

Tarrawonga Coal Mine Air Quality and Greenhouse Gas Management Plan

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1 Introduction

1.1 Overview of Approved Operations

The Tarrawonga Coal Mine (TCM) is an open cut mining operation located approximately 15 kilometres northeast of Boggabri and 42 kilometres north-northwest of Gunnedah in New South Wales (Figure 1). The mine is owned and operated by Whitehaven Coal Mining Pty Ltd (Whitehaven).

The TCM commenced operations in 2006 and has approval to produce up to 3.5 million tonnes per annum of run-of-mine (ROM) coal via conventional open cut mining methods. Sized coal produced on-site is transported via road to the Whitehaven coal handling and preparation plant located to the north of Gunnedah prior to being railed to the port of Newcastle via the Werris Creek Mungindi Railway. The operation of a mine has potential to impact on the air quality within and beyond the boundaries of the mine site. Approved activities generate fugitive dust and other emissions to air include carbon monoxide (CO), sulphur dioxide (SO2) and nitrogen dioxide (NO2) from diesel powered equipment and vehicle exhausts and emissions associated with blasting and spontaneous combustion.

TCM operates under Project Approval (MP) 11_0047 (granted 22 January 2013), inclusive of multiple modifications since this date. Further details on each modification can be found in the 'Definition' section of Project Approval (MP) 11 0047.

A full project description, including history of operations, current operating approach and mining methods are outlined within the TCM Project Environmental Assessment and previous Annual Environmental Management Reports/Annual Reviews (AEMR/Annual Review) for the site. These documents can be found on the Whitehaven Coal website.

1.2 Baseline Data

Baseline air quality monitoring for the TCM commenced in 2005 with detailed baseline data available in the <u>TCM Project Environmental Assessment</u>. A network of thirteen dust deposition gauges (DDGs) were monitored between 2005 and 2011. The annual average dust deposition for this period was 2.4 g/m²/month.

A PM10 High Volume Air Sampler (HVAS) commenced monitoring in 2007, and run on a one day in six cycle. The annual average PM10 for the period 2007 -2011 was 15.4µg/m³.

Due to the nature of greenhouse gas monitoring, there is no baseline data available. A <u>greenhouse gas assessment</u> was undertaken in 2012 for TCM that included a forecast of average GHG emissions per year of 204,181tCOe- over the life of the mine.

1.3 Purpose

The purpose of this Air Quality & Greenhouse Gas Management Plan (AQGGMP) is to provide an overview of, and direction to the systems, processes and documentation that have been established to:

- ensure compliance with operating conditions of all active approvals;
- minimise the impact of dust from mining activity on the environment and nearby residences;
- minimise the release of greenhouse gas (GHG) emissions and prevent the emission of offensive odours; and
- evaluate and report on the effectiveness of the air quality management system; and maintain an effective response mechanism to deal with exceedances and complaints.

1.4 Scope

The scope of this Management Plan applies to all activities at TCM, including mining, handling, transport and storage of coal that have the potential to impact on the air quality and greenhouse gases of the immediate and surrounding receiving environment (Figure 1). Tarrawonga is approved under MP 11_0047 to carry out mining operations at a maximum rate of 3.5 million tonnes per annum (Mtpa) using truck and excavator method until the end of December 2030

The impacts of blasting on air quality are managed via the Blast Management Plan (WHC_PLN_TAR_Blast Management Plan) (BMP). In addition, the health and safety of workers from air quality is included in the Air

Quality, Dust and Other Airborne Contaminants Principal Hazard Management Plan (WHC-PLN-OC-TAR-Air Quality Dust and Other Airborne Contaminants) and is therefore not included in this Management Plan.

1.5 Management Systems

Tarrawonga Coal Mine; as a Whitehaven Coal operation, has well-established management systems that are aligned with the international management system standard ISO 14001. These management systems provide the framework to support the planning, implementation, monitoring and review to achieve continual improvement in air quality management. To minimise the air quality impacts of these activities a risk-based approach has been established, which includes mechanisms for predictive forecasting and air quality monitoring, providing feedback on the effectiveness of controls and enabling adaptive air quality management.

2 Legislative Requirements

Requirements and commitments associated with air quality and GHG are defined within the following approvals:

- Tarrawonga Coal Mine Project Approval (MP) 11_0047 (including modifications); and
- Environmental Protection Licence (EPL) 12365.

Standards, guidelines and additional legislation relevant to the preparation this AQGHGMP and the management of emissions from TCM are available in section 11 references.

In accordance with the Project Approval, Tarrawonga Coal Mine must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not cause exceedances of the criteria listed in Table 1 at any residence or on more than 25% of any privately-owned land (unless otherwise approved) inclusive of those criteria related to land acquisition. In accordance with the Project Approval, Tarrawonga Coal Mine shall implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site to the satisfaction of the Secretary. This AQGHGMP has been developed in accordance with the Project approval and other relevant conditions, as provided in Appendix 1, Table 5 and Table 6.

Table 1 - Tarrawonga Coal Mine air quality and dust deposition criteria

Pollutant	Averaging period	Impact assessment		Land acquisitio	n
	(applied timeframe)	Criterion	Basis	Criterion	Basis
TSP	Annual	nnual ^a 90µg/m³ Cumulative ^a 90µg/m³		^a 90µg/m ³	Cumulative
PM ₁₀	Annual	^a 30µg/m ³	Cumulative	^a 30µg/m ³	Cumulative
PM ₁₀	24-hour	^a 50µg/m ³	Cumulative	^a 150µg/m ³	Cumulative
PM ₁₀	24-hour	^b 50μg/m3 Cumulative ^b 50μς		^b 50μg/m3	Cumulative
Deposited Dust	Annual	^b 2g/m ² /month	Incremental	^b 2g/m ² /month	Incremental
Deposited Dust	Annual	^a 4g/m2/month	Cumulative	^a 4g/m ² /month	Cumulative

^a Total impact (project plus to all other sources);

^b Project only impact

2.1 BTM Complex Air Quality Management Strategy

The BTM Complex is an existing mining precinct centred within and around the Leard State Forest, approximately 15 km northeast of Boggabri in the Narrabri Shire local government area. The BTM Complex currently includes the existing Tarrawonga Coal Mine (TCM) in the south, the Boggabri Coal Mine (BCM) to the north and the Maules Creek Coal Mine (MCCM) to the northwest.

The purpose of the BTM Complex Air Quality Management strategy (AQMS) is to document the approach that mines within the Boggabri-Tarrawonga-Maules Creek Complex (BTM Complex) will take to monitor and manage cumulative air quality impacts. The approved AQMS for the Boggabri Mine, Tarrawonga Mine and MCCM Complex (BTM Complex) includes details on:

- · Shared monitoring network;
- · Predictive and real-time air dispersion model;
- · Configuring predictive and reactive triggers;
- · Generating reports and alerts;
- · Communication between mining operations relating to air quality triggers; and
- Process of identifying and apportioning the source/s and contribution/s to cumulative air impacts.

The implementation of any site management and/or corrective measures will be the responsibility of each operation as per their site's AQGHGMPs. A copy of the AQMS is publicly available on the Whitehaven Coal website.

3 Consultation and Communication

This Management Plan has been prepared in consultation with the Department of Planning, Housing and Infrastructure(DPHI). In addition, Tarrawonga Coal Mine has extensive consultation and communication processes, including but not limited to:

- A comprehensive community engagement program which includes a Community Consultative Committee (CCC);
- Monthly engagement via the Boggabri Tarrawonga Maules Creek (BTM) mine complex for coordination of air quality management at the respective mines to minimise cumulative air quality impacts:
- Ongoing consultation with relevant government agencies including the Environmental Protection Authority (EPA);
- A community response line (1800 942 836) which enables members of the community to contact environment and community staff directly to discuss concerns with air quality; and,
- Publicly available project approvals, environmental and other related documentation (annual reports, complaints register, CCC minutes) via the Whitehaven Coal website (https://whitehavencoal.com.au/our-business/our-assets/tarrawonga-mine/).

4 Risk Management

Tarrawonga Coal Mine implements a comprehensive risk management system as documented in the Whitehaven Coal HSE Risk Management Standard (WHC-STD-HSE Risk Management) and the Whitehaven Coal HSE Risk Management Procedure (WHC-PRO-HSE Risk Management). Air quality and GHG risks and their associated control measures are documented in the Tarrawonga Coal Broadbrush Risk Assessment; the control measures are summarised in Section 5 of this Management Plan. Operational and project related changes that have the potential to materially alter the air quality or GHG risk profile are managed through the Whitehaven Coal Management of Change Standard (WHC-STD-Management of Change).

5 Control Measures

5.1 Overview of operation controls

The Project Approval requires Tarrawonga Coal Mine to implement reasonable and foreseeable avoidance and mitigation measures' regarding dust or particulate matter emissions. Key operational control measures are included in Table 2.

Table 2 – Key air quality control measures

Risk	Source	Mitigation Measures	Responsibility	Timing
Dust exceeds criteria	Areas disturbed by mining activity (surface disturbance)	Disturb minimum area necessary for mining as per Rehabilitation Management Plan (RMP) and Forward Program	Technical Services Superintendent	Ongoing
	distance	Reshape, topsoil and rehabilitate completed overburden emplacement areas as soon as practicable	Operations Manager	Ongoing
		Where practicable, soil stripping is undertaken at a time when there is sufficient soil moisture	Operations Manager	Ongoing
		Activate Trigger Action Response Plan (TARP) (See 5.3 TARP, Appendix 2 and 3)	OCE	As required
Excessive dust lift-off	Hardstand areas	Site speed limits apply	Operations Manager	Ongoing
dust iiit-oii		Apply dust suppressant on hardstand areas used regularly for access.	Production Superintendent	As required
Excessive dust lift-off and	Overburden emplacement and coal handling	Ripping of softer overburden material is avoided during adverse weather conditions	Operations Manager	As required
community complaints		Temporarily vegetate exposed surface of unused overburden emplacement areas	Operations Manager	As required
		Maintain unsealed coal handling areas in a moist condition	ROM Supervisor	As required
Excessive dust lift-off	Unsealed roads	All roads are speed limited	Production Superintendent	Ongoing
		Apply dust suppressant on major haul roads	Operations Manager	As required
		Apply dust suppressant on minor roads used regularly for access	Operations Manager	As required
Excessive dust lift-off	Drilling & Blasting	Drill rigs fitted with water sprays	Drill & Blast Superintendent	Ongoing
		Assessment of weather conditions prior to blasting	Drill & Blast Superintendent	Ongoing
Excessive dust lift-off and community	Coal Processing	Dust suppressant is applied at the feed hopper, crusher, conveyor transfer and discharge points	ROM Supervisor	Ongoing
complaints		Conveyors are shielded and cleaned where practical	ROM Supervisor	Ongoing
		Trucks transporting coal offsite from the Coal Processing Area are covered	ROM Supervisor	Ongoing

Risk	Source	Mitigation Measures	Responsibility	Timing
Excessive GHG emissions	GHG from fuel burn from mining equipment	Trucks and plant on-site will be well maintained.	Maintenance Manager	Ongoing
	oquipmont	Unnecessary idling for trucks and plant will be avoided	Production Superintendent	Ongoing
		Ensure dump trucks are fully loaded for each load prior to hauling	Production Superintendent	Ongoing
		Optimisation of fleet and haulage routes to ensure efficiency of equipment travel where possible	Production Superintendent	Ongoing
		Turn off any unnecessary lighting	Production Superintendent	Ongoing
Odour generated	Spontaneous Combustion	Minimise time coal is in the stockpile	ROM Supervisor	Ongoing
generates	osinip u ousin	Doze down sides and compact with a track dozer	ROM Supervisor	Ongoing
		Monitor the stockpile on regular basis by visual means	ROM Supervisor	Ongoing
Fume	Blasting	Planning and Designing of blasts as per internal procedures Drill & Blast Superintendent		Ongoing
		Risk analysing each blast prior to blasting using internal hazard analysis and checklists as per Blast Management Plan	Drill & Blast Superintendent	Ongoing
		Firing blasts in opportune weather conditions as per Blast Management Plan	Drill & Blast Superintendent	Ongoing

^{*}Dust suppressants is inclusive of water and chemical suppressants

Key operational control procedures supporting the above air quality management measures as a result of mining activity include:

5.1.1 WHC-PRO-OC-Load, Haul and Dumps

This procedure outlines the controls for prevention and mitigation of dust from operations for the preparation, loading and transportation of coal, overburden, or other material to a ROM pad, dump or stockpile, and applies to operational areas in Open Cut Operations.

5.1.2 WHC-PRO-OC-Clearing and Pre Strip

This procedure provides for the safe clearing of trees and topsoil within defined and approved open cut areas, in accordance with the Project Approval. The document outlines the ground disturbance permit process for Tarrawonga Coal Mine and details control measures to be implemented during vegetation clearing, topsoil stripping and topsoil stockpiling to ensure activities are undertaken in an environmentally responsible manner and in accordance with statutory requirements and site environmental management plans.

5.1.3 WHC-PRO-OC-Safe Operation of a Watercart

This procedure outlines a standard work practice for the identification of risks associated with the operation of water carts and the suppression of dust on roads.

5.1.4 WHC-STD-OC-Conveyors

This procedure defines the requirements for conveyors with regards to covers, sprays and maintenance activities to prevent and mitigate dust emissions.

5.1.5 WHC-STD-OC-Road and Dump Design

This procedure outlines the processes to ensure roads and dumps are designed and maintained to acceptable standards to prevent and mitigate dust emissions. This includes but not limited to material used for road construction, stockpile heights and drainage considering dust generation potential.

5.2 Trigger Action Response Plan

Tarrawonga Coal use visual dust monitoring and meteorological monitoring as the primary means for reactive air quality management.

5.2.1 Visual Dust Trigger Action Response Plan

Visual inspection of dust will be conducted at all times by personnel at TCM to determine whether visible dust levels are within appropriate levels, or if further mitigation is required. A TARP has been developed for the site which provides visual dust trigger indicators, (normal, level 1 and level 2), and sets out the corresponding response/actions if the trigger is reached. This is provided in Appendix 2.

5.2.2 Meteorological Risk Response Matrix

A meteorological risk/response matrix has been developed for the site to identify operational practices or weather conditions that require specific action to mitigate potential impacts. The intent behind the risk response matrix is to understand the prevailing conditions and implement management practices accordingly to avoid subsequent air quality impacts. Meteorological data is obtained from the Templemore weather station. The real time monitors provides for site alerts in the event that wind speed measurements approach compliance thresholds. This is provided in Appendix 3.

5.3 Greenhouse Gas Management

The main sources of GHG emissions at TCM and considered in the AQGHGMP are:

- Fuel consumption (diesel) during mining operations (mine haulage fleet and heavy vehicle equipment, blasting fuel and generator use) Scope 1; and
- Release of fugitive emissions from the mining of coal seams Scope 1.

TCM is not connected to the electricity grid and relies on generators for power generation. A small amount of electricity is purchased for TCM owned properties that contain monitoring equipment. From October 2022 WHC offset Scope 2 emissions by purchasing 100% carbon neutral electricity across all sites including Tarrawonga.

The GHG management for the Project will focus on emissions management and reductions associated with energy efficiency and diesel consumption.

Emissions during operations will be minimised as follows:

- · consideration of the fuel efficiency of all mobile and fixed equipment during procurement;
- ensure dump trucks are fully loaded for each load prior to hauling to maximise productivity and efficiency with regard to the amount of fuel used per unit of material moved;
- optimisation of fleet and haulage routes including gradient management and minimisation of track resistance to ensure efficiency of equipment travel where possible;
- · consideration of the energy efficiency of all new major electrical equipment during procurement; and
- turning off unnecessary lighting around the mine site consistent with safety requirements.

WHC is investigating technologies to reduce mine haulage fleet diesel emissions in the short to medium term, and are engaging with OEM suppliers in relation to their low-carbon truck technology development pathways. Based on this engagement, WHC do not anticipate low-carbon truck electrified solutions suitable for our open cut mines to be commercially available before 2030. Automation haulage trucks will not be feasible as an alternative, due to TCM's current life of mine and mine planning restrictions.

TCM also conducted an assessment to quantify methane emissions during the FY13 Fugitive Gas estimate for Tarrawonga. During this program it was identified that TCM is in a low gas carbon dioxide zone with

extremely low methane emissions <10%. Fugitive emissions contribute <3% of TCM's overall emissions. As a result, there is no feasibility of any methane capture or reduction programs.

TCM conducts regular reviews and monitors GHG emissions through an internal purpose-built tracking system further detail on this can be found in Whitehaven Sustainability report published annually.

5.4 Odour Management

It is a requirement of the Project Approval that no offensive odours are emitted from the site, as defined under the Protection of the Environment Operations Act 1997 (NSW). The primary potential sources of odour at Tarrawonga Coal Mine are spontaneous combustion and blast fume.

The WHC-PLN-OC-TAR-Spontaneous Combustion documents a systematic way approach to managing the risks associated with spontaneous combustion within the Tarrawonga Coal Mine by:

- identifying those materials with a propensity for spontaneous combustion;
- implementing preventative measures to minimise the risk of these materials spontaneously combusting; and,
- implementing control measures as outlined in Table 2 to manage outbreaks of spontaneous combustion.

Details on management of blast fume can be found in:

- TCMs approved Blast Management Plan (WHC-PLN-TAR-Blast Management Plan).
- TCMs internal Blast Fume Management Procedure (WHC_PRO_OC_Blast Fume Management), and Blast Planning, Design and Record Keeping Procedure (WHC-PRO-OC-Blast Planning, Design and Record Keeping)

6 Air Quality Monitoring

6.1 Monitoring Program

An Air Quality Monitoring Program has been established to evaluate and report on:

- the effectiveness of the management of emissions to air;
- · compliance with air quality criteria; and
- compliance with air quality operating conditions.

Monitoring is conducted in accordance with relevant standards as outlined in Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA, 2022). All statutory monitoring locations will conform to the requirements of AS 3580.1.1:2007 Methods for sampling and analysis of ambient air – Part 1.1: Guide to siting air monitoring equipment, subject to local site constraints. The effectiveness of the monitoring program will be evaluated each year upon the review of this plan as per the requirements of section 9.2 and reported on each year in the annual review.

Note that direct monitoring of TSP is not conducted as the TSP values are determined by multiplying measured PM10 values by a factor of 2. This approach was accepted by DPHI for all Whitehaven sites in a letter dated 5^{th} August 2011.

6.1.1 Meteorological Monitoring & Forecasting

The weather station at Templemore is sited in accordance with AM-2, Guide for measurement of horizontal wind for air quality applications (AS 2923-1987 or AS/NZS 3580.14-2014), and AM-4, Meteorological monitoring guidance for regulatory modelling applications EPA 454/R-99-005 (USEPA (2000)). TCM uses predictive meteorological forecasting and predictive air dispersion modelling, together with real time monitoring data to inform operational practices.

6.1.2 Particulate Matter

Data obtained from the real-time air quality monitoring network provide continuous and real-time dust level information as well as daily reports and alarm notifications to key personnel (i.e. OCE, Operations Manager, Environmental Superintendent or representative). In addition to daily reports, the monitoring data can be downloaded via the web interface as required. The location of monitoring equipment is presented in Table 3 and Figure 1. The types of monitoring instruments used are included below;

- A High Volume Air Sampler (HVAS) is used to measure PM10 concentrations in the ambient air. HVAS monitoring is conducted approximately every 6 days for a 24-hour monitoring period. A NATA accredited analytical laboratory then conducts gravimetric analysis of the filter papers to determine the PM10 level. The High Volume Air sampler (HVAS) installed at the privately owned 'Coomalgah' property is used for compliance purposes. It is located at approximately 6 kms to the Southeast of the mine (Figure 1). The Project Approval criteria that applies for the HVAS for particulate matter are defined for TSP and PM10 in Table 1 and are referred to as long term (annual average) and short-term (24-hour average) criteria.
- Real-time particulate monitoring is conducted using tapered element oscillating microbalance
 analysers (TEOMs) to measure real-time PM10 and PM2.5 concentrations to guide day to day mining
 operations. The TEOM installed at the mine owned property 'Flixton" is used to ensure compliance
 with the EPL requirement to have a continuous PM10 monitor in operation. The TEOM located at 'Willgai' measures PM2.5 however no compliance criteria applies. Should either of these monitors be
 inoperative due to unforeseen circumstances, other monitors on the BTM network including ESamplers will be used to supplement data to guide daily operational response's to dust.
- An e-sampler is a light scattering aerosol monitor that can be used to continuously measure concentrations of particulates. The samplers operate on solar power and can be relocated as required. E-sampler's are installed on the southeast and southwest side of the pit (part of the BTM complex network) and on the south of Goonbri Road on one of the mine related properties (Figure 1). The e-samplers are used for upwind/ downwind calculations to evaluate the likely dust contributions of the operations in the BTM Complex. The location of these 'e-samplers' will move periodically as BTM Complex mining operations progress. The monitors are for management purposes and not to assess compliance as they inform predictive assessments together with not remaining in fixed locations.

Table 3 - Air Monitoring Locations

Monitor*	Easting	Northing	Residence/Property	Parameter	Frequency
Dust gauge EB-4	230897	6605869	"Templemore"	"Templemore" Deposited dust	
Dust gauge EB-5	231117	6606212	"Bollol Creek Station"	Deposited dust	30 days (+/- 2 days)
Dust gauge EB-6	229044	6603178	"Ambardo"	Deposited dust	30 days (+/- 2 days)
Dust gauge EB-7	226672	6603754	6603754 "Tarrawonga" Deposited dust		30 days (+/- 2 days)
Dust gauge EB-9	230504	30504 6601914 "Pine Grove"		Deposited dust	30 days (+/- 2 days)
Dust gauge EB-10	226420	i doddord farfaworiga wiire		Deposited dust	30 days (+/- 2 days)
Dust gauge EB-11	227176 6606259 SW of boundary of ML1579			Deposited dust	30 days (+/- 2 days)
Dust gauge EB-14	gauge 226926 6607770		Tarrawonga Coal Mine	Deposited dust	30 days (+/- 2 days)

Monitor*	Easting	Northing	Residence/Property	Parameter	Frequency		
Dust gauge EB-15	226872	6606994	Tarrawonga Coal Mine	Deposited dust	30 days (+/- 2 days)		
Dust gauge EB-16	225440			<i>"Taylor Vale"</i> Deposited dust		1 4 7 1 4 1 4 1	
TEOM	231803	6596402	"Will-gai"	PM _{2.5}	Continuous		
TEOM	232784	6603658	"Flixton"	PM ₁₀	Continuous		
HVAS	235883	6605901	"Coomalgah" ¹	PM ₁₀	Every 6 days		
E- sampler ES04	227288	6606720	Mine Site**	PM ₁₀	Continuous		
E- sampler ES05	230910 6606695		Mine site**	PM ₁₀	Continuous		
E- sampler ES06	sampler 230867 6605784		"Templemore"	PM ₁₀	Continuous		

^{*} See Figure 1

6.1.3 Deposited Dust

Particles larger than 50 µm are measured as deposited dust. The Environment Protection Authority (EPA) expresses dust deposition criteria in terms of an acceptable increase in dust deposition over the existing background deposition levels to represent both an incremental (project alone) and cumulative criterion. The long-term (annual average) EPA criteria for depositional dust that apply to TCM are provided in Table 1. Dust deposition gauges are exposed for 30 days (+/- 2 days) and analysed for insoluble solids and ash residue. Monitoring for depositional dust is conducted to comply with AS 3580.10.1-2003 Determination of particulates – Deposited Matter – Gravimetric Method.

6.1.4 Greenhouse Gas Emissions

TCM forms part of the WHC's National Greenhouse and Energy Reporting Scheme (NGERS) reporting requirements. Under NGERS requirements, relevant sources as discussed in Section 5.4 of GHG emissions and energy consumption must be measured and reported on an annual basis, allowing major sources and trends in emissions/energy consumption to be identified.

Each financial year, WHC's NGER data is independently assured. During this assurance process the TCM GHG emissions data collection, record keeping and verification are audited to ensure compliance with Section 19 of the National Greenhouse and Energy Reporting Act 2007.

GHG emissions and performance for each calendar year will be reported within the TCM Annual Review. This will include reporting on any new energy savings projects that have been implemented by TCM or are planned to be implemented in the following year.

6.1.5 Blast Fume Management

All blast fume generated from blasting activities will be actively monitored as per TCMs Blast Management Plan and any blast fume over thresholds mentioned within the plan will be reported to the DPE within required time frames.

^{**}E-samplers are mobile units and location may change as required.

¹ Privately-owned land

7 Responsibilities

Table 4- Roles and Responsibilities

Role	Responsibility
Operations Manager, Statutory Open Cut Examiner (OCE), Production Superintendent, Drill & Blast Superintendent and Maintenance Manager	Implementation of operational controls listed in Table 2.
Environmental Superintendent, Officer or delegate	Maintenance and update of this plan and Monitoring program implementation
Property Officer	Provide all new tenants or property managers the 'Mine Dust and You' fact sheet as updated by the EPA.
	Ensure all prospective tenants are aware of the risks associated with residing near the mine (on properties outlined within the EA), as outlined within this plan, by providing the abovementioned factsheet.
	Liaise, as required, with any resident and the Environment Superintendent regarding monitoring data that may be presented to a medical practitioner.
All employees	All employees at TCM share the responsibility of maintaining the Licence to Operate which includes the management of Air Quality and are referenced where applicable in operational control documentation.

8 Data Quality Assurance

- Real-time data (TEOM and E-Sampler) is accessed by a web interface that provides notifications when
 equipment is not operating as required or a dust trigger level is reached. Additional quality checks are
 undertaken when a dust trigger alert is reached. Validations on the daily TEOM averages are
 undertaken by an external contractor.
- Depositional dust samples are analysed monthly by a National Association of Testing Authorities accredited laboratory to determine the mass deposition rate of insoluble solids, ash, combustible matter, soluble solids and total solids from ambient air.
- Monitoring equipment is maintained and calibrated in accordance with manufacturer's specifications and relevant standards.
- Random audits of operating responses to real time air quality management systems are undertaken as required.

9 Compliance obligations

9.1 **Protocol for determining exceedances**

Where monitoring results are above the air quality criteria listed in Table 1, an investigation will be conducted to validate the monitoring result. An investigation will be conducted to validate the monitoring result for an exceedance which includes estimating the contribution from TCM activities and the recording of the reasonable and feasible mitigation measures implemented.

The method for estimating the incremental contribution from TCM activities includes determining the surrounding dust concentrations for the 24 hour period using upwind and downwind concentrations together with meteorological data. An incident is defined when contribution from TCM activities (incremental contribution) exceeds the criteria. If an incident is identified the reporting timeframes will be followed as per Section 9.3, Incident Notification.

Affected landowners of an exceedance of air quality criteria will be notified as soon as practical following receipt of results in accordance Schedule 4 Condition 4 MP 11 0047.

As per Schedule 4, Conditions 1-3, where WHC is entering an agreement with a new prospective tenant on any land where predictions in the EA identified greater emissions than the air quality criteria, the tenant will be advised of their rights that they have under the Project Approval. They will be provided with the latest version of the 'Mine Dust and You' fact sheet issued by NSW health, and advised to consult their medical practitioner to discuss air quality and any health impacts that may arise. TCM will provide the relevant air quality monitoring data, to the satisfaction of the Secretary.

9.2 **Non-compliance Notification**

A written report on a non-compliance with required contents will be provided to the DPHI via the major projects website within 7 days of becoming aware of the non-compliance (or as otherwise directed by the DPHI) as per the requirements of Schedule 5 Condition 8A and 8B, MP 11 0047.

9.3 **Incident Notification**

In accordance with Schedule 5 Condition 8 MP 11 0047 and under Section 148 of the Protection of the Environment Operations Act 1997 (POEO Act) the Secretary of DPHI and representatives of all relevant regulatory agencies will be informed of any incident that;

- has caused, or threatens to cause, material harm to the environment; and
- breaches or exceeds the limits or performance measures/criteria in this approval.

A notification will be provided to the DPHI immediately after becoming aware of an incident via the major project's website. A written report on the incident will be provided to the DPHI via the major project's website within 7 days and a detailed report with 30 days of becoming aware of the incident (or as otherwise directed of DPHI) the requirements **Appendix** MP 11 0047. as per If a non-compliance has been notified to the DPHI as an incident, it does not also need to be notified as a noncompliance.

Reporting to additional regulatory authorities will be executed to meet legal obligations.

94 **Complaint Handling**

Whilst all endeavours will be made by TCM to avoid adverse air quality impacts on local landowners / residents, it is acknowledged that impacts may occur. In order to ensure an appropriate and consistent level of reporting. response and follow-up to any complaints is adopted by TCM, the following complaints management protocol will be followed:

- a publicly advertised telephone complaints line will be in place to receive complaints;
- initial response is provided where practical within 24 hours of receipt of a complaint;
- an investigation will be initiated as per for an exceedance (Section 9.1); and
- all details regarding the complaint including investigation outcomes and follow up actions will be documented in a complaints register. Revision: 10

A copy of the complaints register will be updated monthly on the TCM website. A summary of complaints received every 12 months will be included in the Annual Review

10 Reporting and Review

10.1 Reporting

10.1.1 Regular monitoring reports on webpage

In accordance with Schedule 5 Condition 13, the following reports are updated as per requirements and available on the WHC website, including:

- · Daily weather forecasts for the week;
- Daily non-validated air quality monitoring data;
- Operational responses to noise and dust levels;
- · Monthly reporting results as per the BTM AQMS; and
- Summary reports available on a monthly basis required under the EPL.

10.1.2 Compliance Reporting

An overview of any non-compliances or incidents received during the reporting year are included in TCM's annual review. Refer to section 10.1.5 for further detail on the annual review.

10.1.3 CCC Reporting

A Community Consultative Committee (CCC) has been established and will continue to be operated for the duration of operations on site. Regular briefings to the CCC will be provided, including a summary of results from the TCM air quality monitoring network.

10.1.4 Annual Review

By the end of March each year, TCM will review the environmental performance of TCM (including air quality) for the previous calendar year. The air quality component of the Annual Review includes the required detail as per the DPHI Annual Review Guideline (2015). The Annual Review will be sent to the relevant regulatory agencies for review and made publicly available on the WHC website.

10.2 Review

This Management Plan and the BTM Complex AQMS will be reviewed and evaluated to assess its adequacy and effectiveness, to the satisfaction of the Secretary (in consultation with relevant government agencies) in accordance with Condition 4 and 5 of Schedule 5 of the Project Approval MP 11_0047. This requires that this is undertaken within 3 months of:

- a) The submission of the annual review
- b) The submission of an incident report
- c) The submission of an audit
- d) Any modifications to the conditions of the Approval.

If necessary, the Management Plan and the BTM Complex AQMS will be revised to incorporate any recommended measures to improve the environmental performance of Tarrawonga Coal Mine resulting from audits, community complaints (Section 9.4) and incident investigation findings (Section 9.3). In addition, the review process will include ongoing evaluation of operational modifications, alternative methodologies and new technologies that become available for their potential to lessen air quality impacts.

10.3 Independent Audit

In accordance with Schedule 5 Condition 10 MP 11_0047an Independent Environmental Audit (IEA) of TCM was initially undertaken in 2014 and additional IEAs have been and will continue to be undertaken every 3 years thereafter. The IEA includes a review of the air quality performance of TCM, assess compliance with the requirements in this plan, and implementation of air quality management measures, as per the Independent Audit Post Approval Requirements (2020) or the most up to date version of this document.

11 References

Commonwealth of Australia (2014), Clean Energy Legislation (Carbon Tax Repeal).

Commonwealth of Australia (1979), Environmental Planning and Assessment Act 1979 (EP&A Act).

Commonwealth of Australia (1998), National Environment Protection (Ambient Air Quality) Measure

Commonwealth of Australia (1998), National Environment Protection (National Pollutant Inventory) Measure.

Commonwealth of Australia (2007), National Greenhouse and Energy Reporting Act (NGER Act).

Commonwealth of Australia (2008), National Greenhouse and Energy Reporting (Measurement) Determination.

Commonwealth of Australia (1997), Protection of the Environment Operations Act 1997 (POEO Act).

Commonwealth of Australia (2010), Protection of the Environment Operations (Clean Air) Regulation 2010.

Commonwealth of Australia (2012), National Pollutant Inventory Emission Estimation Techniques Manual for Mining, Version 3.1.

Environment Protection Authority (2022), Approved methods for the modelling and assessment of air pollutants Environmental Protection Licence 12365.

Resource Strategies (2012), Tarrawonga Coal Project Environmental Assessment– specifically Section 4.7

PAE Holmes (2012), Tarrawonga Coal Project - Appendix D Air Quality and Greenhouse Gas Assessment

Standards Australia (2008) AS 3580.9.8-2008: Methods for sampling and analysis of ambient air - Determination of suspended particulate matter - PM10 continuous direct mass method using a tapered element oscillating microbalance analyser.

Standards Australia (2007) AS 3580.1.1:2007: Methods for sampling and analysis of ambient air - Guide to siting air monitoring equipment.

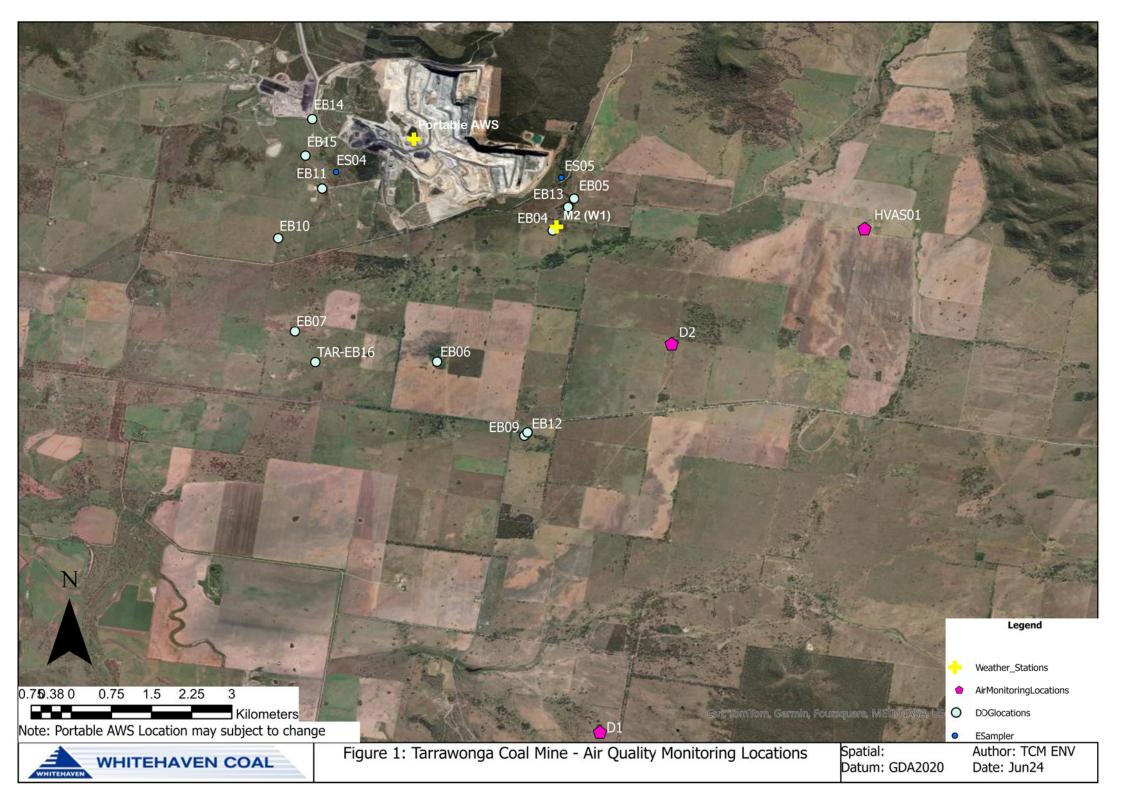
Standards Australia (1987) AS 2923-1987: Ambient air - Guide for measurement of horizontal wind for air quality applications.

11.1 Version Control

Revision	Description	Author	Authorised by	Date
0 Ed1	Document Developed	R.W.Corkery& CO Pty Ltd	Keith Ross	December 2005
1	Document review	Jill Scealy	Danny Young	June 2009
0 Ed2	2010 Modification Review	Jill Scealy	Danny Young	March 2011
1	Inclusion of GHG Management information	Jill Johnson	Danny Young	January 2012
2	MP11_0047 Review	Lachy Johnson	Jill Johnson	June 2014
3	MP11_0047 Review	Lachy Johnson	Jill Johnson	September 2014
4	MP11_0047 Review	Lachy Johnson	Jill Johnson	January 2015
5	MP11_0047 Review	Lachy Johnson	Anthony Margetts	June 2017
6	MP11_0047 Review	Todoroski Air Sciences	Environmental Superintendent	August 2018
7	MP11_0047 Review	Todoroski Air Sciences	Environmental Superintendent	October 2019
8	Response to RFI from DPIE	Todoroski Air Sciences	Environmental Superintendent	February 2021
9	MP11_0047 Review (MOD7)	TCM	TCM	May 2021
10	MP11_0047 review	TCM	Environmental Superintendent	November 2024

Figure 1: Air Quality Monitoring Locations

Note: this map replaces SOC-1 in MP 11_0047



Appendix 1: Project approval conditions

Table 5 – MP11 0047 Air Quality and Greenhouse Gas Management Requirements

Table 5 – MP11_0047 Air Quality and Greenhouse Gas Management Required Approval Condition	Relevant section of this AQGHGMP
Operating Conditions	
Schedule 3 Condition 28. The Proponent shall:	Section 5
(a) implement best practice air quality management practices on site, including all reasonable and feasible measures to minimise odour, fume and dust emissions of the project;	
(b) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting, predictive and real time air dispersion modelling and real-time air quality monitoring data to guide the day-to-day planning of mining operations and implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this approval;	Section 6
(c) manage PM _{2.5} levels in accordance with any requirements of the EPL;	Section 6
(d) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events;	Section 6
(e) minimise any visible off-site air pollution;	Section 5
(f) minimise the surface disturbance of the site generated by the project; and	Section 5
(g) co-ordinate the air quality management on site with the air quality management at other mines within the Leard Forest Mining Precinct to minimise the cumulative air quality impacts of the mines, to the satisfaction of the Secretary.	Section 2.1 and 6
Air Quality and Greenhouse Gas Management Plan	
Schedule 3 Condition 29. The Proponent shall prepare and implement an Air Quality and Greenhouse Gas Management Plan for the project to the satisfaction of the Secretary. This plan must:	Section 3
(a) be prepared in consultation with the EPA and be submitted to the Secretary for approval by the end of May 2013;	
(b) describe the measures that would be implemented to ensure:	Section 5 and 6
 best management practice is being employed; 	
 the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and 	
compliance with the relevant conditions of this consent.	
(c) describe the proposed air quality management system	Section 5 and 6
(d) include a risk/response matrix to codify mine operational responses to varying levels of risk resulting from weather conditions and specific mining activities;	Section 5.2, Appendix 1 and 2
(e) include commitments to provide summary reports and specific briefings at CCC meetings on issues arising from air quality monitoring;	Section 10.1.3
(f) include an air quality monitoring program that:	Section 6, 8 and 9.
 uses a combination of real-time monitors and supplementary monitors to evaluate the performance of the project; 	
 adequately supports the proactive and reactive air quality management system; 	
 includes PM2.5 monitoring; 	
 includes monitoring of occupied mine-owned residences and residences on the air quality affected land in Table 1, subject to the agreement of the tenant and/or landowner; 	
 evaluates and reports on the effectiveness of the air quality management system; 	
 includes sufficient random audits of operating responses to real time air quality management systems to determine the ongoing effectiveness of these responses in maintaining the project within the relevant criteria in this Schedule and the requirements of conditions 24 and 25, above; 	
 includes a protocol for determining any exceedences of the relevant conditions in this approval; and 	
(g) includes a Leard Forest Mining Precinct Air Quality Management Strategy that has been prepared in consultation with other coal mines in the Precinct to minimise the cumulative air quality impacts of all mines within the Precinct, that includes:	Section 2.1

Approval Condition	Relevant section of this AQGHGMP
 systems and processes to ensure that all mines are managed to achieve criteria; 	ve their air quality
 a shared environmental monitoring network and data sharing protocol; 	
 control monitoring site(s) to provide real time data on background air quinfluenced by mining in the Leard Forest Mining Precinct and represent air quality); 	
 a shared predictive and real time air dispersion model covering the Lea Precinct to be used for assessment of cumulative impacts, optimising lo shared real time monitoring network, validation of air predictions and op measures; and 	ocation of the
 procedures for identifying and apportioning the source/s and contribution air impacts for both mines and other sources, using the air quality and remonitoring network and appropriate investigative tools such as modelling plume dispersion, dual synchronised monitors and chemical methods of apportionment (where possible). 	meteorological ng of post incident

Table 6 - MP 11_0047 General Requirements

Approval Condition	Relevant Section of this AQGHGMP
Schedule 3 Condition 22. Control of offensive odour	Section 5.4
Schedule 3 Condition 23. Minimising Greenhouse Gas emissions	Section 5.3
Schedule 3 Condition 27. Mine owned land	Section 4.3
Schedule 3 Condition 30. Meteorological Monitoring	Section 6.1.1
Schedule 4 Condition 1-3. Notification of Landowners/Tenants	Section 9.1
Schedule 5 Condition 8, 8A and 8B. Online reporting	Section 9.2 and 9.3

Appendix 2: Dust Trigger Action Response Plan

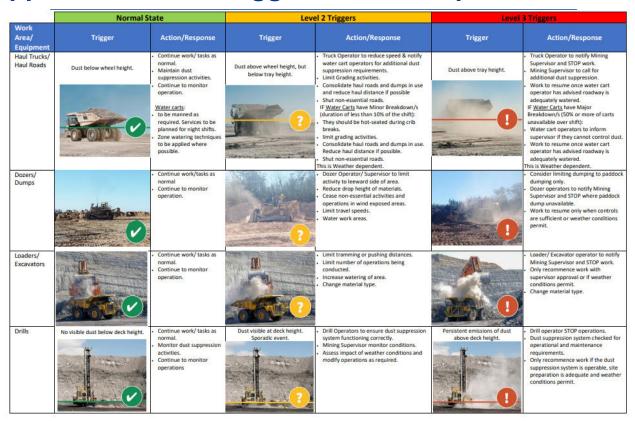


Figure 2 Dust TARP

Appendix 3: Meteorological Risk Response Matrix

Location/ Activity	Wind Speed <7m/s (Normal - Low Risk Conditions)	Wind Speed from 7 to 10 m/s (Medium Risk	Wind Speed >10m/s (Medium and <u>High Risk</u> Conditions) ^{1, 2} North South East West			
wind Direction	All	All	North	South	East	west
Highest dumping area close to southern boundary			STOP	STOP	STOP	STOP
Elevated dumping area close to southern boundary			STOP	CHECK Activity and STOP if emissions cannot be controlled	STOP	STOP
Elevated dumping area close to northern boundary		Formal visible	STOP	STOP	STOP	STOP
Highest Dumping area close to western and northern boundaries	No specific action required. Visible dust TARP operates at all times	No specific action required. Visible dust TARP operates at all times Activity is suspended if its emissions cannot be	STOP	STOP	STOP	STOP
Elevated central dumping area			operates at all times Activity is suspended if its emissions	CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled
Soil Stripping and Vegetation Clearing		conditied.	STOP	STOP	STOP	STOP
Crusher and Loader			CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled
Excavators and Dozers			CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled	CHECK Activity and STOP if emissions cannot be controlled

¹ May result in assessment and implementation of additional mitigation measures or suspension of activity.

Figure 3 Meteorological Risk Response Matrix

² SMS message also sent to OCE, Operations Manager and Environmental Team representatives.

Department of Planning, Housing & Infrastructure



Group Manager – Approvals and Environment Tarrawonga Coal Pty Ltd PO Box 600 Gunnedah, NSW, 2380

27/11/2024

Tarrawonga Coal Expansion – Air Quality and Greenhouse Gas Management Plan (AQGGMP)

Dear

Thank you for submitting the revised Air Quality and Greenhouse Gas Management Plan in accordance with Condition 29, Schedule 3 of the consent for the Tarrawonga Coal Expansion (MP11_007). I also acknowledge your response to the Department's review comments and request for additional information.

I note the revised AQGGMP contains the information required by the conditions of approval.

Accordingly, as nominee of the Planning Secretary, I approve the revised AQGGMP (rev 10, November 2024).

You are reminded that if there are any inconsistencies between the AQGGMP and the conditions of approval, the conditions prevail.

Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact

.

Yours sincerely



Director

Resource Assessments

As nominee of the Planning Secretary