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AIR QUALITY AND GREENHOUSE GAS MANAGEMENT PLAN

Tahmoor Coal

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Contents

1 Purpose

The purpose of this Air Quality and Greenhouse Gas Management Plan (hereafter referred to as the 'Plan', or 'AQGHGMP') is to document the management practices and control measures which have been implemented by Tahmoor Coking Coal Operations (TCCO) at Tahmoor Coal, to maintain compliance with all relevant approval conditions related to air quality. In addition to air quality and particulate matter emissions, this Plan also identifies control measures aimed at minimising the release of fugitive greenhouse gas emissions from the operation of Tahmoor Coal

2 Scope

This Plan applies to all land owned, leased and managed by Tahmoor Coal.

The key objectives of this Plan are to:

a) Describe the practical mitigation and control measures implemented to minimise the generation of particulate matter emissions (colloquially referred to as dust) arising from the activities at Tahmoor Coal;

b) Identify personnel responsible for the effective implementation of these controls; and

c) Identify a process of review and improvement.

Tahmoor Coal's annual review of the Broad-Brush Risk Assessment (BBRA) acts as a program to investigate and implement improvements directly relating to refining the performance of the mine over time.

3 Planning

3.1 Environmental Protection Licence

TCCO's Environmental Protection Licence 1389 (EPL) does not specify ambient air quality limits, however under Section 4 (Operating Conditions), a general condition is provided in Table 1.Table 1: EPL 1389 Operating Conditions

	EPL Condition Description	Section Where Addressed in this Plan
Section 4 Condition 03.1	The premises must be maintained in a condition which minimises or prevents the emission of dust from the premises.	Section 1.3 Section 3

3.2 Development Consent Conditions

Conditions of consent related to air quality and greenhouse gas emission management are provided in **Table 2**.

Table 2: Conditions of Consent

Development Consent	Condition Number	Condition Description	Section where addressed in this plan
DA 1975	DU 2	The external drift conveyor and transfer building, the inclined external coal transfer conveyor, the 3x 2000 tonne coal storage bins and the cross coal conveyor at the top of these bins shall be totally enclosed with sheeting as shown on detail on drawing No. A2/1665.	Section 3.1

<table>
<tr><th>Development Consent</th><th>Condition Number</th><th>Condition Description</th><th>Section where addressed in this plan</th></tr>
<tr><td></td><td>DU 4</td><td>A fully automatic and effective water spray system shall be installed in the 20,000 tonne emergency stockpile area to maintain an effective dampening of the entire coal surface to a minimum depth of 10 centimetres. Details of the system are to be submitted to the Commission before any installation is commenced.

A reliable warning system shall be installed to operate on a 24 hour per day, 7 day per week basis to ensure that water sprays on the stockpile are operated as early as possible before weather changes likely to be accompanied by strong winds, and in any case, whenever the wind velocity rises above 10 meters per second in dry weather.</td><td>Section 3.1
Section 3.3</td></tr>
<tr><td></td><td>DU 5</td><td>Effective water spray systems shall be installed at each conveyor transfer point external to the drift portal and around the bottom discharge gate of each 2,000 tonne coal storage bin. The operation of all water sprays shall be automatically controlled.</td><td>Section 3.1</td></tr>
<tr><td></td><td>DU 6</td><td>The main internal access roadway from the property entrance on the Hume Highway to the rail truck loading area beneath the 3x 2,000 tonne coal storage bins, the car parking area, and all internal access roadways connecting to other facilities at the central services site shall be permanently sealed with bitumen or its equivalent and kept clean and free from dust at all times.</td><td>Section 3.1</td></tr>
<tr><td>DA 1988</td><td>5</td><td>(Coal haulage by road) all trucks shall be kept clean and loads covered at all times to avoid nuisance from windblown dust.</td><td>Section 3.1</td></tr>
<tr><td>DA 67 – 98 (2020 MOD, Modification 5)</td><td>36</td><td>Greenhouse Gas Emissions

The Applicant must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the Tahmoor Coal, to the satisfaction of the Secretary.</td><td>Section 4.5
Section 4.6
Section 4.7</td></tr>
<tr><td></td><td>37</td><td>Air Quality Assessment Criteria

The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the Tahmoor Coal do not exceed the criteria listed in Tables 3 at any residence on privately-owned land or on more than 25 percent of any privately-owned land.

Table 3
<table>
<tr><th>Pollutant</th><th>Averaging Period</th><th>Criterion</th></tr>
<tr><td>Particulate matter < 10 µm (PM10)</td><td>Annual</td><td>a,c 25 µg/m3</td></tr>
<tr><td>Particulate matter < 10 µm (PM10)</td><td>24 hour</td><td>b 50 µg/m3</td></tr>
<tr><td>Particulate matter < 2.5 µm (PM2.5)</td><td>Annual</td><td>a,c 80 µg/m3</td></tr>
</table></td><td>Section 4.1
Appendix 1</td></tr>
</table>

Development Consent	Condition Number	Condition Description	Section where addressed in this plan
		<table><tr><td>Particulate matter < 2.5 µm (PM2.5)</td><td>24 hour</td><td colspan="2">b 25 µg/m3</td></tr><tr><td>Total suspended particulates (TSP)</td><td>Annual</td><td colspan="2">a,c 90 µg/m3</td></tr><tr><td>Deposited dust</td><td>Annual</td><td>b 2 g/m2/month</td><td>a 4 g/m2/month</td></tr></table> Notes: a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources). b Incremental impact (i.e. incremental increase in concentrations due to the project on its own). c Excludes extraordinary events such as bushfires, prescribed burning, dust storms, fire incidents or any other activity agreed by the Secretary. d Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.	
	38	Operating Conditions The Applicant must: (a) implement best practice air quality management on site, including all reasonable and feasible measures to minimise the off-site odour, and dust emissions generated by the Tahmoor Coal including those generated by any spontaneous combustion on site; (b) minimise any visible air pollution generated by the Tahmoor Coal; (c) regularly assess the air quality monitoring and meteorological forecasting data, and modify and/or suspend operations on site to ensure compliance with the relevant conditions of consents for the Tahmoor Coal, to the satisfaction of the Secretary.	Section 3.1 Section 3.4
	39	Air Quality & Greenhouse Gas Management Plan The Applicant shall prepare and implement an Air Quality & Greenhouse Gas Management Plan for the Tahmoor Coal to the satisfaction of the Secretary. This plan must: (a) be prepared in consultation with OEH, and submitted for approval to the Secretary by 31 October 2012; (b) describe the measures that would be implemented to ensure compliance with the relevant conditions of consents for the Tahmoor Coal; (c) describe the measures that would be implemented to minimise the release of greenhouse gas emissions from the Tahmoor Coal; and	Entire Document

Development Consent	Condition Number	Condition Description	Section where addressed in this plan
		(d) include an air quality monitoring program, that includes a protocol for determining exceedances with the relevant conditions of consents for the Tahmoor Coal. The Applicant must implement the Air Quality and Greenhouse Gas Management Plan as approved by the Secretary.	
	40	Notification of Landowners Within 2 weeks of obtaining monitoring results showing an exceedance of the relevant criteria in Tables 1-3, the Applicant shall notify the affected landowner and tenants in writing of the exceedance, and provide monitoring results to each of these parties until the Tahmoor Coal is complying with the relevant criteria again.	Section 5.3
	41	Independent Review If an owner of privately-owned land considers the Tahmoor Coal to be exceeding the relevant criteria in Tables 1-3, then he/she may ask the Secretary in writing for an independent review of the impacts of the Tahmoor Coal on his/her land. If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision the Applicant must: (a) commission a suitably qualified, experienced and independent person, whose appointment has been approved by the Secretary, to: • consult with the landowner to determine his/her concerns; • conduct monitoring to determine whether the Tahmoor Coal is complying with the relevant criteria in Tables 1-3; and • if the Tahmoor Coal is not complying with these criteria, then identify the measures that could be implemented to ensure compliance with the relevant criteria; and (b) give the Secretary and landowner a copy of the independent review.	Not Referenced
	42	If the independent review determines that the Tahmoor Coal is complying with the relevant criteria in Tables 1-3, then the Applicant may discontinue the independent review with the approval of the Secretary. If the independent review determines that the Tahmoor Coal is not complying with the relevant criteria in Tables 1-3, then the Applicant must: (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent person, and conduct further monitoring until the Tahmoor Coal complies with the relevant criteria to the satisfaction of the Secretary; or (b) secure a written agreement with the landowner to allow exceedances of the relevant criteria	Not Referenced

3.3 Impact Assessment Criteria

The Office of Environment and Heritage (OEH) have provided guidelines for modelling and assessment of air pollutants. The OEH Impact Assessment Criteria, extracted from the DEC Approved Methods and Guidance from the Modelling and Assessment of Air Pollutants in New South Wales (DEC 2005), are

provided in**Table 3**. Tahmoor Coal depositional dust samples are collected monthly and reviewed against this annual averaging criterion to identify trends and action as required.

Table 3: OEH Impact Assessment Criteria

Criteria	Averaging Period	Concentration (G/M2/Month)
maximum increase in deposited dust levels	Annual	2
Maximum total deposited dust level	Annual	4

4 Implementation

4.1 Overview of Dust Management System

Based on a surface characterisation study, along with an audit and risk assessment conducted at Tahmoor Coal in August 2011, each work area at the site has been categorised and rated for its dust generation risk level without dust controls (**Table 4**). Table 5provides details of the type of controls that are available for use in these areas (and other additional areas) and how they may be accessed in instances of high dust levels. Figure 1provides the key transfer points within the Tahmoor Coal Surface Operations.

In addition to the characterisation and dust gap analysis, risks related to air quality are identified annually in both the Broad Brush Risk Assessment (BBRA) for Tahmoor Coal and the Environment & Community specific BBRA (ECBBRA). The hazards identified in these risk assessments are included in this Plan.

Table 4: Risk of Dust Generation per Work Area

Work Areas	Risk of Dust Generation
Unsealed Roads – General	High
Sealed Roads – Refuse Area Haul Road	Low
Sealed Roads – Coal Handling Preparation Plant (CHPP) Workshop & Office Areas	Low
Sealed Roads – Pit top, Stores and Yard area	Medium
Exposed Areas – Unsealed Storage Yard	Medium
Exposed Areas – Refuse Emplacement Area	Low
Coal Stockpiles – Run of Mine (ROM) Coal	High
Coal Stockpiles Product Coal	High
Rehabilitated Areas – Refuse Emplacement Area	Low

Table 5: Work Areas and Risk of Dust Generation (without Controls)

Work Area By Type	Dust Control Available	Access to Controls / Responsibility
Unsealed Roads – General	Water Truck	Cleary Bros water truck on daily circuit, and increased frequency based on weather conditions. If dusty conditions are detected which require watering, personnel to contact CHPP Control Room to notify water truck
	Chemical Dust suppression	Petrotac chemical dust suppression applied monthly (or more as required). E&C Department to coordinate monthly application.
	Sealing	Identified on a risk based approach by E&C during audits and inspections.

Work Area By Type	Dust Control Available	Access to Controls / Responsibility
	Reduction of speed limits	Operator responsibility to drive to conditions, reduce speed as required until dust controls are implemented.
	Reduction of traffic	Operator responsibility to drive to conditions, reduce trafficking as required until dust controls are implemented.
	Reduction of haul distances	Where practical the distances hauled will be minimised. Haulage route will be determined with input from CHPP and haulage contractor.
	Visual inspections	By supervisor at the start of each shift, and by all personnel during work (i.e. report dusty conditions to control room for action).
	Minimise Spillage / avoid overloading	Operators to avoid overloading trucks to reduce spillage and arrange clean-up of any spills as they occur.
	Covering of loads if hauling dry (<10% moisture) material	Haulage supervisor to ensure trucks with load covers are available and used. Operator responsibility to ensure loads is covered.
	Revegetation	Identified on a risk-based approach by E&C during audits and inspections.
Sealed Roads – Refuse Area Haul Road	Water Truck	Cleary Bros water truck on daily circuit, and increased frequency based on weather conditions. If dusty conditions are detected which require watering, personnel to contact CHPP Control Room to notify water truck.
	Road Sweeper	E&C Department to coordinate road sweeper as required.
	Reduction of haul distances	Where practical the distances hauled will be minimised. Haulage route will be determined with input from CHPP and haulage contractor.
	Visual inspections	By supervisor at the start of each shift, and by all personnel during work (i.e. report dusty conditions to control room for action).
	Minimise spillage / avoid overloading	Operators to avoid overloading trucks to reduce spillage, and arrange clean-up of any spills as they occur.
	Covering of loads if hauling dry (<10% moisture) material	Haulage supervisor to ensure trucks with load covers are available and used. Operator responsibility to ensure loads is covered.
Sealed Roads – Pit Top, Stores and Yard Area	Water Truck	Cleary Bros water truck on daily circuit, and increased frequency based on weather conditions. If dusty conditions are detected which require watering, personnel to contact CHPP Control Room to notify water truck.
	Chemical Dust suppression	Petrotac chemical dust suppression applied monthly (or more as required). E&C Department to coordinate monthly application.
	Sealing	Identified on a risk based approach by E&C during audits and inspections.
	Reduction of speed limits	Operator responsibility to drive to conditions, reduce speed as required until dust controls are implemented.
	Reduction of traffic	Operator responsibility to drive to conditions, reduce trafficking as required until dust controls are implemented.
	Visual inspections	By supervisor at the start of each shift, and by all personnel during work (i.e. report dusty conditions to control room for action).

Work Area By Type	Dust Control Available	Access to Controls / Responsibility
	Revegetation	Identified on a risk based approach by E&C during audits and inspections.
Exposed Areas – Refuse	Reduction of traffic	Operator responsibility to drive to conditions, reduce trafficking as required until dust controls are implemented.
Emplacement Areas	Visual Inspections	By supervisor at the start of each shift, and by all personnel during work (i.e. report dusty conditions to control room for action).
	Revegetation	Identified on a risk based approach by E&C during audits and inspections.
Coal Stockpiles – ROM Coal	Automatic water sprays	Automatic sprays triggered by wind speed monitoring at the on-site Weather Station, linked back to CHPP Citect Control. If wind is in excess of 5m/s they are automatically triggered. The CHPP Control Room also has the ability to manually override them so that they may be switch on at any time as required by conditions.
	Manual water sprays	The CHPP also have the ability to manually set up additional sprays as required by conditions.
	Water truck	Cleary Bros water truck on daily circuit, and increased frequency based on weather conditions. If dusty conditions are detected which require watering, personnel to contact CHPP Control Room to notify water truck.
	Visual inspections	By supervisor at the start of each shift, and by all personnel during work (i.e. report dusty conditions to control room for action).
	Reduction of speed limits	Operator responsibility to drive to conditions, reduce speed as required until dust controls are implemented.
	Reduction of traffic	Operator responsibility to drive to conditions, reduce trafficking as required until dust controls are implemented.
Coal Stockpiles – Product Coal	Water truck	Cleary Bros water truck on daily circuit, and increased frequency based on weather conditions. If dusty conditions are detected which require watering, personnel to contact CHPP Control Room to notify water truck.
	Visual inspections	By supervisor at the start of each shift, and by all personnel during work (i.e. report dusty conditions to control room for action).
	Reduction of speed limits	Operator responsibility to drive to conditions, reduce speed as required until dust controls are implemented.
	Reduction of traffic	Operator responsibility to drive to conditions, reduce trafficking as required until dust controls are implemented.
	Visual inspections	By E&C personnel during work (i.e. report dusty conditions to control room for action), and through audits and inspections.
	Revegetation	Identified on a risk based approach by E&C during audits and inspections.
Rehabilitated Areas – Refuse	Reduction of traffic	Operator responsibility to drive to conditions, reduce trafficking as required until dust controls are implemented.

Work Area By Type	Dust Control Available	Access to Controls / Responsibility
Emplacement Area	Reduction of haul distances	Where practical the distances hauled will be minimised. Haulage route will be determined with input from CHPP and haulage contractor.
Additional Areas – Off Site Road Haulage	Visual inspections	By supervisor at the start of each shift, and by all personnel during work (i.e. report dusty conditions to control room for action).
	Minimise spillage/avoid overloading	Operators to avoid overloading trucks to reduce spillage, and arrange clean-up of any spills as they occur.
	Covering of loads if hauling dry (<10% moisture) material	Haulage supervisor to ensure trucks with load covers are available and used. Operator responsibility to ensure loads is covered.
	Securing tailgate	Operator responsibility to ensure tailgate is secured to prevent spillage or leaking of wet material.
	Wash down trucks prior to exiting site	Operator responsibility to ensure truck is free of loose mud/coal/other material before leaving site to prevent tracking this material onto public roads.
	Visual inspections	By E&C personnel during work (i.e. report dusty conditions to control room for action), and through audits and inspections.
	Revegetation	Identified on a risk based approach by E&C during audits and inspections.
Additional Areas – Topsoil Stockpiles	Reduction of traffic	Operator responsibility to drive to conditions, reduce trafficking as required until dust controls are implemented.
	Enclosed conveyors, under pans, belt cleaners, skirting points, chutes	Currently within the plant there are already a number of established controls in use. Maintenance is organised by the CHPP Supervisors as scheduled by work orders or as required.
Additional Areas – Coal Handling Transfer Points		

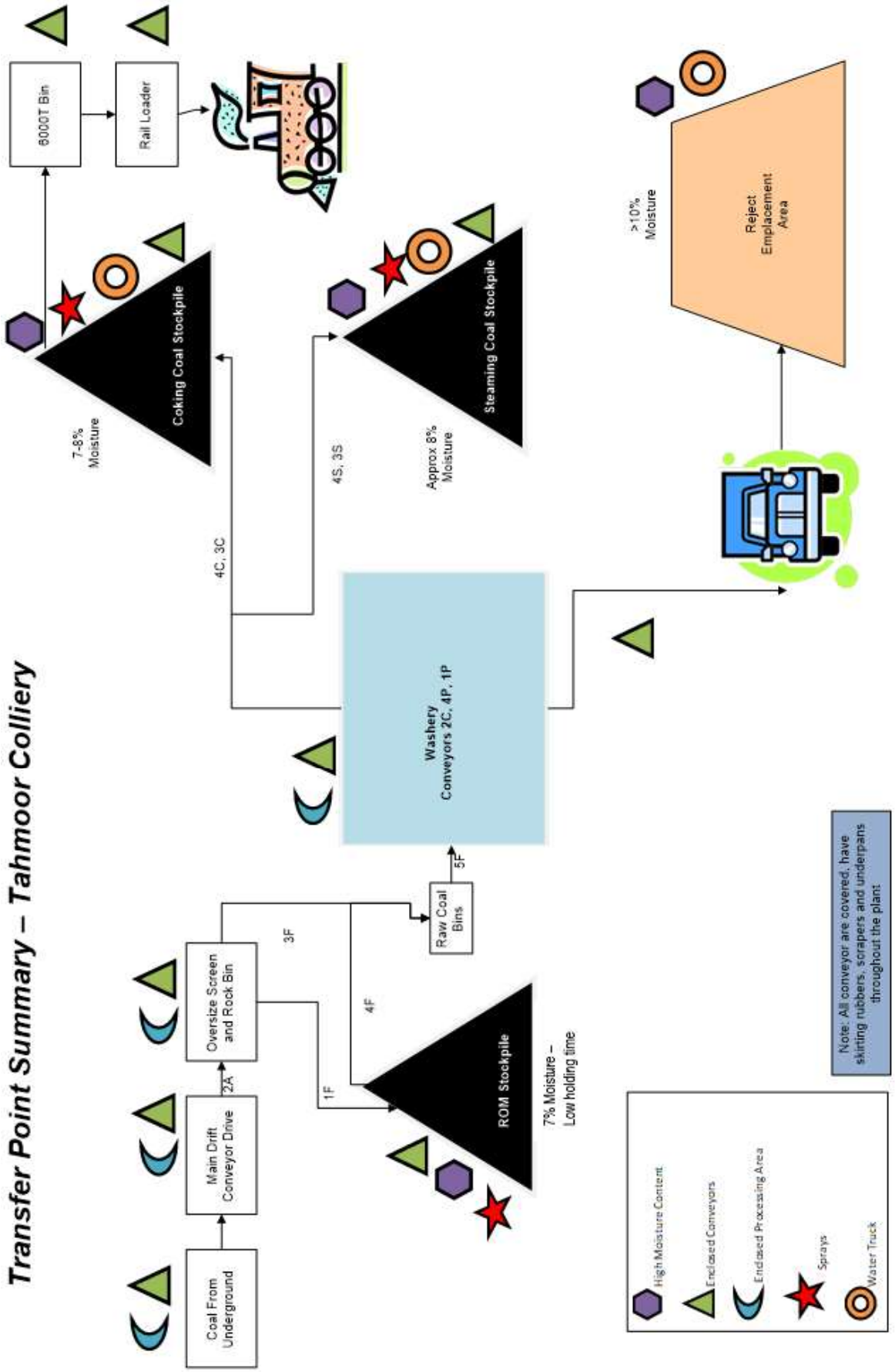


Figure 1– Tahmoor Coal Transfer Points

4.2 Materials Characterisation

There are a number of different materials types on-site with the potential to generate dust. In 2012, samples were taken from a number of points to characterise and identify the risks of different areas across the surface operations. **Table 6** and **Figure 3** provide the risk rankings by colour at key locations.

Table 6: Risk Matrix for Characterisation Samples by Sample Location

	ROM Coal Stockpile	Product Coal Stockpile – Steaming	Product Coal Stockpile – Coking	Unsealed Road – REA light vehicle track	Reject – REA Area 14 dumped in past month	Topsoil – stockpile
Moisture Content						
Particle Size Distribution						
Heavy Metal Concentration						

Materials were analysed for a number of heavy metals including Arsenic, Cadmium, Nickel, Zinc and Lead. All levels were below the National Environment Protection Measures (NEPM) soil investigation values, and hence not considered a risk.

Moisture content varied between 2.7% and 7.6% with Coking Coal, Unsealed Roads and Reject having the lowest and hence the greatest potential risk.

Figure 2provides a summary of the Particle Size Distribution from the material characterised at Tahmoor Coal. Those with the greatest amount of silts and clays pose the greatest risk for dust generation, and the coarser materials such as gravel and cobbles pose a much lower risk.

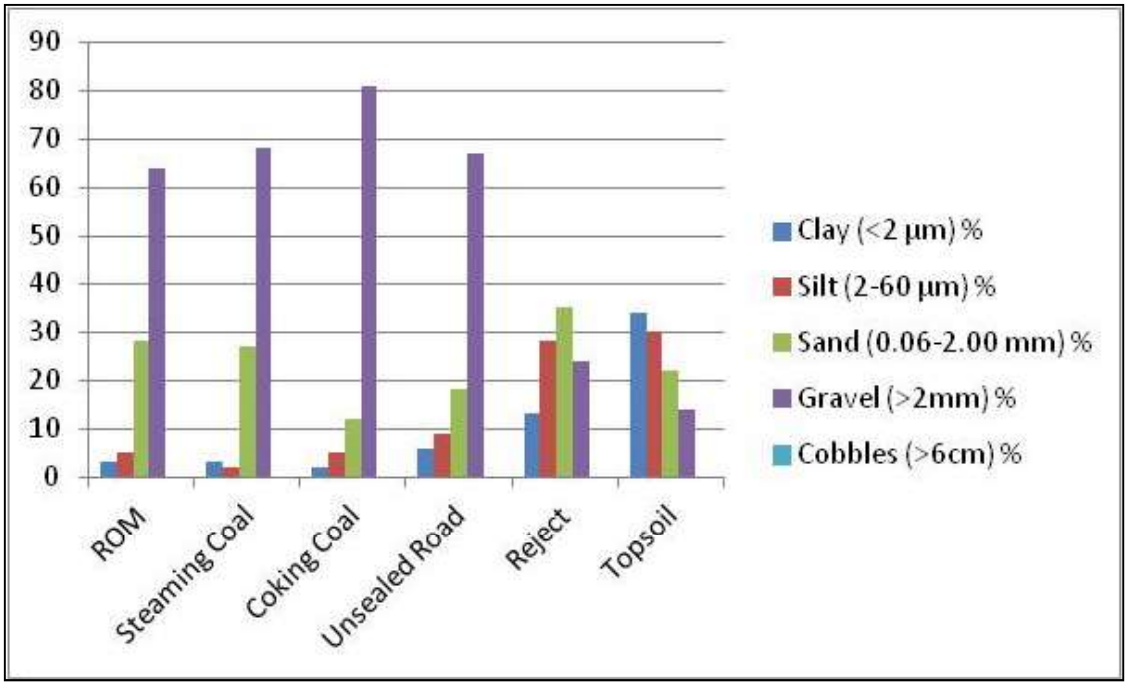


Figure 2– Tahmoor Coal Particle Size Distribution by Sample Location

Figure 3– Potential risk of Dust Generation by Surface Type (Red = High Risk, Orange = medium Risk, Green = Low Risk).

4.3 Dust Suppression Infrastructure

Both automatic and manual sprays are utilised on coal stockpiles at Tahmoor Coal. Locations of sprays used on the product coal stockpiles are provided **in Figure 4.**

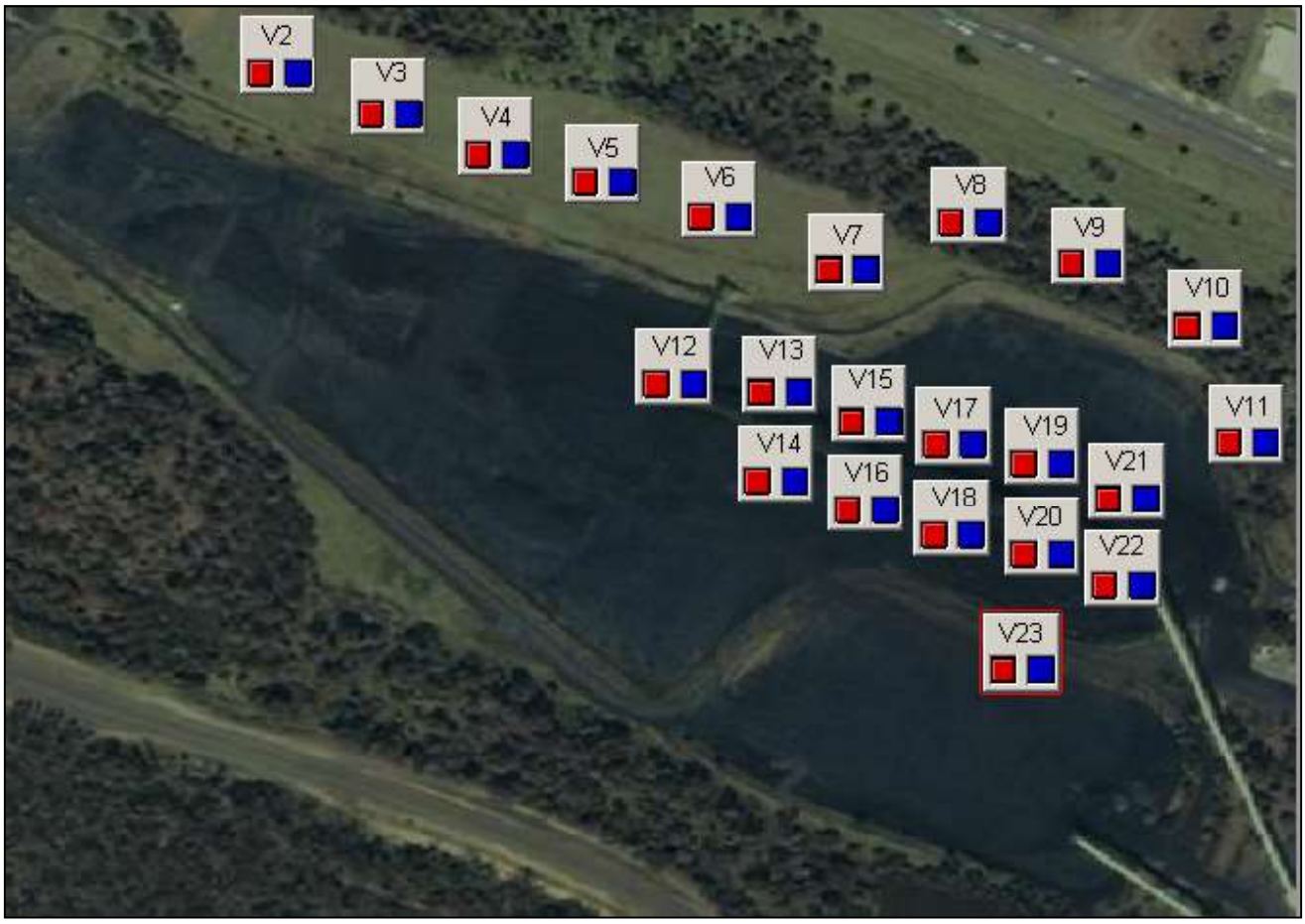


Figure 4– Location of Product Coal Stockpile Sprays

There are two dedicated water truck fill points on-site. One is located next to the start of the REA 3R conveyor, and the other at the end of 3R at the base of the reject bin. Mine process water is supplied from the M4 dam and pumped to both fill points for use. These locations are provided in **Figure 5.**

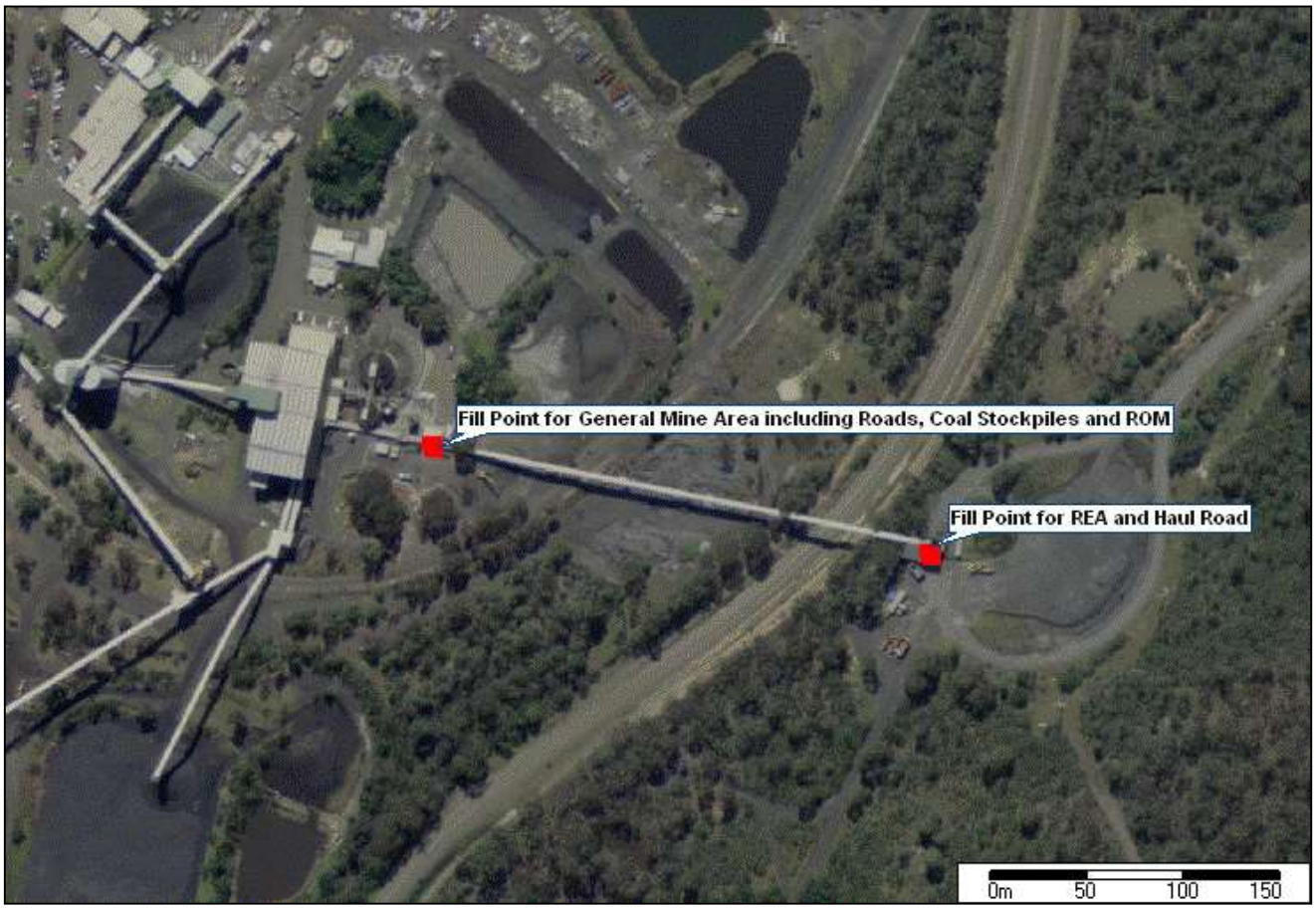


Figure 5– Location of Water Cart Fill Points

Overwatering of the unsealed road must not occur as it may cause erosion and increased likelihood of dust generation. Suitably trained operators and dedicated watering equipment should be used to ensure the amount of water sprayed onto roads effectively controls dust, while not affecting the integrity of the road.

4.4 Visual Triggers

In 2011, following the 'Katestone Benchmarking Study' prepared for OEH, Tahmoor Coal implemented the Minimum Requirements for Dust Management which Tahmoor Coal has implemented. Amongst other dust requirements, the new standard provides a guide for visual triggers to be used on mobile equipment. Tahmoor has adopted the visual trigger system provided in Upper Hunter Valley Open Cut Coal Mine Draft Dust Assessment Handbook for mobile equipment at Tahmoor Coal Operations.

If wheel generated dust is visible above wheel arches then a water truck should be called, and operations modified to control emissions until the road is watered (**Figure 6**).

If wheel generated dust (or dust from loading or tipping) is visible above the tray height or cabin roof then operations should be modified or ceased until dust controls are implemented (**Figure 7**).

Figure 6– Visual Trigger (Dust must be below wheel arches)

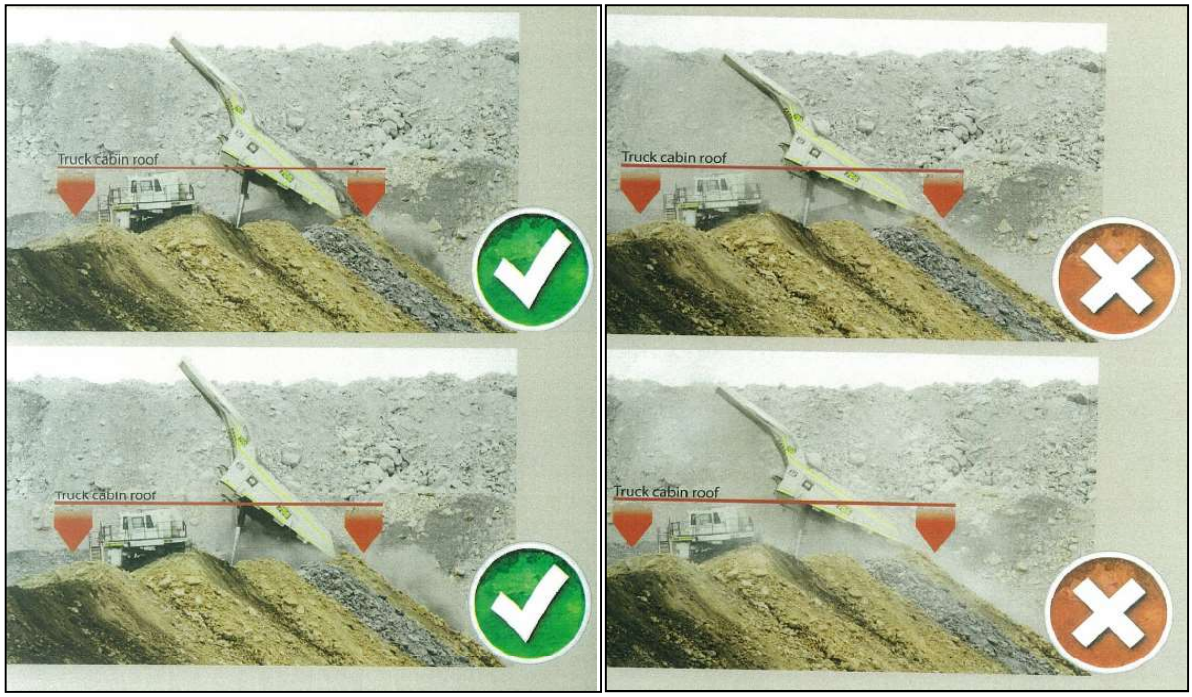


Figure 7– Visual Trigger (Dust must be below tray height / cabin roof)

5 Measurement and Evaluation

5.1 Air Quality Monitoring – Depositional Dust

Tahmoor Coal undertakes due diligence depositional dust monitoring as part of their commitment to responsible environmental management. Dust monitoring is undertaken using both on-site and off-site dust deposition gauges.

Tahmoor Coal historical Environmental Impact Statements (EIS) included assessment of baseline air quality and atmospheric conditions, including some proposed controls which have been carried through to present day from the original site development.

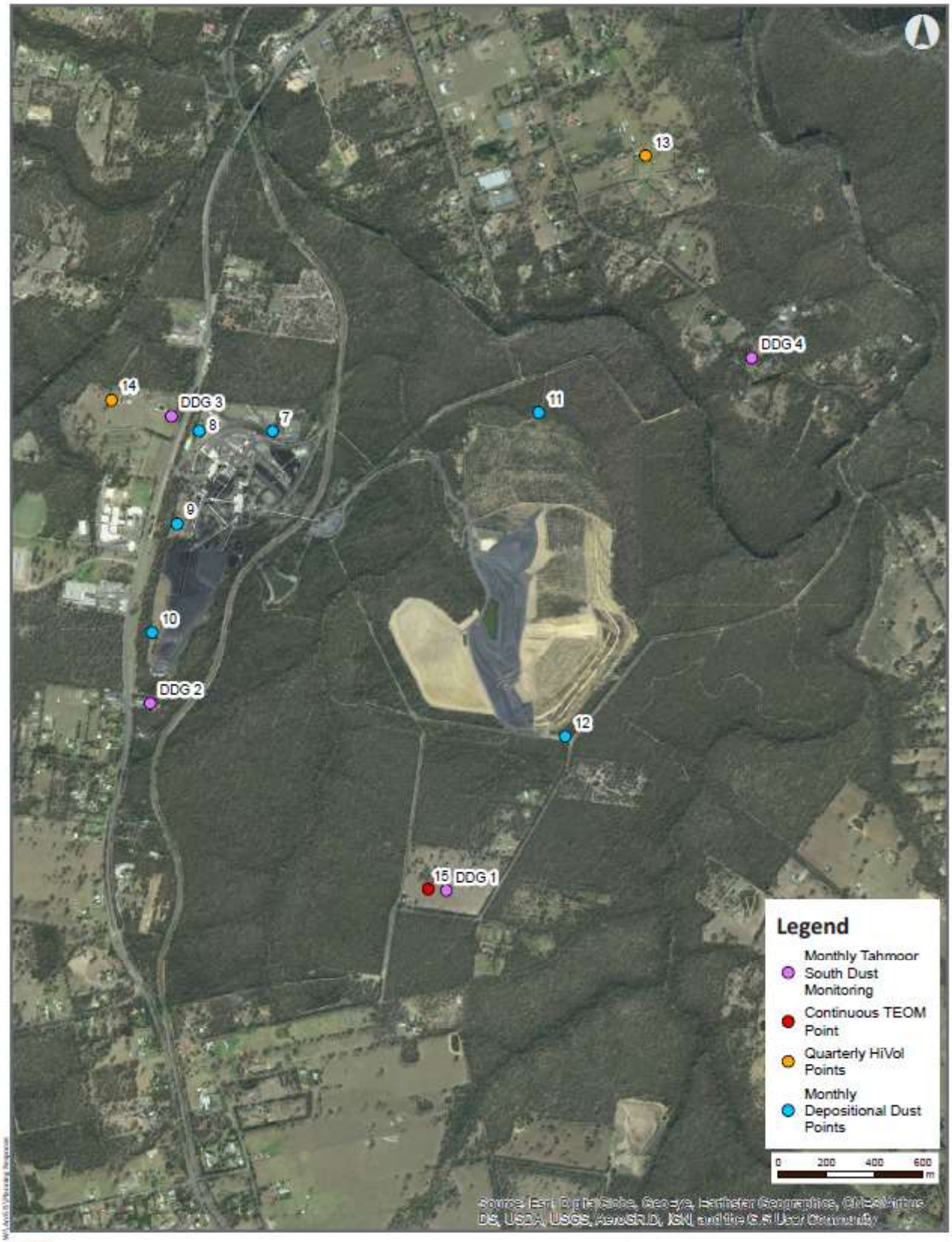
Table 6 and **Figure 8** present the locations of on-site dust gauges, and **Figure 9** presents the locations of off-site dust gauges. Note that whilst these locations are generally fixed and constant, new locations may be introduced and old locations may be removed as required. These changes will be reflected through internal review of this Plan.

Dust deposition gauges are sampled monthly. The parameter measured for each dust gauge is insoluble solids, reported as g/m2/month. Dust deposition is compared to the impact assessment criterion of 4 g/m2/month set by the Approved Methods and Guidance for the Modelling and Assessment of Air Pollutants in New South Wales (NSW DEC 2005).

Explanation and justification for the site's air quality monitoring program is provided in Appendix 1 – Tahmoor Coal Air Quality Monitoring Program (AECOM, 2012).

Table 7: Locations of On-site Dust Gauges

Dust Gauge No.	EPA ID Number	Description
1	7	Gas Plant Header Tank
2	8	Top of fan House Bund
3	9	By Entry to Stockpiles
4	10	Bund by Graveyard
7	11	End of Road Reject Area 1
8	12	By New Entry to Reject Area
9	Nil	South Side of the site Boundary
10	Nil	West Side of the Site Boundary
11	Nil	North Side of the Site Boundary
12	Nil	East Side of the Site Boundary



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Air Quality Monitoring

Air Quality and Greenhouse Management Plan

Date: 22/01/2021

Figure 8 – Air Quality Monitoring Points

5.2 Air Quality Monitoring – Particulate Matter (PM10)

Due to the nature of operations and historical monitoring data at Tahmoor Coal, the EPA has agreed that the site has a low risk of exceedance of PM10 levels beyond the boundary of the site. Despite this, a program of due diligence monitoring for PM10 sized particulate matter will be conducted to provide confidence to both regulators and the community that air quality conditions on and off-site satisfy the short and long-term PM10 approval criteria for the Tahmoor Coal in accordance with Condition 37 of DA67/98 (2020) – see Section 2.2

A program of quarterly PM10 monitoring will be conducted at nominated sensitive receptor locations. Details of sampling are summarised in **Table 8** and the AECOM – Air Quality Monitoring Report in the Appendix A.

It has been determined that while we are sample PM10 and depositional dust it is not a requirement to sample TSP. Should the results from PM10 or depositional dust monitoring show high dust levels, monitoring frequency and type will be reassessed.

Table 8: Quarterly PM10 Monitoring

Air Sampler Number	EPA ID Number	Type	Description
1	15	High Volume Air Sampler	4 Hodgson Grove North Easter side of boundary
2	14	High Volume Air Sampler	2 Olive Lane West side of the site boundary
3	13	TEOM	115 Charlies Point Road South side of the site boundary

5.3 Air Quality Monitoring – Sensitive Receptors

During monitoring, it is important to take into consideration the dust levels at sensitive receptors. A sensitive receptor is defined by OEH as "…a location where people are likely to work or reside; this may include a dwelling, school, hospital, office or public recreational area."

Potential sensitive receptors located near the Tahmoor Coal surface operations are identified in **Figure 9.**

If an exceedance of air quality occurs the relevant landholders will be notified in writing of the exceedance.

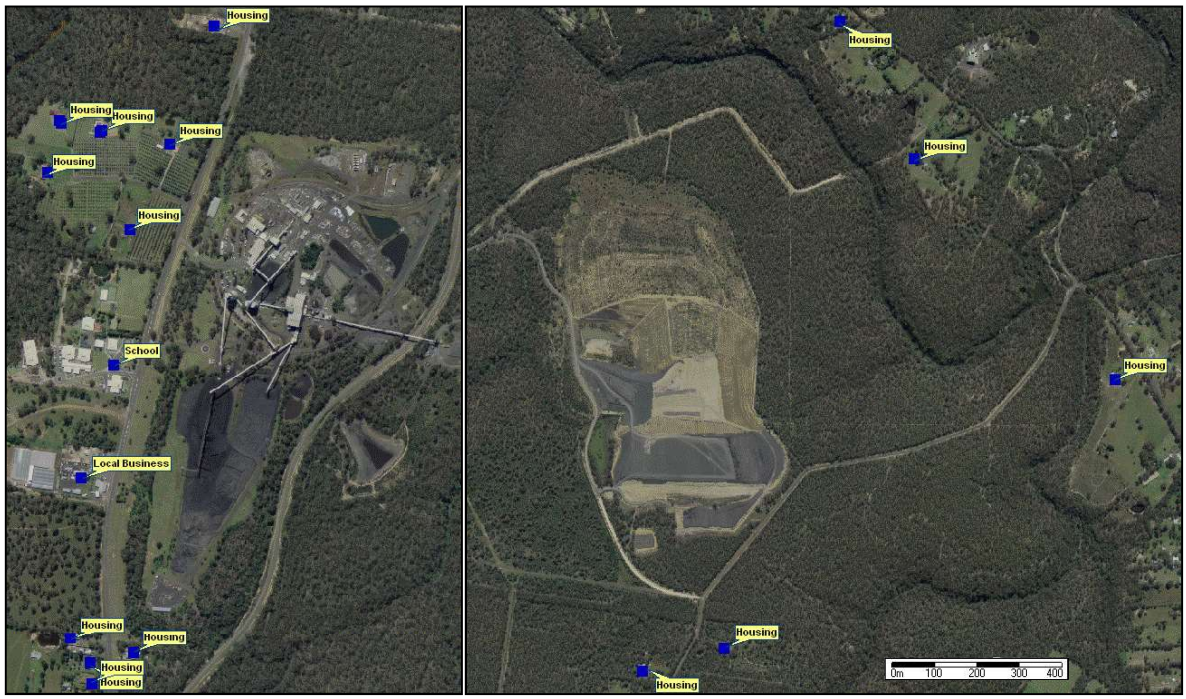

Figure 9 – Sensitive Receptors near Tahmoor Coal

5.4 Community Complaints

All complaints relating to dust are to be managed in accordance with Community Complaint & Enquiry Procedure. The complaint will be recorded using either the Communication Log, or should be entered directly into the compliance database (CMO), and forwarded to the Environment & Community Department to investigate. Where possible, corrective actions should be implemented and tracked using CMO.

The Community Coordinator, and/or Environment Coordinator are to ensure complaint notification is undertaken in accordance with TCCO requirements.

5.5 Records

All records pertaining to environmental monitoring on-site are maintained by the Environment & Community Department. Data is reviewed monthly in accordance with TAH-HSEC-00129 Environmental Monitoring Program to identify trends so actions can be initiated and implemented as required. If required by a monitoring exceedance, notification to landowners must be undertaken in accordance with DA67-98 (2020) Condition 40.

5.6 Greenhouse Gas Monitoring – Overview

Tahmoor monitors and report greenhouse gas emissions in accordance with the *National Greenhouse and Energy Reporting (NGER) Measurement Determination 2008*, which provides methods and criteria for calculating greenhouse gas emissions and energy data under the National Greenhouse and Energy Reporting Act 2007.

The method and process flows for monitoring and reporting of greenhouse gases is detailed in the Tahmoor NGER Process Map. A simplified overview of Tahmoor's inputs and emission outputs is provided in **Figure 10**.

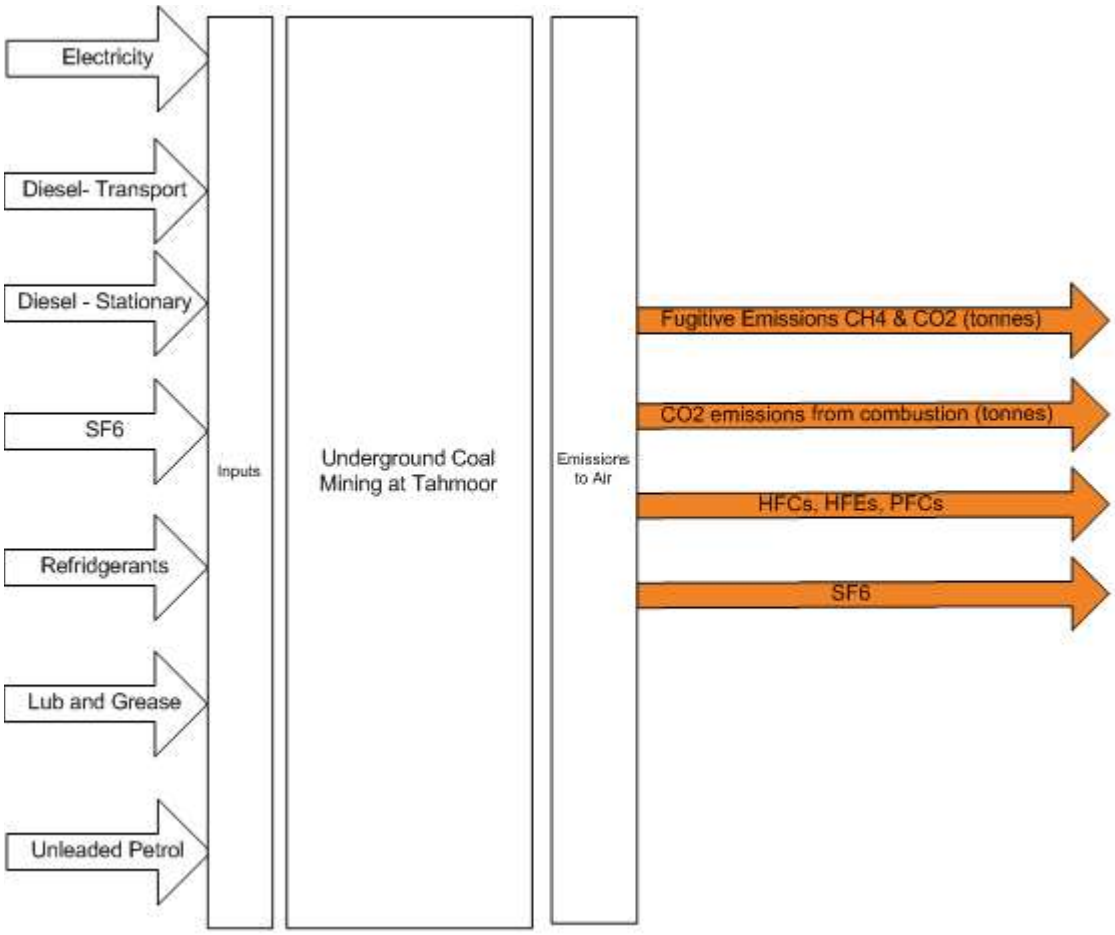

Figure 10– Tahmoor NGER Process Map Overview

5.6.1 Greenhouse Gas Monitoring – Scope 1 Fugitive Emissions

The main greenhouse gas emissions at Tahmoor Coal are Scope 1 Fugitive Emissions from three main sources:

a) Mine Ventilation Air (No.2 Up-cast Shaft);

b) Gas Extraction Plant; and

c) Gas Flaring Plant.

5.6.2 Ventilation Emissions

Flow volumes, gas concentrations (CO2 and CH4), temperature, pressure and humidity are measured in the No.2 ventilation shaft and reported in accordance with NGER requirements.

5.6.3 Gas Extraction Plant, Gas Flaring Plant and Third-Party Power Station

Gas is drained using in-seam gas drilling techniques to capture and direct pre-mining and post-mining (goaf) gas to the Gas Extraction Plant located on the surface at Tahmoor Coal. Gas is then sent to a third party owned on-site power station EDL, with surplus gas sent the on-site Gas Flaring Plant.

Tahmoor Coal has adopted a strategy whereby the maximum level of gas available is provided to the EDL power station, with only the excess gas flared, to ensure the site is always reducing the mine's emissions profile.

5.6.4 Other Sources

Other sources of Scope 1 emissions at Tahmoor Coal include the use of diesel, unleaded fuel, lubricants, greases and waste oil. Usage is monitored and reported in accordance with NGER requirements.

5.7 Greenhouse Gas Monitoring – Scope 2 Emissions

The main scope 2 emissions at Tahmoor Coal include the use of electricity, used to power much of the infrastructure Coking Coal and on the surface including the longwall and development mining equipment, coal handling and preparation equipment, ventilation fans and lighting. Electricity usage is monitored and reported in accordance with NGER requirements.

All incidents, non-compliances and exceedances relating to air quality and greenhouse gas monitoring are dealt with in accordance with the TAH-HSEC-00173 Environmental Management System Framework.

Compliance will be determined by monitoring. If it determined that TCCO is not in compliance, additional monitoring will be scheduled. Outcomes of the dust monitoring and any actions taken will be provided to the NSW Department of Planning and Environment - Resources Regulator as required.

All non-compliances will be treated as Environmental Incidents as per the Tahmoor Coal Incident and Hazard Procedure.

6 Definitions

Term	Meaning
Emissions	Dust, odours, combustion emissions, greenhouse gas (GHG) emissions, visible air pollution and other particulate or gaseous emissions produced by the project

7 Accountabilities

Role	Accountabilities for this document
Operations Manager	Responsible for assisting in management of all legislative compliance on-site including overall management of statutory roles and functions.
Environment and Community Manager	Responsible for managing environmental compliance on-site. Provide adequate resources to assist the implementation of the AQGHGMP and related Procedures. Ensure air quality management procedures and actions are undertaken. Ensure the implementation of the monitoring program. Undertake periodic review of air quality monitoring results as necessary to ensure monitoring is effective.
Environment Specialist	Responsible for coordinating environmental compliance on-site. Implement the AQGHGMP and related procedures. Implement and manage the air quality monitoring program and ensure the system is maintained and effective. Ensure all community complaints are addressed, investigated and appropriately managed as per site procedures, and reported internally as required. Engage a suitably qualified acoustics consultant to undertake attended air quality monitoring and investigations as required.

Role	Accountabilities for this document
	Ensure air quality complaint data and other relevant information is reviewed monthly to identify any trends or issues to target in relation to noise management.
Community Coordinator	Ensure the Tahmoor Coal Community Consultative Committee (TCCCC) is informed of community complaint statistics related to air quality management at group meetings.

8 Review and Improvement

8.1 Audit

Audits of the ***Air Quality and Greenhouse Gas Management Plan*** shall be conducted in consultation with the Plan owner and nominated individuals and shall focus on the content and implementation.

Audits on the content shall consist of a determination of understanding of the ***Air Quality and Greenhouse Gas Management Plan*** the individual's allocated responsibility under this plan.

Audits on the implementation shall consist of reviews of the safe working procedures and risk assessments developed to ensure safe operation of the ***Air Quality and Greenhouse Gas Management Plan*** they may also involve discussions with personnel involved in the management plan to determine understanding and compliance.

Should an audit of the ***Air Quality and Greenhouse Gas Management Plan*** determine that a deficiency is evident in the content or implementation; a corrective action must be developed and implemented. Actions will be assigned to a nominated individual and tracked in CMO.

The ***Environment and Community Manager*** is responsible to verify that the nominated corrective action has been implemented by way of a follow up audit.

Any changes ***Air Quality and Greenhouse Gas Management Plan*** are to be managed and communicated to all personnel in line with the Change Management Process.

8.2 Review

This ***Air Quality and Greenhouse Gas Management Plan*** will be reviewed:

Event based: a review will be triggered following any event or finding that identifies an inadequacy in the ***Air Quality and Greenhouse Gas Management Plan***, risk assessment or associated documents to continue to effectively manage the identified hazard; a change to the workplace itself or any aspect of the work environment, a change to a system of work, a process or a procedure; or

Time based: in the absence of regular event-based reviews, a ***3 yearly*** review will be conducted to determine that there are not changes to the hazards and issued being managed in the ***Air Quality and Greenhouse Gas Management Plan*** and that they system and procedures detailed in the ***Air Quality and Greenhouse Gas Management Plan*** are being complied with.

If deemed appropriate, external service providers may be included in the review process. All reviews are to be documented.

9 Document Information

Relevant legislation, standards and other reference information must be regularly reviewed and monitored for updates and should be included in the site management system. Related documents and reference information in this section provides the linkage and source to develop and maintain site compliance information.

9.1 Related Documents

Related documents, listed in the below table, are internal documents directly related to or referenced from this document.

Number	Title
TAH-HSEC-00120	Community Complaint and Enquiry Procedure
TAH-HSEC-00129	Environmental Monitoring Program
TAH-HSEC-00097	Tahmoor NGER Process Map
TAH-HSEC-00172	Community Complaint and Enquiry or Communication Form
TAH-HSEC-0073	Environmental Management System Framework

9.2 Reference Information

Reference information, listed in the below table, is information that is directly related to the development of this document or referenced from within this document.

Title
Department of Environment & Conservation (2000 and 2017) NSE Industrial Noise Policy.
Department of Environment & Conservation (1994) Environmental Noise Control Manual
Australian Standards (1997) 1055 – 1997; Acoustics – Description and Measurement of Environmental Noise
Australian Standard (2004) AS IEC 61672.1 – 2004 – Electroacoustics – Sound level meters

10 Change Information

10.1 Change Information

Full details of the document history are recorded in the document control register, by version

Version	Date Reviewed	Review team (Consultation)	Change Summary
0.1	November 2008	Paul Amidy	Document drafted
0.2	November 2008	Ben De-Somer	Review of draft and approved for document control
1.0	1st October 2011	Nicholas Wandke, Fiona Robinson	Changed document to new document template, and reviewed to include all requirements from *XCN Dust Management Minimum Requirements.*
1.1	2nd October 2012	Nicholas Wandke, Fiona Robinson	Reviewed document and updated in accordance with DA67-98 Condition 39, including renaming the document from Dust Management Plan to Air Quality & Greenhouse Gas Management Plan
1.2	30th October 2012	Nichola Wandke, Andrew Couldridge (EPA)	Reviewed in consultation with EPA. No major amendment until final advice from EPA is provided (after 31/10/2012).

Version	Date Reviewed	Review team (Consultation)	Change Summary
1.3	6th December 2012	Nicholas Wandke, Jessie Giblett (DP&I), William Dove (EPA)	Updated to incorporate EPA / DP&I comments regarding periodic PM10 monitoring.
2.0	6th May 2013	Nicholas Wandke	Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2012 Annual Review to DP&I. No changes made to document.
2.1	16th June 2014	Fiona Robinson	Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2013 Annual Review to DP&I. Updated Template. Update PM10 Monitoring to reflect agreement with the EPA and DPI and current monitoring arrangements.
3.0	9th June 2015	Fiona Robinson	Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2014 Annual Review to DP&I. Updated Template.
3.1	25th May 2016	Fiona Robinson, Samantha Beresford	Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2015 Annual Review to DP&E
4.0	30th June 2017	Fiona Robinson, Dakota Brown, Ian Sheppard	Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2016 Annual Review to DP&E.
5.0	22nd June 2018	Fiona Robinson	Reviewed in line with Independent Environmental Audit Recommendations. Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2017 Annual Review, IEA and Direction.
6.0	27th June 2019	Fiona Robinson	Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2018 Annual Review.
7.0	21st June 2020	Fiona Robinson	Reviewed in accordance with Condition 46 of DA67-98 (2012) following submission of the 2019 Annual Review and incident.
8.0	22nd January 2021	Natalie Brumby, April Hudson	Reviewed in accordance with Condition 46 of DA67-98 (2020) following approval of Modification 5 of DA67/98

Appendix A - **AECOM – Air Quality Monitoring Plan**

AECOM

Tahmoor Coal Pty Ltd
03-May-2013

Air Quality Monitoring Plan

Tahmoor Colliery

Appendix B - **Meteorological Triggers – TARP**

Meteorological triggers are applied to wind speed, ambient air temperature and rainfall data logged at 5-minute intervals at the Tahmoor Meteorological Station. Weather alarms will be sent via the mine control room to the required recipients

Meteorological Triggers (a) (b)		
Level 1 Weather Alert	Level 2 Weather Alarm	Level 3 Weather Alarm
5-minute average wind speed exceeds 6.8 m/s (for 3 or more consecutive 5-minute periods) OR 5-minute ambient air temperature is greater than 28°C (for 3 or more consecutive 5-minute periods) AND 24-hour rolling total rainfall is less than 2mm	5-minute average wind speed exceeds 10 m/s (for 3 or more consecutive 5-minute periods) OR 5-minute ambient air temperature is greater than 32°C (for 3 or more consecutive 5-minute periods) AND 24-hour rolling total rainfall is less than 2mm	5-minute average wind speed exceeds 12 m/s (for 3 or more consecutive 5-minute periods) OR 5-minute ambient air temperature is greater than 40°C (for 3 or more consecutive 5-minute periods) AND 24-hour rolling total rainfall is less than 2mm

a) Applied to 5-minute meteorological data recorded at Tahmoor Meteorological Station.

b) ‘Period’ refers to the 5-minute period at which meteorological data is logged.

Appendix C - **Dust Surveillance**

Visual triggers based on which mining activities are modified or ceased are outlined in the dust management TARP, and requirements for on-going visual monitoring of dust levels provided for within operating procedures.

Two dust surveillance cameras have been installed at TCCO to inform operational dust management by enhancing visual dust monitoring capabilities, the locations of which are illustrated in Figure 11.

The cameras record video 24-hours a day, 7 days per week with video footage stored for a period of 7 years. The red dots on the map show the locations of the two cameras.

Surveillance camera imagery is accessible by personnel based in the Mine Control Room. The Mine Controller will regularly assess dust conditions in respects to the visual triggers shown in Table 7 and contact the Shift Supervisor to address any trigger conditions as required.

Figure 11 – Location of Dust Surveillance Cameras at Tahmoor Coal