	11.9	-	11.8	11.0	16.2
25/02/2014	9.9	-	10.2	16.2	13.8
26/02/2014	19.4	-	16.7	20.1	15.2
27/02/2014	16.3	-	15.4	16.2	22.5
28/02/2014	3.8	-	3.8	3.0	3.7
1/03/2014	7.0	-	7.6	5.3	8.8
2/03/2014	6.6	-	6.6	5.7	9.7
3/03/2014	5.1	-	4.7	4.8	9.1
4/03/2014	6.0	-	6.6	6.3	11.5
5/03/2014	12.3	-	10.2	11.4	7.7
6/03/2014	10.3	-	-	10.6	16.6
7/03/2014	21.8	-	-	14.8	19.9
8/03/2014	6.8	-	9.6	5.8	13.5
9/03/2014	7.7	-	7.8	7.0	12.9
10/03/2014	10.7	-	11.5	12.0	14
11/03/2014	8.7	-	10.9	10.7	15.7
12/03/2014	14.8	-	12.3	14.4	13
13/03/2014	14.8	-	15.0	17.4	21.2
14/03/2014	12.7	-	13.7	14.5	12.1
15/03/2014	11.6	-	10.7	8.3	9.2
16/03/2014	11.0	-	12.3	7.1	14.4
17/03/2014	-	-	9.6	10.7	8.9
18/03/2014	-	-	2.7	13.3	12.7
19/03/2014	-	-	13.6	20.1	28.6
20/03/2014	-	-	12.5	13.6	16.5
21/03/2014	-	-	9.3	10.2	10.6
22/03/2014	-	-	10.3	12.6	7.3
23/03/2014	-	-	10.6	14.4	14.6
24/03/2014	-	-	6.7	8.8	8
25/03/2014	-	-	8.8	10.5	12.9

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
26/03/2014	7.7	-	8.2	6.3	10.5
27/03/2014	3.0	-	4.3	1.1	4.1
28/03/2014	6.4	-	7.3	3.9	5.9
29/03/2014	11.5	-	8.4	5.8	5.1
30/03/2014	14.0	-	13.3	11.8	16.5
31/03/2014	15.6	-	14.8	15.9	15.1
1/04/2014	13.2	-	13.4	11.9	13.4
2/04/2014	15.9	-	13.8	22.9	14.4
3/04/2014	15.6	-	14.4	13.7	13.9
4/04/2014	-	-	10.9	7.0	8.3
5/04/2014	-	-	9.1	5.4	7.9
6/04/2014	-	-	8.0	4.8	7
7/04/2014	-	-	8.1	6.7	11.5
8/04/2014	-	-	12.7	10.9	13.3
9/04/2014	-	-	13.0	12.8	12
10/04/2014	-	-	15.9	18.2	15.3
11/04/2014	10.0	-	8.3	5.4	10.5
12/04/2014	18.9	-	-	5.1	6
13/04/2014	8.2	-	7.2	6.0	10.1
14/04/2014	7.4	-	7.9	5.3	11.7
15/04/2014	9.3	-	9.2	7.6	10.6
16/04/2014	10.0	-	10.4	8.5	14.3
17/04/2014	10.7	-	9.0	8.2	14.3
18/04/2014	20.9	-	15.5	17.5	13.3
19/04/2014	22.3	-	13.2	14.4	14
20/04/2014	16.7	-	14.2	16.8	13.9
21/04/2014	17.7	-	16.5	25.2	13.9
22/04/2014	17.9	-	14.2	20.4	13.6
23/04/2014	21.1	-	12.9	25.0	14.9
24/04/2014	20.7	-	13.6	26.2	14.1
25/04/2014	-	-	9.5	7.7	10.3
26/04/2014	-	-	11.2	7.4	11.8
27/04/2014	-	-	10.3	7.4	15.1
28/04/2014	-	-	9.4	8.5	10.6
29/04/2014	-	-	9.8	18.1	5.8
30/04/2014	-	-	6.7	4.2	8.7
1/05/2014	10.4	-	9.9	7.9	12.5
2/05/2014	16.4	-	10.8	7.5	10.1
3/05/2014	-	-	6.5	2.4	7.1
4/05/2014	-	-	7.5	4.9	8.1
5/05/2014	-	-	7.2	4.3	6.6
6/05/2014	-	-	6.9	7.3	5.7
7/05/2014	-	-	10.0	10.5	14.7
8/05/2014	-	-	9.4	10.4	15.4
9/05/2014	-	-	9.0	16.8	13
10/05/2014	-	-	12.1	10.6	8.9
11/05/2014	-	-	7.1	4.3	6.8
12/05/2014	-	-	9.3	6.5	15.6
13/05/2014	-	-	7.0	9.0	10.7
14/05/2014	-	-	6.5	9.4	7.7
15/05/2014	-	-	10.2	10.2	8

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
16/05/2014	-	-	9.3	16.1	8.8
17/05/2014	-	-	10.9	15.1	9.1
18/05/2014	-	-	11.5	14.7	8
19/05/2014	-	-	12.7	20.1	9.9
20/05/2014	-	-	12.3	21.7	10.3
21/05/2014	-	-	11.1	20.1	13.2
22/05/2014	-	-	10.1	30.3	12.2
23/05/2014	-	-	13.2	28.6	13
24/05/2014	-	-	14.1	25.7	11
25/05/2014	-	-	14.7	23.0	11.2
26/05/2014	-	-	10.7	35.4	10.9
27/05/2014	-	-	14.0	22.6	17.2
28/05/2014	-	-	8.1	4.7	8.2
29/05/2014	-	-	5.6	8.3	10.3
30/05/2014	-	-	8.8	7.0	9.4
31/05/2014	-	-	8.2	4.9	9.8
1/06/2014	1.8	-	4.7	1.7	4.6
2/06/2014	6.6	-	5.1	2.5	4.2
3/06/2014	-	-	4.3	2.6	5.1
4/06/2014	-	-	6.2	5.4	6.5
5/06/2014	-	-	9.2	15.8	10.9
6/06/2014	-	-	6.5	5.4	6.5
7/06/2014	-	-	8.9	7.4	9
8/06/2014	-	-	7.7	6.5	10.2
9/06/2014	-	-	8.5	4.3	6.9
10/06/2014	-	-	6.6	4.5	8
11/06/2014	6.3	-	5.2	5.2	9.1
12/06/2014	8.5	-	6.1	8.3	8.2
13/06/2014	7.1	-	8.0	15.4	11.8
14/06/2014	-	-	4.8	2.4	4.3
15/06/2014	-	-	5.8	4.3	7.3
16/06/2014	-	-	6.6	4.7	7.5
17/06/2014	7.1	-	4.3	3.5	4.9
18/06/2014	11.8	-	6.5	7.9	9.4
19/06/2014	-	-	7.3	7.4	6.2
20/06/2014	-	-	6.1	4.5	7.8
21/06/2014	-	-	7.4	7.1	6.4
22/06/2014	-	-	9.3	10.1	10.4
23/06/2014	-	-	7.0	6.5	7.2
24/06/2014	-	-	12.6	10.8	11.4
25/06/2014	-	-	10.9	9.1	9.7
26/06/2014	-	-	9.6	9.4	9.6
27/06/2014	-	-	8.7	7.3	8.5
28/06/2014	-	-	8.6	9.0	11.2
29/06/2014	-	-	7.5	5.1	7.9
30/06/2014	-	-	6.2	4.6	7
1/07/2014	-	-	5.1	4.0	4.8
2/07/2014	-	-	7.8	9.3	5.8
3/07/2014	-	-	12.8	23.7	9.4
4/07/2014	-	-	13.7	32.2	9.6
5/07/2014	-	-	8.8	13.4	8.4

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
6/07/2014	-	-	6.9	8.9	5.5
7/07/2014	-	-	4.8	4.3	4.7
8/07/2014	-	-	7.8	15.4	4.6
9/07/2014	-	-	14.4	24.0	11.7
10/07/2014	-	-	11.7	11.2	13.3
11/07/2014	-	-	9.0	10.8	6.5
12/07/2014	-	-	8.7	11.5	7.8
13/07/2014	-	-	10.0	11.5	8.4
14/07/2014	-	-	13.0	18.3	21.1
15/07/2014	-	-	9.5	20.4	15.5
16/07/2014	-	-	6.3	3.9	6.1
17/07/2014	-	-	6.4	3.2	5.3
18/07/2014	-	-	6.0	3.4	6.1
19/07/2014	-	-	8.3	7.6	7.4
20/07/2014	-	-	9.2	8.6	12.8
21/07/2014	-	-	9.3	9.4	17.4
22/07/2014	-	-	7.9	13.0	11
23/07/2014	-	-	7.4	16.2	8.6
24/07/2014	-	-	8.7	10.1	10.2
25/07/2014	-	-	6.5	2.7	11.8
26/07/2014	-	-	5.0	1.9	-
27/07/2014	-	-	5.0	2.9	-
28/07/2014	-	-	6.3	13.6	-
29/07/2014	-	-	8.7	14.2	5.4
30/07/2014	-	-	10.2	13.8	7.9
31/07/2014	-	-	9.4	12.1	7.5
1/08/2014	-	-	10.7	13.6	9.9
2/08/2014	-	-	6.2	6.6	7.6
3/08/2014	-	-	11.3	9.9	19.6
4/08/2014	-	-	9.6	12.7	9.3
5/08/2014	-	-	12.7	18.7	11
6/08/2014	-	-	14.8	26.8	12.4
7/08/2014	-	-	10.3	19.9	9.7
8/08/2014	-	-	13.6	20.5	18.5
9/08/2014	-	-	12.3	27.4	7.5
10/08/2014	-	-	13.8	16.0	8.5
11/08/2014	-	-	11.1	21.5	12.4
12/08/2014	9.9	-	9.4	14.3	14.2
13/08/2014	9.7	-	10.6	9.7	14.3
14/08/2014	8.8	-	9.8	14.6	-
15/08/2014	10.2	-	11.1	18.7	-
16/08/2014	6.3	-	7.2	9.0	10.3
17/08/2014	5.7	-	4.0	0.8	4.3
18/08/2014	5.4	-	4.3	1.7	4.5
19/08/2014	6.7	-	5.6	3.8	6.4
20/08/2014	7.1	-	7.0	3.7	9.3
21/08/2014	6.7	-	7.0	4.8	8.8
22/08/2014	5.4	-	5.5	3.2	8
23/08/2014	6.8	-	6.8	4.7	8.8
24/08/2014	8.2	-	7.9	9.6	10.2
25/08/2014	8.8	-	7.8	7.6	7.6

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
26/08/2014	7.5	-	7.0	4.1	6.4
27/08/2014	8.0	-	7.3	4.1	7
28/08/2014	8.2	-	8.5	4.5	8.5
29/08/2014	7.5	-	6.4	6.2	8.2
30/08/2014	9.7	-	5.9	5.6	6
31/08/2014	5.8	-	5.1	3.2	5.9
1/09/2014	15.2	-	8.9	10.8	5.4
2/09/2014	8.2	-	6.1	3.3	6.4
3/09/2014	6.1	-	5.4	2.4	5.3
4/09/2014	8.6	-	7.0	5.6	8
5/09/2014	9.8	-	8.8	6.6	9.8
6/09/2014	9.4	-	7.6	5.8	8.2
7/09/2014	6.8	-	7.4	4.1	9.3
8/09/2014	6.5	-	6.3	4.7	7.1
9/09/2014	6.6	-	6.6	12.8	7.5
10/09/2014	11.7	-	9.1	7.0	11
11/09/2014	13.4	-	10.7	10.6	10.8
12/09/2014	15.5	-	13.3	15.4	16.7
13/09/2014	12.2	-	12.6	9.2	13.8
14/09/2014	12.6	-	10.8	8.7	7.4
15/09/2014	15.8	-	13.7	20.6	18.9
16/09/2014	22.3	-	17.8	15.1	17.1
17/09/2014	13.6	-	11.2	14.2	10.4
18/09/2014	11.9	-	9.4	11.6	8.8
19/09/2014	19.3	-	16.9	26.9	8.9
20/09/2014	14.0	-	12.8	16.5	14.2
21/09/2014	11.4	-	11.7	12.0	16.8
22/09/2014	18.0	-	6.4	4.6	15.9
23/09/2014	9.7	-	11.8	7.4	16.7
24/09/2014	10.5	-	15.3	20.6	9.1
25/09/2014	6.4	-	7.7	3.3	7
26/09/2014	5.1	-	5.3	2.8	6.6
27/09/2014	11.2	-	12.1	9.5	15.2
28/09/2014	12.1	-	11.3	10.6	9
29/09/2014	22.1	-	15.9	13.8	11.4
30/09/2014	20.2	-	15.9	17.9	14.6
1/10/2014	13.9	-	12.5	9.5	16.3
2/10/2014	18.2	-	15.1	17.1	13.4
3/10/2014	19.1	-	18.4	16.4	18.7
4/10/2014	18.3	-	15.7	16.4	16.5
5/10/2014	23.5	-	19.5	28.7	12.1
6/10/2014	36.4	-	25.1	5.8	17.8
7/10/2014	20.5	-	-	12.9	22.1
8/10/2014	12.9	-	11.5	8.8	17.4
9/10/2014	12.7	-	13.7	11.0	16.6
10/10/2014	14.5	-	13.8	19.2	16
11/10/2014	22.4	-	17.9	19.3	22.2
12/10/2014	16.8	-	16.3	15.4	20.9
13/10/2014	15.4	-	15.9	14.5	16.6
14/10/2014	12.4	-	7.7	5.8	8.4
15/10/2014	5.2	-	4.2	1.7	4.3

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
16/10/2014	15.1	-	8.3	8.8	9.8
17/10/2014	12.2	-	9.1	11.4	14.3
18/10/2014	12.8	-	12.0	8.3	16.3
19/10/2014	13.0	-	13.4	11.7	10.7
20/10/2014	29.2	-	19.7	23.0	19.3
21/10/2014	12.2	-	12.0	7.5	15.7
22/10/2014	14.1	-	13.1	11.5	16.7
23/10/2014	18.9	-	16.2	18.1	19.1
24/10/2014	19.3	-	17.1	16.2	15.3
25/10/2014	26.1	-	16.3	13.1	17.5
26/10/2014	20.3	-	16.9	13.9	21.7
27/10/2014	41.7	-	33.3	28.2	29.3
28/10/2014	22.5	-	19.2	17.4	18.9
29/10/2014	23.6	-	15.4	25.9	18.9
30/10/2014	20.4	-	18.0	23.3	16.7
31/10/2014	24.3	-	19.0	26.3	35.8
1/11/2014	37.9	-	-	16.8	25.1
2/11/2014	11.0	-	11.0	8.0	12.4
3/11/2014	30.0	-	29.4	25.6	36.6
4/11/2014	30.9	-	29.7	26.8	40.3
5/11/2014	27.0	-	26.1	23.6	24.2
6/11/2014	7.9	-	7.2	5.7	16.5
7/11/2014	-	-	-	18.0	28.4
8/11/2014	-	-	-	12.7	24.6
9/11/2014	24.8	-	-	20.2	30.6
10/11/2014	15.5	-	26.9	25.1	37.9
11/11/2014	28.4	-	16.7	11.2	25.1
12/11/2014	34.7	-	21.4	16.2	29.7
13/11/2014	17.2	-	18.8	15.7	32.4
14/11/2014	21.7	-	24.5	24.0	23.9
15/11/2014	19.1	-	50.5	41.4	55
16/11/2014	34.0	-	13.1	11.0	15.4
17/11/2014	62.1	-	8.3	8.1	9
18/11/2014	15.5	-	16.0	19.9	21.3
19/11/2014	20.6	-	23.1	28.0	27.8
20/11/2014	26.8	-	23.8	31.2	13.6
21/11/2014	40.8	-	24.8	33.3	20.5
22/11/2014	26.5	-	19.8	17.2	36.1
23/11/2014	34.2	-	29.0	26.9	26.7
24/11/2014	21.4	-	20.7	15.6	13.2
25/11/2014	11.4	-	10.5	4.6	13.5
26/11/2014	20.5	-	20.1	14.9	29.9
27/11/2014	17.4	-	17.4	10.4	23.2
28/11/2014	15.7	-	15.7	9.9	21.6
29/11/2014	17.1	-	16.1	10.2	14.6
30/11/2014	16.7	-	16.9	11.1	14.7
1/12/2014	11.3	-	9.4	5.9	10.2
2/12/2014	20.8	-	13.2	10.6	6.6
3/12/2014	18.8	-	16.2	14.5	14.1
4/12/2014	8.3	-	8.7	-	10.4
5/12/2014	13.1	-	11.8	2.3	-

Date	TEOM1	TEOM2	TEOM3	TEOM4	Merriwa
6/12/2014	7.0	-	7.9	1.2	5.2
7/12/2014	8.0	-	7.9	2.9	7.1
8/12/2014	9.7	-	9.5	4.0	7.8
9/12/2014	20.9	-	20.6	16.2	25.7
10/12/2014	16.9	-	19.3	11.1	20.6
11/12/2014	5.7	-	5.3	0.0	6.3
12/12/2014	9.9	-	9.2	3.2	12.7
13/12/2014	11.7	-	11.5	6.3	13.9
14/12/2014	14.9	-	14.3	12.2	15.4
15/12/2014	20.0	-	18.7	15.7	23.4
16/12/2014	21.9	-	20.7	15.4	30.2
17/12/2014	45.7	-	38.0	30.9	55.2
18/12/2014	35.6	-	29.5	22.6	28.6
19/12/2014	23.5	-	19.2	14.7	24.3
20/12/2014	20.9	-	19.4	13.8	25.1
21/12/2014	17.6	-	16.7	12.7	22.4
22/12/2014	16.0	-	14.8	15.7	16.5
23/12/2014	11.8	-	12.2	7.2	11
24/12/2014	15.4	-	13.9	11.8	15.8
25/12/2014	13.3	-	12.5	7.9	11.1
26/12/2014	10.4	-	9.3	3.8	11.2
27/12/2014	17.3	-	15.3	9.5	21.6
28/12/2014	9.3	-	9.1	5.0	9.5
29/12/2014	10.9	-	7.4	4.3	5.2
30/12/2014	26.8	-	17.4	14.5	29.6
31/12/2014	27.5	-	25.5	19.8	31.9

Table B-2: HVAS monitoring data

DATE	HV1	HV2	HV3	HV4	HV5	DATE	PM01	PM02
3/01/2012	13.9	25.3	24.5	21.8	-	3/01/2012	25.2	17.7
9/01/2012	12	13	25.2	14.1	-	9/01/2012	12.7	12.6
15/01/2012	8.3	11.2	13.3	10	-	15/01/2012	11.4	9.5
21/01/2012	13	12.5	17.2	11.9	-	21/01/2012	16.9	20.2
27/01/2012	10.1	9.6	14.5	9.7	-	27/01/2012	13.8	9.6
2/02/2012	3.1	3.8	5.5	4	-	2/02/2012	4.1	3.1
8/02/2012	8.8	12.4	20.7	10.3	-	8/02/2012	18	13
14/02/2012	7.5	12.3	13.9	7.3	-	14/02/2012	17.8	10.4
20/02/2012	4.6	5.5	9.4	9.4	-	20/02/2012	11.2	7.3
26/02/2012	5.4	6.9	11.4	8.7	-	26/02/2012	8.7	9.8
3/03/2012	2.8	3.1	4.1	2.9	-	3/03/2012	5.2	5.1
9/03/2012	6.1	12.8	17.9	8	-	9/03/2012	6.3	6.3
15/03/2012	6.1	12.8	17.9	8	-	15/03/2012	17.6	12.2
21/03/2012	4.6	6.7	11.2	5.8	-	21/03/2012	6.3	5.5
27/03/2012	9.7	-	16.6	10.7	-	27/03/2012	23.4	12.3
2/04/2012	5.5	6.1	9.3	7	-	2/04/2012	9.8	7.8
8/04/2012	21.7	23.6	37.5	20.6	-	8/04/2012	26.5	24.3
14/04/2012	9.9	22.4	19.5	12	-	14/04/2012	14.9	11.4
20/04/2012	5.8	12.4	12.7	7.2	-	20/04/2012	11.6	7.3
26/04/2012	6.9	5.2	15.6	7.4	-	26/04/2012	6.8	6.1
2/05/2012	5.4	8.9	8.5	5.6	-	2/05/2012	9.8	6.1
8/05/2012	8.3	8.6	24.8	7	-	8/05/2012	8.7	8.3
14/05/2012	8.6	9.3	19	13.6	-	14/05/2012	14.5	8.5
20/05/2012	13.1	30.1	24.6	-	-	20/05/2012	14	9.2

DATE	HV1	HV2	HV3	HV4	HV5	DATE	PM01	PM02
26/05/2012	4.9	3.2	13	3.4	-	26/05/2012	4.3	4.1
1/06/2012	7.3	11.9	6.6	4.5	-	1/06/2012	11.9	8
7/06/2012	4	8.3	5.1	2	-	7/06/2012	4.8	1.7
13/06/2012	13.1	5.9	6	4.5	-	13/06/2012	10.6	6.2
19/06/2012	3.1	3.4	2.9	5.3	-	19/06/2012	2.5	3.4
25/06/2012	7.7	5.4	11.8	5.5	-	25/06/2012	3.3	4.9
1/07/2012	7.3	6.6	25	5.4	-	1/07/2012	4.4	5.8
7/07/2012	6.2	11.9	3.9	5.8	-	7/07/2012	7.4	4.7
13/07/2012	4.2	6.4	7.3	4.3	-	13/07/2012	5	4.9
19/07/2012	7.8	7	5.9	4.2	-	19/07/2012	6.3	4.7
25/07/2012	5.4	8.2	6.2	-	-	25/07/2012	7.1	5
31/07/2012	7.7	6.9	7.3	6.1	-	31/07/2012	5.5	4.4
6/08/2012	6.5	8.5	26.4	7.4	-	6/08/2012	6.6	8.7
12/08/2012	6.8	13.8	1.9	-	-	12/08/2012	7.4	5.5
18/08/2012	5.9	4.5	35.4	3.5	-	18/08/2012	4.1	3.6
24/08/2012	7.1	5.9	23.2	5.6	-	24/08/2012	5.7	6.1
30/08/2012	11.1	10.1	35.2	9.9	-	30/08/2012	12.5	9.9
5/09/2012	16.1	12.1	38.8	-	-	5/09/2012	28.1	15.5
11/09/2012	16.9	34.2	40.4	16.8	-	11/09/2012	17.5	13.7
17/09/2012	10.1	25.6	24.1	-	-	17/09/2012	14.8	10.8
23/09/2012	10.1	19.8	33.2	-	-	23/09/2012	10.1	8.9
29/09/2012	7.3	7.4	17.8	7.2	-	29/09/2012	8.3	8.1
5/10/2012	13.2	16	47	20.2	-	5/10/2012	14.3	11.7
11/10/2012	-	7.1	20.8	6.7	-	11/10/2012	5	4.2
17/10/2012	14.4	32.2	36.4	18.4	-	17/10/2012	14.4	13.6
23/10/2012	10.6	47.6	26.8	11.7	-	23/10/2012	13.3	18
29/10/2012	12.2	29.9	25.3	15	-	29/10/2012	22.4	18.2
4/11/2012	15.4	30.5	26.5	15.6	-	4/11/2012	14.4	18.5
10/11/2012	8.4	14.3	18.1	9.8	-	10/11/2012	16.7	11.1
16/11/2012	8	10.6	19.8	13.1	-	16/11/2012	6.4	6.8
22/11/2012	14.8	29.3	29.9	16.9	-	22/11/2012	27.9	21.4
28/11/2012	13	14.9	18.3	13	-	28/11/2012	19.2	14.2
4/12/2012	10.6	12.4	26.9	11.3	-	4/12/2012	12.5	13.7
10/12/2012	5.2	10.8	12.8	16.9	-	10/12/2012	17.5	13.3
16/12/2012	10.9	18.5	22	15.3	-			
22/12/2012	12.9	17.7	24	14.7	-	25/12/2012	6.6	6.7
28/12/2012	13.7	23	24	14.3	-	28/12/2012	13.3	14.2
3/01/2013	12.6	22	23.4	13.6	-	3/01/2013	17.7	16.4
9/01/2013	29.3	-	44.3	29.7	-	9/01/2013	26	22.2
15/01/2013	13.1	-	26.2	17.2	16.1	15/01/2013	21.8	20.2
21/01/2013	12.3	-	21.2	13.8	13	21/01/2013	19.4	17.1
27/01/2013	4.5	-	8	5.5	5.2	27/01/2013	5.4	4.3
2/02/2013	4.3	-	6.5	5.8	4.5	2/02/2013	5.4	3.9
8/02/2013	14.4	-	30	26	25.5	8/02/2013	21.2	18.2
14/02/2013	6.8	-	15.2	8.2	8.8	14/02/2013	19.7	13.4
20/02/2013	12.2	-	21	12.7	15.3	20/02/2013	23.7	16.2
26/02/2013	10.5	-	17.5	10.8	12.6	26/02/2013	16.8	12.1
4/03/2013	10.4	-	18.4	10.5	12.4	4/03/2013	19.2	14.8
10/03/2013	9.9	-	17.5	11.5	12.7	10/03/2013	17.7	14.1
16/03/2013	14.9	-	29.2	13.7	16	16/03/2013	11	11
22/03/2013	9.6	-	26.1	16.2	12.5	22/03/2013	10	8
28/03/2013	11.5	-	31	14.9	18.6	28/03/2013	9	6
3/04/2013	9	-	18.8	8.9	13	3/04/2013	10	5
8/04/2013	6.8	-	10	7.7	10.1	9/04/2013	8	7
14/04/2013	16	-	51.2	18.1	25.5	15/04/2013	14	13
20/04/2013	5.6	-	16	6.7	13	23/04/2013	6	5

DATE	HV1	HV2	HV3	HV4	HV5	DATE	PM01	PM02
26/04/2013	18.4	-	63.7	18.3	19.5	27/04/2013	7	13
2/05/2013	14	-	37.4	14.4	27.4	3/05/2013	17	20
9/05/2013	10.9	-	15.2	14.6	41	9/05/2013	15	12
15/05/2013	6.2	-	6.9	-	43.3	15/05/2013	5	3
21/05/2013	9.8	-	44	-	18.7	21/05/2013	7	7
27/05/2013	6.6	-	13.5	-	9.6	27/05/2013	13	8
2/06/2013	1.2	-	3.1	2	1.8	2/06/2013	2	2
8/06/2013	5.5	-	8	4	4.8	8/06/2013	5	3
14/06/2013	3.3	-	6.5	2.8	2.8	14/06/2013	1	<1
20/06/2013	6.8	-	6.4	9.8	9.2	20/06/2013	7	1
26/06/2013	5.5	-	13.8	6	4.5	26/06/2013	3	<1
2/07/2013	6.7	-	12.5	6.2	8.4	2/07/2013	6	3
8/07/2013	6.3	-	13	8.4	11.8	8/07/2013	6	4
14/07/2013	10.2	-	9.2	8.8	7.4	14/07/2013	12	13
20/07/2013	4.6	-	18.9	3.6	5	20/07/2013	2	2
26/07/2013	9.6	-	28	7.2	18.5	26/07/2013	6	8
1/08/2013	5	-	7.9	5.8	7.9	1/08/2013	8	9
7/08/2013	6.9	-	27.1	8.9	11.6	7/08/2013	3	4
13/08/2013	7.1	-	35.1	5.6	9.7	13/08/2013	4	2
19/08/2013	6.1	-	24	9.5	9.8	19/08/2013	4	2
25/08/2013	6.8	-	30.7	7	12.9	25/08/2013	2	1
31/08/2013	10.5	-	47.7	12.2	19.6	31/08/2013	4	4
6/09/2013	13.7	-	42.9	16.4	36	6/09/2013	13	11
12/09/2013	10.2	-	44.8	11.2	23.5	12/09/2013	35	1
18/09/2013	8.3	-	33.5	8.2	9.4	18/09/2013	1	1
24/09/2013	13.9	-	52.9	18.9	25.2	24/09/2013	9	9
30/09/2013	14.1	-	77.6	17.6	25.3	30/09/2013	6	5
6/10/2013	10.9	-	63.1	16.1	28.8	6/10/2013	3	4
12/10/2013	11	-	58	18.4	22.5	12/10/2013	13	13
18/10/2013	43.7	-	65.1	55.1	49.8	18/10/2013	51	50
24/10/2013	6.1	-	23.8	7.4	15.9	24/10/2013	7	5
30/10/2013	11.2	-	20.8	3.7	14	30/10/2013	21	13
5/11/2013	27.1	-	40.3	31.5	26.4	5/11/2013	29	23
11/11/2013	5.8	-	11.7	5.1	6.3	11/11/2013	10	6
17/11/2013	2.9	-	7.7	3.1	3.3	17/11/2013	5	2
23/11/2013	6.7	-	10.9	7.2	7.8	23/11/2013	8	6
29/11/2013	15.1	-	33	16.2	15.3	29/11/2013	14	10
5/12/2013	10	-	34.7	8.9	13	5/12/2013	10	8
11/12/2013	10.7	-	28.7	13.3	17.3	11/12/2013	17	10
17/12/2013	10.5	-	21	10.6	-	17/12/2013	17	29
23/12/2013	22.9	-	50.7	39.3	-	23/12/2013	32	19
29/12/2013	24.5	-	49.4	26.1	-	29/12/2013	23	18
4/01/2014	15.7	-	32.9	14.8	15.6	4/01/2014	15	14
10/01/2014	27.7	-	36.8	26.4	30.7	10/01/2014	33	29
16/01/2014	41.2	-	56.7	37.7	47.8	16/01/2014	51	47
22/01/2014	8.5	-	17.5	9.1	8.4	22/01/2014	19	22
28/01/2014	6.7	-	18.1	10	11.1	28/01/2014	18	13
3/02/2014	15.5	-	27.7	15.3	15	3/02/2014	31	28
9/02/2014	20.3	-	41.4	25.6	27.8	9/02/2014	27	25
15/02/2014	16.6	-	48.7	16	17.3	15/02/2014	26	25
21/02/2014	13.5	-	32.7	26.5	22.9	21/02/2014	18	12
27/02/2014	13.1	-	20.6	12.5	16.8	27/02/2014	20	16
5/03/2014	8.2	-	20.8	9.2	12.7	5/03/2014	13	10
11/03/2014	8.8	-	15.2	-	16.7	11/03/2014	14	12
17/03/2014	6.6	-	20.7	-	10.8	17/03/2014	7	8
23/03/2014	9.1	-	20.5	12.3	12.9	23/03/2014	10	13

DATE	HV1	HV2	HV3	HV4	HV5	DATE	PM01	PM02
29/03/2014	7	-	27.5	7.1	7.2	29/03/2014	5	5
4/04/2014	6.7	-	11.6	7.4	7.4	4/04/2014	10	10
10/04/2014	12.8	-	20.2	12.8	18.5	10/04/2014	14	16
16/04/2014	6.8	-	11.3	8	9	16/04/2014	8	6
22/04/2014	10.3	-	28.4	11.8	21	22/04/2014	11	9
28/04/2014	6.4	-	12.8	5.5	10.4	28/04/2014	8	4
4/05/2014	4.7	-	21.2	3.1	6.2	4/05/2014	3	15
10/05/2014	8.4	-	13.5	10.3	11.2	10/05/2014	14	10
16/05/2014	8.6	-	13.7	8.7	15.9	16/05/2014	10	9
22/05/2014	7.9	-	18.4	12.2	27.2	22/05/2014	12	9
28/05/2014	6.9	-	20.2	5.3	6.6	28/05/2014	8	8
3/06/2014	1.7	-	8.7	1.8	3.4	3/06/2014	6	2
9/06/2014	7.4	-	8.2	3.1	4.2	9/06/2014	4	2
15/06/2014	2.3	-	9.1	2.8	4.7	15/06/2014	1	1
21/06/2014	5.7	-	15.5	6	7.6	21/06/2014	3	5
27/06/2014	6.9	-	27.4	9.6	9.1	27/06/2014	6	5
3/07/2014	9.2	-	29.2	10.6	22.7	-	-	-
9/07/2014	11.1	-	36.6	14.7	26.4	-	-	-
15/07/2014	6.4	-	14	6.8	22.4	-	-	-
21/07/2014	6.6	-	12.8	6.2	9.8	-	-	-
27/07/2014	2.8	-	9.5	2.6	3.9	-	-	-
2/08/2014	2.3	-	9.8	3.6	6	-	-	-
8/08/2014	11.8	-	17.9	9.6	20.9	-	-	-
14/08/2014	7.6	-	12.2	8.6	17.1	-	-	-
20/08/2014	4.2	-	9.8	3.4	4.7	-	-	-
26/08/2014	3.4	-	7.2	3.7	2.8	-	-	-
1/09/2014	7	-	20.1	7.8	11.1	-	-	-
7/09/2014	4	-	7.7	3.9	4.4	-	-	-
13/09/2014	9.6	-	14.8	9.4	10	-	-	-
19/09/2014	12.7	-	32.3	11.6	24.9	-	-	-
25/09/2014	4.8	-	13.3	5	5	-	-	-
1/10/2014	10	-	20.7	10.7	11.4	-	-	-
7/10/2014	15.3	-	33.6	16.7	16.5	-	-	-
13/10/2014	14.2	-	24.5	6.1	7.7	-	-	-
19/10/2014	12.1	-	20.7	10.2	13	-	-	-
25/10/2014	14.5	-	23.1	19.1	14.6	-	-	-
31/10/2014	18.3	-	37.6	24.4	31.3	-	-	-
6/11/2014	13.2	-	28.1	12	11.6	-	-	-
12/11/2014	18.3	-	27.9	18.1	20.3	-	-	-
18/11/2014	13.3	-	26.3	11.5	20.2	-	-	-
24/11/2014	19.8	-	33.2	22.5	18.4	-	-	-
30/11/2014	15.9	-	23.1	22	13.3	-	-	-
6/12/2014	5.6	-	10.8	4.9	5.4	-	-	-
12/12/2014	8.2	-	13.5	7.4	7.7	-	-	-
18/12/2014	28.3	-	59.1	27.2	29.9	-	-	-
24/12/2014	12.3	-	27.8	12.4	14.7	-	-	-
30/12/2014	22	-	46.7	25.2	25	-	-	-

Appendix C
Emission Inventory

Wilpinjong Coal Mine - Emission Calculation

The mining schedule and mine plan designs provided by Wilpinjong Coal Pty Limited have been combined with emissions factor equations that relate to the quantity of dust emitted from particular activities based on intensity, the prevailing meteorological conditions and composition of the material being handled.

Emission factors and associated controls have been sourced from the United States (US) Environmental Protection Agency (EPA) AP42 Emission Factors (**US EPA, 1985 and Updates**), the National Pollutant Inventory (NPI) document "*Emission Estimation Technique Manual for Mining, Version 3.1*" (**NPI, 2012**), the State Pollution Control Commission document "*Air Pollution from Coal Mining and Related Developments*" (**SPCC, 1983**) and the Office of Environment and Heritage document, "*NSW Coal Mining Benchmarking Study: International Best Practise Measures to Prevent and/or Minimise Emissions of Particulate Matter from Coal Mining*", prepared by Katestone Environmental (**Katestone Environmental, 2010**).

Indicative mine plans for each of the selected years are presented in **Figure C-1** to **Figure C-6**.

The emission factor equations used for each dust generating activity are outlined in **Table C-1** below. Detailed emission inventories for each modelled year are presented in **Table C-2** to **Table C-6**.

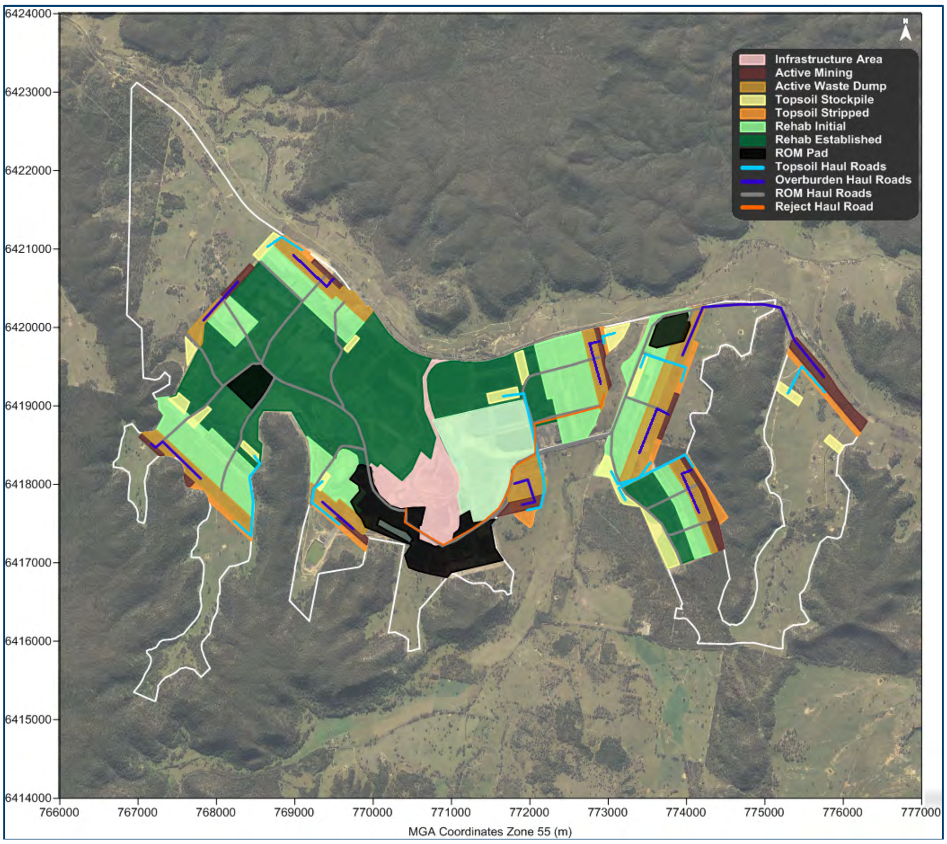


Figure C-1: Indicative mine plan - Year 2018

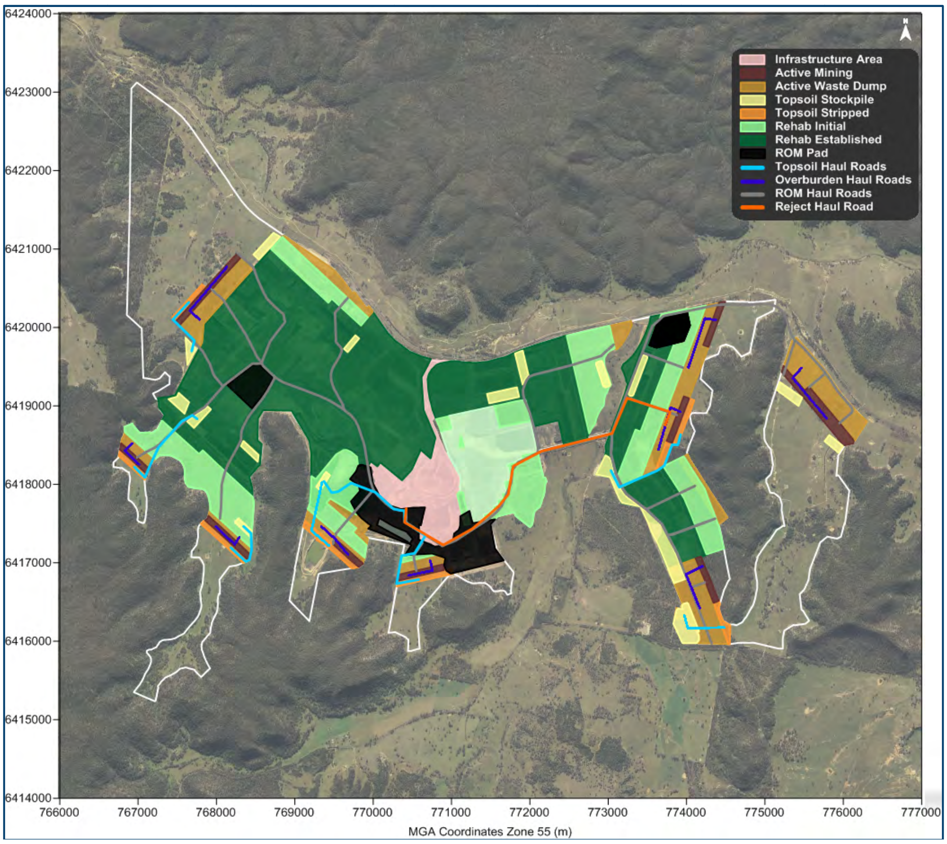


Figure C-2: Indicative mine plan - Year 2020

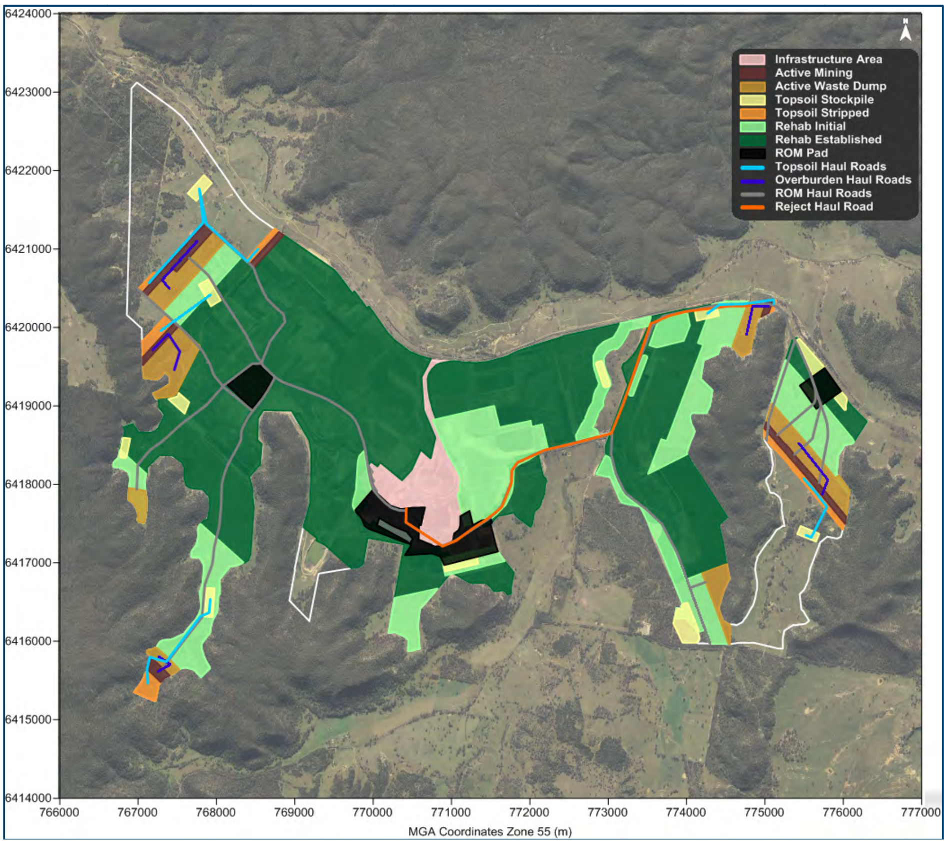


Figure C-3: Indicative mine plan - Year 2024

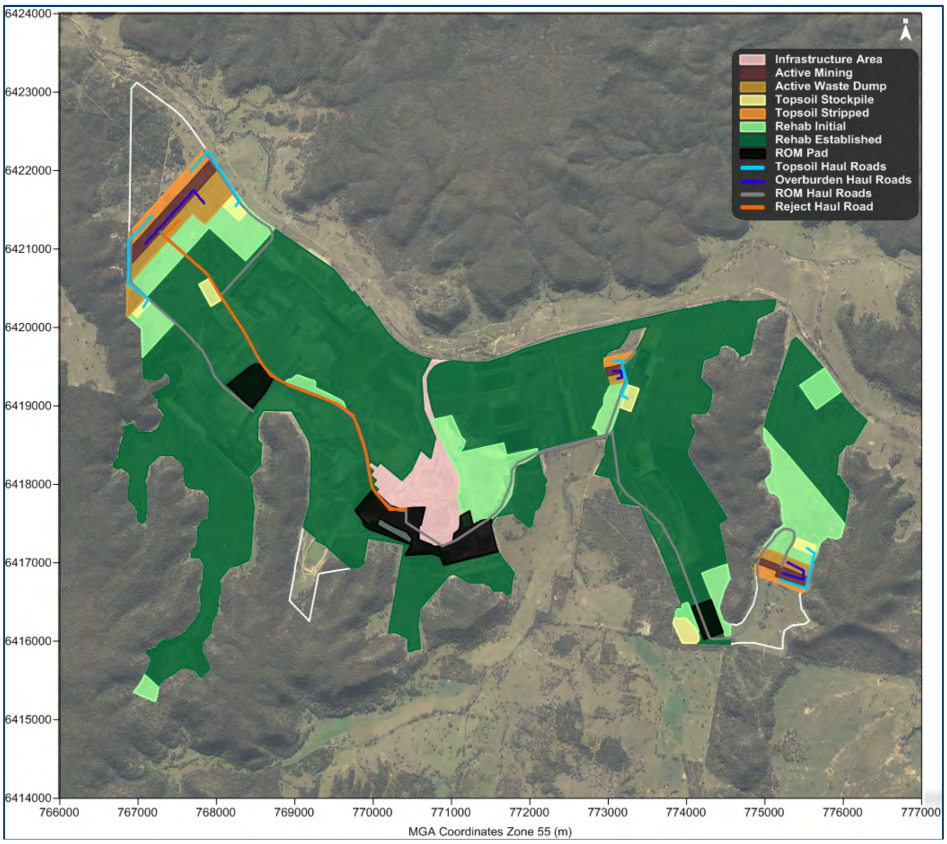


Figure C-4: Indicative mine plan - Year 2028

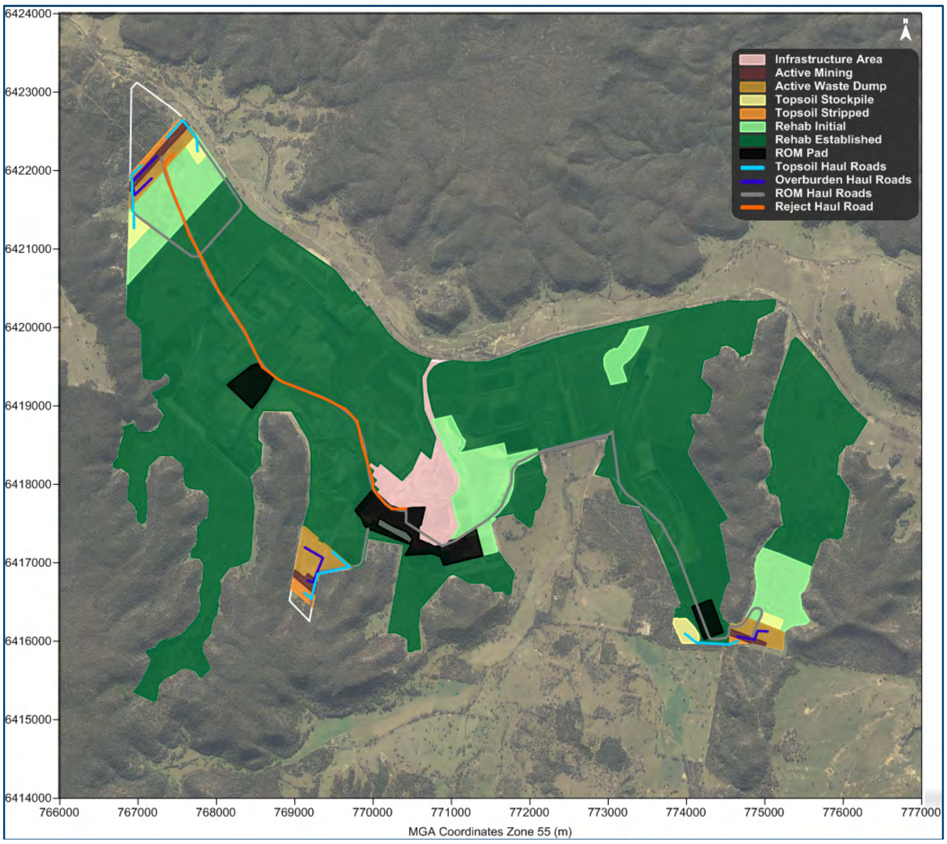


Figure C-5: Indicative mine plan - Year 2031

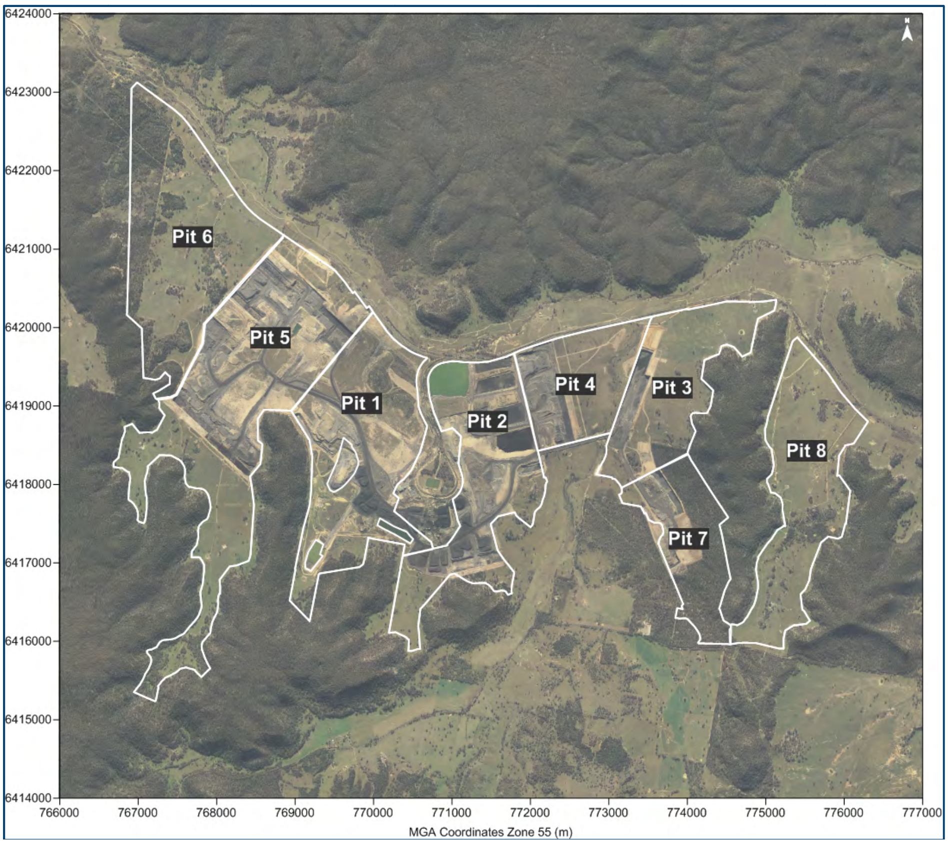


Figure C-6: General pit arrangement

Table C-1: Emission factor equations

Activity	Emission factor equation	Variables	Control
Scraper removing topsoil	$EF = 0.029\ kg/tonne$	-	-
Scraper unloading	$EF = 0.02\ kg/tonne$	-	-
Drilling (overburden/coal)	$EF = 0.59\ kg/hole$	-	90% - water sprays
Blasting (overburden/coal)	$EF = 0.00022 \times A^{1.5}\ kg/blast$	A = area to be blasted (m^2)	-
Loading / emplacing overburden	$EF = k \times 0.0016 \times \left(\frac{U}{2.2}^{1.3} \Big/ \frac{M}{2}^{1.4} \right)\ kg/tonne$	K_{tsp} = 0.74 U = wind speed (m/s) M = moisture content (%)	-
Hauling on unsealed surfaces	$EF = \left(\frac{0.4536}{1.6093}\right) \times k \times (s/12)^{0.7} \times (1.1023 \times M/3)^{0.45}\ kg/VKT$	S = silt content (%) M = average vehicle gross mass (tonnes)	80% - watering of trafficked areas
Dozers activity (topsoil/overburden)	$EF = 2.6 \times \frac{s^{1.2}}{M^{1.3}}\ kg/hour$	S = silt content (%) M = moisture content (%)	20% - travelling on watered routes
Dozer activity (ROM/product coal)	$EF = 35.6 \times \frac{s^{1.2}}{M^{1.3}}\ kg/hour$	S = silt content (%) M = moisture content (%)	-
Loading / emplacing coal	$EF = \frac{0.58}{M^{1.2}}\ kg/tonne$	M = moisture content (%)	50% - water sprays at dump hopper
Screening	$EF = 0.0011\ kg/tonne$	-	-
Crushing	$EF = 0.0006\ kg/tonne$	-	-
Loading product coal to stockpile / train	$EF = k \times 0.0016 \times \left(\frac{U}{2.2}^{1.3} \Big/ \frac{M}{2}^{1.4} \right)\ kg/tonne$	K_{tsp} = 0.74 U = wind speed (m/s) M = moisture content (%)	-
Wind erosion from exposed areas	$EF = 0.4\ kg/ha/hour$	-	21% - vegetation on 30% of area / 90% - re-vegetative ground cover
Wind erosion from active coal stockpiles	$EF = 1.9 \times \left(\frac{s}{1.5}\right) \times 365 \times \left(\frac{365-p}{235}\right) \times \left(\frac{f}{15}\right)\ kg/ha/year$	S = silt content (%) P = number of days per year when rainfall is >0.25mm F = % of time wind speed is >5.4m/s	-
Grading roads	$EF = 0.0034 \times s^{2.5}\ kg/VKT$	S = speed of grader (km/hr)	75% - travelling on watered routes

Table C-2: Emissions inventory - Year 2018

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Stripping Topsoil (Pit 1) - Scraper removing topsoil	1,141	39,356	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper removing topsoil	1,412	48,707	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper removing topsoil	1,538	53,026	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper removing topsoil	408	14,073	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper removing topsoil	1,621	55,895	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper removing topsoil	-	-	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper removing topsoil	1,151	39,679	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper removing topsoil	1,721	59,349	tonnes/year	0.029	kg/t												
OB - Stripping Topsoil (Pit 1) - Scraper (travel mode)	1,199	39,356	tonnes/year	0.152	kg/t	34	tonnes/load	1.5	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 2) - Scraper (travel mode)	3,718	48,707	tonnes/year	0.382	kg/t	34	tonnes/load	3.9	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 3) - Scraper (travel mode)	1,702	53,026	tonnes/year	0.160	kg/t	34	tonnes/load	1.6	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 4) - Scraper (travel mode)	137	14,073	tonnes/year	0.049	kg/t	34	tonnes/load	0.5	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 5) - Scraper (travel mode)	2,113	55,895	tonnes/year	0.189	kg/t	34	tonnes/load	1.9	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 6) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 7) - Scraper (travel mode)	2,053	39,679	tonnes/year	0.259	kg/t	34	tonnes/load	2.6	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 8) - Scraper (travel mode)	1,953	59,349	tonnes/year	0.165	kg/t	34	tonnes/load	1.7	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 1) - Scraper unloading topsoil	787	39,356	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper unloading topsoil	974	48,707	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper unloading topsoil	1,061	53,026	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper unloading topsoil	281	14,073	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper unloading topsoil	1,118	55,895	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper unloading topsoil	794	39,679	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper unloading topsoil	1,187	59,349	tonnes/year	0.020	kg/t												
OB - Dozers on topsoil (Pit 1)	1,924	667	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 2)	2,382	826	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 3)	2,593	899	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 4)	688	239	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 5)	2,733	947	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 6)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 7)	1,940	673	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 8)	2,902	1,006	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Drilling (Pit 1)	527	8,935	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 2)	561	9,506	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 3)	1,579	26,765	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 4)	1,087	18,418	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 5)	1,963	33,273	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 6)	665	11,277	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 7)	1,329	22,529	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 8)	1,161	19,685	holes/year	0.59	kg/hole											90	% Control
OB - Blasting (Pit 1)	11,679	9	blasts/year	1307	kg/blast	32,803	Area of blast in square metres										
OB - Blasting (Pit 2)	12,589	10	blasts/year	1324	kg/blast	33,093	Area of blast in square metres										
OB - Blasting (Pit 3)	31,217	27	blasts/year	1166	kg/blast	30,404	Area of blast in square metres										
OB - Blasting (Pit 4)	23,155	18	blasts/year	1257	kg/blast	31,964	Area of blast in square metres										
OB - Blasting (Pit 5)	43,236	33	blasts/year	1299	kg/blast	32,675	Area of blast in square metres										
OB - Blasting (Pit 6)	13,702	12	blasts/year	1134	kg/blast	29,841	Area of blast in square metres										
OB - Blasting (Pit 7)	27,915	24	blasts/year	1156	kg/blast	30,233	Area of blast in square metres										
OB - Blasting (Pit 8)	21,740	21	blasts/year	1031	kg/blast	28,000	Area of blast in square metres										
OB - Excavator loading OB to haul truck (Pit 1)	3,080	2,137,279	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 2)	3,021	2,096,834	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 3)	16,437	11,407,380	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 4)	8,268	5,738,131	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 5)	13,986	9,706,042	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 6)	9,121	6,329,659	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 7)	13,748	9,541,195	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 8)	24,653	17,109,091	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 1)	725	503,453	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 2)	807	559,838	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Rehandle OB (Pit 3)	2,872	1,993,094	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 4)	2,056	1,427,030	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 5)	3,223	2,236,440	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 6)	499	345,974	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 7)	2,009	1,394,578	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 8)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Hauling to dump from Pit 1	17,516	2,137,279	tonnes/year	0.041	kg/t	181	tonnes/load	1.1	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 2	20,916	2,096,834	tonnes/year	0.050	kg/t	181	tonnes/load	1.3	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 3	137,471	11,407,380	tonnes/year	0.060	kg/t	181	tonnes/load	1.5	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 4	58,850	5,738,131	tonnes/year	0.051	kg/t	181	tonnes/load	1.3	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 5	120,226	9,706,042	tonnes/year	0.062	kg/t	181	tonnes/load	1.6	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 6	65,114	6,329,659	tonnes/year	0.051	kg/t	181	tonnes/load	1.3	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 7	100,237	9,541,195	tonnes/year	0.053	kg/t	181	tonnes/load	1.3	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 8	725,381	17,109,091	tonnes/year	0.212	kg/t	181	tonnes/load	5.4	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Emplacing at dump (Pit 1)	3,080	2,137,279	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 2)	3,021	2,096,834	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 3)	16,437	11,407,380	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 4)	8,268	5,738,131	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 5)	13,986	9,706,042	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 6)	9,121	6,329,659	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 7)	13,748	9,541,195	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 8)	24,653	17,109,091	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Dozers on OB in pit (Pit 1)	64,346	5,448	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 2)	68,225	5,776	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 3)	172,666	14,618	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 4)	124,116	10,508	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 5)	197,469	16,718	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 6)	57,070	4,832	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 7)	185,268	15,685	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 8)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 1)	12,495	1,812	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 2)	13,404	1,944	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 3)	29,988	4,350	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 4)	23,741	3,444	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 5)	45,891	6,657	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 6)	12,381	1,796	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 7)	26,580	3,855	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 8)	16,698	2,422	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Loading ROM coal to haul truck (Pit 1)	75,900	1,100,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 2)	81,420	1,180,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 3)	182,159	2,640,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 4)	144,209	2,090,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 5)	278,759	4,040,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 6)	75,210	1,090,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 7)	161,459	2,340,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 8)	101,430	1,470,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Hauling ROM to hopper from Pit 1	46,723	1,100,000	tonnes/year	0.212	kg/t	181	tonnes/load	5.4	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 2	34,667	1,180,000	tonnes/year	0.147	kg/t	181	tonnes/load	3.8	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 3	185,944	2,640,000	tonnes/year	0.352	kg/t	181	tonnes/load	9.0	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 4	146,194	2,090,000	tonnes/year	0.350	kg/t	181	tonnes/load	9.0	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 5	280,672	4,040,000	tonnes/year	0.347	kg/t	181	tonnes/load	8.9	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 6	65,678	1,090,000	tonnes/year	0.301	kg/t	181	tonnes/load	7.7	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 7	203,132	2,340,000	tonnes/year	0.434	kg/t	181	tonnes/load	11.1	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 8	167,926	1,470,000	tonnes/year	0.571	kg/t	181	tonnes/load	14.6	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 1)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 3)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 5)	83,628	1,212,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 6)	22,563	327,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 8)	30,429	441,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Unloading ROM to hopper (all pits)	550,273	15,950,000	tonnes/year	0.069	kg/t	5.9	moisture content in %									50	% Control
CHPP - Rehandle ROM at hopper / ROM pad	303,599	4,400,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Screening	17,545	15,950,000	tonnes/year	0.0011	kg/Mg												
CHPP - Crushing	9,570	15,950,000	tonnes/year	0.0006	kg/Mg												
CHPP - Sized Coal Unloading to Exisiting Product/Raw Stockpiles	5,967	15,950,000	tonnes/year	0.0004	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to CHPP	3,292	8,800,000	tonnes/year	0.0004	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to trains (BYPASS)	2,675	7,150,000	tonnes/year	0.0004	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Unloading from CHPP to Product Stockpile	3,817	8,800,000	tonnes/year	0.0004	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Loading from Product Stockpile to trains	3,817	8,800,000	tonnes/year	0.0004	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Dozer on ROM Stockpiles	32,535	5,256	hours/year	6.2	kg/h	1.5	silt content in %	5.6	moisture content in %								
CHPP - Dozer on Product/Raw Stockpiles	74,958	10,512	hours/year	7.1	kg/h	1.4	silt content in %	4.7	moisture content in %								
CHPP - Loading coarse rejects	374	2,472,000	tonnes/year	0.0002	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Loading fine rejects from belt filter press	14	528,000	tonnes/year	0.00003	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
CHPP - Hauling coarse and fine rejects	183,295	3,000,000	tonnes/year	0.305	kg/t	181	tonnes/load	7.8	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CHPP - Unloading coarse rejects	374	2,472,000	tonnes/year	0.0002	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Unloading fine rejects	14	528,000	tonnes/year	0.00003	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
WE - Overburden emplacement areas (Pit 1)	85,936	31	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 2)	54,293	20	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 3)	145,531	53	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 4)	35,840	13	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 5)	125,042	45	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 6)	19,386	7	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 7)	42,787	15	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 8)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Open pit (Pit 1)	12,694	4	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 2)	24,887	7	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 3)	15,251	4	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 4)	16,026	5	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 5)	26,333	8	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 6)	13,908	4	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 7)	40,076	11	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 8)	68,783	20	ha	0.40	kg/ha/hour	8,760	hours										
WE - Initial rehab (Pit 1)	12,782	36	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 3)	36,366	104	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 4)	26,571	76	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 5)	48,650	139	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 6)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 7)	9,481	27	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 8)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Topsoil stockpiles (Pit 1)	2,144	3	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 2)	3,401	5	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 3)	2,548	4	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 4)	6,508	9	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 5)	5,622	8	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 6)	4,174	6	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 7)	13,357	19	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 8)	4,299	6	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - ROM stockpiles	24,861	91	ha	272	kg/ha/year	1.5	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Satellite ROM stockpiles	8,434	33	ha	256	kg/ha/year	1.4	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Product stockpiles	2,220	10	ha	222	kg/ha/year	1.2	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
Grading roads	25,879	168,192	km	0.62	kg/VKT	8	speed of graders in km/h									75	% Control
Total TSP emissions (kg/yr)	**7,254,499**																

Table C-3: Emissions inventory - Year 2020

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Stripping Topsoil (Pit 1) - Scraper removing topsoil	1,080	37,233	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper removing topsoil	913	31,498	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper removing topsoil	1,229	42,382	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper removing topsoil	1,465	50,502	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper removing topsoil	717	24,734	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper removing topsoil	555	19,135	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 1) - Scraper (travel mode)	1,359	37,233	tonnes/year	0.183	kg/t	34	tonnes/load	1.8	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 2) - Scraper (travel mode)	3,465	31,498	tonnes/year	0.550	kg/t	34	tonnes/load	5.6	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 3) - Scraper (travel mode)	2,292	42,382	tonnes/year	0.270	kg/t	34	tonnes/load	2.7	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 4) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 5) - Scraper (travel mode)	2,066	50,502	tonnes/year	0.205	kg/t	34	tonnes/load	2.1	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 6) - Scraper (travel mode)	804	24,734	tonnes/year	0.163	kg/t	34	tonnes/load	1.6	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 7) - Scraper (travel mode)	484	19,135	tonnes/year	0.127	kg/t	34	tonnes/load	1.3	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 8) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 1) - Scraper unloading topsoil	745	37,233	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper unloading topsoil	630	31,498	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper unloading topsoil	848	42,382	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper unloading topsoil	1,010	50,502	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper unloading topsoil	495	24,734	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper unloading topsoil	383	19,135	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Dozers on topsoil (Pit 1)	2,747	952	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 2)	2,324	806	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 3)	3,127	1,084	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 4)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 5)	3,726	1,292	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 6)	1,825	633	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 7)	1,412	489	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 8)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Drilling (Pit 1)	432	7,317	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 2)	1,324	22,443	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 3)	1,549	26,251	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 4)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 5)	1,263	21,403	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 6)	1,389	23,546	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 7)	1,127	19,095	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 8)	1,344	22,772	holes/year	0.59	kg/hole											90	% Control
OB - Blasting (Pit 1)	9,504	7	blasts/year	1299	kg/blast	32,667	Area of blast in square metres										
OB - Blasting (Pit 2)	27,678	22	blasts/year	1233	kg/blast	31,556	Area of blast in square metres										
OB - Blasting (Pit 3)	30,352	26	blasts/year	1156	kg/blast	30,228	Area of blast in square metres										
OB - Blasting (Pit 4)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 5)	26,526	21	blasts/year	1239	kg/blast	31,660	Area of blast in square metres										
OB - Blasting (Pit 6)	29,049	25	blasts/year	1151	kg/blast	30,146	Area of blast in square metres										
OB - Blasting (Pit 7)	22,663	20	blasts/year	1108	kg/blast	29,377	Area of blast in square metres										
OB - Blasting (Pit 8)	27,400	24	blasts/year	1123	kg/blast	29,646	Area of blast in square metres										
OB - Excavator loading OB to haul truck (Pit 1)	3,215	2,231,177	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 2)	10,638	7,382,928	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 3)	16,927	11,747,162	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 5)	9,146	6,347,294	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 6)	16,858	11,699,095	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 7)	12,777	8,867,390	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 8)	17,083	11,855,486	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 1)	879	609,749	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 2)	3,706	2,572,070	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Rehandle OB (Pit 3)	2,180	1,512,605	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 5)	2,328	1,615,498	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 6)	1,488	1,032,384	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 7)	2,679	1,859,443	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 8)	2,387	1,656,432	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Hauling to dump from Pit 1	17,345	2,231,177	tonnes/year	0.039	kg/t	181	tonnes/load	1.0	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 2	51,516	7,382,928	tonnes/year	0.035	kg/t	181	tonnes/load	0.9	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 3	137,715	11,747,162	tonnes/year	0.059	kg/t	181	tonnes/load	1.5	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 4	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 5	41,169	6,347,294	tonnes/year	0.032	kg/t	181	tonnes/load	0.8	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 6	163,450	11,699,095	tonnes/year	0.070	kg/t	181	tonnes/load	1.8	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 7	97,588	8,867,390	tonnes/year	0.055	kg/t	181	tonnes/load	1.4	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 8	156,567	11,855,486	tonnes/year	0.066	kg/t	181	tonnes/load	1.7	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Emplacing at dump (Pit 1)	3,215	2,231,177	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 2)	10,638	7,382,928	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 3)	16,927	11,747,162	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 5)	9,146	6,347,294	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 6)	16,858	11,699,095	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 7)	12,777	8,867,390	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 8)	17,083	11,855,486	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Dozers on OB in pit (Pit 1)	33,073	2,800	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 2)	127,984	10,835	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 3)	131,635	11,144	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 4)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 5)	134,819	11,414	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 6)	120,183	10,175	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 7)	136,675	11,571	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 8)	122,707	10,388	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 1)	13,009	1,887	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 2)	36,634	5,314	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 3)	37,681	5,466	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 4)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 5)	35,887	5,205	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 6)	35,438	5,140	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 7)	26,167	3,796	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 8)	32,597	4,728	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Loading ROM coal to haul truck (Pit 1)	60,030	870,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 2)	169,049	2,450,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 3)	173,879	2,520,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 5)	165,599	2,400,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 6)	163,529	2,370,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 7)	120,750	1,750,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 8)	150,419	2,180,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Hauling ROM to hopper from Pit 1	21,499	870,000	tonnes/year	0.124	kg/t	181	tonnes/load	3.2	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 2	40,081	2,450,000	tonnes/year	0.082	kg/t	181	tonnes/load	2.1	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 3	211,991	2,520,000	tonnes/year	0.421	kg/t	181	tonnes/load	10.8	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 4	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 5	180,354	2,400,000	tonnes/year	0.376	kg/t	181	tonnes/load	9.6	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 6	150,316	2,370,000	tonnes/year	0.317	kg/t	181	tonnes/load	8.1	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 7	165,219	1,750,000	tonnes/year	0.472	kg/t	181	tonnes/load	12.1	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 8	277,449	2,180,000	tonnes/year	0.636	kg/t	181	tonnes/load	16.3	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 1)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 3)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 5)	49,680	720,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 6)	49,059	711,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 8)	45,126	654,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Unloading ROM to hopper (all pits)	501,628	14,540,000	tonnes/year	0.069	kg/t	5.9	moisture content in %									50	% Control
CHPP - Rehandle ROM at hopper / ROM pad	257,438	3,731,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Screening	15,994	14,540,000	tonnes/year	0.0011	kg/Mg												
CHPP - Crushing	8,724	14,540,000	tonnes/year	0.0006	kg/Mg												
CHPP - Sized Coal Unloading to Exisiting Product/Raw Stockpiles	5,440	14,540,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to CHPP	3,087	8,250,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to trains (BYPASS)	2,350	6,280,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Unloading from CHPP to Product Stockpile	3,578	8,250,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Loading from Product Stockpile to trains	3,578	8,250,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Dozer on ROM Stockpiles	21,665	3,500	hours/year	6.2	kg/h	1.5	silt content in %	5.6	moisture content in %								
CHPP - Dozer on Product/Raw Stockpiles	57,046	8,000	hours/year	7.1	kg/h	1.4	silt content in %	4.7	moisture content in %								
CHPP - Loading coarse rejects	414	2,735,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Loading fine rejects from belt filter press	13	495,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
CHPP - Hauling coarse and fine rejects	240,055	3,230,000	tonnes/year	0.372	kg/t	181	tonnes/load	9.5	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CHPP - Unloading coarse rejects	414	2,735,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Unloading fine rejects	13	495,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
WE - Overburden emplacement areas (Pit 1)	51,956	19	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 2)	68,418	25	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 3)	107,770	39	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 4)	16,525	6	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 5)	73,536	27	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 6)	77,265	28	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 7)	150,966	55	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 8)	115,925	42	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Open pit (Pit 1)	11,394	3	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 2)	15,156	4	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 3)	30,299	9	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 4)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 5)	29,711	8	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 6)	29,852	9	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 7)	15,193	4	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 8)	54,206	15	ha	0.40	kg/ha/hour	8,760	hours										
WE - Initial rehab (Pit 1)	16,808	48	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 2)	19,663	56	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 3)	23,253	66	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 4)	16,239	46	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 5)	35,887	102	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 6)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 7)	12,496	36	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 8)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Topsoil stockpiles (Pit 1)	2,167	3	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 2)	3,439	5	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 3)	2,554	4	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 4)	4,723	7	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 5)	6,897	10	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 6)	4,178	6	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 7)	23,335	33	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 8)	4,285	6	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - ROM stockpiles	21,836	80	ha	272	kg/ha/year	1.5	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Satellite ROM stockpiles	8,434	33	ha	256	kg/ha/year	1.4	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Product stockpiles	2,220	10	ha	222	kg/ha/year	1.2	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
Grading roads	25,879	168,192	km	0.62	kg/VKT	8	speed of graders in km/h									75	% Control
Total TSP emissions (kg/yr)	**6,494,003**																

Table C-4: Emissions inventory - Year 2024

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Stripping Topsoil (Pit 1) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper removing topsoil	121	4,177	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper removing topsoil	1,257	43,343	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper removing topsoil	2,340	80,688	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper removing topsoil	1,966	67,786	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 1) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 2) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 3) - Scraper (travel mode)	155	4,177	tonnes/year	0.186	kg/t	34	tonnes/load	1.9	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 4) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 5) - Scraper (travel mode)	2,698	43,343	tonnes/year	0.311	kg/t	34	tonnes/load	3.1	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 6) - Scraper (travel mode)	4,462	80,688	tonnes/year	0.276	kg/t	34	tonnes/load	2.8	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 7) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 8) - Scraper (travel mode)	2,614	67,786	tonnes/year	0.193	kg/t	34	tonnes/load	2.0	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 1) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper unloading topsoil	84	4,177	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper unloading topsoil	867	43,343	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper unloading topsoil	1,614	80,688	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper unloading topsoil	1,356	67,786	tonnes/year	0.020	kg/t												
OB - Dozers on topsoil (Pit 1)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 2)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 3)	323	112	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 4)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 5)	3,353	1,162	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 6)	6,242	2,164	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 7)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 8)	5,244	1,818	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Drilling (Pit 1)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 2)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 3)	737	12,499	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 4)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 5)	1,085	18,382	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 6)	3,172	53,756	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 7)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 8)	2,428	41,148	holes/year	0.59	kg/hole											90	% Control
OB - Blasting (Pit 1)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 2)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 3)	12,533	12	blasts/year	1003	kg/blast	27,491	Area of blast in square metres										
OB - Blasting (Pit 4)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 5)	19,525	18	blasts/year	1062	kg/blast	28,566	Area of blast in square metres										
OB - Blasting (Pit 6)	65,773	58	blasts/year	1142	kg/blast	29,979	Area of blast in square metres										
OB - Blasting (Pit 7)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 8)	47,367	44	blasts/year	1074	kg/blast	28,785	Area of blast in square metres										
OB - Excavator loading OB to haul truck (Pit 1)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 3)	11,895	8,254,930	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 5)	13,441	9,328,224	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 6)	40,741	28,274,222	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 8)	31,734	22,023,101	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 1)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Rehandle OB (Pit 3)	841	583,541	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 5)	2,545	1,766,155	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 6)	3,665	2,543,357	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 8)	4,036	2,801,174	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Hauling to dump from Pit 1	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 2	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 3	73,709	8,254,930	tonnes/year	0.045	kg/t	181	tonnes/load	1.1	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 4	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 5	53,004	9,328,224	tonnes/year	0.028	kg/t	181	tonnes/load	0.7	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 6	353,314	28,274,222	tonnes/year	0.062	kg/t	181	tonnes/load	1.6	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 7	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 8	271,935	22,023,101	tonnes/year	0.062	kg/t	181	tonnes/load	1.6	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Emplacing at dump (Pit 1)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 3)	11,895	8,254,930	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 5)	13,441	9,328,224	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 6)	40,741	28,274,222	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 8)	31,734	22,023,101	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Dozers on OB in pit (Pit 1)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 2)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 3)	63,426	5,370	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 4)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 5)	134,039	11,348	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 6)	296,294	25,085	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 7)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 8)	313,318	26,526	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 1)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 2)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 3)	16,483	2,391	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 4)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 5)	28,256	4,099	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 6)	104,586	15,170	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 7)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 8)	68,089	9,876	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Loading ROM coal to haul truck (Pit 1)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 3)	57,960	840,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 5)	99,360	1,440,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 6)	367,769	5,330,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 8)	239,429	3,470,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Hauling ROM to hopper from Pit 1	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 2	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 3	87,238	840,000	tonnes/year	0.519	kg/t	181	tonnes/load	13.3	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 4	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 5	150,855	1,440,000	tonnes/year	0.524	kg/t	181	tonnes/load	13.4	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 6	391,856	5,330,000	tonnes/year	0.368	kg/t	181	tonnes/load	9.4	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 7	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 8	491,678	3,470,000	tonnes/year	0.708	kg/t	181	tonnes/load	18.2	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 1)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 3)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 5)	29,808	432,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 6)	110,331	1,599,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 8)	71,829	1,041,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Unloading ROM to hopper (all pits)	382,259	11,080,000	tonnes/year	0.069	kg/t	5.9	moisture content in %									50	% Control
CHPP - Rehandle ROM at hopper / ROM pad	93,840	1,360,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Screening	12,188	11,080,000	tonnes/year	0.0011	kg/Mg												
CHPP - Crushing	6,648	11,080,000	tonnes/year	0.0006	kg/Mg												
CHPP - Sized Coal Unloading to Exisiting Product/Raw Stockpiles	4,145	11,080,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to CHPP	2,619	7,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to trains (BYPASS)	1,526	4,080,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Unloading from CHPP to Product Stockpile	3,036	7,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Loading from Product Stockpile to trains	3,036	7,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Dozer on ROM Stockpiles	21,665	3,500	hours/year	6.2	kg/h	1.5	silt content in %	5.6	moisture content in %								
CHPP - Dozer on Product/Raw Stockpiles	57,046	8,000	hours/year	7.1	kg/h	1.4	silt content in %	4.7	moisture content in %								
CHPP - Loading coarse rejects	312	2,060,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10.0	moisture content in %								
CHPP - Loading fine rejects from belt filter press	11	420,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
CHPP - Hauling coarse and fine rejects	249,663	2,480,000	tonnes/year	0.503	kg/t	181	tonnes/load	12.9	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CHPP - Unloading coarse rejects	312	2,060,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Unloading fine rejects	11	420,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
WE - Overburden emplacement areas (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 3)	39,988	14	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 4)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 5)	35,115	13	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 6)	173,883	63	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 7)	37,168	13	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 8)	93,707	34	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Open pit (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 3)	4,948	1	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 4)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 5)	13,306	4	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 6)	76,785	22	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 7)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 8)	38,976	11	ha	0.40	kg/ha/hour	8,760	hours										
WE - Initial rehab (Pit 1)	3,313	9	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 2)	55,598	159	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 3)	30,003	86	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 4)	9,781	28	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 5)	27,500	78	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 6)	12,023	34	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 7)	18,943	54	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 8)	22,055	63	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Topsoil stockpiles (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 2)	2,648	4	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 3)	2,405	3	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 4)	2,050	3	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 5)	6,631	9	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 6)	6,347	9	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 7)	7,804	11	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 8)	7,318	10	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - ROM stockpiles	17,046	63	ha	272	kg/ha/year	1.5	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Satellite ROM stockpiles	8,121	32	ha	256	kg/ha/year	1.4	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Product stockpiles	2,220	10	ha	222	kg/ha/year	1.2	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
Grading roads	25,879	168,192	km	0.62	kg/VKT	8	speed of graders in km/h									75	% Control
Total TSP emissions (kg/yr)	**5,888,466**																

Table C-5: Emissions inventory - Year 2028

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Stripping Topsoil (Pit 1) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper removing topsoil	757	26,117	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper removing topsoil	3,714	128,073	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper removing topsoil	1,141	39,353	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 1) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 2) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 3) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 4) - Scraper (travel mode)	695	26,117	tonnes/year	0.133	kg/t	34	tonnes/load	1.3	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 5) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 6) - Scraper (travel mode)	6,590	128,073	tonnes/year	0.257	kg/t	34	tonnes/load	2.6	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 7) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 8) - Scraper (travel mode)	1,457	39,353	tonnes/year	0.185	kg/t	34	tonnes/load	1.9	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 1) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper unloading topsoil	522	26,117	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper unloading topsoil	2,561	128,073	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper unloading topsoil	787	39,353	tonnes/year	0.020	kg/t												
OB - Dozers on topsoil (Pit 1)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 2)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 3)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 4)	2,046	709	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 5)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 6)	10,033	3,478	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 7)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 8)	3,083	1,069	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Drilling (Pit 1)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 2)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 3)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 4)	957	16,224	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 5)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 6)	2,732	46,298	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 7)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 8)	1,416	23,997	holes/year	0.59	kg/hole											90	% Control
OB - Blasting (Pit 1)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 2)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 3)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 4)	21,221	16	blasts/year	1308	kg/blast	32,819	Area of blast in square metres										
OB - Blasting (Pit 5)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 6)	53,041	50	blasts/year	1069	kg/blast	28,693	Area of blast in square metres										
OB - Blasting (Pit 7)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 8)	27,382	26	blasts/year	1065	kg/blast	28,616	Area of blast in square metres										
OB - Excavator loading OB to haul truck (Pit 1)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 3)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 4)	5,949	4,128,754	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 5)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 6)	39,879	27,675,701	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 8)	18,083	12,549,446	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 1)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Rehandle OB (Pit 3)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 4)	1,400	971,726	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 5)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 6)	2,863	1,987,234	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 8)	3,199	2,219,861	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Hauling to dump from Pit 1	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 2	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 3	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 4	16,048	4,128,754	tonnes/year	0.019	kg/t	181	tonnes/load	0.5	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 5	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 6	485,595	27,675,701	tonnes/year	0.088	kg/t	181	tonnes/load	2.2	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 7	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 8	119,303	12,549,446	tonnes/year	0.048	kg/t	181	tonnes/load	1.2	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Emplacing at dump (Pit 1)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 3)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 4)	5,949	4,128,754	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 5)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 6)	39,879	27,675,701	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 8)	18,083	12,549,446	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Dozers on OB in pit (Pit 1)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 2)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 3)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 4)	99,365	8,412	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 5)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 6)	269,216	22,792	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 7)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 8)	190,165	16,100	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 1)	-	-	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 2)	-	-	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 3)	-	-	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 4)	45,579	6,611	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 5)	-	-	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 6)	89,108	12,925	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 7)	-	-	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 8)	46,491	6,744	hours/year	6.9	kg/h	1.74	silt content in %	5.9	moisture content in %								
CL - Loading ROM coal to haul truck (Pit 1)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 3)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 4)	137,999	2,000,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 5)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 6)	269,789	3,910,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 8)	140,759	2,040,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Hauling ROM to hopper from Pit 1	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 2	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 3	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 4	139,649	2,000,000	tonnes/year	0.349	kg/t	181	tonnes/load	8.9	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 5	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 6	360,275	3,910,000	tonnes/year	0.461	kg/t	181	tonnes/load	11.8	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 7	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 8	294,788	2,040,000	tonnes/year	0.723	kg/t	181	tonnes/load	18.5	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 1)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 3)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 5)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 6)	80,937	1,173,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 8)	42,228	612,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Unloading ROM to hopper (all pits)	274,274	7,950,000	tonnes/year	0.069	kg/t	5.9	moisture content in %									50	% Control
CHPP - Rehandle ROM at hopper / ROM pad	96,255	1,395,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Screening	8,745	7,950,000	tonnes/year	0.0011	kg/Mg												
CHPP - Crushing	4,770	7,950,000	tonnes/year	0.0006	kg/Mg												
CHPP - Sized Coal Unloading to Exisiting Product/Raw Stockpiles	2,974	7,950,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to CHPP	1,871	5,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to trains (BYPASS)	1,104	2,950,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Unloading from CHPP to Product Stockpile	2,169	5,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Loading from Product Stockpile to trains	2,169	5,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Dozer on ROM Stockpiles	21,665	3,500	hours/year	6.2	kg/h	1.5	silt content in %	5.6	moisture content in %								
CHPP - Dozer on Product/Raw Stockpiles	57,046	8,000	hours/year	7.1	kg/h	1.4	silt content in %	4.7	moisture content in %								
CHPP - Loading coarse rejects	247	1,630,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Loading fine rejects from belt filter press	8	300,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
CHPP - Hauling coarse and fine rejects	158,623	1,930,000	tonnes/year	0.411	kg/t	181	tonnes/load	10.5	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CHPP - Unloading coarse rejects	247	1,630,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Unloading fine rejects	8	300,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
WE - Overburden emplacement areas (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 3)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 4)	6,569	2	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 5)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 6)	121,620	44	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 7)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 8)	26,410	10	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Open pit (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 3)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 4)	7,391	2	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 5)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 6)	83,316	24	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 7)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 8)	27,442	8	ha	0.40	kg/ha/hour	8,760	hours										
WE - Initial rehab (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 2)	26,567	76	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 3)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 4)	5,163	15	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 5)	4,453	13	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 6)	31,966	91	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 7)	6,059	17	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 8)	33,723	96	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Topsoil stockpiles (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 3)	2,904	4	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 4)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 5)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 6)	7,679	11	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 7)	4,987	7	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 8)	2,060	3	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - ROM stockpiles	17,046	63	ha	272	kg/ha/year	1.5	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Satellite ROM stockpiles	7,431	29	ha	256	kg/ha/year	1.4	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Product stockpiles	2,220	10	ha	222	kg/ha/year	1.2	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
Grading roads	19,409	126,144	km	0.62	kg/VKT	8	speed of graders in km/h									75	% Control
Total TSP emissions (kg/yr)	**4,179,306**																

Table C-6: Emissions inventory - Year 2031

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Stripping Topsoil (Pit 1) - Scraper removing topsoil	859	29,617	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper removing topsoil	1,259	43,398	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper removing topsoil	-	-	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper removing topsoil	247	8,519	tonnes/year	0.03	kg/t												
OB - Stripping Topsoil (Pit 1) - Scraper (travel mode)	1,382	29,617	tonnes/year	0.233	kg/t	34	tonnes/load	2.4	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 2) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 3) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 4) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 5) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 6) - Scraper (travel mode)	1,407	43,398	tonnes/year	0.162	kg/t	34	tonnes/load	1.6	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 7) - Scraper (travel mode)	-	-	tonnes/year	0.000	kg/t	34	tonnes/load	-	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 8) - Scraper (travel mode)	245	8,519	tonnes/year	0.144	kg/t	34	tonnes/load	1.5	km/return trip	3.4	kg/VKT	7.1	% silt content	71	Ave GMV (tonnes)	80	% Control
OB - Stripping Topsoil (Pit 1) - Scraper unloading topsoil	592	29,617	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 2) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 3) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 4) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 5) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 6) - Scraper unloading topsoil	868	43,398	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 7) - Scraper unloading topsoil	-	-	tonnes/year	0.020	kg/t												
OB - Stripping Topsoil (Pit 8) - Scraper unloading topsoil	170	8,519	tonnes/year	0.020	kg/t												
OB - Dozers on topsoil (Pit 1)	5,508	1,909	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 2)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 3)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 4)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 5)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 6)	8,070	2,798	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 7)	-	-	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Dozers on topsoil (Pit 8)	1,584	549	hours/year	2.9	kg/h	7.5	silt content in %	5.9	moisture content in %								
OB - Drilling (Pit 1)	347	5,876	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 2)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 3)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 4)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 5)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 6)	2,340	39,669	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 7)	-	-	holes/year	0.59	kg/hole											90	% Control
OB - Drilling (Pit 8)	916	15,524	holes/year	0.59	kg/hole											90	% Control
OB - Blasting (Pit 1)	7,010	6	blasts/year	1193	kg/blast	30,863	Area of blast in square metres										
OB - Blasting (Pit 2)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 3)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 4)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 5)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 6)	45,749	43	blasts/year	1076	kg/blast	28,820	Area of blast in square metres										
OB - Blasting (Pit 7)	-	-	blasts/year	0	kg/blast	-	Area of blast in square metres										
OB - Blasting (Pit 8)	17,694	17	blasts/year	1064	kg/blast	28,595	Area of blast in square metres										
OB - Excavator loading OB to haul truck (Pit 1)	5,242	3,637,884	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 3)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 5)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 6)	35,904	24,917,532	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Excavator loading OB to haul truck (Pit 8)	11,601	8,050,930	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 1)	353	244,800	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
OB - Rehandle OB (Pit 3)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 5)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 6)	2,213	1,535,952	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Rehandle OB (Pit 8)	2,874	1,994,851	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Hauling to dump from Pit 1	38,446	3,637,884	tonnes/year	0.053	kg/t	181	tonnes/load	1.4	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 2	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 3	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 4	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 5	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 6	361,352	24,917,532	tonnes/year	0.073	kg/t	181	tonnes/load	1.9	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 7	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Hauling to dump from Pit 8	59,068	8,050,930	tonnes/year	0.037	kg/t	181	tonnes/load	0.9	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
OB - Emplacing at dump (Pit 1)	5,242	3,637,884	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 2)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 3)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 4)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 5)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 6)	35,904	24,917,532	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 7)	-	-	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Emplacing at dump (Pit 8)	11,601	8,050,930	tonnes/year	0.001	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	2	moisture content in %								
OB - Dozers on OB in pit (Pit 1)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 2)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 3)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 4)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 5)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 6)	298,888	25,304	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 7)	-	-	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
OB - Dozers on OB in pit (Pit 8)	197,775	16,744	hours/year	11.8	kg/h	7.48	silt content in %	2	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 1)	16,166	2,345	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 2)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 3)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 4)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 5)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 6)	93,158	13,513	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 7)	-	-	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Dozers ripping/pushing/clean-up (Pit 8)	35,619	5,167	hours/year	6.9	kg/h	1.7	silt content in %	5.9	moisture content in %								
CL - Loading ROM coal to haul truck (Pit 1)	40,710	590,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 3)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 5)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 6)	234,599	3,400,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Loading ROM coal to haul truck (Pit 8)	89,700	1,300,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Hauling ROM to hopper from Pit 1	19,249	590,000	tonnes/year	0.163	kg/t	181	tonnes/load	4.2	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 2	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 3	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 4	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 5	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 6	333,221	3,400,000	tonnes/year	0.490	kg/t	181	tonnes/load	12.6	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 7	-	-	tonnes/year	0.000	kg/t	181	tonnes/load	-	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Hauling ROM to hopper from Pit 8	161,697	1,300,000	tonnes/year	0.622	kg/t	181	tonnes/load	15.9	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 1)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 2)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 3)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										

ACTIVITY	TSP emission (kg/y)	Intensity	Units	Emission Factor	Units	Variable 1	Units	Variable 2	Units	Variable 3	Units	Variable 4	Units	Variable 5	Units	Variable 6	Units
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 4)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 5)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 6)	70,380	1,020,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 7)	-	-	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CL - Unload/Load ROM coal at Satellite ROM PAD (Pit 8)	26,910	390,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Unloading ROM to hopper (all pits)	182,504	5,290,000	tonnes/year	0.069	kg/t	5.9	moisture content in %									50	% Control
CHPP - Rehandle ROM at hopper / ROM pad	48,714	706,000	tonnes/year	0.069	kg/t	5.9	moisture content in %										
CHPP - Screening	5,819	5,290,000	tonnes/year	0.0011	kg/Mg												
CHPP - Crushing	3,174	5,290,000	tonnes/year	0.0006	kg/Mg												
CHPP - Sized Coal Unloading to Exisiting Product/Raw Stockpiles	1,979	5,290,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to CHPP	1,122	3,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Loading from RAW to trains (BYPASS)	857	2,290,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	5.2	moisture content in %								
CHPP - Unloading from CHPP to Product Stockpile	1,301	3,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Loading from Product Stockpile to trains	1,301	3,000,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	4.7	moisture content in %								
CHPP - Dozer on ROM Stockpiles	21,665	3,500	hours/year	6.2	kg/h	1.5	silt content in %	5.6	moisture content in %								
CHPP - Dozer on Product/Raw Stockpiles	57,046	8,000	hours/year	7.1	kg/h	1.4	silt content in %	4.7	moisture content in %								
CHPP - Loading coarse rejects	183	1,210,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Loading fine rejects from belt filter press	5	180,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
CHPP - Hauling coarse and fine rejects	128,193	1,390,000	tonnes/year	0.461	kg/t	181	tonnes/load	11.8	km/return trip	7.1	kg/VKT	7.1	% silt content	234	Ave GMV (tonnes)	80	% Control
CHPP - Unloading coarse rejects	183	1,210,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	10	moisture content in %								
CHPP - Unloading fine rejects	5	180,000	tonnes/year	0.000	kg/t	1.217	average of (wind speed/2.2)^1.3 in m/s	35	moisture content in %								
WE - Overburden emplacement areas (Pit 1)	66,120	24	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 3)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 4)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 5)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 6)	46,669	17	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 7)	-	-	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Overburden emplacement areas (Pit 8)	36,586	13	ha	0.40	kg/ha/hour	8,760	hours									21	% Control
WE - Open pit (Pit 1)	12,797	4	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 3)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 4)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 5)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 6)	27,859	8	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 7)	-	-	ha	0.40	kg/ha/hour	8,760	hours										
WE - Open pit (Pit 8)	10,147	3	ha	0.40	kg/ha/hour	8,760	hours										
WE - Initial rehab (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 2)	31,785	91	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 3)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 4)	6,131	17	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 5)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 6)	34,770	99	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 7)	-	-	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Initial rehab (Pit 8)	20,569	59	ha	0.40	kg/ha/hour	8,760	hours									90	% Control
WE - Topsoil stockpiles (Pit 1)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 2)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 3)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 4)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 5)	-	-	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 6)	6,482	9	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 7)	4,999	7	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - Topsoil stockpiles (Pit 8)	2,086	3	ha	0.40	kg/ha/hour	8,760	hours									80	% Control
WE - ROM stockpiles	13,374	49	ha	272	kg/ha/year	1.5	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Satellite ROM stockpiles	7,431	29	ha	256	kg/ha/year	1.4	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
WE - Product stockpiles	2,220	10	ha	222	kg/ha/year	1.2	silt content in %	63	No. days when RF>0.25mm	4.6	% time WS>5.4m/s						
Grading roads	12,940	84,096	km	0.62	kg/VKT	8	speed of graders in km/h									75	% Control
Total TSP emissions (kg/yr)	**3,081,133**																

Appendix D

Further Detail Regarding Coal Dust Emissions from Train Wagons

Coal dust emissions from train wagons have the potential to originate from the coal surface of loaded wagons, leakage from wagon doors, re-suspension and wind erosion of coal spilled in the rail corridor, residual coal in unloaded wagons, and parasitic load on sills, shear plates and bogies of wagons.

The surface of loaded wagons provides a significant exposed area, which is subject to wind erosion and air movement during transport. The amount of dust potentially generated during transport is related to the inherent dustiness of the coal material and the interactions of the air with the exposed coal surface (**Connell Hatch, 2008**).

Coal dust can potentially leak from the bottom doors of train wagons and fall into the ballast of the train line. This occurs when the doors of the wagon are not completely sealed. The amount of material released will depend on the material properties of the coal, and the vibrational forces experienced by the coal in the wagons that potentially break down the coal material. Dust impacts from this source are considered to be low as the ballast would provide a sufficient shielding effect to prevent particle lift-off (**Connell Hatch, 2008**).

During the loading process and in transit, there is potential for coal material to be spilled into the train corridor and cause parasitic loading on the sills, shear plates and bogies. These sources of emissions are easily prevented by careful loading of the material and profiling the shape of the load (**Connell Hatch, 2008**).

Residual coal remaining in an unloaded wagon can dry and become airborne during travel back to the site. This source is dependent on meteorological conditions, the train travel speed and the extent of any turbulent air generated in the unloaded wagon space causing the residual coal particles to become airborne.

Site-specific coal testing

Site-specific coal testing of product and bypass coal from the Wilpinjong Coal Mine (WCM) was conducted by Introspec Consulting to determine the propensity for dust lift-off during train transport. The testing forms part of a larger study for dust lift-off during train transport of numerous New South Wales (NSW) coal samples.

The coal samples are tested in a wind tunnel under various conditions. Samples are prepared with a moisture content typically between 7 percent (%) and 11.2%. Each sample is pre-dried in an oven for a period of two hours at 35 degrees Celsius, to simulate summer drying conditions, before being placed in the wind tunnel for the six hour simulated travel time. The oven exposure also takes account of time the train may spend at mine load-out following loading of the first wagon. Dust lift-off tests have been conducted with sample trays located in the wind tunnel at an incline of 35 degrees, as the typical rail transport angle of repose.

Test were performed for “severe” rail transport under adverse wind conditions (i.e. being exposed to a wind speed of 20 metres per second [m/s]) and for a “normal maximum” NSW rail transport adverse wind conditions (i.e. being exposed to a wind speed of 10m/s).

The tests also simulated four different options of surface treatment under each condition; including no surface treatment, application of 1 litre per square metre (l/m^2) of water, application of $3l/m^2$ of water and a typical cost effective surface veneer chemical (2% in water) at $1l/m^2$.

Initially the tests were completed on one sample of product washed coal (PWC1) and one sample of product bypass coal (PBC1). An additional round of testing was completed on a second washed coal sample (PWC2), as the results of the first round of testing were not considered representative of the site’s coal.

A summary of the dust lift-off test results for the WCM product washed and bypass coal is presented in **Table D-1**.

Table D-1: Dust lift-off results for product and bypass coal

Coal type	Moisture Content (%)	Treatment	Dilution	Wind speed (m/s)	Duration	Dust lift-off (g/m²)
PWC1	7	-	-	20	6	6600
PWC1	7	H_2O	1l/m^2	20	6	2400
PWC1	7	H_2O	3l/m^2	20	6	2000
PWC1	7	Vital Chemical	2% @ 1l/m^2	20	6	0
PBC1	7	-	-	20	6	834
PBC1	7	H_2O	1l/m^2	20	6	537
PBC1	7	H_2O	3l/m^2	20	6	393
PBC1	7	Vital Chemical	2% @ 1l/m^2	20	6	0
PWC1	7	-	-	10	6	1000
PWC1	7	H_2O	1l/m^2	10	6	285
PWC1	7	H_2O	3l/m^2	10	6	285
PWC1	7	Vital Chemical	2% @ 1l/m^2	10	6	0
PBC1	7	-	-	10	6	180
PBC1	7	H_2O	1l/m^2	10	6	186
PBC1	7	H_2O	3l/m^2	10	6	96
PBC1	7	Vital Chemical	2% @ 1l/m^2	10	6	0
PWC2	7	-	-	20	6	2745
PWC2	7	H_2O	1l/m^2	20	6	375
PWC2	11.2	-	-	20	6	288
PWC2	11.2	H_2O	1l/m^2	20	6	81

PWC = product washed coal, PBC = product bypass coal, H_2O = water, g/m^2 = grams per square metre.

Based on these results, it is observed that there is much lower dust lift-off under "normal maximum" conditions compared to the "severe" conditions.

With the application of 3l/m² of water, more fine particles appear to float to the surface, which are producing misleading results for this test. It is likely that this is due to the testing trays being very shallow. This may also be why the result for "normal maximum" conditions for PBC1 with the application of 1l/m² was greater than for no treatment.

The product washed coal also appears to emit more dust than the product bypass coal. An analysis of the particle size distribution of the sampled coal types indicates a much higher proportion of fine particles for the product washed coal compared to the product bypass coal, which is most likely causing this result.

The coal moisture content of the samples varies with particle size as fine particles have a collectively larger surface area than the same mass of larger particles. If a coal sample with a top size of 6.3mm is removed from a coal sample with a top size of 50 millimetres (mm), the moisture content will be higher than the moisture content of the full sample with a top size of 50mm.

The additional testing of the second product washed coal sample (PWC2), with an increased coal sample moisture content based on the adjustment for product washed coal type, which is considered to be representative of the sample, indicated much lower dust lift-off.

Train wagon emission estimation

Dust emissions for the transportation of coal from the Project via the Sandy Hollow-Gulgong railway have been estimated based on the dust lift-off testing for the moisture adjusted product washed coal samples with no treatment under "severe" conditions (i.e. 288g/m²). As the sampling tended to indicate that the propensity for dust lift-off from the product bypass coal would be lower, it is assumed all coal leaving WCM is product washed coal and as such the dust emission estimate would likely be conservative.

The Project estimates an average of six train movements per day, with each train assumed to have a capacity of approximately 8,600 tonnes of coal, 96 wagons per train and an average exposed surface area of 30 square metres for each wagon. The Project would result in an estimated emission rate of approximately 1,664 grams (g) of Total Suspended Particulates (TSP) per kilometre (km) per train or 17.3g of TSP per km per wagon. With an estimated journey length of 500km, a conservative estimate of the total TSP emissions would be 832kg.

A full-scale study by **Ferreira et al. (2003)** that conducted measurements of coal dust emissions from coal wagons over a 350km journey with an average train speed of between 55 and 60 kilometres per hour found the total emission for an uncovered rail wagon was determined to be 9.6g of TSP per km which is much lower than the estimated emission rate for the WCM product washed coal.

Assessment of coal dust emissions from train wagons

Modelling approach

The transportation model CAL3QHCR, developed by the US EPA, has been used to assess potential impacts from this source. CAL3QHCR was designed for use in dispersion modelling of road transport emissions, however given the similar linear nature of the potential train wagon emissions compared to road transport emissions it is considered to be a suitable model for this situation also.

To consider the range of varying land use between the Project site and the Port of Newcastle, and the varying orientation of the rail line relative to the prevailing winds, the dispersion model has been set up to assess theoretical sections of the rail line over a distance of 3km with two varying alignments (north/south and east/west) and two different land use categories. Dust level calculation points were applied at a 10m spacing, perpendicular from the centre of the rail line source alignment out to a distance of 200m either side of the rail line.

Modelling predictions

Figure D-1 presents the model predictions for each scenario. The modelling predictions indicate that at distances of 50 metres (m) and beyond from the rail track centreline, the maximum 24 hour average TSP concentration for all assessed scenarios would be approximately 4.2 micrograms per cubic metre ($\mu g/m^3$) for the Project. By assuming that 40% of the TSP is PM_{10} (**NSW Minerals Council, 2000**), the predicted maximum 24 hour average PM_{10} concentration would be approximately 1.7$\mu g/m^3$.

For urban areas, the predicted maximum 24 hour average TSP level at 50m from the rail line centre would be approximately 2.6$\mu g/m^3$.

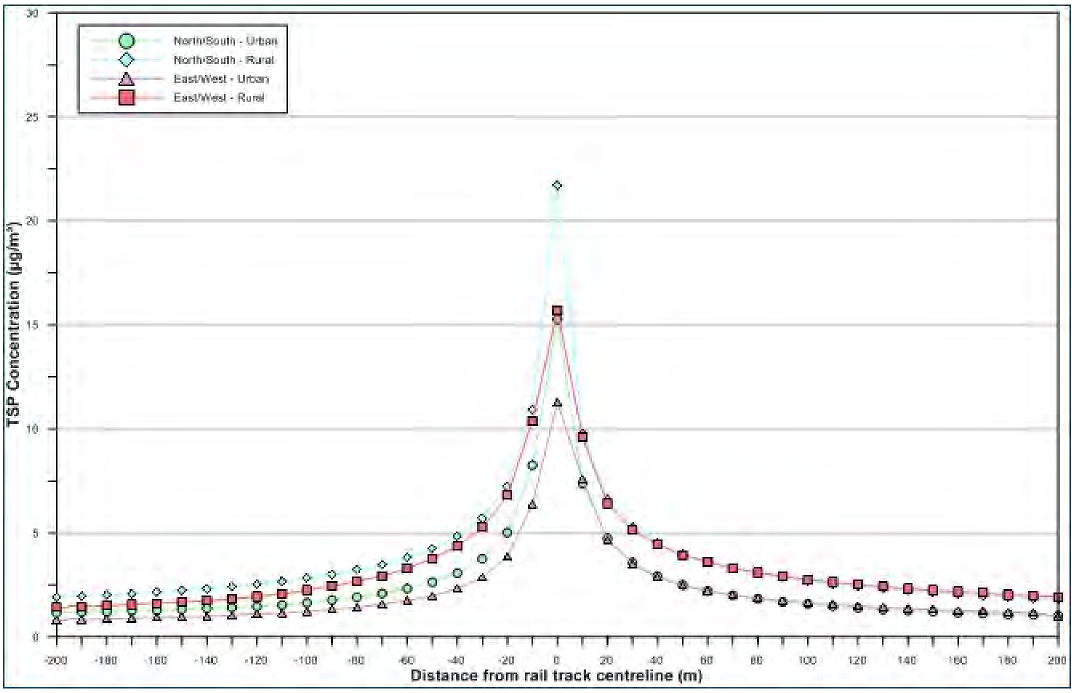


Figure D-1: Maximum 24 hour average TSP concentration based on train wagon emissions from the Project

Summary

The detailed study of dust emissions generated during rail transport of coal conducted by Katestone Environmental for Queensland Rail Limited (**Connell Hatch, 2008**) found that, based on monitoring and modelling of the emissions and impacts of coal train wagons, there appears to be a minimal risk of adverse impact on human health. The study found that concentrations of coal dust at the edge of the rail corridor are below levels known to cause adverse impacts on amenity.

A more recent review of a study conducted for the Australian Rail Track Corporation Ltd (**Ryan and Wand, 2014**) for trains travelling on the Hunter Valley network found no significant difference in the particulate matter measurements for passing freight and coal trains (loaded and unloaded). The study determined that the significant increase of smaller particles ($PM_{2.5}$ and PM_1) measured suggest that the elevated particle matter levels were mostly due to diesel particles associated with locomotive emissions as opposed to coal dust which tends to be in the larger particle range.

This assessment is consistent with the findings of these studies in indicating that the potential for any adverse air quality impacts associated with coal dust generated during rail transport would be low and would not make any appreciable difference to air quality.

Appendix E

Further Detail Regarding 24 hour PM_{10} Analysis

The analysis below provides a cumulative 24 hour $PM_{2.5}$ impact assessment per the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (**New South Wales Department of Environment and Conservation, 2005**) refer to the worked example on Pages 52 to 54.

The background level is the total ambient measured level at the nearest monitoring station to the receptor assessed in each table including the potential current contribution due to the Wilpinjong Coal Mine (WCM).

The predicted increment is the change in level predicted to occur at the receptor due to the WCM incorporating the Project.

The total is the sum of the background level and the predicted level. The totals may have minor discrepancies due to rounding.

Each table assesses one receptor. The left hand half of the table examines the cumulative impact during the periods of highest background levels and the right hand half of the table examines the cumulative impact during the periods of highest contribution from the WCM incorporating the Project.

The orange shading represents days where the existing background level is already above the criteria. This can be the result of bushfire events, dust storms and localised sources, and is included for completeness.

The green shading represents days ranked per the highest background level but below the criteria.

The blue shading represents days ranked per the highest predicted increment level but below the criteria.

The values in **bold red** are above the criteria.

Tables E-1 to **E-20** show the predicted maximum cumulative levels at each receptors surrounding the Project.

Table E-1: Receptor 101 – Year 2018

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.2**	-	-	-	-
26/09/2013	**71.6**	2.4	**74.0**	-	-	-	-
30/04/2013	**68.3**	0.0	**68.3**	-	-	-	-
29/04/2013	**57.6**	5.6	**63.2**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.0	**50.1**	-	-	-	-
6/09/2013	44.8	5.9	**50.8**	20/05/2013	15.8	21.0	36.8
7/11/2013	43.0	0.4	43.4	16/06/2013	6.6	19.7	26.4
1/10/2013	42.6	2.8	45.4	7/07/2013	15.6	18.2	33.8
28/10/2013	42.4	0.0	42.4	19/08/2013	11.2	16.1	27.2
5/09/2013	42.4	4.4	46.8	18/06/2013	8.6	14.6	23.3
21/12/2013	41.6	0.9	42.4	6/07/2013	17.2	14.6	31.7
7/09/2013	41.4	3.9	45.4	21/05/2013	21.4	14.5	35.9
3/11/2013	41.2	5.9	47.1	5/08/2013	25.7	14.0	39.7
14/03/2013	40.0	0.3	40.3	14/05/2013	9.4	14.0	23.4
14/12/2013	39.5	0.9	40.4	15/06/2013	6.7	14.0	20.7
2/09/2013	39.5	0.1	39.5	17/06/2013	7.6	12.7	20.3
6/11/2013	39.0	0.0	39.0	20/09/2013	22.6	12.6	35.2
4/11/2013	38.9	0.0	38.9	19/05/2013	9.5	12.4	22.0
1/05/2013	38.4	4.3	42.7	15/05/2013	10.3	12.1	22.5
25/04/2013	38.0	4.1	42.2	18/05/2013	10.4	11.6	22.0

Table E-2: Receptor 102 – Year 2018

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.3**	-	-	-	-
26/09/2013	**71.6**	6.7	**78.3**	-	-	-	-
30/04/2013	**68.3**	0.1	**68.4**	-	-	-	-
29/04/2013	**57.6**	7.7	**65.3**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.1	**50.1**	-	-	-	-
6/09/2013	44.8	7.1	**51.9**	16/06/2013	6.6	26.2	32.8
7/11/2013	43.0	0.6	43.6	20/05/2013	15.8	26.1	42.0
1/10/2013	42.6	3.3	45.9	7/07/2013	15.6	25.6	41.1
28/10/2013	42.4	0.0	42.5	19/08/2013	11.2	18.8	30.0
5/09/2013	42.4	6.0	48.4	18/06/2013	8.6	17.8	26.4
21/12/2013	41.6	1.5	43.1	6/07/2013	17.2	17.8	35.0
7/09/2013	41.4	6.2	47.7	21/05/2013	21.4	16.4	37.8
3/11/2013	41.2	7.9	49.1	14/05/2013	9.4	16.3	25.7

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
14/03/2013	40.0	0.7	40.7	5/08/2013	25.7	16.1	41.8
14/12/2013	39.5	1.7	41.2	19/05/2013	9.5	15.3	24.9
2/09/2013	39.5	0.2	39.6	20/09/2013	22.6	14.3	37.0
6/11/2013	39.0	0.0	39.0	20/08/2013	7.2	13.9	21.1
4/11/2013	38.9	0.0	38.9	3/06/2013	8.9	13.8	22.7
1/05/2013	38.4	5.7	44.1	11/09/2013	22.6	13.5	36.2
25/04/2013	38.0	8.5	46.6	15/05/2013	10.3	13.4	23.8
10/05/2013	37.9	1.2	39.1	24/08/2013	8.0	13.2	21.2
28/04/2013	37.9	5.1	42.9	2/08/2013	14.4	13.1	27.5
9/09/2013	37.2	0.1	37.3	15/06/2013	6.7	12.9	19.7
12/01/2013	36.6	2.3	39.0	8/08/2013	2.1	12.9	15.0

Table E-3: Receptor 901 – Year 2018

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	4/08/2013	11.3	21.0	32.2
4/11/2013	39.8	0.0	39.8	21/07/2013	8.7	17.9	26.6
21/12/2013	39.2	3.0	42.2	18/09/2013	11.2	15.8	27.0
13/10/2013	38.9	4.2	43.1	17/05/2013	9.1	15.5	24.6
6/11/2013	38.8	0.0	38.8	17/09/2013	5.6	15.4	21.0
28/10/2013	37.8	3.5	41.3	16/05/2013	7.9	15.0	22.9
18/01/2013	37.1	9.6	46.7	19/07/2013	6.5	14.1	20.5
20/10/2013	36.7	4.4	41.0	19/09/2013	12.7	13.7	26.4
7/11/2013	34.4	7.4	41.8	13/06/2013	5.4	13.3	18.7
14/03/2013	33.8	0.1	33.9	4/07/2013	12.1	12.4	24.5

Table E-4: Receptor 952 – Year 2018

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	21/07/2013	8.7	19.5	28.2
4/11/2013	39.8	0.0	39.8	4/08/2013	11.3	19.3	30.6
21/12/2013	39.2	3.3	42.5	17/05/2013	9.1	17.3	26.4
13/10/2013	38.9	4.7	43.6	16/05/2013	7.9	16.7	24.6
6/11/2013	38.8	0.0	38.8	18/09/2013	11.2	16.2	27.4
28/10/2013	37.8	3.4	41.2	17/09/2013	5.6	16.2	21.8
18/01/2013	37.1	10.4	47.5	19/07/2013	6.5	15.9	22.4

20/10/2013	36.7	4.7	41.4	13/06/2013	5.4	14.9	20.3
7/11/2013	34.4	8.4	42.8	18/05/2013	8.7	14.6	23.3
14/03/2013	33.8	0.1	33.9	19/09/2013	12.7	13.8	26.5

Table E-5: Receptor 101 – Year 2020

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.2**	-	-	-	-
26/09/2013	**71.6**	3.2	**74.8**	-	-	-	-
30/04/2013	**68.3**	0.0	**68.3**	-	-	-	-
29/04/2013	**57.6**	3.0	**60.7**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.0	**50.1**	-	-	-	-
6/09/2013	44.8	3.2	48.1	20/05/2013	15.8	15.6	31.4
7/11/2013	43.0	0.3	43.3	7/07/2013	15.6	14.2	29.8
1/10/2013	42.6	2.3	45.0	19/08/2013	11.2	13.8	25.0
28/10/2013	42.4	0.0	42.4	16/06/2013	6.6	12.4	19.1
5/09/2013	42.4	2.7	45.2	21/05/2013	21.4	10.7	32.1
21/12/2013	41.6	0.6	42.1	15/06/2013	6.7	10.3	17.0
7/09/2013	41.4	3.3	44.7	18/06/2013	8.6	10.3	18.9
3/11/2013	41.2	3.8	45.0	20/08/2013	7.2	9.1	16.3
14/03/2013	40.0	0.2	40.2	5/08/2013	25.7	9.0	34.8
14/12/2013	39.5	0.7	40.2	20/09/2013	22.6	9.0	31.6

Table E-6: Receptor 102 – Year 2020

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.3**	-	-	-	-
26/09/2013	**71.6**	8.1	**79.7**	-	-	-	-
30/04/2013	**68.3**	0.1	**68.4**	-	-	-	-
29/04/2013	**57.6**	4.2	**61.8**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.0	**50.1**	-	-	-	-
6/09/2013	44.8	3.7	48.5	7/07/2013	15.6	19.0	34.6
7/11/2013	43.0	0.4	43.5	20/05/2013	15.8	18.4	34.2
1/10/2013	42.6	3.6	46.2	19/08/2013	11.2	15.1	26.2
28/10/2013	42.4	0.0	42.4	16/06/2013	6.6	14.9	21.5
5/09/2013	42.4	3.8	46.2	11/09/2013	22.6	14.2	36.8
21/12/2013	41.6	1.0	42.5	3/06/2013	8.9	13.5	22.4
7/09/2013	41.4	5.2	46.6	8/08/2013	2.1	12.2	14.3
3/11/2013	41.2	5.3	46.5	18/06/2013	8.6	11.2	19.9

14/03/2013	40.0	0.6	40.5	21/05/2013	21.4	10.6	32.0
14/12/2013	39.5	1.3	40.8	24/10/2013	10.9	10.6	21.5
2/09/2013	39.5	0.2	39.6	19/05/2013	9.5	10.3	19.9

Table E-7: Receptor 901 – Year 2020

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	19/07/2013	6.5	18.0	24.5
4/11/2013	39.8	0.0	39.8	8/11/2013	26.1	14.0	40.1
21/12/2013	39.2	2.0	41.2	3/08/2013	8.6	12.8	21.4
13/10/2013	38.9	3.3	42.2	17/05/2013	9.1	12.2	21.3
6/11/2013	38.8	0.0	38.8	21/10/2013	18.0	12.0	30.0
28/10/2013	37.8	3.0	40.8	18/05/2013	8.7	11.5	20.2
18/01/2013	37.1	6.0	43.1	4/08/2013	11.3	11.4	22.7
20/10/2013	36.7	3.8	40.4	22/03/2013	14.2	11.4	25.6
7/11/2013	34.4	8.5	42.8	15/07/2013	9.8	11.2	21.0
14/03/2013	33.8	0.2	34.0	21/07/2013	8.7	10.8	19.6

Table E-8: Receptor 952 – Year 2020

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	19/07/2013	6.5	22.0	28.4
4/11/2013	39.8	0.0	39.8	8/11/2013	26.1	16.6	42.7
21/12/2013	39.2	2.1	41.3	22/03/2013	14.2	14.6	28.9
13/10/2013	38.9	4.0	42.9	3/08/2013	8.6	14.1	22.7
6/11/2013	38.8	0.0	38.8	21/10/2013	18.0	13.4	31.4
28/10/2013	37.8	2.6	40.4	18/05/2013	8.7	13.0	21.7
18/01/2013	37.1	5.9	43.0	15/07/2013	9.8	12.6	22.4
20/10/2013	36.7	4.2	40.9	17/05/2013	9.1	11.9	21.0
7/11/2013	34.4	10.0	44.4	30/09/2013	19.8	11.8	31.6
14/03/2013	33.8	0.2	34.0	21/07/2013	8.7	10.9	19.6

Table E-9: Receptor 101 – Year 2024

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.2**	-	-	-	-
26/09/2013	**71.6**	3.2	**74.8**	-	-	-	-
30/04/2013	**68.3**	0.0	**68.3**	-	-	-	-
29/04/2013	**57.6**	1.8	**59.4**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.0	**50.1**	-	-	-	-
6/09/2013	44.8	1.8	46.6	7/07/2013	15.6	13.5	29.1
7/11/2013	43.0	0.3	43.3	20/05/2013	15.8	12.4	28.2
1/10/2013	42.6	2.9	45.6	17/06/2013	7.6	11.8	19.3
28/10/2013	42.4	0.0	42.4	5/08/2013	25.7	11.0	36.7
5/09/2013	42.4	2.1	44.5	15/06/2013	6.7	10.8	17.6
21/12/2013	41.6	0.3	41.9	19/05/2013	9.5	10.3	19.8
7/09/2013	41.4	2.9	44.3	16/06/2013	6.6	10.1	16.8
3/11/2013	41.2	3.0	44.1	9/08/2013	11.1	10.0	21.1
14/03/2013	40.0	0.3	40.3	14/05/2013	9.4	9.8	19.3
14/12/2013	39.5	0.4	39.9	21/05/2013	21.4	9.7	31.1

Table E-10: Receptor 102 – Year 2024

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.2**	-	-	-	-
26/09/2013	**71.6**	8.5	**80.1**	-	-	-	-
30/04/2013	**68.3**	0.0	**68.3**	-	-	-	-
29/04/2013	**57.6**	2.9	**60.5**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.0	**50.1**	-	-	-	-
6/09/2013	44.8	2.1	46.9	7/07/2013	15.6	17.5	33.1
7/11/2013	43.0	0.5	43.6	11/09/2013	22.6	16.5	39.1
1/10/2013	42.6	5.2	47.8	3/06/2013	8.9	15.4	24.3
28/10/2013	42.4	0.0	42.4	20/05/2013	15.8	14.4	30.3
5/09/2013	42.4	2.9	45.3	8/08/2013	2.1	13.5	15.6
21/12/2013	41.6	0.4	42.0	19/05/2013	9.5	12.9	22.5
7/09/2013	41.4	3.5	44.9	18/04/2013	14.0	12.9	26.9
3/11/2013	41.2	3.9	45.1	5/08/2013	25.7	12.6	38.3
14/03/2013	40.0	0.9	40.8	16/06/2013	6.6	12.2	18.9
14/12/2013	39.5	1.0	40.5	17/06/2013	7.6	12.2	19.8
2/09/2013	39.5	0.2	39.6	26/04/2013	26.2	12.0	38.2
6/11/2013	39.0	0.0	39.0	21/09/2013	19.2	12.0	31.2
4/11/2013	38.9	0.0	38.9	9/08/2013	11.1	11.4	22.5

1/05/2013	38.4	2.1	40.5	23/04/2013	25.0	11.4	36.4

Table E-11: Receptor 901 – Year 2024

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	19/07/2013	6.5	37.9	44.3
4/11/2013	39.8	0.0	39.8	22/03/2013	14.2	36.1	50.4
21/12/2013	39.2	1.3	40.5	1/06/2013	9.0	28.8	37.8
13/10/2013	38.9	12.6	**51.5**	6/06/2013	13.1	21.5	34.6
6/11/2013	38.8	0.0	38.8	15/07/2013	9.8	20.8	30.6
28/10/2013	37.8	1.9	39.7	12/06/2013	5.9	20.5	26.4
18/01/2013	37.1	3.5	40.6	4/12/2013	18.5	18.3	36.8
20/10/2013	36.7	5.2	41.8	30/09/2013	19.8	17.6	37.4
7/11/2013	34.4	5.4	39.8	9/09/2013	21.0	17.0	38.0
14/03/2013	33.8	0.2	34.0	8/11/2013	26.1	17.0	43.1
30/04/2013	31.9	0.0	31.9	28/11/2013	19.0	16.4	35.3

Table E-12: Receptor 952 – Year 2024

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**				
19/10/2013	49.6	0.0	49.6	19/07/2013	6.5	38.0	44.5
4/11/2013	39.8	0.0	39.8	22/03/2013	14.2	36.6	**50.9**
21/12/2013	39.2	1.8	41.0	1/06/2013	9.0	33.8	42.8
13/10/2013	38.9	16.4	**55.3**	6/06/2013	13.1	25.9	39.1
6/11/2013	38.8	0.0	38.8	12/06/2013	5.9	22.8	28.8
28/10/2013	37.8	2.1	39.9	15/07/2013	9.8	22.6	32.4
18/01/2013	37.1	5.5	42.7	4/12/2013	18.5	19.7	38.1
20/10/2013	36.7	5.3	41.9	30/09/2013	19.8	19.0	38.8
7/11/2013	34.4	6.1	40.5	8/01/2013	ND	18.1	18.1
14/03/2013	33.8	0.2	34.0	20/12/2013	25.6	17.0	42.7
30/04/2013	31.9	0.0	31.9	8/11/2013	26.1	17.0	43.1

ND – No data

Table E-13: Receptor 101 – Year 2028

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.2**	-	-	-	-
26/09/2013	**71.6**	1.6	**73.3**	-	-	-	-
30/04/2013	**68.3**	0.0	**68.3**	-	-	-	-
29/04/2013	**57.6**	0.4	**58.0**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.0	**50.1**	-	-	-	-
6/09/2013	44.8	1.0	45.8	5/08/2013	25.7	12.1	37.8
7/11/2013	43.0	0.1	43.2	17/06/2013	7.6	11.9	19.4
1/10/2013	42.6	3.0	45.7	7/07/2013	15.6	9.1	24.7
28/10/2013	42.4	0.0	42.4	5/07/2013	13.4	8.5	21.9
5/09/2013	42.4	1.9	44.3	3/08/2013	13.2	8.5	21.7
21/12/2013	41.6	0.2	41.7	19/05/2013	9.5	7.9	17.4
7/09/2013	41.4	1.0	42.4	23/08/2013	11.3	7.8	19.1
3/11/2013	41.2	1.2	42.4	19/09/2013	28.4	7.6	36.0
14/03/2013	40.0	0.1	40.0	21/05/2013	21.4	7.5	28.9
14/12/2013	39.5	0.0	39.5	14/05/2013	9.4	7.5	16.9

Table E-14: Receptor 102 – Year 2028

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	**88.2**	0.0	**88.2**	-	-	-	-
26/09/2013	**71.6**	1.8	**73.4**	-	-	-	-
30/04/2013	**68.3**	0.1	**68.3**	-	-	-	-
29/04/2013	**57.6**	0.7	**58.3**	-	-	-	-
19/10/2013	**55.7**	0.0	**55.7**	-	-	-	-
18/10/2013	**54.2**	0.0	**54.2**	-	-	-	-
20/10/2013	**50.1**	0.0	**50.1**	-	-	-	-
6/09/2013	44.8	1.3	46.1	5/08/2013	25.7	14.7	40.5
7/11/2013	43.0	0.2	43.3	17/06/2013	7.6	13.8	21.4
1/10/2013	42.6	5.2	47.9	7/07/2013	15.6	11.5	27.1
28/10/2013	42.4	0.0	42.5	3/08/2013	13.2	11.3	24.5
5/09/2013	42.4	2.6	45.0	5/07/2013	13.4	10.0	23.4
21/12/2013	41.6	0.2	41.8	19/09/2013	28.4	9.5	37.9
7/09/2013	41.4	0.7	42.2	23/08/2013	11.3	9.5	20.7
3/11/2013	41.2	1.7	42.9	21/05/2013	21.4	9.3	30.7
14/03/2013	40.0	0.2	40.1	3/06/2013	8.9	8.6	17.5
14/12/2013	39.5	0.1	39.6	14/05/2013	9.4	8.4	17.9

Table E-15: Receptor 901 – Year 2028

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	13/06/2013	5.4	10.6	15.9
4/11/2013	39.8	0.0	39.8	4/08/2013	11.3	10.4	21.6
21/12/2013	39.2	1.9	41.1	21/07/2013	8.7	9.7	18.5
13/10/2013	38.9	2.0	40.9	14/06/2013	3.6	9.2	12.8
6/11/2013	38.8	0.0	38.8	17/09/2013	5.6	7.8	13.4
28/10/2013	37.8	0.4	38.2	19/09/2013	12.7	7.2	19.8
18/01/2013	37.1	5.6	42.8	17/05/2013	9.1	7.1	16.2
20/10/2013	36.7	0.9	37.5	7/08/2013	11.5	6.7	18.3
7/11/2013	34.4	1.4	35.8	23/12/2013	25.8	6.3	32.1
14/03/2013	33.8	0.0	33.8	18/09/2013	11.2	5.7	16.9

Table E-16: Receptor 952 – Year 2028

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	21/07/2013	8.7	10.1	18.9
4/11/2013	39.8	0.0	39.8	4/08/2013	11.3	10.0	21.3
21/12/2013	39.2	2.0	41.2	14/06/2013	3.6	9.4	13.1
13/10/2013	38.9	1.8	40.7	17/05/2013	9.1	9.3	18.3
6/11/2013	38.8	0.0	38.8	19/09/2013	12.7	8.6	21.2
28/10/2013	37.8	0.2	38.0	7/08/2013	11.5	8.1	19.7
18/01/2013	37.1	6.4	43.6	5/07/2013	9.4	7.3	16.7
20/10/2013	36.7	0.7	37.4	3/08/2013	8.6	7.2	15.8
7/11/2013	34.4	1.2	35.6	19/05/2013	7.7	7.0	14.7
14/03/2013	33.8	0.0	33.8	23/12/2013	25.8	6.9	32.7

Table E-17: Receptor 101 – Year 2031

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	88.2	0.0	88.2	-	-	-	-
26/09/2013	71.6	0.5	72.2	-	-	-	-
30/04/2013	68.3	0.0	68.3	-	-	-	-
29/04/2013	57.6	-0.6	57.1	-	-	-	-
19/10/2013	55.7	0.0	55.7	-	-	-	-
18/10/2013	54.2	0.0	54.2	-	-	-	-
20/10/2013	50.1	0.0	50.1	-	-	-	-
6/09/2013	44.8	0.3	45.1	5/08/2013	25.7	10.2	35.9
7/11/2013	43.0	0.1	43.1	17/06/2013	7.6	9.8	17.3
1/10/2013	42.6	3.2	45.9	5/07/2013	13.4	7.3	20.6
28/10/2013	42.4	0.0	42.4	3/08/2013	13.2	6.7	19.9
5/09/2013	42.4	1.5	44.0	7/07/2013	15.6	6.5	22.1
21/12/2013	41.6	0.0	41.6	23/08/2013	11.3	6.4	17.6
7/09/2013	41.4	0.3	41.8	19/09/2013	28.4	6.1	34.5
3/11/2013	41.2	-0.1	41.0	21/05/2013	21.4	5.5	26.9
14/03/2013	40.0	0.0	39.9	19/05/2013	9.5	5.4	15.0
14/12/2013	39.5	-0.3	39.3	14/05/2013	9.4	5.0	14.5

Table E-18: Receptor 102 – Year 2031

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM4)	Predicted increment due to Project	Total cumulative 24-hr average level
9/05/2013	88.2	0.0	88.2	-	-	-	-
26/09/2013	71.6	0.4	72.0	-	-	-	-
30/04/2013	68.3	0.0	68.3	-	-	-	-
29/04/2013	57.6	-0.5	57.1	-	-	-	-
19/10/2013	55.7	0.0	55.7	-	-	-	-
18/10/2013	54.2	0.0	54.2	-	-	-	-
20/10/2013	50.1	0.0	50.1	-	-	-	-
6/09/2013	44.8	0.6	45.4	5/08/2013	25.7	12.4	38.1
7/11/2013	43.0	0.1	43.2	17/06/2013	7.6	11.6	19.2
1/10/2013	42.6	4.8	47.4	3/08/2013	13.2	9.6	22.8
28/10/2013	42.4	0.0	42.5	5/07/2013	13.4	8.7	22.1
5/09/2013	42.4	2.2	44.7	19/09/2013	28.4	8.2	36.7
21/12/2013	41.6	0.0	41.6	7/07/2013	15.6	8.1	23.7
7/09/2013	41.4	0.0	41.4	23/08/2013	11.3	7.8	19.1
3/11/2013	41.2	-0.2	40.9	21/05/2013	21.4	6.7	28.0
14/03/2013	40.0	0.0	39.9	9/08/2013	11.1	6.4	17.5
14/12/2013	39.5	-0.4	39.1	12/08/2013	9.5	6.4	15.9

Table E-19: Receptor 901 – Year 2031

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	4/08/2013	11.3	8.6	19.9
4/11/2013	39.8	0.0	39.8	18/05/2013	8.7	6.7	15.4
21/12/2013	39.2	0.4	39.6	19/09/2013	12.7	6.3	18.9
13/10/2013	38.9	-1.6	37.3	19/05/2013	7.7	5.7	13.4
6/11/2013	38.8	0.0	38.8	7/08/2013	11.5	5.7	17.2
28/10/2013	37.8	-0.6	37.2	3/08/2013	8.6	5.5	14.1
18/01/2013	37.1	1.5	38.6	21/08/2013	9.5	5.4	14.9
20/10/2013	36.7	-0.7	35.9	6/07/2013	9.8	5.0	14.8
7/11/2013	34.4	-0.7	33.7	20/09/2013	17.4	4.9	22.2
14/03/2013	33.8	-0.1	33.7	18/06/2013	7.7	4.7	12.3

Table E-20: Receptor 952 – Year 2031

Ranked by Highest to Lowest Background Concentrations				Ranked by Highest to Lowest Predicted Incremental Concentration			
Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level	Date	Measured background level (TEOM3)	Predicted increment due to Project	Total cumulative 24-hr average level
18/10/2013	**51.7**	0.0	**51.7**	-	-	-	-
19/10/2013	49.6	0.0	49.6	4/08/2013	11.3	7.7	19.0
4/11/2013	39.8	0.0	39.8	18/05/2013	8.7	6.4	15.1
21/12/2013	39.2	0.1	39.3	19/05/2013	7.7	5.5	13.2
13/10/2013	38.9	-1.7	37.1	21/08/2013	9.5	5.3	14.8
6/11/2013	38.8	0.0	38.8	7/08/2013	11.5	5.2	16.8
28/10/2013	37.8	-0.7	37.1	18/06/2013	7.7	4.8	12.5
18/01/2013	37.1	0.8	37.9	19/09/2013	12.7	4.8	17.4
20/10/2013	36.7	-0.7	36.0	3/08/2013	8.6	4.8	13.3
7/11/2013	34.4	-0.8	33.6	20/09/2013	17.4	4.6	22.0
14/03/2013	33.8	-0.1	33.7	6/07/2013	9.8	4.5	14.3

Appendix F

Modelling Predictions and Isopleth Diagrams

Table F-1: Modelling predictions for Year 2018 – Privately-owned receptors

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
69	0.8	0.0	6.1	0.3	0.5	0.01	3.3	12.6	21.3	1.1
101	3.5	0.4	27.1	2.8	4.5	0.07	3.7	15.6	26.1	1.2
102	4.7	0.5	36.8	3.9	6.3	0.09	3.9	16.9	28.2	1.2
103	2.3	0.2	18.7	1.8	3.0	0.04	3.6	14.8	24.7	1.2
104	2.4	0.3	18.7	2.0	3.3	0.04	3.6	15.0	25.1	1.2
105_R1	2.6	0.2	20.7	1.8	2.8	0.04	3.6	14.7	24.6	1.2
105_R2	2.6	0.2	20.7	1.8	3.0	0.04	3.6	14.8	24.8	1.2
107	2.5	0.2	20.0	1.6	2.6	0.03	3.6	14.5	24.3	1.2
109	1.5	0.2	11.0	1.3	2.1	0.03	3.5	14.2	23.7	1.1
113	1.2	0.1	8.6	0.9	1.5	0.02	3.4	13.6	22.8	1.1
115	1.1	0.1	7.8	0.9	1.4	0.02	3.4	13.5	22.7	1.1
150A	3.1	0.3	24.4	2.6	4.1	0.12	3.6	15.0	25.2	1.2
153	0.9	0.1	7.0	0.4	0.6	0.01	3.3	12.5	21.1	1.1
160A	1.5	0.2	11.7	1.4	2.2	0.04	3.5	13.7	23.1	1.2
160B	1.5	0.2	11.9	1.4	2.3	0.04	3.5	13.7	23.1	1.2
167	2.0	0.2	15.8	1.3	2.0	0.03	3.5	14.1	23.5	1.1
170	1.1	0.1	9.0	0.5	0.9	0.02	3.3	12.9	21.8	1.1
175	0.5	0.0	3.6	0.3	0.4	0.01	3.3	12.4	21.0	1.1
176_R1	1.5	0.2	10.9	1.3	2.1	0.03	3.5	14.1	23.7	1.1
176_R2	1.5	0.2	10.7	1.3	2.0	0.03	3.5	14.1	23.6	1.1
200	1.1	0.1	7.5	0.8	1.3	0.02	3.4	13.4	22.5	1.1
201	1.1	0.1	8.4	0.8	1.2	0.01	3.4	13.4	22.5	1.1
215	0.4	0.0	2.4	0.1	0.2	0.00	3.2	12.2	20.6	1.1
216	0.4	0.0	2.5	0.1	0.2	0.00	3.2	12.2	20.6	1.1
217	0.4	0.0	2.5	0.1	0.2	0.00	3.2	12.2	20.6	1.1
220	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.1	20.5	1.1
221	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.1	20.6	1.1
225	0.4	0.0	2.7	0.1	0.2	0.00	3.2	12.2	20.7	1.1
226	0.4	0.0	2.5	0.1	0.2	0.00	3.2	12.2	20.6	1.1
227	0.4	0.0	2.6	0.1	0.2	0.00	3.2	12.2	20.6	1.1
227_C1	0.3	0.0	2.4	0.1	0.2	0.00	3.2	12.2	20.6	1.1
227_C2	0.3	0.0	2.6	0.1	0.2	0.00	3.2	12.2	20.6	1.1
229	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.1	20.5	1.1
248	0.4	0.0	2.8	0.1	0.2	0.00	3.2	12.2	20.6	1.1
250	0.4	0.0	3.5	0.2	0.2	0.00	3.2	12.2	20.7	1.1
251	0.5	0.0	3.6	0.2	0.2	0.00	3.2	12.2	20.7	1.1
255	0.5	0.0	3.7	0.2	0.3	0.00	3.2	12.2	20.7	1.1
900	3.6	0.4	28.3	3.2	5.1	0.16	3.7	15.7	26.3	1.3
901	3.5	0.5	27.9	3.9	6.3	0.19	3.8	16.4	27.5	1.3
903	3.5	0.4	27.3	3.0	4.8	0.15	3.7	15.5	25.9	1.3
908	3.5	0.4	27.0	3.0	4.8	0.15	3.7	15.5	26.0	1.3
914	3.4	0.4	26.3	2.9	4.7	0.14	3.7	15.4	25.8	1.3
921	3.4	0.4	26.8	3.1	5.1	0.15	3.7	15.7	26.2	1.3
933	3.4	0.4	26.3	3.2	5.2	0.16	3.7	15.7	26.3	1.3

Receptor ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
935	3.3	0.4	26.0	3.3	5.3	0.16	3.7	15.8	26.5	1.3
942	3.3	0.5	25.8	3.5	5.7	0.17	3.8	16.0	26.8	1.3
944	3.4	0.5	27.4	3.8	6.1	0.19	3.8	16.3	27.3	1.3
952	3.7	0.6	29.2	4.2	6.8	0.20	3.9	16.8	28.0	1.3

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-2: Modelling predictions for Year 2018 – Mine-owned receptors

Receptor ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_28C	6.5	1.2	48.2	9.2	15.0	0.36	4.5	22.0	36.5	1.5
1_45	21.9	7.0	**173.7**	54.5	93.0	1.21	**10.4**	**68.1**	**115.8**	2.4
1_49	3.0	0.2	21.9	1.7	2.7	0.06	3.5	14.3	23.8	1.2
1_83	6.9	1.3	**54.5**	9.7	16.1	0.29	4.6	22.5	37.6	1.4
1_100B	2.1	0.2	16.4	1.1	1.7	0.05	3.4	13.4	22.5	1.2
1_106	2.8	0.3	22.7	2.0	3.2	0.04	3.6	15.0	25.1	1.2
1_129	5.6	0.9	43.2	7.1	11.5	0.25	4.2	19.8	32.9	1.4
1_130	7.7	1.3	**60.2**	9.6	16.0	0.30	4.6	22.4	37.5	1.4
1_133	4.9	0.8	39.3	6.2	10.1	0.20	4.1	18.9	31.5	1.3
1_135	4.1	0.7	32.4	5.1	8.1	0.18	4.0	17.7	29.5	1.3
1_136	4.3	0.7	34.5	4.9	7.8	0.16	4.0	17.5	29.1	1.3
1_140	3.4	0.4	27.3	3.2	5.2	0.12	3.7	15.8	26.3	1.2
1_143	4.7	0.8	37.8	5.7	9.2	0.19	4.1	18.4	30.6	1.3
1_145	4.6	0.7	37.0	5.4	8.7	0.17	4.0	18.0	30.1	1.3
1_151	0.9	0.0	5.6	0.3	0.4	0.01	3.3	12.6	21.2	1.1
1_152	4.4	0.6	35.2	4.8	7.7	0.15	3.9	17.4	29.1	1.3
1_154	0.5	0.0	3.3	0.2	0.3	0.00	3.3	12.3	20.8	1.1
1_156	0.6	0.0	4.5	0.2	0.4	0.01	3.3	12.3	20.8	1.1
1_158	1.8	0.1	14.0	1.0	1.5	0.04	3.4	13.2	22.3	1.2
1_159	1.3	0.1	10.0	0.7	1.1	0.03	3.3	12.9	21.8	1.1
1_162	1.6	0.2	12.7	1.4	2.3	0.04	3.5	13.7	23.1	1.2
1_163	1.3	0.2	10.1	1.2	1.9	0.03	3.4	13.4	22.6	1.1
1_164	9.2	0.9	**71.5**	6.6	10.7	0.27	4.2	19.4	32.2	1.4
1_910	3.3	0.4	25.9	2.8	4.5	0.14	3.7	15.3	25.6	1.3
1_912	3.3	0.4	26.0	2.8	4.5	0.14	3.7	15.3	25.6	1.3
1_913	3.3	0.4	25.7	2.8	4.4	0.13	3.7	15.3	25.5	1.3
1_915	3.5	0.4	27.5	3.1	5.0	0.15	3.7	15.6	26.1	1.3
1_917	3.4	0.4	26.3	3.0	4.8	0.15	3.7	15.5	25.9	1.3
1_920	3.4	0.4	26.2	3.0	4.9	0.15	3.7	15.6	26.0	1.3
1_926	3.4	0.4	26.2	3.2	5.1	0.15	3.7	15.7	26.2	1.3
1_927	3.3	0.4	25.9	3.1	5.0	0.15	3.7	15.6	26.2	1.3

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_929	3.5	0.4	27.1	3.3	5.3	0.16	3.7	15.8	26.4	1.3
1_931	3.6	0.4	27.7	3.3	5.4	0.17	3.7	15.9	26.5	1.3
1_934	3.5	0.5	27.0	3.4	5.5	0.17	3.7	15.9	26.6	1.3
1_937	3.5	0.5	26.9	3.5	5.6	0.17	3.8	16.0	26.7	1.3
1_938	3.5	0.5	27.5	3.5	5.7	0.18	3.8	16.1	26.9	1.3
1_939	3.5	0.5	27.6	3.6	5.8	0.18	3.8	16.2	27.0	1.3
1_941	3.4	0.5	26.7	3.6	5.8	0.18	3.8	16.1	27.0	1.3
1_947B	3.5	0.5	27.7	3.8	6.2	0.19	3.8	16.4	27.4	1.3
1_953	3.7	0.6	29.2	4.3	7.0	0.21	3.9	16.9	28.3	1.3
1_956	3.7	0.6	29.8	4.7	7.7	0.22	3.9	17.4	29.0	1.3
1_W88A	1.0	0.1	6.4	0.4	0.5	0.01	3.3	12.7	21.3	1.1
1_W88B	1.1	0.1	6.9	0.4	0.6	0.01	3.3	12.7	21.4	1.1
1_WF	3.2	0.1	22.0	1.1	1.6	0.02	3.5	13.8	23.0	1.1
1_WK	1.5	0.1	10.0	0.6	0.8	0.01	3.4	13.0	21.8	1.1
1_WR	2.5	0.2	18.3	1.8	2.9	0.08	3.5	14.2	23.8	1.2
1_WT	2.3	0.2	18.0	1.3	2.0	0.06	3.4	13.6	22.9	1.2
32_12	3.2	0.4	23.3	2.8	4.2	0.05	7.9	**48.2**	79.2	2.0
32_13	3.3	0.4	24.1	2.9	4.4	0.05	7.6	**46.0**	75.4	2.0
32_14	4.3	0.4	32.8	3.3	5.0	0.06	5.8	**32.1**	52.5	1.6
32_29A	1.9	0.1	15.6	1.0	1.6	0.03	3.4	13.6	22.9	1.1
32_29B	1.5	0.1	12.5	0.7	1.2	0.02	3.4	13.2	22.2	1.1
32_32C	7.1	1.2	**54.1**	8.8	13.8	0.17	6.0	**33.6**	55.9	1.7
32_33A	2.3	0.3	18.6	2.5	3.9	0.12	3.9	17.3	28.8	1.3
32_33B_5	2.3	0.3	18.5	2.5	4.0	0.12	3.9	17.4	29.0	1.3
32_48A	0.8	0.0	5.9	0.3	0.5	0.01	3.3	12.6	21.2	1.1
32_48B	0.9	0.0	6.6	0.3	0.5	0.01	3.3	12.6	21.3	1.1
32_M02	1.0	0.1	8.3	0.5	0.8	0.02	3.3	12.9	21.7	1.1
32_M03	1.2	0.1	9.7	0.7	1.2	0.03	3.4	13.3	22.4	1.1

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-3: Modelling predictions for Year 2020 – Privately-owned receptors

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
69	0.6	0.0	5.1	0.3	0.5	0.01	3.3	12.6	21.2	1.1
101	2.5	0.3	19.8	2.2	3.6	0.06	3.6	15.0	25.1	1.2
102	3.2	0.4	25.4	3.1	5.1	0.07	3.7	16.0	26.9	1.2
103	2.1	0.2	16.6	1.5	2.4	0.03	3.5	14.3	24.0	1.2
104	2.2	0.2	17.5	1.6	2.6	0.04	3.6	14.5	24.3	1.2
105_R1	2.0	0.2	16.0	1.4	2.3	0.03	3.5	14.2	23.9	1.1
105_R2	2.0	0.2	16.4	1.4	2.4	0.03	3.5	14.3	24.0	1.2

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
107	1.7	0.2	13.4	1.3	2.0	0.03	3.5	14.1	23.6	1.1
109	1.2	0.1	8.1	1.0	1.7	0.02	3.5	13.8	23.2	1.1
113	0.9	0.1	6.5	0.8	1.2	0.02	3.4	13.3	22.4	1.1
115	0.8	0.1	5.9	0.7	1.1	0.01	3.4	13.3	22.3	1.1
150A	3.0	0.3	23.9	2.6	4.2	0.14	3.6	15.0	25.2	1.3
153	0.9	0.1	6.6	0.3	0.5	0.01	3.3	12.5	21.0	1.1
160A	1.2	0.2	9.7	1.1	1.8	0.03	3.4	13.4	22.7	1.1
160B	1.3	0.2	10.2	1.2	1.9	0.04	3.4	13.5	22.7	1.1
167	1.3	0.1	10.5	1.0	1.6	0.02	3.4	13.7	23.0	1.1
170	1.0	0.1	7.8	0.5	0.8	0.02	3.3	12.9	21.7	1.1
175	0.4	0.0	2.9	0.2	0.4	0.01	3.3	12.4	20.9	1.1
176_R1	1.1	0.1	8.0	1.0	1.7	0.02	3.5	13.8	23.1	1.1
176_R2	1.1	0.1	7.9	1.0	1.6	0.02	3.4	13.7	23.1	1.1
200	0.8	0.1	5.6	0.6	1.0	0.01	3.4	13.2	22.1	1.1
201	0.8	0.1	6.1	0.6	1.0	0.01	3.4	13.2	22.2	1.1
215	0.3	0.0	2.1	0.1	0.2	0.00	3.2	12.2	20.6	1.1
216	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.1	20.6	1.1
217	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.1	20.6	1.1
220	0.3	0.0	2.0	0.1	0.1	0.00	3.2	12.1	20.5	1.1
221	0.3	0.0	2.0	0.1	0.2	0.00	3.2	12.1	20.5	1.1
225	0.4	0.0	2.3	0.1	0.2	0.00	3.2	12.2	20.6	1.1
226	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.2	20.6	1.1
227	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.2	20.6	1.1
227_C1	0.3	0.0	2.1	0.1	0.2	0.00	3.2	12.1	20.5	1.1
227_C2	0.3	0.0	2.3	0.1	0.2	0.00	3.2	12.2	20.6	1.1
229	0.3	0.0	1.9	0.1	0.2	0.00	3.2	12.1	20.5	1.1
248	0.3	0.0	2.5	0.1	0.2	0.00	3.2	12.2	20.6	1.1
250	0.4	0.0	3.1	0.1	0.2	0.00	3.2	12.2	20.6	1.1
251	0.4	0.0	3.2	0.1	0.2	0.00	3.2	12.2	20.6	1.1
255	0.4	0.0	3.1	0.2	0.2	0.00	3.2	12.2	20.7	1.1
900	2.8	0.4	22.4	3.1	5.2	0.18	3.7	15.6	26.2	1.3
901	2.4	0.5	19.1	3.7	6.0	0.19	3.8	16.2	27.1	1.3
903	3.2	0.4	25.5	3.0	4.9	0.17	3.7	15.4	25.9	1.3
908	2.7	0.4	21.9	3.0	4.9	0.16	3.7	15.4	25.9	1.3
914	2.6	0.4	21.4	2.9	4.8	0.16	3.7	15.4	25.8	1.3
921	2.5	0.4	20.6	3.1	5.0	0.17	3.7	15.5	26.1	1.3
933	2.4	0.4	19.7	3.1	5.1	0.16	3.7	15.6	26.2	1.3
935	2.3	0.4	18.8	3.2	5.2	0.17	3.7	15.7	26.3	1.3
942	2.3	0.4	18.4	3.3	5.5	0.17	3.7	15.8	26.6	1.3
944	2.4	0.5	19.2	3.6	5.9	0.19	3.8	16.1	27.0	1.3
952	2.9	0.5	22.1	3.9	6.4	0.20	3.8	16.5	27.5	1.3

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-4: Modelling predictions for Year 2020 – Mine-owned receptors

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_28C	9.6	1.2	**75.2**	9.3	15.1	0.36	4.5	22.0	36.6	1.5
1_45	17.4	4.9	**129.5**	38.3	65.7	0.84	**8.3**	**51.7**	88.4	2.0
1_49	3.0	0.2	21.5	1.8	2.8	0.08	3.5	14.3	24.0	1.2
1_83	6.1	1.2	48.2	9.4	15.9	0.29	4.6	22.2	37.3	1.4
1_100B	2.5	0.1	20.0	1.0	1.7	0.05	3.4	13.3	22.4	1.2
1_106	2.0	0.2	16.5	1.6	2.5	0.03	3.5	14.5	24.3	1.2
1_129	6.9	0.9	**52.9**	6.8	11.1	0.25	4.2	19.5	32.4	1.4
1_130	7.3	1.2	**57.5**	9.4	15.8	0.31	4.6	22.1	37.2	1.4
1_133	4.9	0.8	39.4	5.8	9.6	0.20	4.1	18.5	30.9	1.3
1_135	3.7	0.6	29.1	4.6	7.5	0.17	3.9	17.2	28.7	1.3
1_136	4.0	0.6	32.0	4.4	7.1	0.16	3.9	17.0	28.4	1.3
1_140	2.6	0.4	20.4	2.9	4.7	0.11	3.7	15.4	25.8	1.2
1_143	4.6	0.7	37.1	5.3	8.6	0.18	4.0	17.9	29.9	1.3
1_145	4.5	0.7	35.9	4.9	8.0	0.16	4.0	17.5	29.3	1.3
1_151	0.7	0.0	5.1	0.3	0.4	0.01	3.3	12.5	21.1	1.1
1_152	4.2	0.6	33.5	4.3	7.0	0.15	3.9	16.9	28.3	1.3
1_154	0.5	0.0	3.0	0.2	0.3	0.00	3.3	12.3	20.7	1.1
1_156	0.6	0.0	4.2	0.2	0.3	0.01	3.3	12.3	20.8	1.1
1_158	1.7	0.1	13.4	0.9	1.4	0.05	3.4	13.1	22.1	1.2
1_159	1.5	0.1	11.8	0.7	1.1	0.03	3.3	12.9	21.7	1.1
1_162	1.4	0.2	11.0	1.2	1.9	0.04	3.4	13.5	22.7	1.1
1_163	1.1	0.1	9.0	1.0	1.6	0.03	3.4	13.2	22.3	1.1
1_164	9.6	1.0	**74.6**	7.8	13.1	0.40	4.3	20.5	34.5	1.5
1_910	3.0	0.4	24.2	2.8	4.6	0.16	3.7	15.3	25.6	1.3
1_912	2.9	0.4	23.1	2.8	4.6	0.15	3.7	15.3	25.6	1.3
1_913	3.0	0.4	23.7	2.8	4.6	0.15	3.6	15.2	25.6	1.3
1_915	2.7	0.4	21.8	3.1	5.0	0.17	3.7	15.5	26.1	1.3
1_917	2.6	0.4	20.9	3.0	4.8	0.16	3.7	15.4	25.9	1.3
1_920	2.5	0.4	20.5	3.0	4.9	0.16	3.7	15.5	25.9	1.3
1_926	2.4	0.4	19.8	3.1	5.0	0.16	3.7	15.5	26.1	1.3
1_927	2.4	0.4	19.7	3.0	5.0	0.16	3.7	15.5	26.0	1.3
1_929	2.5	0.4	20.2	3.2	5.2	0.17	3.7	15.7	26.3	1.3
1_931	2.5	0.4	20.5	3.2	5.3	0.18	3.7	15.7	26.4	1.3
1_934	2.4	0.4	19.3	3.3	5.4	0.18	3.7	15.8	26.5	1.3
1_937	2.4	0.4	18.9	3.3	5.5	0.18	3.7	15.8	26.5	1.3
1_938	2.4	0.5	19.4	3.4	5.6	0.19	3.7	15.9	26.7	1.3
1_939	2.5	0.5	19.6	3.5	5.7	0.19	3.7	16.0	26.8	1.3
1_941	2.4	0.5	19.2	3.4	5.6	0.18	3.7	15.9	26.7	1.3
1_947B	2.5	0.5	19.5	3.6	5.9	0.19	3.8	16.2	27.1	1.3
1_953	3.3	0.5	25.2	4.0	6.6	0.20	3.8	16.6	27.8	1.3
1_956	3.9	0.6	30.0	4.4	7.1	0.21	3.9	16.9	28.3	1.3
1_W88A	0.9	0.0	5.7	0.3	0.5	0.01	3.3	12.6	21.2	1.1
1_W88B	1.0	0.1	6.1	0.4	0.5	0.01	3.3	12.7	21.3	1.1
1_WF	3.2	0.1	21.8	1.1	1.6	0.03	3.5	13.7	23.0	1.1

Receptor ID	$PM_{2.5}$ ($\mu g/m^3$)		PM_{10} ($\mu g/m^3$)		TSP ($\mu g/m^3$)	DD ($g/m^2/mth$)	$PM_{2.5}$ ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	TSP ($\mu g/m^3$)	DD ($g/m^2/mth$)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_WK	1.3	0.1	8.8	0.5	0.8	0.01	3.3	12.9	21.7	1.1
1_WR	2.5	0.2	19.8	1.8	2.9	0.09	3.5	14.1	23.7	1.2
1_WT	2.6	0.2	20.5	1.2	2.0	0.06	3.4	13.5	22.8	1.2
32_12	3.0	0.4	22.9	2.6	3.9	0.05	7.8	**47.0**	77.1	1.9
32_13	3.1	0.4	23.8	2.7	4.0	0.05	7.5	**44.9**	73.5	1.9
32_14	3.9	0.4	29.7	3.1	4.7	0.06	5.7	**31.2**	51.0	1.6
32_29A	1.6	0.1	13.4	1.0	1.6	0.03	3.4	13.6	22.8	1.1
32_29B	1.4	0.1	11.7	0.7	1.1	0.02	3.4	13.1	22.1	1.1
32_32C	6.6	1.2	50.3	8.8	13.8	0.16	6.0	**33.3**	55.3	1.6
32_33A	2.1	0.3	17.2	2.4	3.8	0.12	3.9	17.1	28.5	1.3
32_33B_5	2.1	0.3	17.0	2.5	3.8	0.12	3.9	17.3	28.7	1.3
32_48A	0.7	0.0	5.3	0.3	0.4	0.01	3.3	12.5	21.1	1.1
32_48B	0.8	0.0	5.9	0.3	0.5	0.01	3.3	12.6	21.2	1.1
32_M02	0.8	0.1	6.9	0.5	0.8	0.02	3.3	12.8	21.6	1.1
32_M03	0.9	0.1	7.2	0.7	1.1	0.03	3.4	13.2	22.3	1.1

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-5: Modelling predictions for Year 2024 – Privately-owned receptors

Receptor ID	$PM_{2.5}$ ($\mu g/m^3$)		PM_{10} ($\mu g/m^3$)		TSP ($\mu g/m^3$)	DD ($g/m^2/mth$)	$PM_{2.5}$ ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	TSP ($\mu g/m^3$)	DD ($g/m^2/mth$)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
69	0.7	0.0	4.8	0.3	0.5	0.01	3.3	12.6	21.2	1.1
101	2.1	0.3	16.5	2.0	3.4	0.05	3.6	14.9	25.1	1.2
102	2.7	0.4	21.6	3.0	5.1	0.07	3.7	16.0	27.1	1.2
103	1.3	0.2	10.0	1.4	2.3	0.03	3.5	14.2	23.9	1.1
104	1.4	0.2	10.6	1.5	2.5	0.03	3.5	14.4	24.3	1.2
105_R1	1.2	0.2	10.0	1.3	2.1	0.03	3.5	14.1	23.7	1.1
105_R2	1.3	0.2	10.2	1.3	2.2	0.03	3.5	14.2	23.9	1.1
107	1.1	0.2	8.9	1.2	1.9	0.03	3.5	13.9	23.4	1.1
109	1.1	0.1	7.6	1.0	1.6	0.02	3.4	13.7	23.0	1.1
113	0.8	0.1	5.9	0.7	1.2	0.02	3.4	13.2	22.3	1.1
115	0.7	0.1	5.3	0.7	1.1	0.01	3.4	13.2	22.2	1.1
150A	3.2	0.3	25.3	2.1	3.4	0.09	3.6	14.6	24.4	1.2
153	0.7	0.0	5.1	0.3	0.5	0.01	3.3	12.4	21.0	1.1
160A	1.1	0.1	8.3	1.0	1.7	0.03	3.4	13.4	22.6	1.1
160B	1.1	0.1	8.8	1.0	1.7	0.03	3.4	13.4	22.6	1.1
167	0.9	0.1	7.0	0.9	1.5	0.02	3.4	13.6	22.8	1.1
170	0.7	0.1	5.4	0.5	0.8	0.02	3.4	13.1	22.0	1.1
175	0.3	0.0	2.4	0.2	0.3	0.01	3.3	12.4	21.0	1.1
176_R1	1.0	0.1	7.5	1.0	1.6	0.02	3.4	13.7	23.0	1.1
176_R2	1.0	0.1	7.4	0.9	1.5	0.02	3.4	13.6	22.9	1.1

Receptor ID	$PM_{2.5}$ (µg/m^3)		PM_{10} (µg/m^3)		TSP (µg/m^3)	DD (g/m^2/mth)	$PM_{2.5}$ (µg/m^3)	PM_{10} (µg/m^3)	TSP (µg/m^3)	DD (g/m^2/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
200	0.7	0.1	5.0	0.6	1.0	0.01	3.4	13.1	22.0	1.1
201	0.6	0.1	5.0	0.6	1.0	0.01	3.4	13.1	22.1	1.1
215	0.3	0.0	1.9	0.1	0.2	0.00	3.2	12.2	20.6	1.1
216	0.3	0.0	2.0	0.1	0.2	0.00	3.2	12.1	20.5	1.1
217	0.3	0.0	2.1	0.1	0.2	0.00	3.2	12.1	20.5	1.1
220	0.3	0.0	2.1	0.1	0.1	0.00	3.2	12.1	20.5	1.1
221	0.3	0.0	2.1	0.1	0.1	0.00	3.2	12.1	20.5	1.1
225	0.4	0.0	2.6	0.1	0.2	0.00	3.2	12.2	20.6	1.1
226	0.4	0.0	2.3	0.1	0.2	0.00	3.2	12.1	20.6	1.1
227	0.4	0.0	2.4	0.1	0.2	0.00	3.2	12.2	20.6	1.1
227_C1	0.3	0.0	2.0	0.1	0.2	0.00	3.2	12.1	20.5	1.1
227_C2	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.1	20.6	1.1
229	0.3	0.0	1.7	0.1	0.1	0.00	3.2	12.1	20.5	1.1
248	0.3	0.0	1.8	0.1	0.2	0.00	3.2	12.2	20.6	1.1
250	0.3	0.0	2.1	0.1	0.2	0.00	3.2	12.2	20.6	1.1
251	0.3	0.0	2.2	0.1	0.2	0.00	3.2	12.2	20.6	1.1
255	0.3	0.0	2.5	0.1	0.2	0.00	3.2	12.2	20.7	1.1
900	4.0	0.3	30.8	2.6	4.2	0.11	3.6	15.1	25.3	1.2
901	4.9	0.5	38.1	3.5	5.7	0.16	3.8	16.1	26.9	1.3
903	3.3	0.3	25.9	2.3	3.7	0.10	3.6	14.8	24.8	1.2
908	3.7	0.3	29.2	2.5	4.0	0.11	3.6	15.0	25.1	1.2
914	3.7	0.3	29.0	2.4	3.9	0.10	3.6	14.9	25.0	1.2
921	4.0	0.3	31.5	2.6	4.3	0.12	3.6	15.2	25.4	1.2
933	4.1	0.4	32.1	2.7	4.4	0.12	3.6	15.3	25.6	1.2
935	4.2	0.4	32.9	2.8	4.6	0.13	3.7	15.4	25.8	1.3
942	4.3	0.4	33.9	3.1	5.0	0.14	3.7	15.6	26.2	1.3
944	4.8	0.4	37.6	3.4	5.5	0.16	3.7	15.9	26.7	1.3
952	4.9	0.5	38.2	3.8	6.3	0.18	3.8	16.4	27.6	1.3

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-6: Modelling predictions for Year 2024 – Mine-owned receptors

Receptor ID	$PM_{2.5}$ (µg/m^3)		PM_{10} (µg/m^3)		TSP (µg/m^3)	DD (g/m^2/mth)	$PM_{2.5}$ (µg/m^3)	PM_{10} (µg/m^3)	TSP (µg/m^3)	DD (g/m^2/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_28C	7.5	1.4	**56.5**	11.1	19.0	0.50	4.8	23.9	40.6	1.6
1_45	19.1	4.0	**146.6**	31.1	55.7	0.75	7.4	**45.0**	79.0	1.9
1_49	1.9	0.2	13.1	1.5	2.3	0.06	3.5	14.0	23.5	1.2
1_83	6.4	1.3	50.0	10.3	17.9	0.31	4.7	23.1	39.6	1.4
1_100B	1.4	0.1	11.0	0.9	1.4	0.04	3.4	13.2	22.2	1.2
1_106	1.3	0.2	10.6	1.4	2.4	0.03	3.5	14.4	24.1	1.2
1_129	5.9	1.0	47.0	7.7	13.0	0.29	4.3	20.4	34.5	1.4

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_130	7.2	1.4	**57.4**	10.5	18.2	0.33	4.7	23.3	39.8	1.5
1_133	5.9	0.9	47.3	6.9	11.7	0.22	4.2	19.6	33.1	1.3
1_135	4.8	0.7	38.5	5.3	8.8	0.18	4.0	18.0	30.2	1.3
1_136	4.1	0.6	32.6	4.8	8.0	0.16	3.9	17.4	29.3	1.3
1_140	4.0	0.4	31.9	2.9	4.7	0.10	3.7	15.4	25.8	1.2
1_143	5.2	0.8	41.7	6.1	10.2	0.20	4.1	18.8	31.7	1.3
1_145	4.5	0.7	36.0	5.3	9.0	0.17	4.0	18.0	30.4	1.3
1_151	0.7	0.0	4.7	0.3	0.4	0.01	3.3	12.5	21.1	1.1
1_152	4.1	0.6	32.4	4.7	7.8	0.15	3.9	17.3	29.1	1.3
1_154	0.4	0.0	2.9	0.2	0.3	0.00	3.2	12.2	20.7	1.1
1_156	0.5	0.0	3.5	0.2	0.3	0.00	3.3	12.3	20.7	1.1
1_158	1.2	0.1	9.6	0.8	1.3	0.03	3.4	13.0	22.0	1.1
1_159	0.8	0.1	6.6	0.6	0.9	0.03	3.3	12.8	21.6	1.1
1_162	1.2	0.1	9.5	1.1	1.8	0.03	3.4	13.4	22.6	1.1
1_163	1.0	0.1	8.1	0.9	1.5	0.03	3.4	13.1	22.2	1.1
1_164	4.6	0.5	36.2	3.7	6.2	0.17	3.8	16.6	27.9	1.3
1_910	3.3	0.3	25.9	2.2	3.6	0.09	3.6	14.7	24.7	1.2
1_912	3.5	0.3	26.9	2.3	3.7	0.10	3.6	14.8	24.8	1.2
1_913	3.4	0.3	26.3	2.2	3.6	0.09	3.6	14.7	24.7	1.2
1_915	3.9	0.3	30.3	2.5	4.1	0.11	3.6	15.1	25.3	1.2
1_917	3.8	0.3	30.0	2.5	4.1	0.11	3.6	15.0	25.2	1.2
1_920	3.9	0.3	30.5	2.6	4.2	0.11	3.6	15.1	25.3	1.2
1_926	4.0	0.4	31.6	2.7	4.4	0.12	3.6	15.2	25.5	1.2
1_927	4.0	0.4	31.3	2.7	4.3	0.12	3.6	15.2	25.5	1.2
1_929	4.2	0.4	33.2	2.8	4.5	0.12	3.7	15.3	25.7	1.2
1_931	4.3	0.4	33.8	2.8	4.6	0.13	3.7	15.4	25.7	1.3
1_934	4.4	0.4	34.5	2.9	4.7	0.13	3.7	15.5	25.9	1.3
1_937	4.5	0.4	35.3	3.0	4.9	0.14	3.7	15.5	26.0	1.3
1_938	4.7	0.4	36.6	3.1	5.0	0.14	3.7	15.6	26.2	1.3
1_939	4.8	0.4	37.5	3.1	5.1	0.14	3.7	15.7	26.3	1.3
1_941	4.7	0.4	36.6	3.1	5.1	0.14	3.7	15.7	26.3	1.3
1_947B	4.6	0.5	35.9	3.4	5.6	0.16	3.7	16.0	26.9	1.3
1_953	4.6	0.5	35.1	4.0	6.6	0.19	3.8	16.6	27.8	1.3
1_956	4.7	0.6	35.0	4.4	7.4	0.22	3.9	17.1	28.7	1.3
1_W88A	0.8	0.0	5.1	0.3	0.5	0.01	3.3	12.6	21.2	1.1
1_W88B	0.8	0.1	5.4	0.4	0.5	0.01	3.3	12.7	21.3	1.1
1_WF	1.8	0.2	11.9	1.4	2.2	0.07	3.5	14.0	23.6	1.2
1_WK	1.1	0.1	8.3	0.6	0.9	0.02	3.4	13.0	21.8	1.1
1_WR	1.9	0.2	14.7	1.4	2.1	0.05	3.5	13.8	23.1	1.2
1_WT	1.5	0.1	11.9	1.1	1.7	0.04	3.4	13.4	22.5	1.2
32_12	3.1	0.4	24.0	3.0	4.5	0.05	5.3	28.0	46.5	1.4
32_13	3.3	0.4	25.2	3.1	4.7	0.05	5.4	28.5	47.4	1.5
32_14	4.3	0.5	33.2	3.7	5.6	0.06	5.3	28.0	46.2	1.4
32_29A	1.6	0.2	13.0	1.4	2.3	0.06	3.5	14.2	23.9	1.2
32_29B	1.2	0.1	9.7	0.8	1.3	0.03	3.4	13.4	22.6	1.1

Receptor ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
32_32C	7.9	1.6	**59.5**	11.9	18.7	0.21	**16.8**	**119.1**	**216.3**	**4.5**
32_33A	1.3	0.2	10.3	1.9	2.9	0.08	4.4	21.4	36.0	1.4
32_33B_5	1.3	0.2	10.5	1.9	2.9	0.09	4.5	21.5	36.3	1.4
32_48A	0.8	0.0	5.2	0.3	0.4	0.01	3.3	12.5	21.1	1.1
32_48B	1.0	0.0	6.3	0.3	0.5	0.01	3.3	12.6	21.2	1.1
32_M02	0.6	0.1	4.8	0.5	0.7	0.02	3.4	13.0	21.9	1.1
32_M03	0.8	0.1	6.0	0.7	1.1	0.03	3.4	13.7	23.0	1.2

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-7: Modelling predictions for Year 2028 – Privately-owned receptors

Receptor ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
69	0.4	0.0	2.4	0.2	0.3	0.00	3.3	12.5	21.1	1.1
101	1.4	0.2	10.7	1.2	2.0	0.03	3.5	14.2	23.9	1.2
102	1.8	0.2	14.3	1.7	2.8	0.04	3.6	15.0	25.1	1.2
103	0.9	0.1	6.8	0.9	1.4	0.02	3.5	13.8	23.2	1.1
104	1.0	0.1	7.4	0.9	1.5	0.02	3.5	14.0	23.4	1.1
105_R1	0.8	0.1	6.4	0.8	1.3	0.02	3.4	13.7	23.1	1.1
105_R2	0.9	0.1	6.7	0.9	1.4	0.02	3.5	13.8	23.2	1.1
107	0.8	0.1	5.8	0.8	1.2	0.02	3.4	13.6	22.9	1.1
109	0.7	0.1	5.2	0.7	1.1	0.01	3.4	13.4	22.6	1.1
113	0.5	0.1	3.6	0.5	0.8	0.01	3.4	13.1	22.0	1.1
115	0.5	0.1	3.7	0.5	0.8	0.01	3.4	13.0	21.9	1.1
150A	2.6	0.2	20.5	1.8	3.0	0.10	3.5	14.4	24.2	1.2
153	0.5	0.0	3.8	0.2	0.3	0.01	3.3	12.4	20.9	1.1
160A	0.7	0.1	5.1	0.6	1.0	0.02	3.4	13.0	22.0	1.1
160B	0.7	0.1	5.1	0.6	1.0	0.02	3.4	13.0	22.0	1.1
167	0.6	0.1	4.7	0.6	1.0	0.01	3.4	13.3	22.4	1.1
170	0.4	0.0	3.0	0.3	0.4	0.01	3.3	12.9	21.7	1.1
175	0.2	0.0	1.3	0.1	0.2	0.00	3.3	12.4	20.9	1.1
176_R1	0.7	0.1	5.0	0.6	1.0	0.01	3.4	13.4	22.5	1.1
176_R2	0.6	0.1	4.9	0.6	1.0	0.01	3.4	13.4	22.5	1.1
200	0.5	0.1	3.4	0.4	0.7	0.01	3.3	12.9	21.8	1.1
201	0.6	0.1	4.9	0.4	0.7	0.01	3.4	13.0	21.9	1.1
215	0.2	0.0	1.3	0.1	0.1	0.00	3.2	12.1	20.5	1.1
216	0.2	0.0	1.4	0.1	0.1	0.00	3.2	12.1	20.5	1.1
217	0.2	0.0	1.4	0.1	0.1	0.00	3.2	12.1	20.5	1.1
220	0.2	0.0	1.3	0.1	0.1	0.00	3.2	12.1	20.5	1.1
221	0.2	0.0	1.3	0.1	0.1	0.00	3.2	12.1	20.5	1.1
225	0.2	0.0	1.4	0.1	0.1	0.00	3.2	12.1	20.5	1.1

Receptor ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
226	0.2	0.0	1.2	0.1	0.1	0.00	3.2	12.1	20.5	1.1
227	0.2	0.0	1.3	0.1	0.1	0.00	3.2	12.1	20.5	1.1
227_C1	0.2	0.0	1.0	0.1	0.1	0.00	3.2	12.1	20.5	1.1
227_C2	0.2	0.0	1.1	0.1	0.1	0.00	3.2	12.1	20.5	1.1
229	0.1	0.0	1.0	0.1	0.1	0.00	3.2	12.1	20.5	1.1
248	0.2	0.0	1.2	0.1	0.1	0.00	3.2	12.1	20.5	1.1
250	0.2	0.0	1.4	0.1	0.1	0.00	3.2	12.1	20.6	1.1
251	0.2	0.0	1.5	0.1	0.1	0.00	3.2	12.2	20.6	1.1
255	0.2	0.0	1.4	0.1	0.2	0.00	3.2	12.2	20.7	1.1
900	3.0	0.3	23.9	2.2	3.7	0.14	3.6	14.8	25.0	1.3
901	3.1	0.3	25.4	2.5	4.2	0.16	3.6	15.2	25.7	1.3
903	2.9	0.3	23.2	2.1	3.5	0.13	3.6	14.8	24.9	1.3
908	2.8	0.3	22.5	2.0	3.4	0.13	3.6	14.7	24.7	1.3
914	2.7	0.3	21.6	2.0	3.3	0.12	3.6	14.6	24.6	1.2
921	3.1	0.3	24.7	2.1	3.5	0.13	3.6	14.7	24.8	1.3
933	3.2	0.3	26.1	2.1	3.5	0.13	3.6	14.7	24.8	1.3
935	3.4	0.3	27.1	2.1	3.6	0.13	3.6	14.8	24.9	1.3
942	3.3	0.3	26.7	2.2	3.7	0.14	3.6	14.9	25.1	1.3
944	3.3	0.3	26.6	2.4	4.1	0.16	3.6	15.1	25.5	1.3
952	2.6	0.4	21.4	2.7	4.6	0.17	3.7	15.4	26.1	1.3

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-8: Modelling predictions for Year 2028 – Mine-owned receptors

Receptor ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_28C	4.4	0.9	34.3	6.6	11.2	0.23	4.2	19.6	33.1	1.4
1_45	4.6	1.2	36.0	9.0	15.2	0.21	4.7	23.2	39.1	1.4
1_49	1.7	0.1	13.1	1.0	1.4	0.03	3.4	13.7	22.9	1.2
1_83	2.4	0.5	18.0	4.0	6.7	0.11	3.9	17.0	28.6	1.2
1_100B	1.4	0.1	10.7	0.6	1.0	0.03	3.4	13.0	21.9	1.1
1_106	0.9	0.1	7.1	0.9	1.5	0.02	3.5	13.9	23.4	1.1
1_129	3.5	0.6	27.0	4.6	7.7	0.15	3.9	17.5	29.5	1.3
1_130	2.9	0.6	22.8	4.5	7.6	0.13	3.9	17.5	29.4	1.3
1_133	3.2	0.5	24.5	4.0	6.6	0.12	3.9	16.8	28.3	1.2
1_135	2.7	0.5	20.8	3.5	5.8	0.11	3.8	16.3	27.4	1.2
1_136	2.2	0.4	17.3	2.9	4.8	0.09	3.7	15.7	26.3	1.2
1_140	1.8	0.3	14.1	1.9	3.2	0.07	3.6	14.6	24.5	1.2
1_143	2.9	0.5	22.4	3.6	5.9	0.11	3.8	16.4	27.5	1.2
1_145	2.4	0.4	18.7	2.9	4.8	0.09	3.7	15.8	26.5	1.2
1_151	0.4	0.0	3.0	0.2	0.2	0.00	3.3	12.4	21.0	1.1

Receptor ID	$PM_{2.5}$ (μg/m³)		PM_{10} (μg/m³)		TSP (μg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (μg/m³)	PM_{10} (μg/m³)	TSP (μg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_152	2.2	0.4	16.9	2.7	4.5	0.08	3.7	15.5	26.0	1.2
1_154	0.3	0.0	2.0	0.1	0.2	0.00	3.2	12.2	20.6	1.1
1_156	0.3	0.0	2.6	0.1	0.2	0.00	3.2	12.2	20.7	1.1
1_158	1.4	0.1	11.0	0.5	0.9	0.03	3.3	12.8	21.7	1.1
1_159	0.8	0.1	6.5	0.4	0.6	0.02	3.3	12.7	21.4	1.1
1_162	0.7	0.1	5.3	0.7	1.0	0.02	3.4	13.0	22.0	1.1
1_163	0.6	0.1	4.6	0.6	0.9	0.02	3.3	12.9	21.7	1.1
1_164	3.6	0.4	28.5	2.9	4.8	0.12	3.8	16.1	26.9	1.3
1_910	2.8	0.3	21.9	2.0	3.3	0.11	3.6	14.6	24.5	1.2
1_912	2.8	0.3	22.0	1.9	3.2	0.11	3.6	14.6	24.5	1.2
1_913	2.7	0.3	21.7	1.9	3.2	0.11	3.6	14.5	24.5	1.2
1_915	2.9	0.3	22.7	2.1	3.5	0.13	3.6	14.7	24.9	1.3
1_917	2.9	0.3	22.9	2.0	3.3	0.12	3.6	14.6	24.6	1.2
1_920	3.0	0.3	23.9	2.0	3.4	0.12	3.6	14.6	24.7	1.3
1_926	3.2	0.3	25.7	2.0	3.4	0.13	3.6	14.7	24.8	1.3
1_927	3.2	0.3	25.7	2.0	3.4	0.12	3.6	14.7	24.7	1.3
1_929	3.3	0.3	26.6	2.2	3.6	0.14	3.6	14.8	25.0	1.3
1_931	3.4	0.3	27.0	2.2	3.7	0.15	3.6	14.9	25.1	1.3
1_934	3.5	0.3	27.9	2.2	3.7	0.14	3.6	14.9	25.1	1.3
1_937	3.5	0.3	28.4	2.2	3.8	0.15	3.6	14.9	25.2	1.3
1_938	3.6	0.3	29.2	2.3	3.9	0.16	3.6	15.0	25.3	1.3
1_939	3.7	0.3	29.5	2.4	4.0	0.16	3.6	15.1	25.4	1.3
1_941	3.5	0.3	28.4	2.3	3.9	0.15	3.6	15.0	25.3	1.3
1_947B	2.9	0.3	23.6	2.4	4.1	0.16	3.6	15.1	25.6	1.3
1_953	2.4	0.4	19.5	2.8	4.7	0.17	3.7	15.5	26.2	1.3
1_956	2.4	0.4	19.1	3.1	5.2	0.18	3.7	15.9	26.8	1.3
1_W88A	0.5	0.0	3.3	0.2	0.3	0.00	3.3	12.5	21.1	1.1
1_W88B	0.5	0.0	3.5	0.2	0.3	0.00	3.3	12.6	21.2	1.1
1_WF	1.3	0.1	8.9	0.5	0.8	0.01	3.4	13.4	22.5	1.1
1_WK	0.7	0.0	4.7	0.3	0.5	0.01	3.3	12.8	21.5	1.1
1_WR	2.7	0.2	20.4	1.4	2.2	0.06	3.5	13.9	23.3	1.2
1_WT	1.6	0.1	12.8	0.8	1.2	0.04	3.4	13.2	22.2	1.2
32_12	3.0	0.3	22.8	2.5	3.7	0.04	5.0	26.0	43.0	1.4
32_13	3.2	0.4	24.7	2.6	3.8	0.04	5.1	26.6	44.0	1.4
32_14	5.4	0.4	42.1	3.3	4.8	0.05	5.4	28.3	46.3	1.4
32_29A	0.7	0.1	5.4	0.5	0.8	0.02	3.5	13.8	23.0	1.1
32_29B	0.6	0.1	4.7	0.4	0.6	0.01	3.4	13.2	22.2	1.1
32_32C	10.9	1.9	**83.5**	14.6	22.1	0.24	**18.1**	**129.4**	**234.0**	4.0
32_33A	0.9	0.2	7.5	1.1	1.8	0.05	5.2	28.3	52.3	2.5
32_33B_5	0.9	0.2	7.4	1.2	1.8	0.05	5.5	30.1	56.0	2.6
32_48A	0.4	0.0	2.5	0.2	0.3	0.00	3.3	12.5	21.1	1.1
32_48B	0.4	0.0	2.8	0.2	0.3	0.00	3.3	12.6	21.2	1.1
32_M02	0.3	0.0	2.5	0.3	0.4	0.01	3.3	12.8	21.6	1.1
32_M03	0.4	0.1	2.9	0.4	0.6	0.01	3.4	13.4	22.5	1.1

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-9: Modelling predictions for Year 2031 – Privately-owned receptors

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
69	0.3	0.0	1.9	0.2	0.2	0.00	3.3	12.5	21.0	1.1
101	0.8	0.1	6.3	0.8	1.3	0.02	3.5	13.8	23.2	1.1
102	1.0	0.1	7.7	1.1	1.8	0.02	3.5	14.3	24.0	1.2
103	0.6	0.1	4.8	0.6	0.9	0.01	3.4	13.5	22.7	1.1
104	0.7	0.1	5.0	0.6	1.0	0.01	3.4	13.6	22.9	1.1
105_R1	0.6	0.1	4.7	0.6	0.9	0.01	3.4	13.5	22.6	1.1
105_R2	0.6	0.1	4.8	0.6	0.9	0.01	3.4	13.5	22.7	1.1
107	0.6	0.1	4.4	0.5	0.8	0.01	3.4	13.4	22.4	1.1
109	0.5	0.1	3.8	0.4	0.7	0.01	3.4	13.2	22.2	1.1
113	0.3	0.0	2.6	0.3	0.5	0.01	3.3	12.9	21.7	1.1
115	0.3	0.0	2.4	0.3	0.5	0.01	3.3	12.9	21.7	1.1
150A	2.0	0.3	15.8	1.9	3.3	0.10	3.5	14.5	24.6	1.2
153	0.4	0.0	2.9	0.2	0.2	0.00	3.3	12.3	20.8	1.1
160A	0.4	0.1	3.0	0.4	0.6	0.01	3.3	12.8	21.6	1.1
160B	0.4	0.1	2.9	0.4	0.6	0.01	3.3	12.8	21.6	1.1
167	0.5	0.1	3.6	0.4	0.7	0.01	3.4	13.1	22.1	1.1
170	0.3	0.0	2.3	0.2	0.3	0.01	3.3	12.8	21.7	1.1
175	0.2	0.0	1.0	0.1	0.2	0.00	3.3	12.3	20.8	1.1
176_R1	0.5	0.1	3.7	0.4	0.7	0.01	3.4	13.2	22.2	1.1
176_R2	0.5	0.1	3.6	0.4	0.7	0.01	3.4	13.2	22.1	1.1
200	0.3	0.0	2.3	0.3	0.5	0.01	3.3	12.8	21.6	1.1
201	0.4	0.0	2.7	0.3	0.5	0.01	3.3	12.9	21.7	1.1
215	0.1	0.0	1.0	0.1	0.1	0.00	3.2	12.1	20.5	1.1
216	0.1	0.0	1.0	0.1	0.1	0.00	3.2	12.1	20.5	1.1
217	0.1	0.0	1.1	0.1	0.1	0.00	3.2	12.1	20.5	1.1
220	0.1	0.0	1.0	0.0	0.1	0.00	3.2	12.1	20.5	1.1
221	0.1	0.0	1.0	0.0	0.1	0.00	3.2	12.1	20.5	1.1
225	0.2	0.0	1.1	0.1	0.1	0.00	3.2	12.1	20.5	1.1
226	0.1	0.0	1.0	0.1	0.1	0.00	3.2	12.1	20.5	1.1
227	0.2	0.0	1.0	0.1	0.1	0.00	3.2	12.1	20.5	1.1
227_C1	0.1	0.0	0.8	0.1	0.1	0.00	3.2	12.1	20.5	1.1
227_C2	0.1	0.0	0.9	0.1	0.1	0.00	3.2	12.1	20.5	1.1
229	0.1	0.0	0.8	0.0	0.1	0.00	3.2	12.1	20.4	1.1
248	0.1	0.0	0.8	0.1	0.1	0.00	3.2	12.1	20.5	1.1
250	0.1	0.0	0.9	0.1	0.1	0.00	3.2	12.1	20.5	1.1
251	0.1	0.0	1.0	0.1	0.1	0.00	3.2	12.1	20.6	1.1
255	0.1	0.0	1.1	0.1	0.1	0.00	3.2	12.2	20.6	1.1
900	1.5	0.3	11.9	2.1	3.7	0.13	3.6	14.8	25.0	1.3
901	1.2	0.2	9.4	1.7	2.9	0.10	3.5	14.4	24.3	1.2
903	1.8	0.3	14.9	2.2	3.9	0.14	3.6	14.9	25.2	1.3
908	1.6	0.3	12.3	2.0	3.5	0.12	3.6	14.7	24.9	1.3
914	1.6	0.3	12.3	2.0	3.5	0.11	3.6	14.6	24.8	1.2
921	1.4	0.3	10.9	2.0	3.4	0.12	3.6	14.6	24.7	1.2
933	1.3	0.2	10.4	1.9	3.3	0.11	3.6	14.6	24.6	1.2

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
935	1.2	0.2	9.8	1.9	3.2	0.11	3.5	14.5	24.5	1.2
942	1.1	0.2	9.3	1.8	3.0	0.10	3.5	14.5	24.4	1.2
944	1.2	0.2	9.6	1.7	3.0	0.10	3.5	14.4	24.4	1.2
952	1.0	0.2	8.4	1.6	2.8	0.09	3.5	14.4	24.3	1.2

*Advisory NEPM reporting standard applicable to the population as a whole

Table F-10: Modelling predictions for Year 2031 – Mine-owned receptors

Receptor ID	$PM_{2.5}$ (µg/m³)		PM_{10} (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_28C	1.6	0.3	12.1	2.4	4.1	0.09	3.7	15.4	26.0	1.2
1_45	1.7	0.4	13.4	3.1	5.2	0.08	3.9	17.3	29.1	1.3
1_49	1.6	0.1	12.4	0.9	1.4	0.04	3.4	13.6	22.9	1.2
1_83	1.2	0.2	8.7	1.8	3.0	0.05	3.6	14.8	24.9	1.2
1_100B	1.5	0.1	12.4	0.5	0.8	0.02	3.3	12.8	21.7	1.1
1_106	0.7	0.1	5.2	0.6	1.0	0.01	3.4	13.6	22.9	1.1
1_129	1.5	0.3	11.1	2.0	3.3	0.07	3.6	14.9	25.0	1.2
1_130	1.4	0.3	10.0	1.9	3.2	0.06	3.6	14.9	25.1	1.2
1_133	1.4	0.2	10.5	1.9	3.0	0.05	3.6	14.7	24.7	1.2
1_135	1.3	0.2	9.3	1.8	2.9	0.06	3.6	14.6	24.5	1.2
1_136	1.1	0.2	7.6	1.5	2.4	0.05	3.5	14.3	24.0	1.2
1_140	1.0	0.2	7.7	1.3	2.1	0.04	3.5	13.9	23.4	1.2
1_143	1.3	0.2	9.5	1.7	2.8	0.05	3.6	14.6	24.5	1.2
1_145	1.1	0.2	7.8	1.5	2.4	0.04	3.5	14.3	24.0	1.2
1_151	0.3	0.0	2.3	0.1	0.2	0.00	3.3	12.4	20.9	1.1
1_152	1.1	0.2	7.2	1.4	2.3	0.04	3.5	14.2	23.8	1.2
1_154	0.2	0.0	1.6	0.1	0.1	0.00	3.2	12.2	20.6	1.1
1_156	0.3	0.0	2.0	0.1	0.2	0.00	3.2	12.2	20.6	1.1
1_158	0.8	0.1	6.7	0.4	0.6	0.02	3.3	12.7	21.4	1.1
1_159	0.8	0.0	6.6	0.3	0.5	0.02	3.3	12.5	21.2	1.1
1_162	0.4	0.1	2.9	0.4	0.6	0.01	3.3	12.8	21.6	1.1
1_163	0.3	0.0	2.5	0.3	0.6	0.01	3.3	12.6	21.3	1.1
1_164	2.8	0.4	21.9	2.8	5.0	0.16	3.7	16.0	27.0	1.3
1_910	1.8	0.3	14.4	2.1	3.6	0.12	3.6	14.7	24.9	1.3
1_912	1.8	0.3	13.9	2.0	3.5	0.12	3.6	14.7	24.8	1.2
1_913	1.8	0.3	14.5	2.0	3.5	0.12	3.6	14.7	24.8	1.2
1_915	1.5	0.3	11.7	2.0	3.5	0.13	3.6	14.7	24.9	1.3
1_917	1.5	0.3	11.7	2.0	3.4	0.11	3.6	14.6	24.7	1.2
1_920	1.5	0.3	11.3	2.0	3.4	0.11	3.6	14.6	24.7	1.2
1_926	1.4	0.2	10.6	1.9	3.3	0.11	3.6	14.6	24.6	1.2
1_927	1.4	0.2	10.7	1.9	3.3	0.11	3.6	14.6	24.6	1.2

Receptor ID	PM2.5 (µg/m³)		PM10 (µg/m³)		TSP (µg/m³)	DD (g/m²/mth)	PM2.5 (µg/m³)	PM10 (µg/m³)	TSP (µg/m³)	DD (g/m²/mth)
	Project impact						Total impact			
	24-hr ave.	Ann. ave.	24-hr ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.	Ann. ave.
	Air quality impact criteria / Advisory reporting standard*									
	25*	-	50	-	-	2	8*	30	90	4
1_929	1.3	0.3	10.4	1.9	3.3	0.12	3.6	14.6	24.7	1.2
1_931	1.3	0.3	10.7	2.0	3.4	0.12	3.6	14.6	24.7	1.3
1_934	1.3	0.2	10.0	1.9	3.2	0.11	3.6	14.6	24.6	1.2
1_937	1.2	0.2	9.8	1.9	3.2	0.11	3.6	14.5	24.6	1.2
1_938	1.2	0.2	10.1	1.9	3.2	0.12	3.6	14.6	24.6	1.2
1_939	1.3	0.2	10.3	1.9	3.2	0.12	3.6	14.6	24.6	1.2
1_941	1.2	0.2	9.9	1.8	3.1	0.11	3.5	14.5	24.5	1.2
1_947B	1.1	0.2	9.0	1.7	2.8	0.10	3.5	14.4	24.3	1.2
1_953	1.0	0.2	7.9	1.6	2.7	0.09	3.5	14.4	24.2	1.2
1_956	1.1	0.2	8.0	1.6	2.8	0.08	3.5	14.4	24.3	1.2
1_W88A	0.4	0.0	2.6	0.1	0.2	0.00	3.3	12.5	21.1	1.1
1_W88B	0.4	0.0	2.7	0.2	0.2	0.00	3.3	12.5	21.1	1.1
1_WF	1.0	0.1	6.8	0.5	0.7	0.01	3.4	13.3	22.4	1.1
1_WK	0.5	0.0	3.5	0.2	0.4	0.01	3.3	12.7	21.4	1.1
1_WR	1.7	0.1	13.1	1.1	1.9	0.06	3.4	13.6	23.0	1.2
1_WT	1.4	0.1	11.5	0.6	1.0	0.03	3.4	13.0	21.9	1.1
32_12	2.8	0.3	21.7	2.5	3.8	0.04	5.0	26.0	43.1	1.4
32_13	3.1	0.4	24.2	2.6	4.0	0.04	5.1	26.7	44.2	1.4
32_14	6.1	0.5	47.5	3.5	5.4	0.06	5.4	28.6	46.8	1.4
32_29A	0.6	0.1	4.7	0.4	0.7	0.01	3.4	13.7	22.9	1.1
32_29B	0.5	0.0	4.0	0.3	0.5	0.01	3.4	13.2	22.1	1.1
32_32C	17.6	3.7	**135.5**	28.7	46.4	0.53	**19.9**	**143.4**	**258.2**	**4.3**
32_33A	0.5	0.1	4.4	0.9	1.3	0.04	5.2	28.0	51.8	2.5
32_33B_5	0.5	0.1	4.4	0.9	1.4	0.04	5.4	29.8	55.6	2.6
32_48A	0.3	0.0	2.0	0.1	0.2	0.00	3.3	12.5	21.0	1.1
32_48B	0.3	0.0	2.3	0.1	0.2	0.00	3.3	12.5	21.1	1.1
32_M02	0.2	0.0	1.9	0.2	0.3	0.01	3.3	12.7	21.5	1.1
32_M03	0.3	0.0	2.3	0.3	0.5	0.01	3.4	13.3	22.4	1.1

*Advisory NEPM reporting standard applicable to the population as a whole

Figure F-1: Predicted maximum incremental 24 hour average $PM_{2.5}$ concentrations (µg/m³) - Year 2018

Figure F-2: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2018

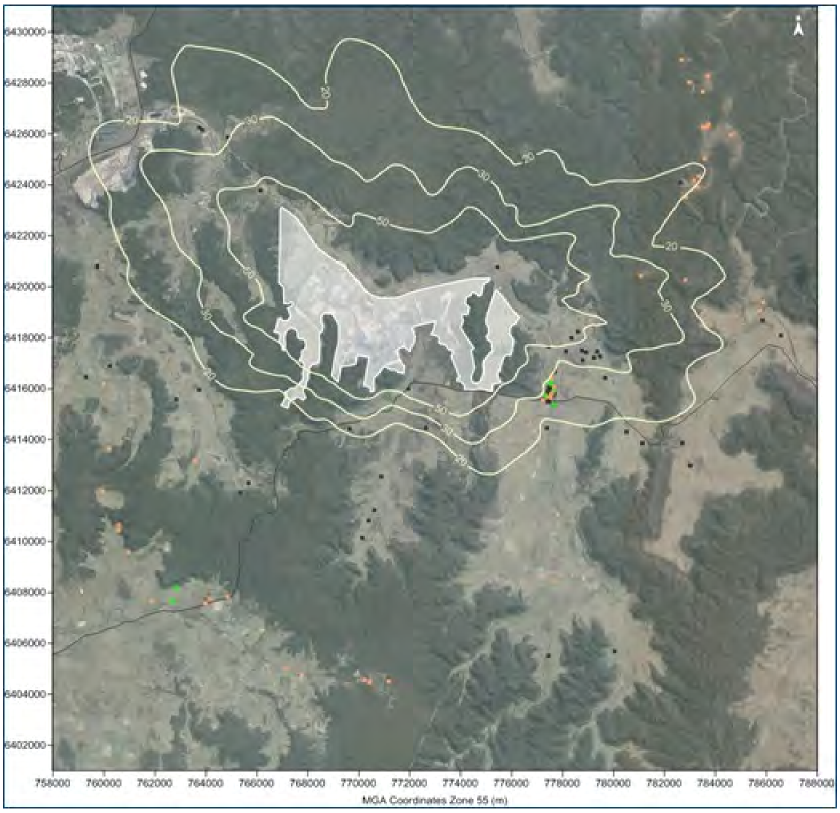


Figure F-3: Predicted maximum incremental 24 hour average PM_{10} concentrations (µg/m³) - Year 2018

Figure F-4: Predicted incremental annual average PM_{10} concentrations (µg/m³) - Year 2018

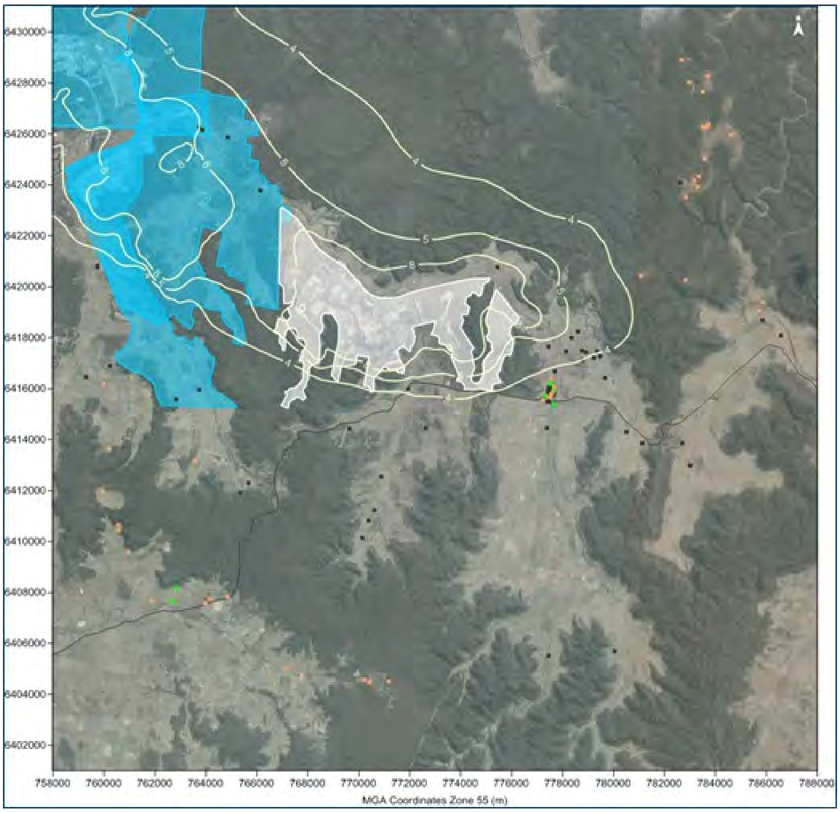


Figure F-5: Predicted cumulative annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2018 (the blue areas show other nearby mines included in the cumulative modelling results)

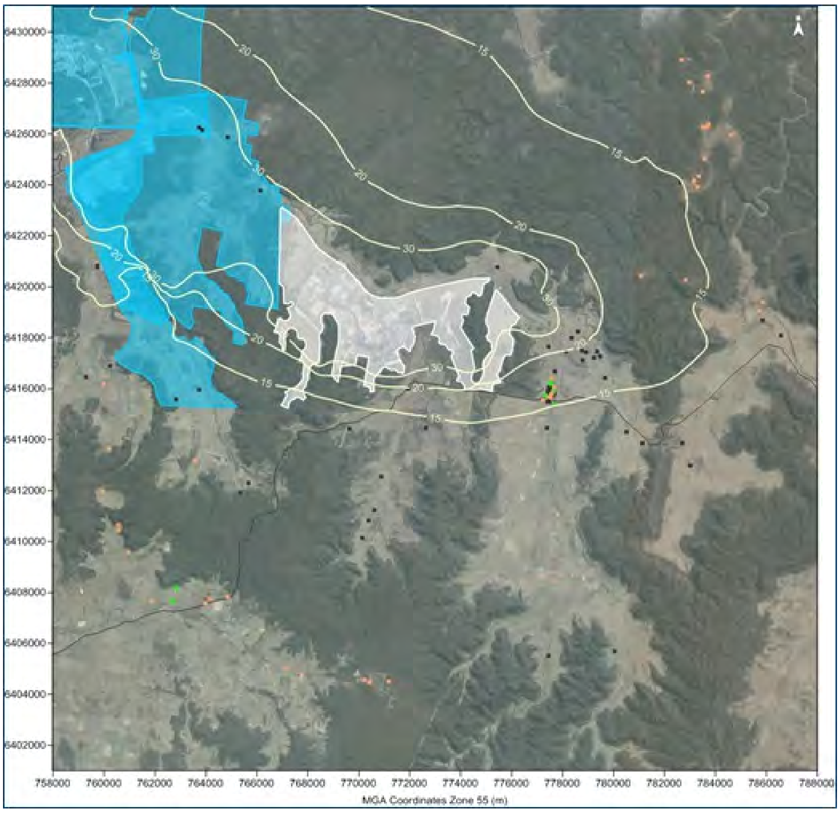
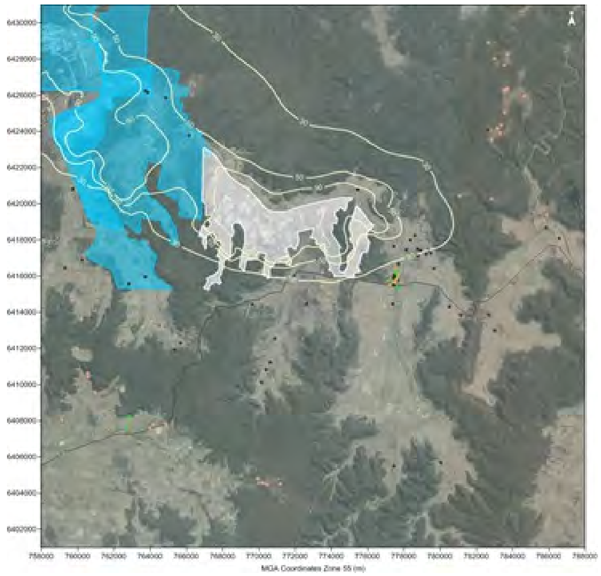


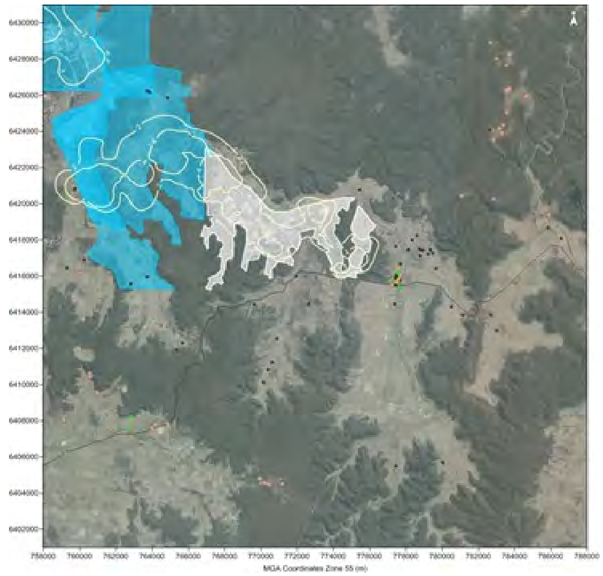
Figure F-6: Predicted cumulative annual average PM_{10} concentrations (µg/m³) - Year 2018 (the blue areas show other nearby mines included in the cumulative modelling results)

TSP – incremental

Dust deposition - incremental



TSP - cumulative



Dust deposition - cumulative

Figure F-7: Predicted annual average TSP concentrations (µg/m³) and dust deposition levels (g/m²/month) - 2018 (the blue areas show other nearby mines included in the cumulative modelling results)

Figure F-8: Predicted maximum incremental 24 hour average $PM_{2.5}$ concentrations (µg/m³) - Year 2020

Figure F-9: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2020

Figure F-10: Predicted maximum incremental 24 hour average PM_{10} concentrations (µg/m³) - Year 2020

Figure F-11: Predicted incremental annual average PM_{10} concentrations (µg/m³) - Year 2020

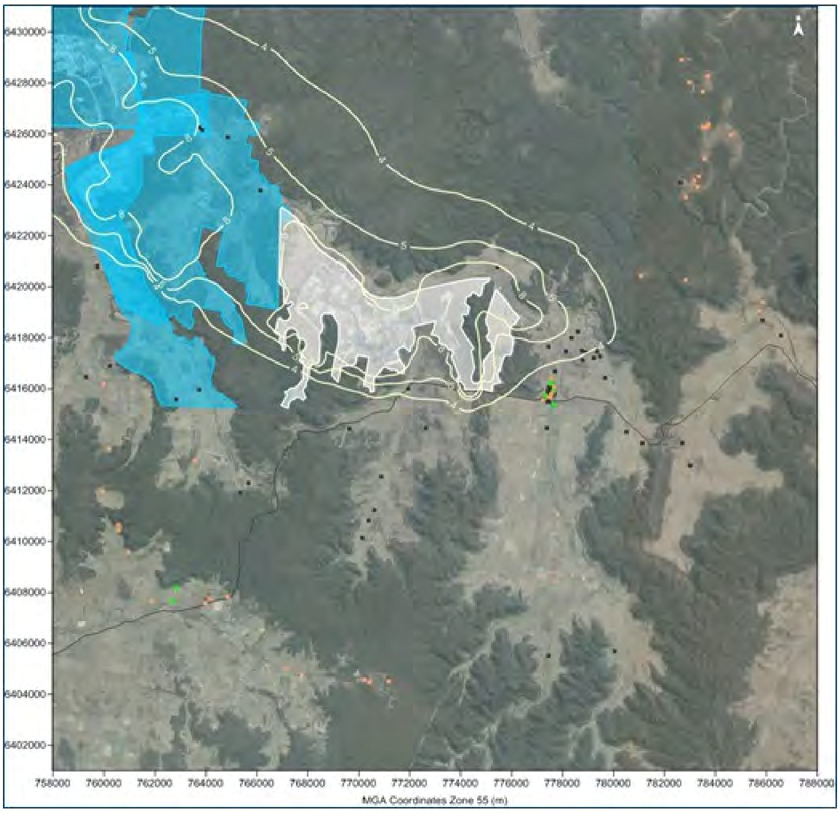


Figure F-12: Predicted cumulative annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2020 (the blue areas show other nearby mines included in the cumulative modelling results)

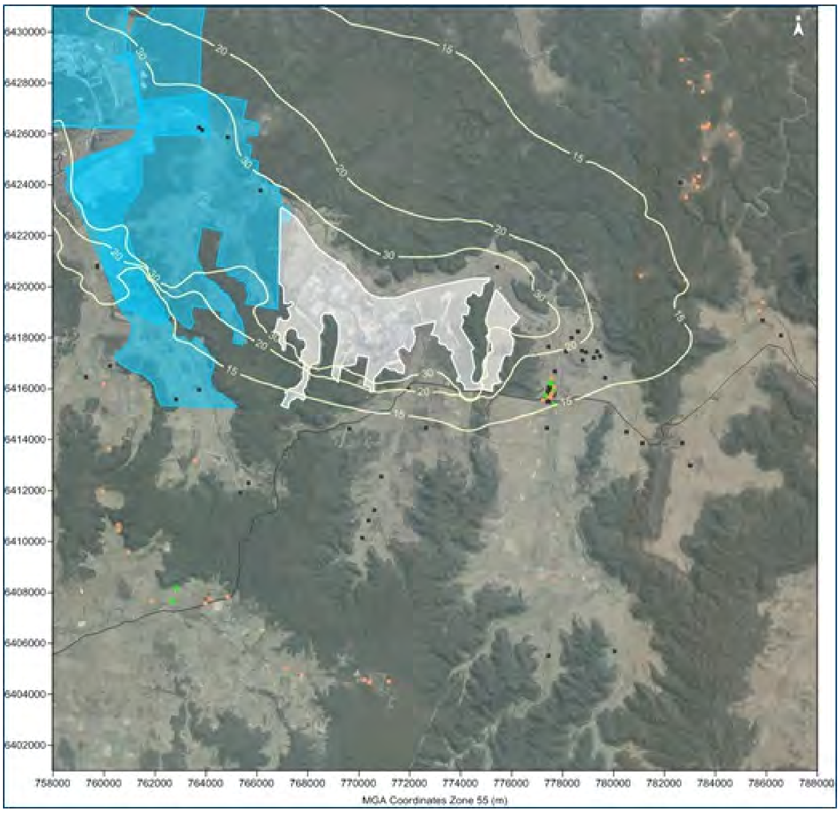


Figure F-13: Predicted cumulative annual average PM_{10} concentrations (µg/m³) - Year 2020 (the blue areas show other nearby mines included in the cumulative modelling results)

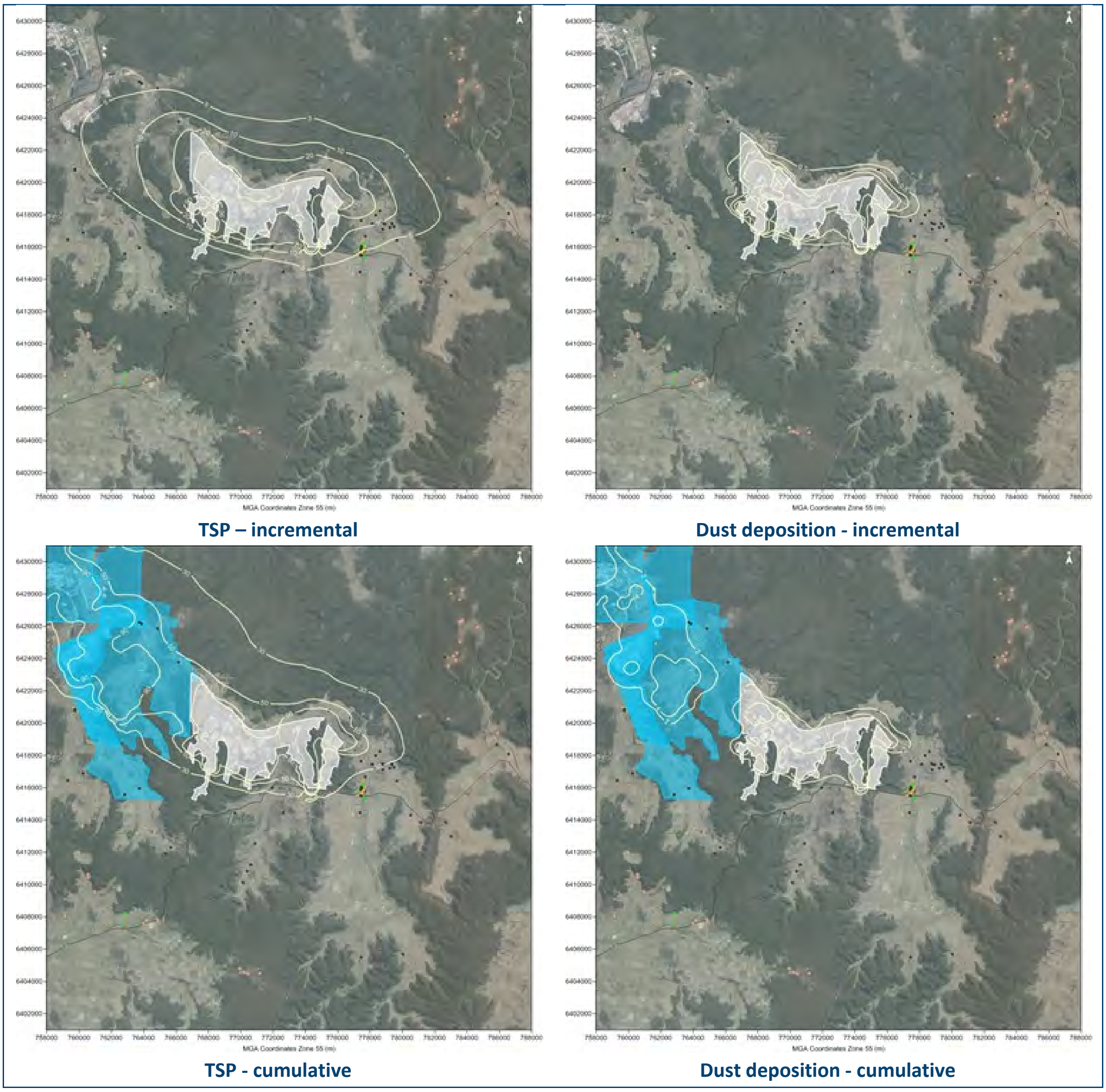


Figure F-14: Predicted annual average TSP concentrations (µg/m³) and dust deposition levels (g/m²/month) - 2020 (the blue areas show other nearby mines included in the cumulative modelling results)

Figure F-15: Predicted maximum incremental 24 hour average $PM_{2.5}$ concentrations (µg/m³) - Year 2024

Figure F-16: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2024

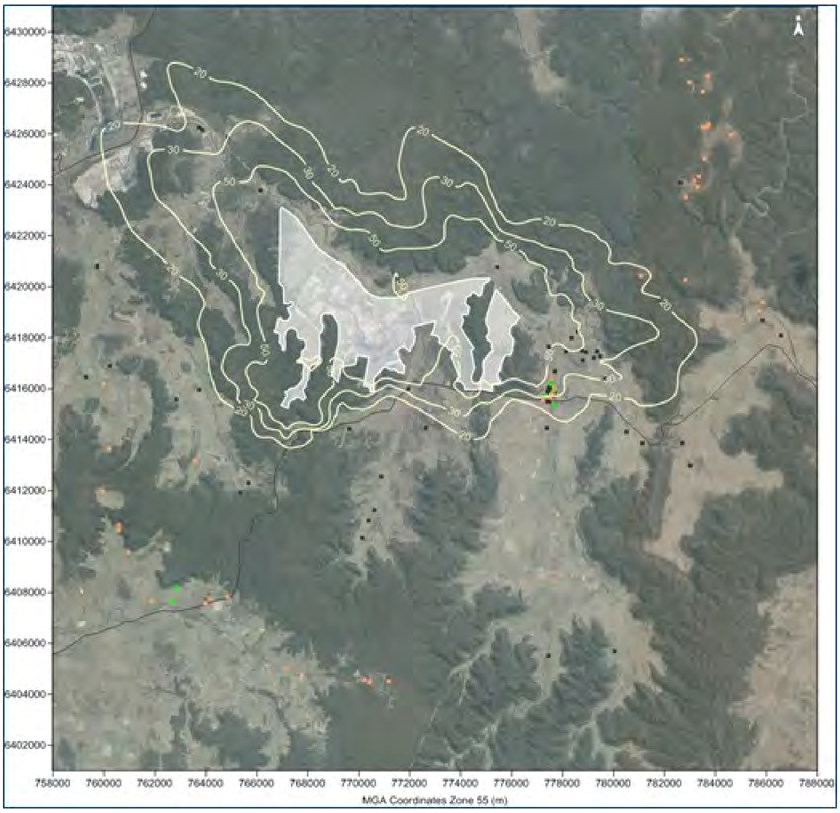


Figure F-17: Predicted maximum incremental 24 hour average PM_{10} concentrations (µg/m³) - Year 2024

Figure F-18: Predicted incremental annual average PM_{10} concentrations (µg/m³) - Year 2024

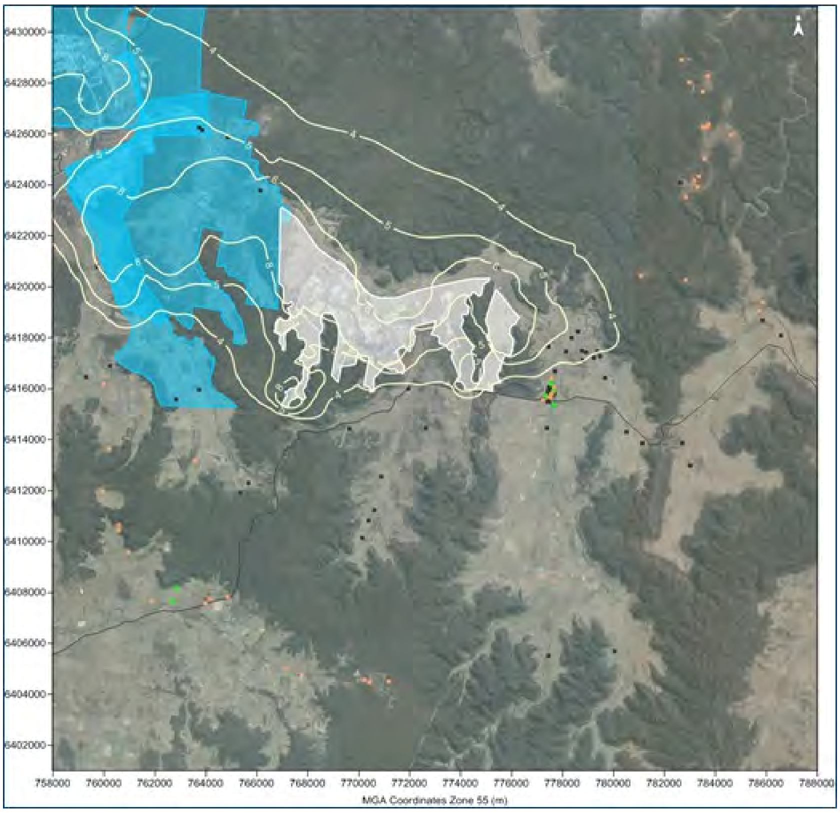


Figure F-19: Predicted cumulative annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2024 (the blue areas show other nearby mines included in the cumulative modelling results)

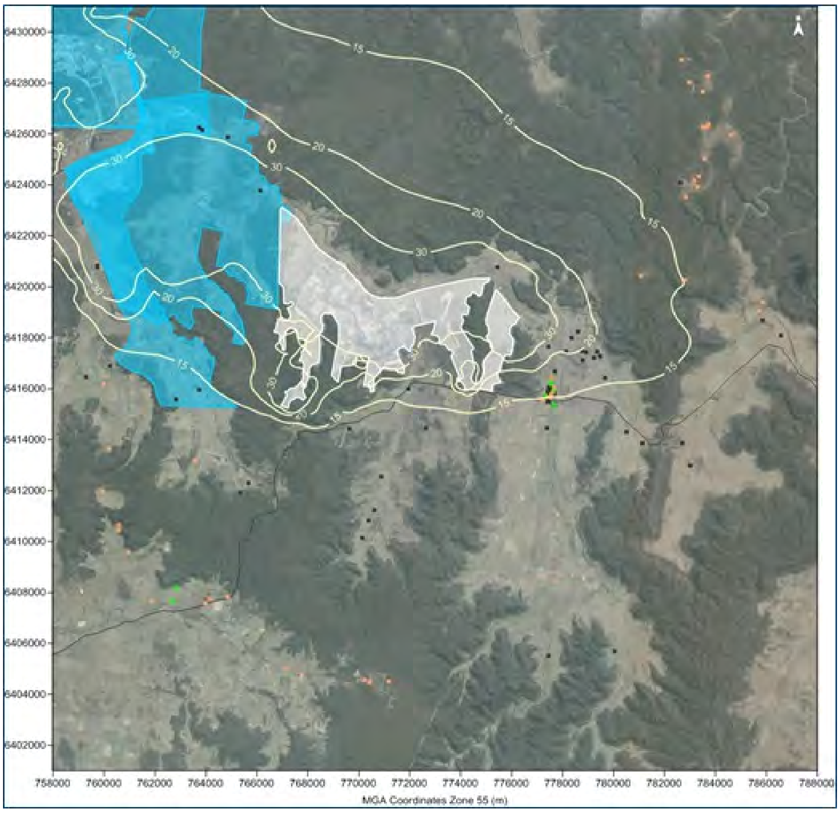
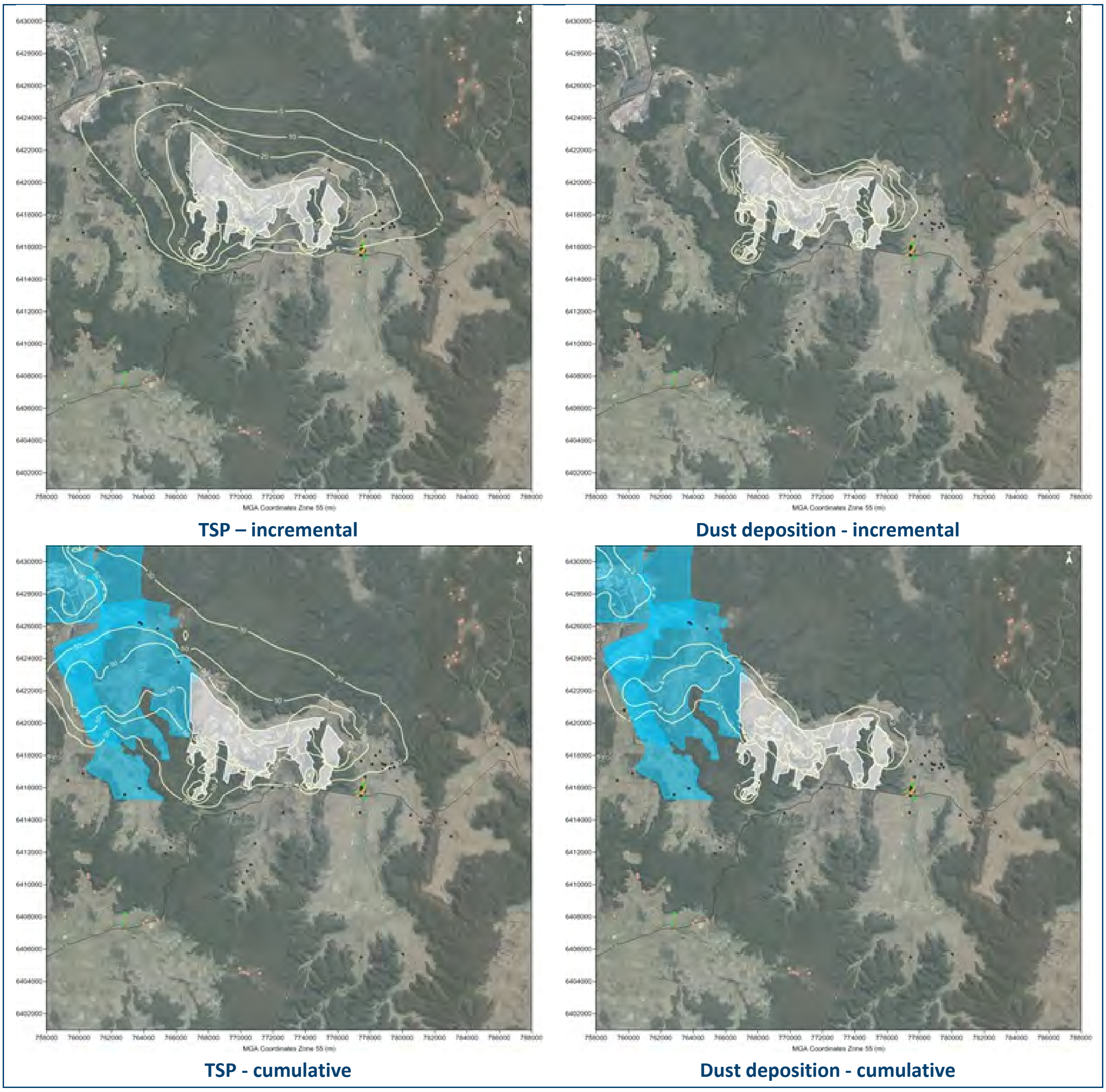


Figure F-20: Predicted cumulative annual average PM_{10} concentrations (µg/m³) - Year 2024 (the blue areas show other nearby mines included in the cumulative modelling results)



TSP – incremental

Dust deposition - incremental

TSP - cumulative

Dust deposition - cumulative

Figure F-21: Predicted annual average TSP concentrations (µg/m³) and dust deposition levels (g/m²/month) – 2024 (the blue areas show other nearby mines included in the cumulative modelling results)

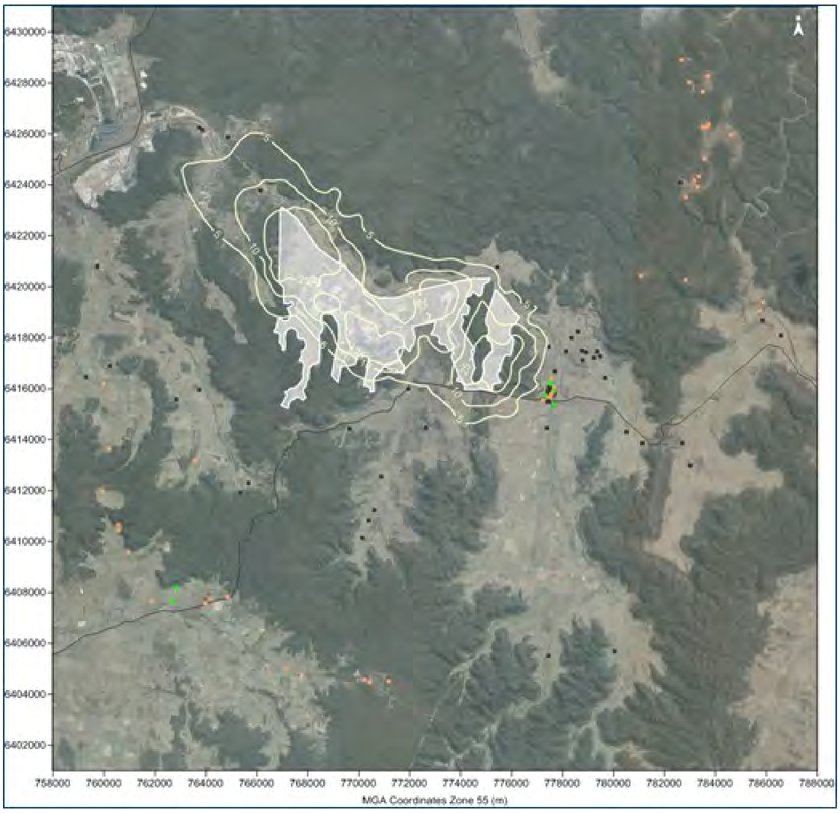


Figure F-22: Predicted maximum incremental 24 hour average $PM_{2.5}$ concentrations (µg/m³) - Year 2028

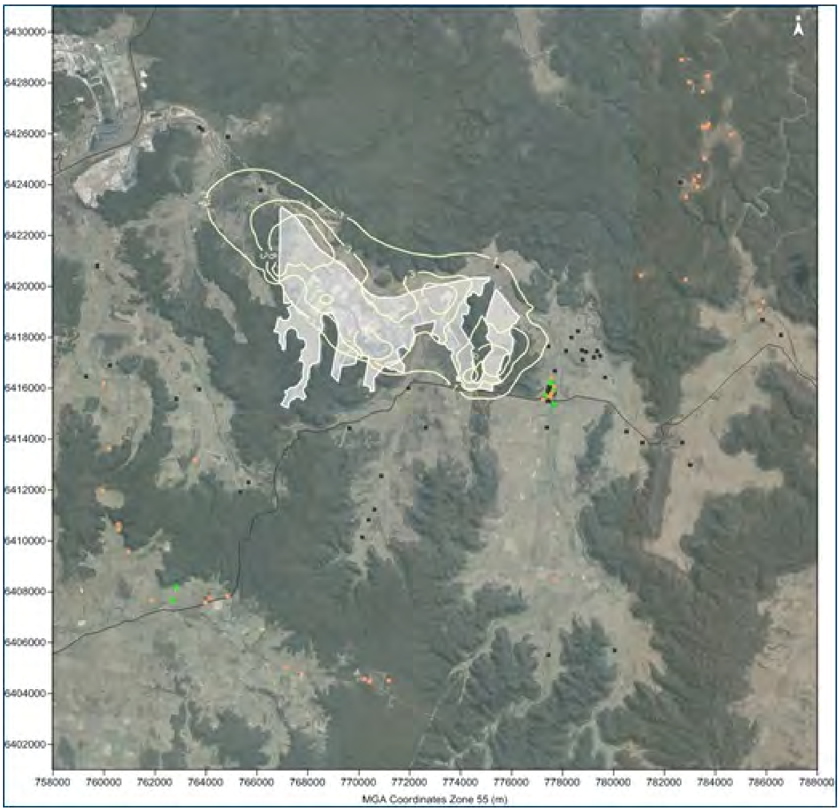


Figure F-23: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2028

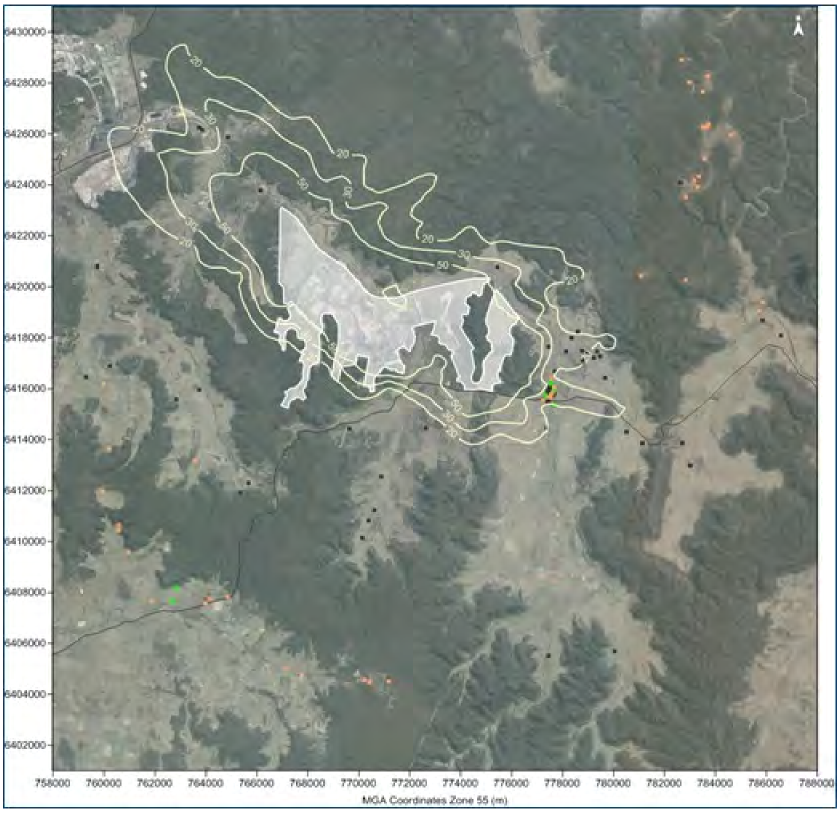


Figure F-24: Predicted maximum incremental 24 hour average PM_{10} concentrations (µg/m³) - Year 2028

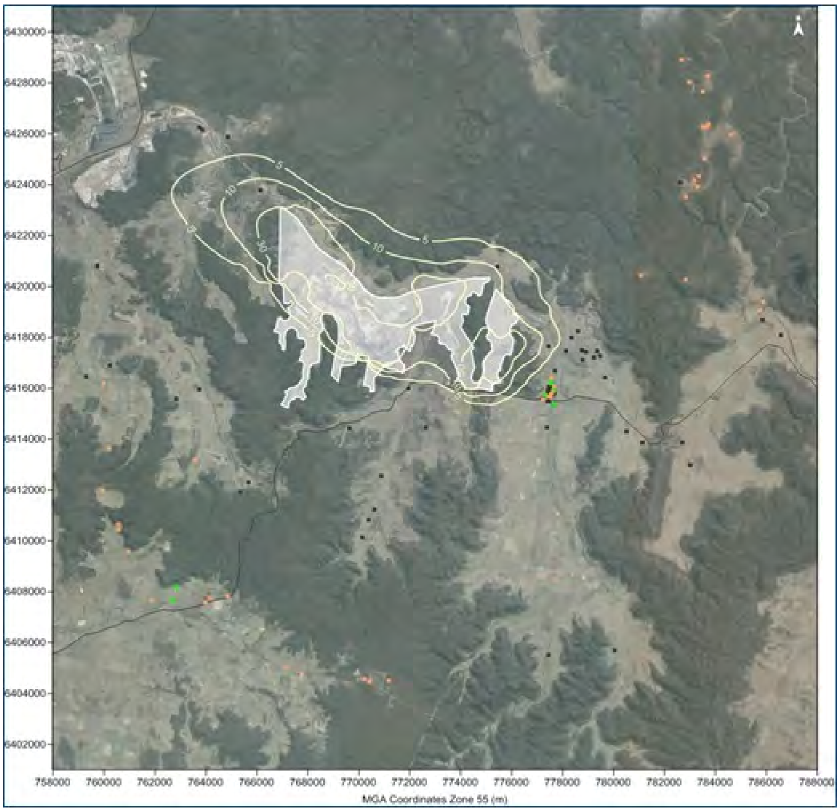


Figure F-25: Predicted incremental annual average PM_{10} concentrations (µg/m³) - Year 2028

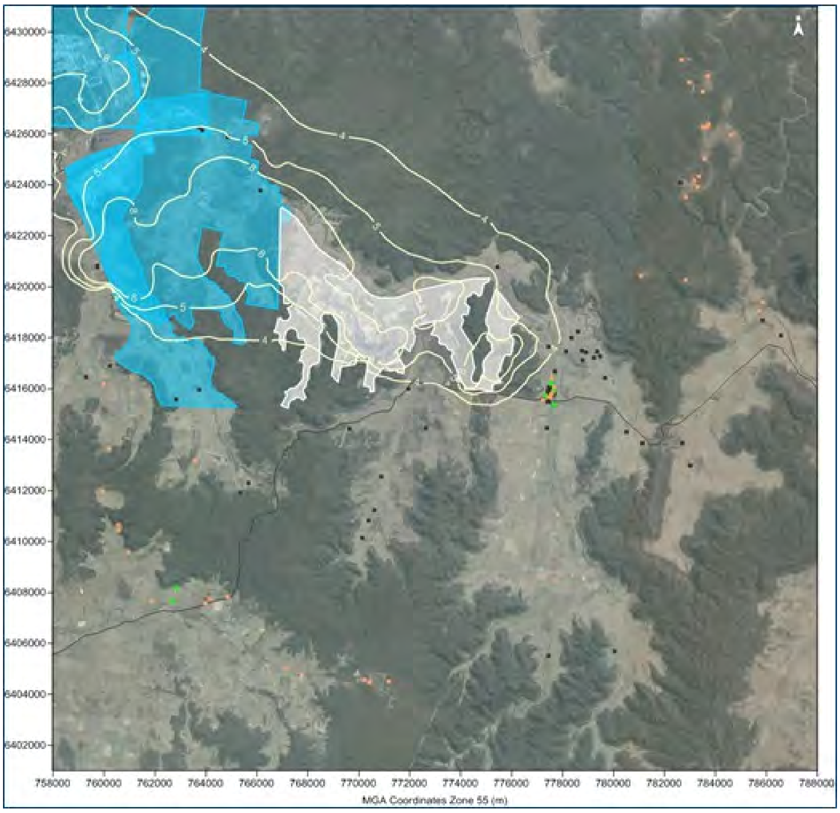


Figure F-26: Predicted cumulative annual average $PM_{2.5}$ concentrations (μg/m³) - Year 2028 (the blue areas show other nearby mines included in the cumulative modelling results)

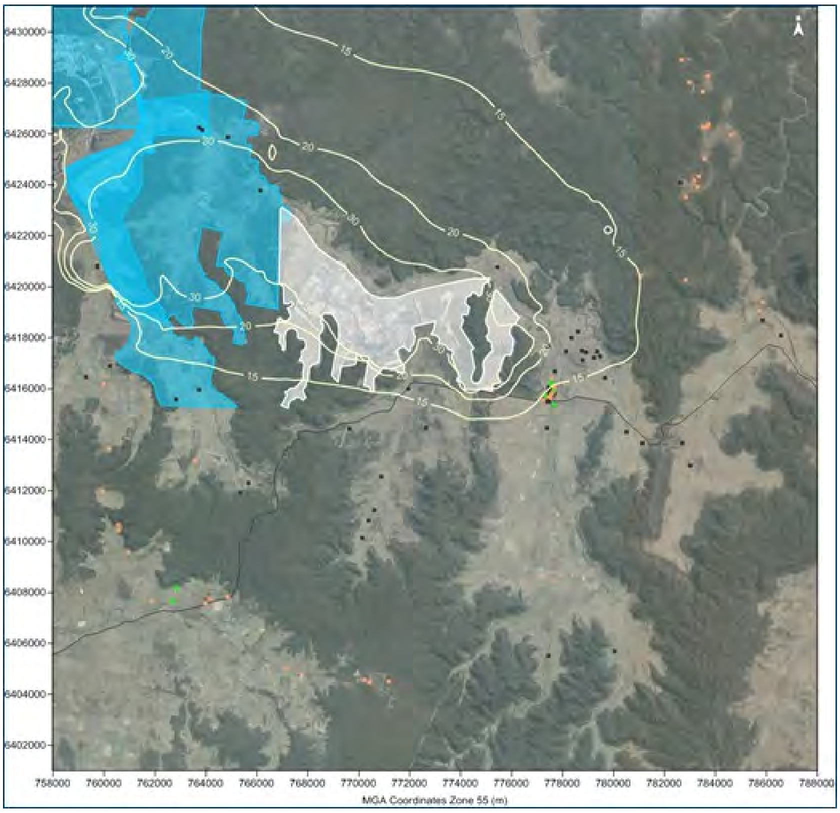


Figure F-27: Predicted cumulative annual average PM_{10} concentrations (μg/m³) - Year 2028 (the blue areas show other nearby mines included in the cumulative modelling results)

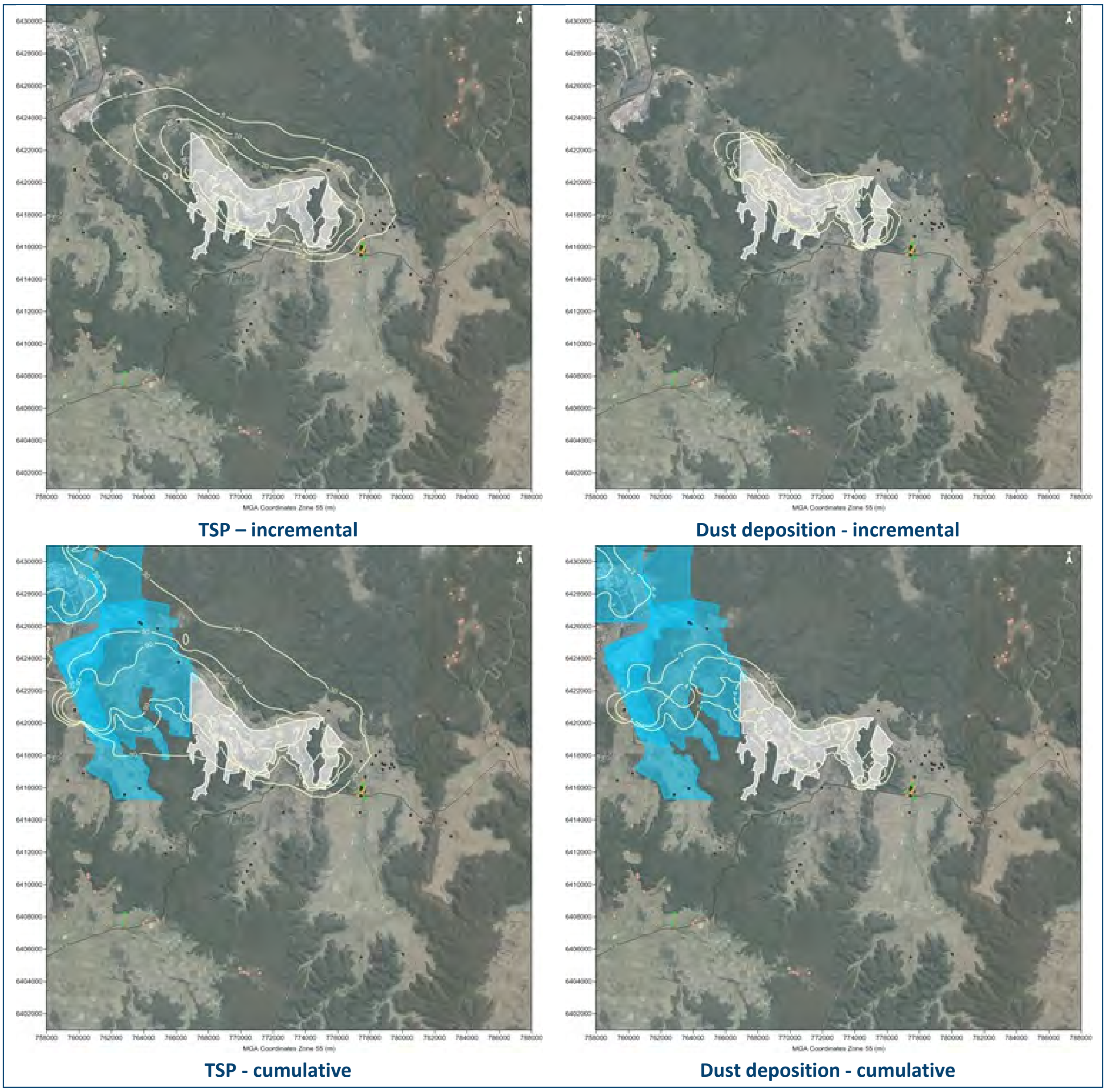


Figure F-28: Predicted annual average TSP concentrations (µg/m³) and dust deposition levels (g/m²/month) - 2028 (the blue areas show other nearby mines included in the cumulative modelling results)

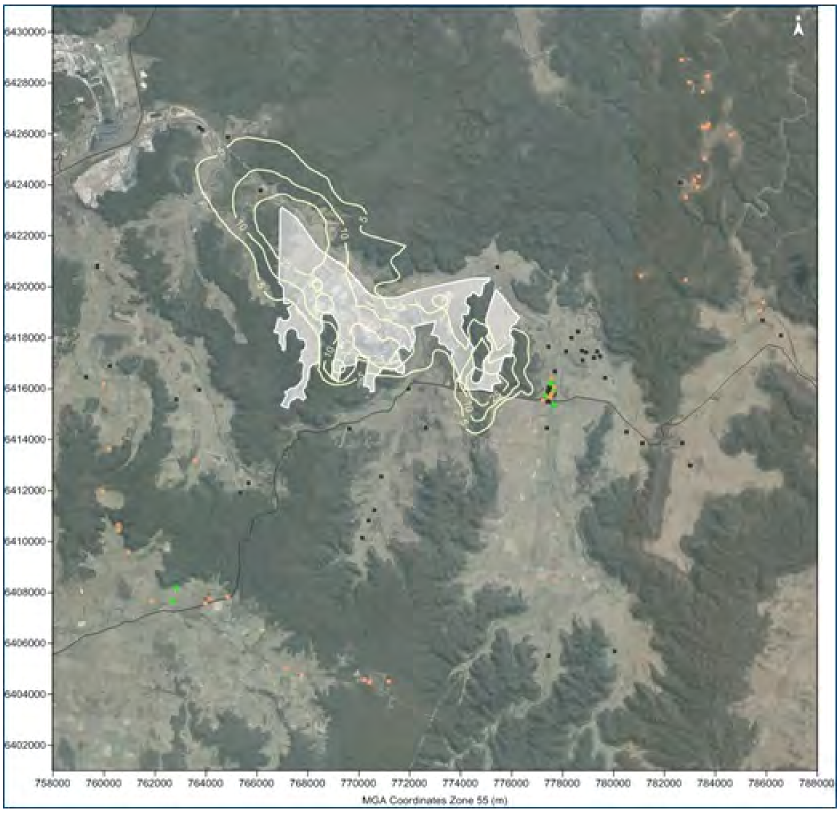


Figure F-29: Predicted maximum incremental 24 hour average $PM_{2.5}$ concentrations (µg/m³) - Year 2031

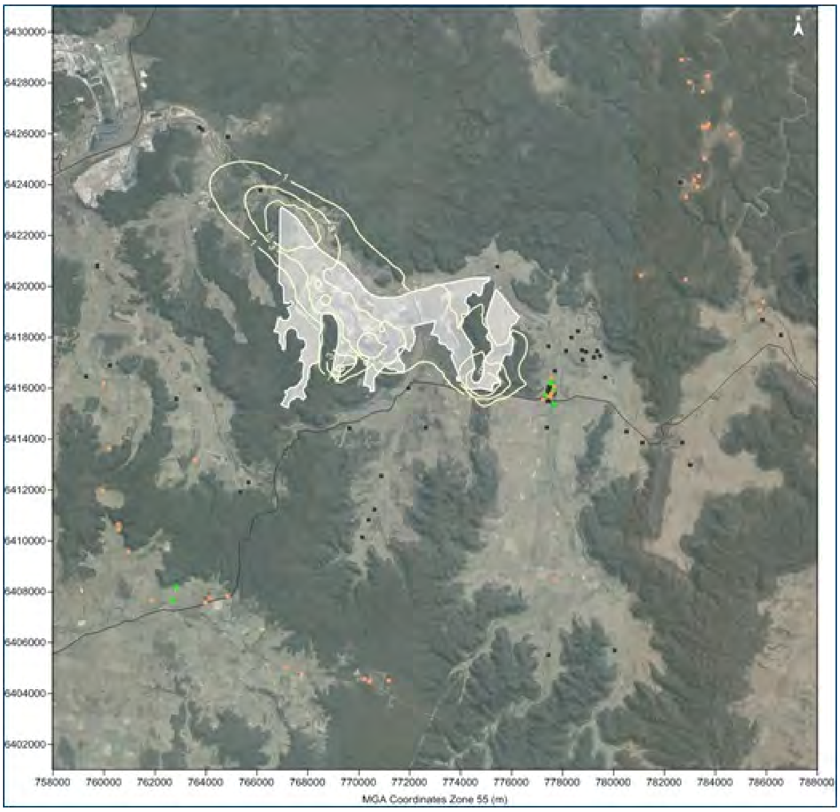


Figure F-30: Predicted incremental annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2031

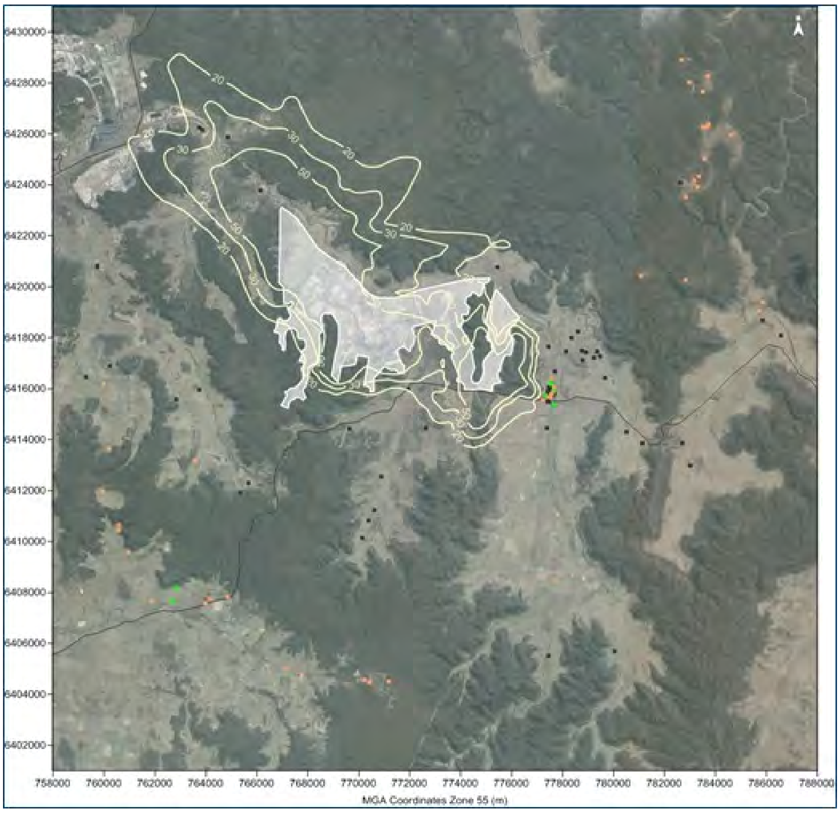


Figure F-31: Predicted maximum incremental 24 hour average PM_{10} concentrations (µg/m³) - Year 2031

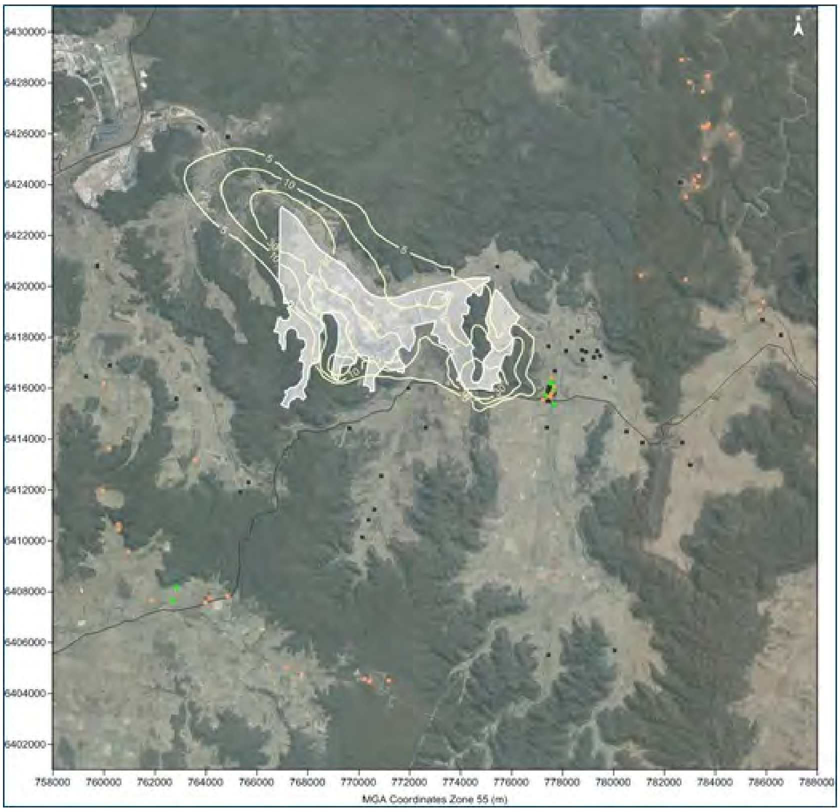


Figure F-32: Predicted incremental annual average PM_{10} concentrations (µg/m³) - Year 2031

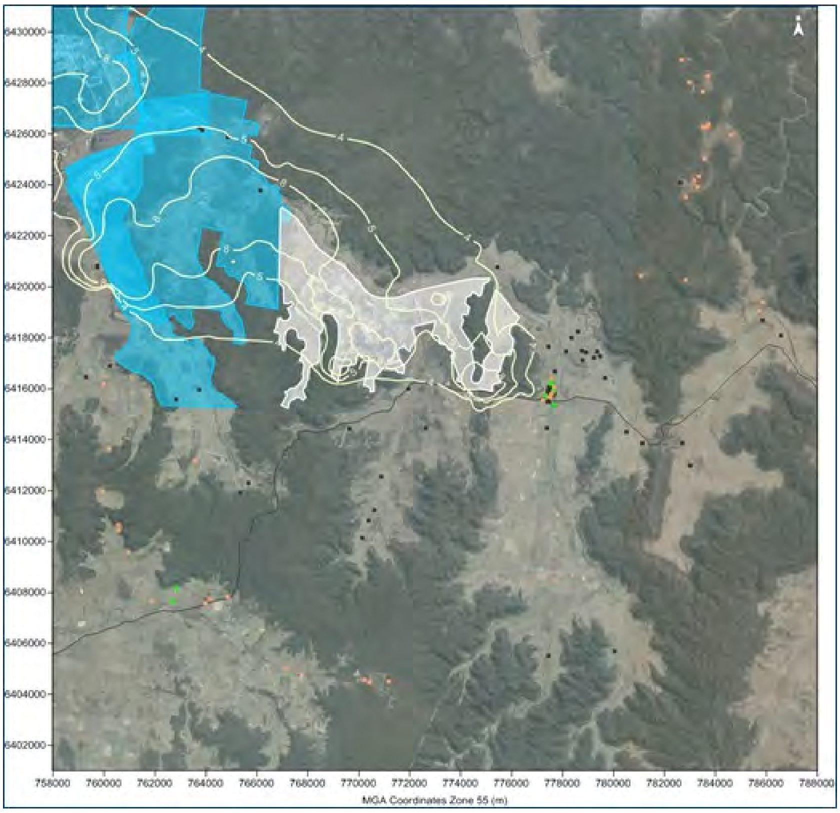


Figure F-33: Predicted cumulative annual average $PM_{2.5}$ concentrations (µg/m³) - Year 2031 (the blue areas show other nearby mines included in the cumulative modelling results)

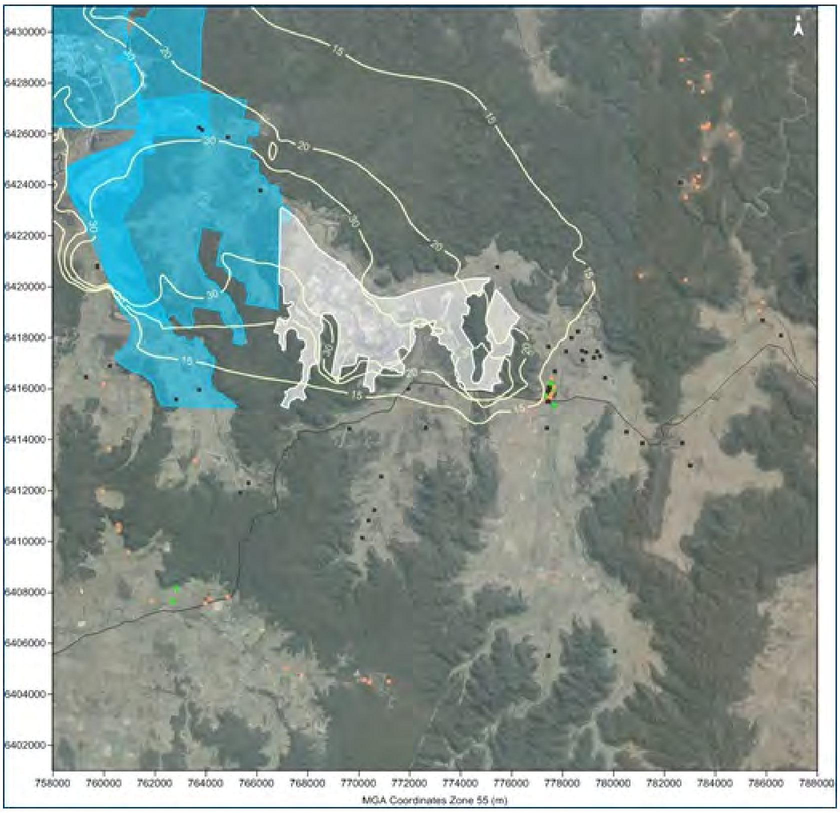


Figure F-34: Predicted cumulative annual average PM_{10} concentrations (µg/m³) - Year 2031 (the blue areas show other nearby mines included in the cumulative modelling results)

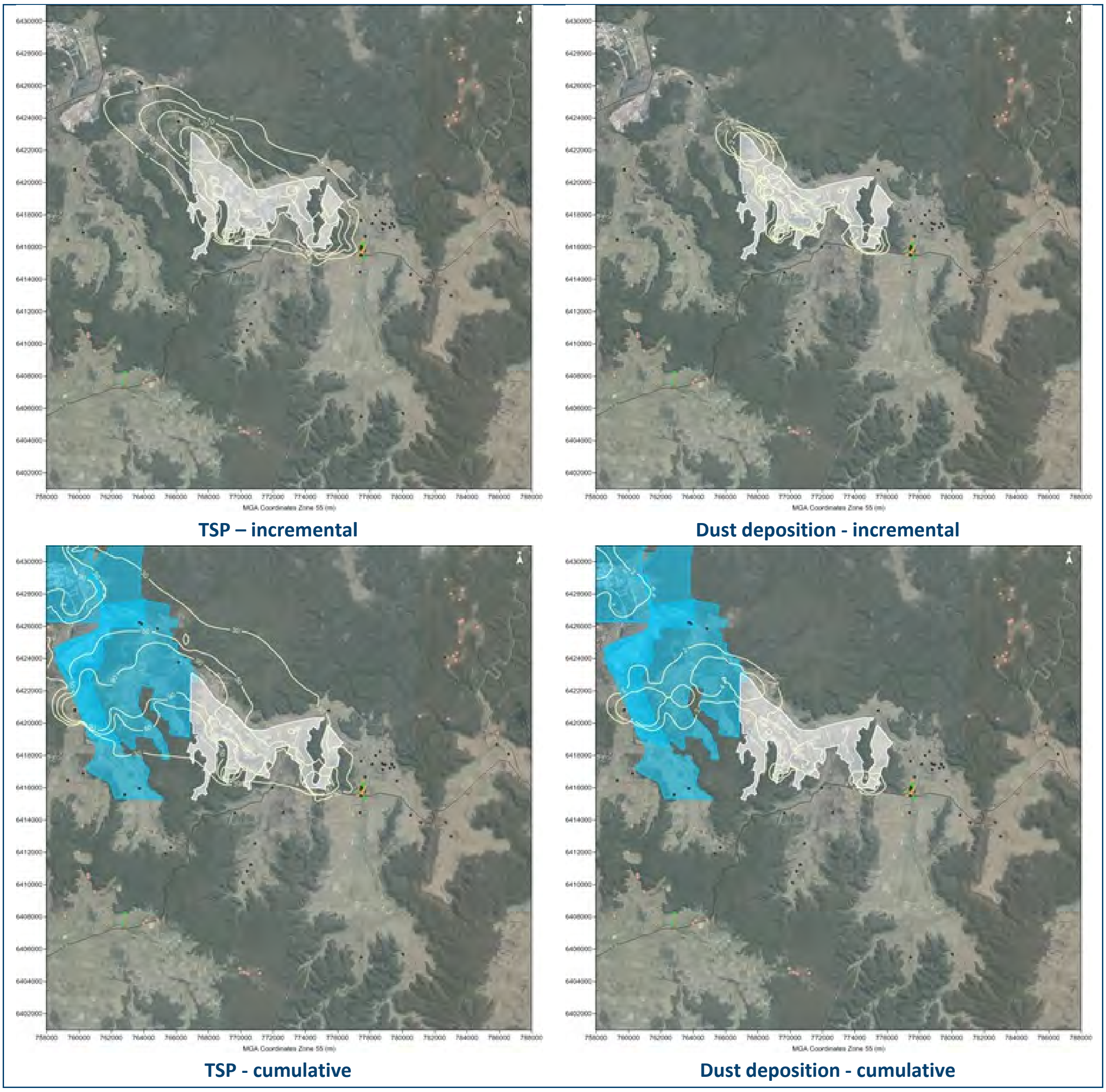


Figure F-35: Predicted annual average TSP concentrations (µg/m³) and dust deposition levels (g/m²/month) - 2031 (the blue areas show other nearby mines included in the cumulative modelling results)