

Clean TeQ Sunrise Project Air Quality Management Plan

2020-CTEQ-0000-66AA-0005

21 August 2019

REVISION 2

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1. INTRODUCTION

The Clean TeQ Sunrise Project (the Project) is a nickel cobalt scandium open cut mining project situated near the village of Fifield, approximately 350 kilometres (km) west-northwest of Sydney, in New South Wales (NSW) (Figure 1).

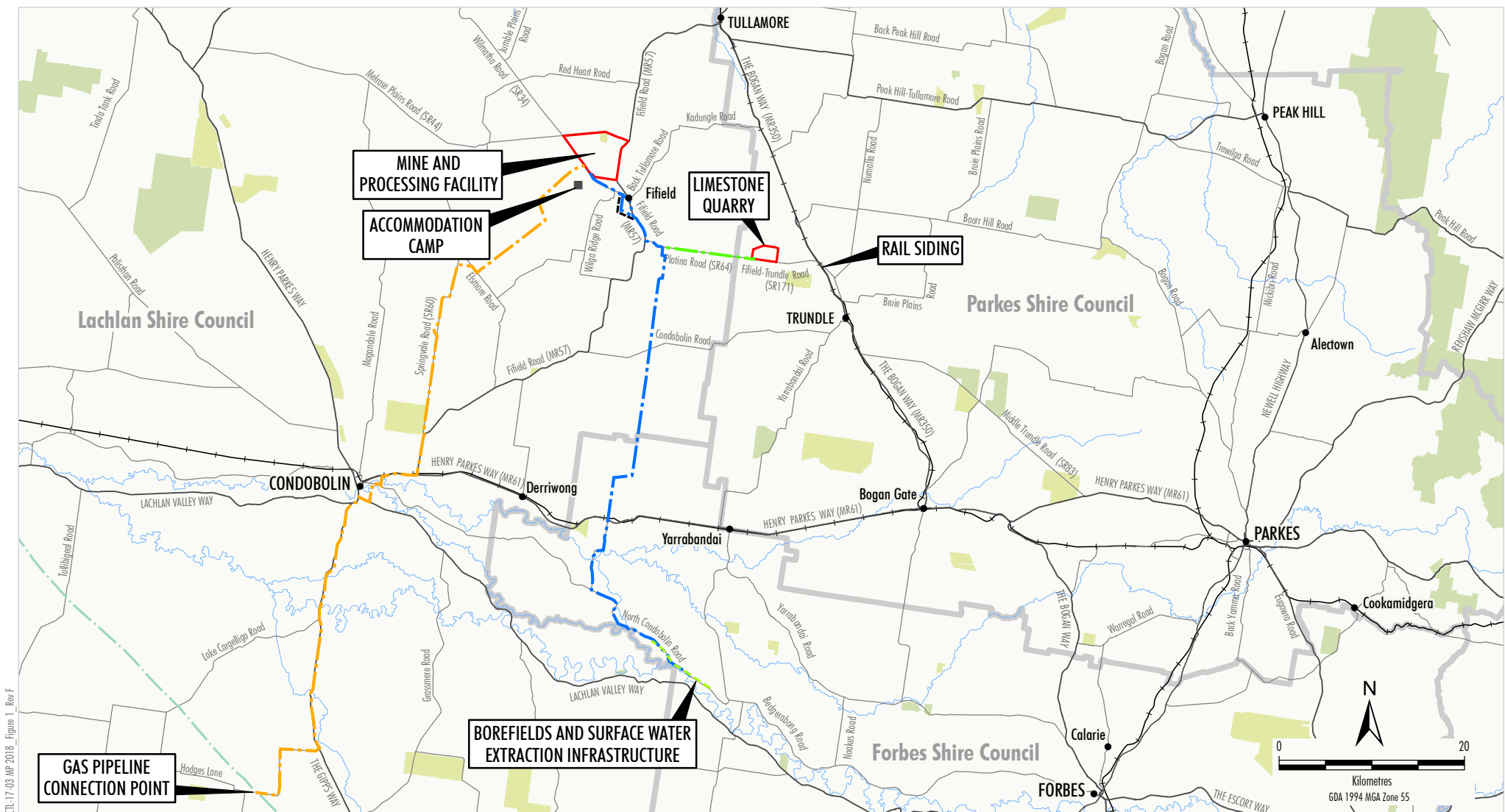
The Project includes the establishment and operation of the following:

- mine (including the processing facility);
- limestone quarry;
- rail siding;
- gas pipeline;
- borefields, surface water extraction infrastructure and water pipeline;
- accommodation camp; and
- associated transport activities and transport infrastructure (e.g. the Fifield Bypass, road and intersection upgrades).

Clean TeQ Sunrise Pty Ltd owns the rights to develop the Project. Clean TeQ Sunrise Pty Ltd is a wholly owned subsidiary of Clean TeQ Holdings Limited (Clean TeQ).

Development Consent DA 374-11-00 for the Project was issued under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) in 2001. Six modifications to Development Consent DA 374-11-00 have since been granted under the EP&A Act:

- 2005 – to allow for an increase of the autoclave feed rate, limestone quarry extraction rate and adjustments to ore processing operations;
- 2006 – to allow for the reconfiguration of the borefields;
- 2017 – to allow for the production of scandium oxide;
- 2017 – to amend hazard study requirements;
- 2018 – to relocate the accommodation camp; and
- 2018 – to implement opportunities to improve the overall efficiency of the Project.



CTL-17-03 MP 2018_Figure 1_Rer F



- LEGEND**
- National Park/Conservation Area
 - State Forest
 - Local Government Boundary
 - Railway
 - Existing Gas Pipeline
 - Mining Lease Boundary (ML)
 - Fifiel Bypass
 - Gas Pipeline
 - Water Pipeline
 - Limestone Quarry Water Pipeline
 - Borefield Infrastructure Corridor

Source: Black Range Minerals (2000); Clean TeQ (2017, 2018);
NSW Department of Industry (2018); NSW Land & Property Information
(2017); Office of Environment and Heritage NSW (2017)

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Regional Location

Figure 1

1.1 Purpose and Scope

This Air Quality Management Plan (AQMP) has been prepared by Clean TeQ to satisfy the requirements of Conditions 23 and 24, Schedule 3 of Development Consent DA 374-11-00 (Table 1).

Table 1 – Specific Development Consent Conditions

Project Development Consent DA 374-11-00 Schedule 3	Section Where Addressed in this AQMP
Air Quality Management Plan	
23. Prior to carrying out any development under this consent after 6 May 2017, unless otherwise agreed by the Secretary, the Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:	This AQMP
a) be prepared in consultation with the EPA;	Section 2
b) outline the procedure for notifying property owners and occupiers likely to be affected by dust from the operations;	Section 10.2
c) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent;	Section 8
d) include an air quality monitoring program that:	
• includes real-time monitoring;	Section 9
• supports proactive and reactive air quality management strategies;	Section 9
• includes monitoring of the sulphuric acid plant stack emissions, including continuous monitoring of in-stack pollutant concentrations;	To be included in future versions of the AQMP prior to commencing operations.
• includes key performance indicators;	Section 6
• evaluates and reports on: <ul style="list-style-type: none"> – baseline monitoring; – compliance against the air quality operating conditions; – compliance against the air quality criteria in this consent; – the effectiveness of the air quality management system; and 	Section 4.1 Section 11 Section 9 Section 11
• considers what real-time and/or regular reporting on air quality monitoring data would be useful to provide regularly on the Applicant's website;	Section 12
e) defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.	Section 12.1
24. The Applicant must implement the approved Air Quality Management Plan for the development.	
Air Quality Verification	
24A. The Applicant must provide an Air Quality Verification Report to the satisfaction of the EPA, that confirms all sulphuric acid plant and power generation facility stack emission discharges will comply with the prescribed concentrations contained in the Protection of the Environment Operations (Clean Air) Regulation 2010 and best practice emissions concentrations.	An Air Quality Verification Report will be provided upon construction of the processing facility.

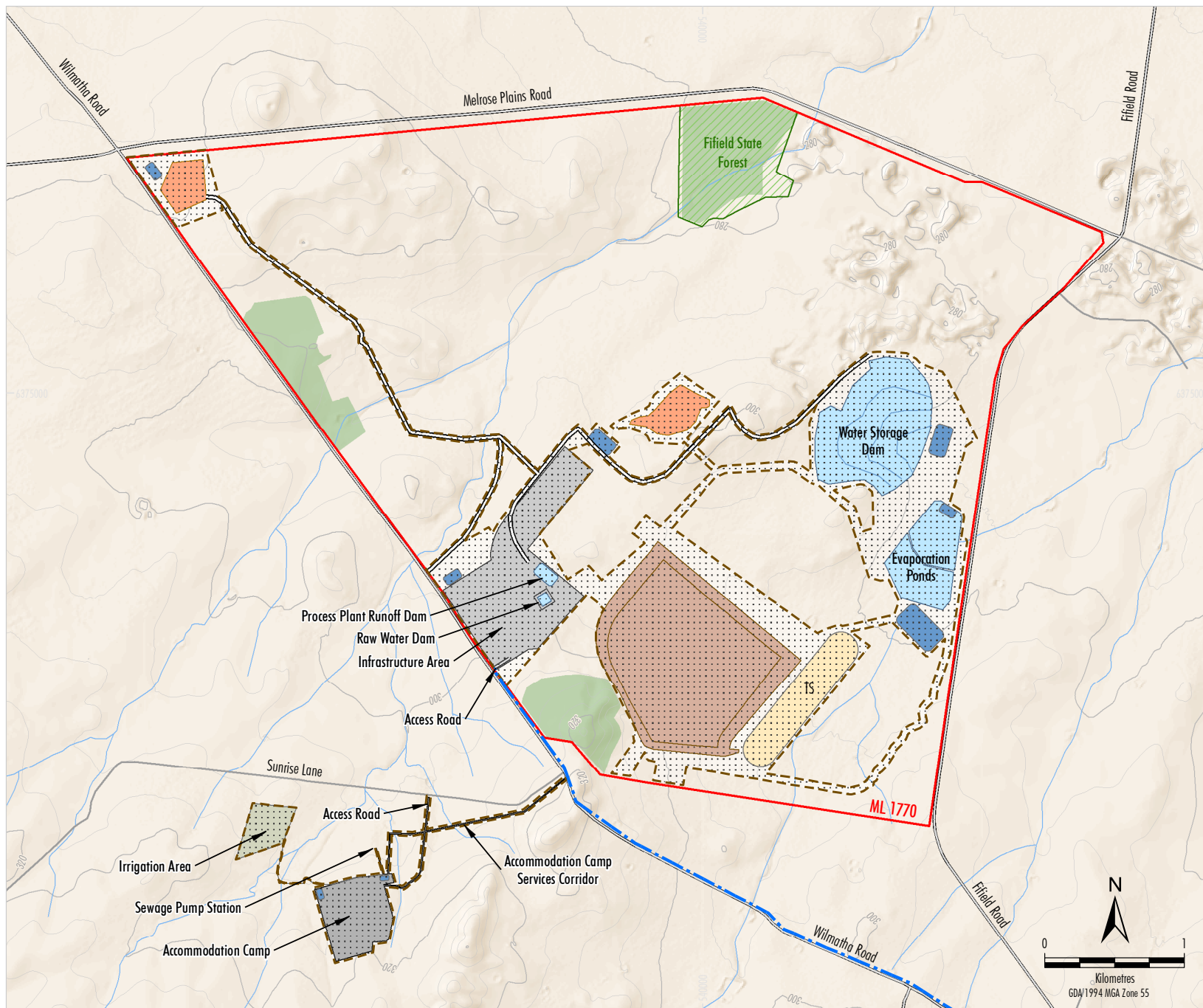
Note: EPA refers to the NSW Environment Protection Authority.

On 5 July 2018, the Secretary of the Department of Planning and Environment (now the Department of Planning, Industry and Environment [DPIE]) (the Secretary) approved the progressive submission of environmental management plans for the Project in accordance with Condition 12, Schedule 2 of Development Consent DA 374-11-00. The scope of this AQMP is specifically related to the following initial Project construction activities:

- development of the mine, including:
 - site establishment and earthworks;
 - construction of site access roads and haul roads;
 - processing facility earthworks;
 - establishment of temporary facilities required for construction activities (e.g. offices, lay down areas, communications infrastructure);
 - construction of the mine infrastructure area including the offices, workshops, warehouse, laboratory and amenities buildings, fuel storage areas, potable water treatment plant and car parking facilities;
 - construction of the tailings storage facility and evaporation pond;
 - construction of water management infrastructure including the raw water dam, water storage dam and sediment dams;
 - construction and operation of the concrete batch plant;
 - development of gravel and clay borrow pits (including blasting and crushing);
 - installation of appropriate fencing and barriers to ensure public safety and security for mining and construction;
 - other associated minor infrastructure, plant, equipment and activities;
- development and operation of the accommodation camp;
- development and operation of the borefields, surface water extraction infrastructure and water pipeline¹; and
- road upgrades.

The general arrangement of the mine and processing facility during the initial construction activities is shown on Figure 2.

¹ The water pipeline includes the Fifield Bypass and Alternative Pipeline Route alignments.



- LEGEND**
- State Forest
 - Mining Lease Boundary (ML)
 - Initial Construction Activities
 - Surface Development Area
 - Tailings Storage Facility
 - Borrow Pit
 - TS Topsoil Stockpile
 - Infrastructure Area
 - Water Storage
 - Sediment Dam
 - Existing Open Woodland to be Maintained
 - Water Pipeline

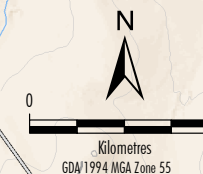
Note: The sediment dam located in the footprint of the evaporation ponds will be used during construction of the evaporation ponds and will be decommissioned once the evaporation ponds are constructed.

Source: Black Range Minerals (2000); Clean TeQ (2017, 2019); NSW Department of Industry (2018); NSW Land & Property Information (2017)

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**Mine and Processing Facility
General Arrangement
(Initial Construction Activities)**



1.2 Structure of this Air Quality Management Plan

The remainder of this AQMP is structured as follows:

- Section 2: Describes the review and update of this AQMP.
- Section 3: Outlines the statutory requirements applicable to this AQMP.
- Section 4: Outlines the existing environment including baseline data and sensitive receptors in the vicinity of the Project.
- Section 5: Outlines the relevant criteria applicable to the Project.
- Section 6: Details the specific performance indicators Clean TeQ proposes to use to guide the implementation of the air quality management measures and judge their performance.
- Section 7: Describes potential dust generating activities at the Project.
- Section 8: Describes the management and control measures to be implemented, where relevant, at the Project.
- Section 9: Outlines the air quality monitoring program components including locations, frequency and parameters.
- Section 10: Provides a contingency plan to manage unprecedented impacts and their consequences.
- Section 11: Describes the program to review and report on the effectiveness of management measures and improvement of environmental performance.
- Section 12: Describes the protocol for management and reporting of incidents, complaints and non-compliances with statutory requirements.
- Section 13: Provides references cited in this AQMP.

2. AIR QUALITY MANAGEMENT PLAN REVIEW AND UPDATE

The previous version of this AQMP was provided to the NSW EPA for the purposes of consultation in accordance with Condition 23, Schedule 3 of Development Consent DA 374-11-00. A letter was received from the EPA on 25 October 2018 stating the EPA had no specific comments regarding the content of this AQMP.

Following receipt of this letter, minor revisions have been made to reflect the determination of Modification 4 in December 2018. With the agreement of the Secretary and consistent with Condition 12, Schedule 2 of Development Consent 374-11-00, this AQMP has not been re-submitted to the EPA for comment due to the minor nature of the revisions.

Consistent with the Secretary's approval for the progressive submission of environmental management plans on 5 July 2018, this AQMP would be re-submitted and approved prior to the commencement of construction of the limestone quarry, rail siding and gas pipeline, as well as prior to the commencement of mining operations.

In accordance with Condition 6, Schedule 5 of Development Consent DA 374-11-00, this AQMP will be reviewed, and if necessary revised (to the satisfaction of the Secretary), within three months of the submission of:

- an Annual Review (Condition 5, Schedule 5);
- an incident report (Condition 8, Schedule 5);
- an independent environmental audit (Condition 10, Schedule 5); or
- any modification to the conditions of Development Consent DA 374-11-00 (unless the conditions require otherwise).

The reviews would be undertaken to ensure this AQMP is updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the Project.

Within four weeks of conducting a review of this AQMP, the Secretary will be advised of the outcomes of the review and any revised documents submitted to the Secretary for approval.

If agreed with the Secretary, a revision to this AQMP required under Development Consent DA 374-11-00 may be prepared without undertaking consultation with all parties nominated under the relevant condition of Development Consent DA 374-11-00.

The revision status of this AQMP is indicated on the title page of each copy. The approved AQMP will be made publicly available on the Clean TeQ website, in accordance with Condition 12, Schedule 5 of Development Consent DA 374-11-00.

3. STATUTORY OBLIGATIONS

Clean TeQ's statutory obligations relevant to air quality management are contained in:

- the conditions of Development Consent DA 374-11-00;
- relevant licences and permits, including conditions attached to mining leases; and
- other relevant legislation.

Obligations relevant to this AQMP are described below.

3.1 Development Consent DA 374-11-00

The conditions of Development Consent DA 374-11-00 relevant to the content and structure of this AQMP are described below. A comprehensive list of all conditions in Development Consent DA 374-11-00 relevant to air quality is provided in Appendix A.

3.1.1 Air Quality Management Plan Requirements

Condition 23, Schedule 3 of Development Consent DA 374-11-00 requires the preparation of an AQMP (refer Table 1).

3.1.2 Management Plan (General) Requirements

Condition 4, Schedule 5 of Development Consent DA 374-11-00 outlines the general management plan requirements that are also applicable to the preparation of this AQMP. Table 2 presents these requirements and indicates where each is addressed within this AQMP.

Table 2 – Management Plan (General) Requirements

Schedule 5, Development Consent DA 374-11-00	AQMP Section
Management Plan Requirements	
4. <i>The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, are consistent with other plans prepared for other stakeholders, and include:</i>	
(a) <i>detailed baseline data;</i>	Section 4.1
(b) <i>a description of:</i> <ul style="list-style-type: none"> <i>the relevant statutory requirements (including any relevant approval, licence or lease conditions);</i> 	Section 3
<ul style="list-style-type: none"> <i>any relevant limits or performance measures/criteria;</i> 	Section 5
<ul style="list-style-type: none"> <i>the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</i> 	Section 6
(c) <i>a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</i>	Section 8
(d) <i>a program to monitor and report on the:</i> <ul style="list-style-type: none"> <i>impacts and environmental performance of the development;</i> <i>effectiveness of any management measures (see c above);</i> 	Sections 9, 11 and 12
(e) <i>a contingency plan to manage any unpredicted impacts and their consequences;</i>	Section 10
(f) <i>a program to investigate and implement ways to improve the environmental performance of the development over time;</i>	Section 11
(g) <i>a protocol for managing and reporting any:</i> <ul style="list-style-type: none"> <i>incidents;</i> <i>complaints;</i> <i>non-compliances with statutory requirements; and</i> 	Section 12.1 Section 12.2 Section 12.3
(h) <i>exceedances of the impact assessment criteria and/or performance criteria; and</i>	Sections 8, 10 and 12
(i) <i>a protocol for periodic review of the plan.</i>	Section 11
<i>Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.</i>	

3.2 Licences, Permits and Leases

In addition to the requirements of Development Consent DA 374-11-00, all activities at or in association with the Project will be undertaken in accordance with the following licences, permits and leases which have been issued or are pending issue:

- Mining Lease 1770 issued by the NSW Minister for Resources under the NSW *Mining Act, 1992*.
- Mining Operations Plan(s) submitted and approved by the NSW Division of Resources and Geoscience.
- Environment Protection Licence (EPL) 21146 issued under Part 3 of the NSW *Protection of the Environment Operations Act, 1997* (POEO Act) by the NSW EPA.
- Water supply works, water use approvals and water access licences (WALs) issued by Department of Industry – Lands & Water under the NSW *Water Management Act 2000* including:
 - Water Supply Works Approval 70CA614098 for the Project borefields.
 - WAL 32068 in the Upper Lachlan Alluvial Groundwater Source (Upper Lachlan Alluvial Zone 5 Management Zone) for 3,154 share components under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*.

- WAL 39837 in the Upper Lachlan Alluvial Groundwater Source (Upper Lachlan Alluvial Zone 5 Management Zone) for 766 share components under the *Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012*.
- WAL 28681 in the Lachlan Fold Belt Murray-Darling Basin (MDB) Groundwater Source (Lachlan Fold Belt MDB [Other] Management Zone), for 243 share components under the *Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011*.
- WAL 6679 for 123 share components (General Security) under the *Water Sharing Plan for the Lachlan Regulated River Water Source 2016*.
- WAL 1798 in the Lachlan Regulated River Water Source, for 300 share components (General Security) under the *Water Sharing Plan for the Lachlan Regulated River Water Source 2016*.
- WAL 42370 in the Lachlan Regulated River Water Source, for zero share components (High Security) under the *Water Sharing Plan for the Lachlan Regulated River Water Source 2016*.
- Groundwater licences for monitoring bores under the *Water Management Act 2000*.
- Aboriginal Heritage Impact Permits (AHIPs) (AHIP #C0003049 and AHIP #C0003887) issued by the Office of Environment and Heritage (OEH) under the *NSW National Parks and Wildlife Act, 1974*.
- Mining and workplace health and safety related approvals granted by the NSW Department of Industry and SafeWork NSW.
- Permits under the *Roads Act 1993*.
- Heavy Vehicle Authorisation Permit 119039 issued by the National Heavy Vehicle Regulator under the *Heavy Vehicle National Law NSW*.
- Crown Land Licences issued under the *Crown Land Management Act 2016*.

3.3 Other Legislation

Clean TeQ will conduct the Project consistent with the requirements of Development Consent DA 374-11-00 and any other legislation applicable to an approved Part 4 Project under the EP&A Act.

In addition to the statutory obligations described in Sections 3.1 and 3.2, the following NSW Acts (and their Regulations) may be applicable to the conduct of the Project:

- *Aboriginal Land Rights Act, 1983*;
- *Biodiversity Conservation Act, 2016*;
- *Biosecurity Act, 2015*;
- *Crown Land Management Act, 2016*;
- *Contaminated Land Management Act, 1997*;

- *Dams Safety Act, 2015;*
- *Dangerous Goods (Road and Rail Transport) Act, 2008;*
- *Energy and Utilities Administration Act, 1987;*
- EP&A Act;
- *Fisheries Management Act, 1994;*
- *Forestry Act, 2012;*
- *Mining Act, 1992;*
- *National Parks and Wildlife Act, 1974;*
- *Pipelines Act, 1967;*
- POEO Act;
- *Rail Safety (Adoption of National Law) Act, 2012;*
- *Roads Act, 1993;*
- *Water Act, 1912;*
- *Water Management Act, 2000;*
- *Work Health and Safety Act, 2011; and*
- *Work Health and Safety (Mines and Petroleum Sites) Act, 2013.*

Other guidelines and standards that were considered during the preparation of this AQMP include, but are not limited to, the *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (NSW Department of Environment and Conservation [DEC], 2007) and the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (NSW EPA, 2017).

Commonwealth Acts which may also be applicable to the conduct of the Project include:

- *Environment Protection and Biodiversity Conservation Act, 1999; and*
- *Native Title Act, 1993.*

Relevant licences or approvals required under these Acts will be obtained as required.

4. EXISTING ENVIRONMENT

The Project is located approximately 350 km west-northwest of Sydney, near the village of Fifield, NSW (Figure 1).

The substances considered in this AQMP are those identified in Development Consent DA 374-11-00 that have potential to affect the general health and amenity of the community and the surrounding environment. This includes particulate matter, which refers to particles of varying size and composition that are defined as follows:

- Total Suspended Particulate matter (TSP) – refers to the total dust particles that are suspended in the air and nominally defined with an upper size range of 30 micrometres (μm).
- PM_{10} – refers to particulate matter with an aerodynamic diameter less than or equal to 10 μm .
- $\text{PM}_{2.5}$ – refers to particulate matter with an aerodynamic diameter less than or equal to 2.5 μm .
- Deposited dust – refers to the largest dust particles in the air. These particles rarely travel far from the source as they rapidly settle under gravity.

Other substances relevant to mining and processing operations, such as oxides of nitrogen, as well as odour, are not considered in this plan.

4.1 Baseline Data

4.1.1 Site-specific Monitoring Data

Dust in the vicinity of the Project was monitored by a series of five dust gauges during the period September 1997 to August 2000 to support the Project's Environmental Impact Statement (EIS). The dust gauges measured deposited dust levels on a monthly basis.

The average measured dust deposition across all five monitoring sites was 2.5 grams per square metre per month ($\text{g}/\text{m}^2/\text{month}$).

The monitoring sites are presented on Figure 3.

4.1.2 Monitoring Data – Industry Operated Sites

The Northparkes Mine (located approximately 60 km east-southeast of the mine) and the Cowal Gold Mine (located approximately 100 km south of the mine) operate air quality monitoring networks for compliance purposes.

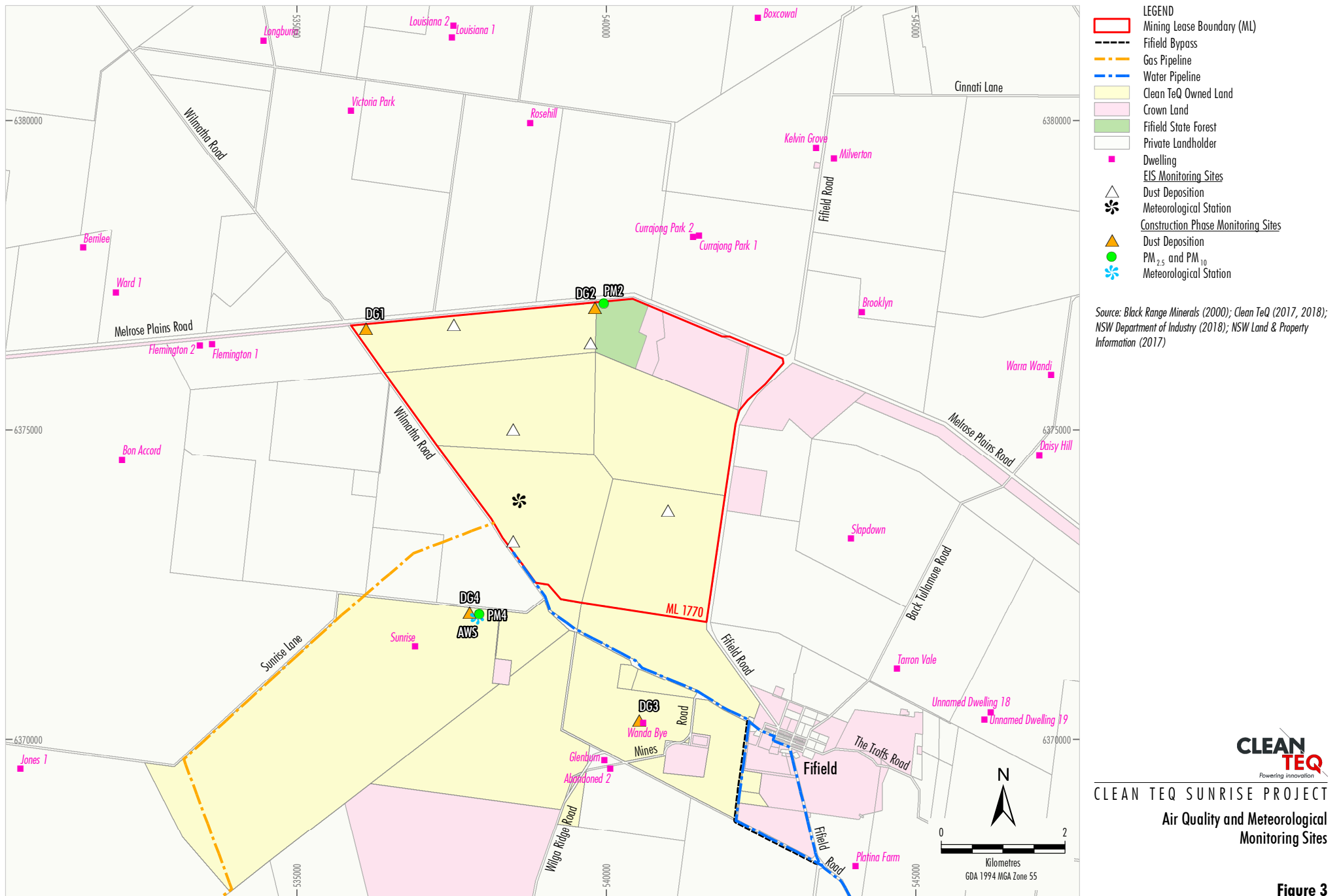


Figure 3

In addition to these existing mining projects, rural baseline monitoring data have been collected for a proposed mine located at Bylong (located approximately 250 km to the east-northeast of the mine) and at an approved but not developed mine at Cobbora (located approximately 180 km to the north-east of the mine).

Publicly available monitoring data for these sites is provided in Table 3.

Table 3 – Regional Air Quality Monitoring Data from Industry Operated Sites

Site	Metric	Value	Source/Assumption
Northparkes Mine	PM ₁₀	10.4 µg/m ³	Estimated monthly average PM ₁₀ concentration, taken from graphs presented in the 2015 Annual Environmental Monitoring Report averaged across three monitoring sites.
	TSP	30 µg/m ³	Approximate rolling annual average TSP concentration at the end of 2015, taken from graphs presented in the 2015 Annual Environmental Monitoring Report and averaged across three monitoring sites.
Cowal Gold Mine	PM ₁₀	15.1 µg/m ³	PM ₁₀ concentrations are not measured but instead derived from TSP data, based on the assumption that 40% of TSP is PM ₁₀ .
	TSP	37.9 µg/m ³	Average of reported monitoring data for a single site for 2015.
Bylong Project	PM ₁₀	12.9 µg/m ³	As reported in the Air Quality Impact Assessment for the Bylong Coal Project (Pacific Environment Limited, 2015)
	PM _{2.5}	6.5 µg/m ³	As reported in the Air Quality Impact Assessment for the Bylong Coal Project (Pacific Environment Limited, 2015)
	TSP	32 µg/m ³	Derived from PM ₁₀ data, as reported in the Air Quality Impact Assessment for the Bylong Coal Project (Pacific Environment Limited, 2015)
Cobbora Project	PM ₁₀	11.8 µg/m ³	Average PM ₁₀ concentration for the modelling period as reported in the Air Quality Impact Assessment for the Cobbora Coal Project (ENVIRON Australia Pty Limited [ENVIRON], 2015)
	TSP	29.4 µg/m ³	Derived from PM ₁₀ data, as reported in the Air Quality Impact Assessment for the Cobbora Coal Project (ENVIRON, 2015)

After: Ramboll Environ (2017).

µg/m³ = micrograms per cubic metre.

4.1.3 Monitoring Data – Government Operated Sites

The OEH operate a number of rural monitoring stations, including at Bathurst (approximately 210 km east-southeast), Wagga Wagga (approximately 260 km south), Merriwa (approximately 290 km east-northeast) and Albury (approximately 370 km south).

The annual average PM₁₀ concentrations recorded at these stations for the period 2011 to 2015 are provided in Table 4.

Table 4 – Regional Annual Average PM10 Monitoring Data from Government Operated Sites

Site	Statistic	2011	2012	2013	2014	2015
Bathurst	Mean	11 µg/m ³	13 µg/m ³	15 µg/m ³	15 µg/m ³	13 µg/m ³
Merriwa		-	14 µg/m ³	15 µg/m ³	15 µg/m ³	13 µg/m ³
Wagga Wagga		17 µg/m ³	19 µg/m ³	22 µg/m ³	21 µg/m ³	20 µg/m ³
Albury		12 µg/m ³	14 µg/m ³	16 µg/m ³	16 µg/m ³	14 µg/m ³

After: Ramboll Environ (2017).

4.2 Meteorological Conditions

An on-site meteorological monitoring station was installed in September 1998 to provide baseline data for the Project EIS and was removed in 1999.

A new meteorological station was installed in November 2018 (Figure 3). At the time of writing this AQMP, there was insufficient data to generate representative meteorological conditions for the mine site.

The closest Bureau of Meteorology Station (BoM) automatic weather station (AWS) site, Condobolin Airport AWS, located approximately 40 km south-southwest, has been reviewed to determine if the recorded data would be representative of the mine site.

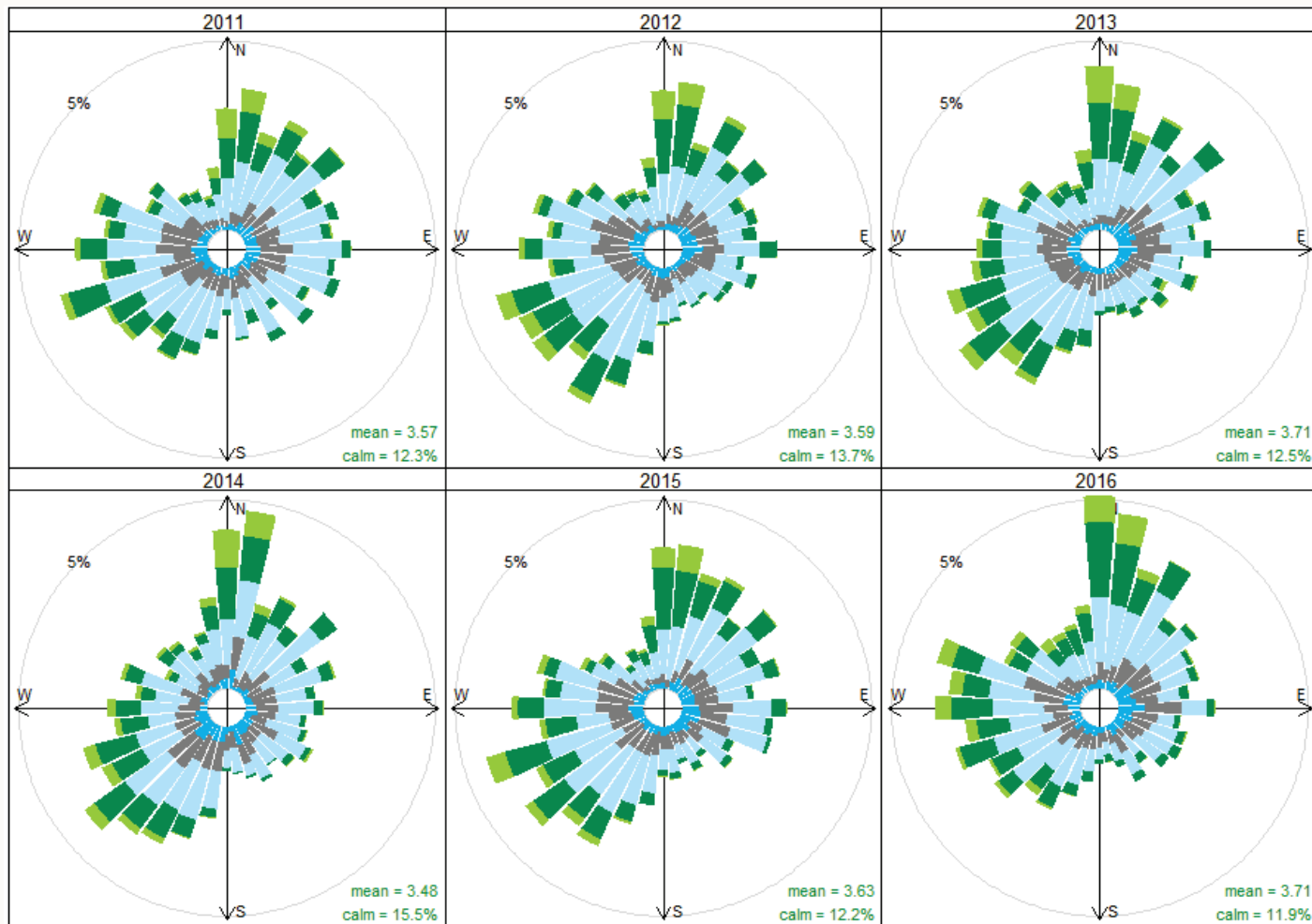
The wind roses generated for the Condobolin Airport AWS present wind direction and wind speed as a percentage of time for 2011 to 2016 (Figure 4). The wind roses show similar wind patterns to those recorded while the on-site meteorological station was operating.

Winds are dominant from the north-northeast and south-west and to a lesser extent, winds from most other directions.

4.3 Sensitive Receptors

Relevant receptors that may experience air quality impacts associated with the initial construction activities of the Project are shown on Figure 3.

Given the progressive nature of the construction activities associated with the water pipeline, sensitive receivers in the vicinity of the water pipeline alignment would be unlikely to be exposed to significant air quality impacts.



LEGEND
Frequency of Counts by Wind Direction (%)
(ms⁻¹)

- 0.5 to 1.5
- 1.5 to 3
- 3 to 5.5
- 5.5 to 8
- 8 to 16.9

Source: Ramboll Environ (2017)

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Wind Roses
2011 to 2016
(Condobolin Airport Automatic Weather Station)

Figure 4

5. AIR QUALITY CRITERIA

5.1 Development Consent DA 374-11-00

5.1.1 Air Quality Criteria

Condition 21, Schedule 3 of Development Consent DA 374-11-00 requires that Clean TeQ shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria listed in Tables 5, 6 and 7 at any residence on privately-owned land.

Table 5 – Long-term Criteria for Particulate Matter

Pollutant	Averaging Period	^d Criterion
TSP matter	Annual	^a 90 µg/m ³
Particulate matter <10 µm (PM ₁₀)	Annual	^a 25 µg/m ³
Particulate matter <2.5 µm (PM _{2.5})	Annual	^a 8 µg/m ³

Source: Development Consent DA 374-11-00.

Table 6 – Short-term Criterion for Particulate Matter

Pollutant	Averaging Period	^d Criterion
Particulate matter <10 µm (PM ₁₀)	24 hour	^a 50 µg/m ³
Particulate matter <2.5 µm (PM ₁₀)	24 hour	^a 25 µg/m ³

Source: Development Consent DA 374-11-00.

Table 7 – Long-term Criterion for Deposited Dust

Pollutant	Averaging Period	Maximum Increase in Deposited Dust Level	Maximum Total Deposited Dust Level
^c Deposited dust	Annual	^b 2 g/m ² /month	^a 4 g/m ² /month

Source: Development Consent DA 374-11-00.

Notes to Tables 5 to 7:

µg/m³ = micrograms per cubic metre; g/m²/month = grams per square metre per month.

^a Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).

^b Incremental impact (i.e. incremental increase in concentrations due to the development on its own).

^c Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air – Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

^d Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.

5.1.2 Operating Conditions

Condition 22, Schedule 3 of Development Consent DA 374-11-00 requires that Clean TeQ:

(a) *minimise:*

- dust emissions from the development;*
- the surface disturbance of the development, including implementing interim rehabilitation strategies to stabilise areas prone to dust generation that cannot be permanently rehabilitated; and*
- the greenhouse gas emissions of the development;*

(b) *carry out any monitoring required by the EPA, and publish the results of this monitoring on its website.*

5.2 Environment Protection License 21146

There are no specific air quality criteria included in EPL 21146. Condition O3 of EPL 21146 includes conditions relating to the management of dust, which are consistent with the operating conditions required by Condition 22, Schedule 3 of Development Consent DA 374-11-00. The air monitoring requirements required by Condition M2.2 of EPL 21146 are consistent with the air quality monitoring program described in Section 9 of this AQMP.

6. PERFORMANCE INDICATORS

The following air quality related performance indicators will be used to judge the performance of the Project:

- results of monitoring are compliant with the air quality criteria in Section 5; and
- complaints are minimised and appropriate management actions are implemented following receipt of a complaint (Section 12.2).

Section 10 details the Contingency Plan to be implemented to manage any unpredicted impacts.

Sections 11 and 12 detail the reporting that will be undertaken by Clean TeQ.

7. DUST GENERATING SOURCES

7.1 Initial Construction Activities

Typically, dust generation associated with initial construction activities of the Project would be due to:

- traffic on unsealed roads, or across unsealed surfaces;
- loading and unloading of materials;
- re-handling of materials;
- clearing of vegetation and topsoil stripping;
- wind erosion from exposed areas;
- dozers operating on material;
- stockpiling materials, including topsoil and gravels;
- grading roads; and
- developing trenches for the water pipeline.

Relative to mining operations, the scale of emissions generating during initial construction activities will be small and there is low risk for any actual impact to occur at sensitive receptors.

8. AIR QUALITY MANAGEMENT AND CONTROL MEASURES

Clean TeQ will minimise dust emissions, surface disturbance and greenhouse gas emissions of the development in accordance with Condition 22, Schedule 3 of Development Consent DA 374-11-00. The effectiveness of air quality and greenhouse gas management and control measures at the Project will be assessed and continually improved through monitoring (Section 9).

8.1 Dust Management and Control Measures

The primary measures that will be implemented to control/minimise dust emissions from the initial construction activities of the Project, including construction of the accommodation camp and water infrastructure, are summarised in Table 8.

Management and control measures may not be limited to those listed in Table 8. For example, if elevated dust levels are recorded, or excessive visible dust emissions from site are observed (e.g. due to high winds), operations on site would be assessed and modified, if required, to minimise dust emissions. Modifications to site operations could include the application of additional dust control measures such as increased watering to minimise the potential for off-site dust impacts.

Table 8 – Dust Management and Control Measures

Target	Management and Control Measure
General	<ul style="list-style-type: none">Site inductions will include air quality requirements to ensure employee and contractor awareness of potential dust impacts, especially with respect to the nearest sensitive receptors.
Disturbed Areas	<ul style="list-style-type: none">Only the minimum area necessary for construction activities will be disturbed.Cleared areas will be watered, as required.Where any exposed areas, stockpiles, etc. are predicted to be inactive for one month or more, a cover crop will be established, if practicable.
Material Stockpiling and Handling	<ul style="list-style-type: none">Long-term stockpiles will be revegetated as soon as practicable following completion.Water carts will be used on stockpile areas to minimise dust generation as necessary.Material handling and stripping/ripping will be avoided or postponed if excessive dust lift-off occurs. Material with low moisture content will be sprayed with water prior to and/or during handling if necessary to control visible dust.The drop height will be minimised when loading or unloading material as far as practicable.Spillage from loading/unloading will be minimised and cleaned up as soon as practicable.
Roads	<ul style="list-style-type: none">Roads will be constructed in a proper manner and consideration will be given to constructing all major haul roads using material with low silt/fines content.Speed limits will be imposed on all roads.Water carts will be utilised as necessary to minimise excessive visible dust.Road vehicles will remain on formed roads and tracks where practicable.

8.2 Greenhouse Gas Emissions

The primary source of greenhouse gas emissions at the Project is the release of carbon dioxide (CO₂) and methane (CH₄) during the combustion of diesel fuel.

Greenhouse gas emissions at the Project will be minimised through the efficient use of diesel fuel by the mobile fleet. Efficient diesel use is promoted by:

- minimising the re-handling of material;
- maintaining the mobile fleet in good operating order; and
- optimising the design of roads to minimise the distance travelled between working areas.

Greenhouse gas emissions from the Project will be tracked and reported each year in the Annual Review, prepared in accordance with Condition 5, Schedule 5 of Development Consent DA 374-11-00, and through the National Greenhouse and Energy Reporting Scheme, if the relevant reporting thresholds are met.

9. AIR QUALITY MONITORING PROGRAM

To assess compliance with the relevant criteria, air quality monitoring will be conducted at various locations that are considered representative of sensitive receivers in the areas that may be potentially influenced by initial construction activities.

The Project air quality and meteorological monitoring system is summarised in Table 9 and Figure 3.

Table 9 – Project Air Quality Monitoring System

Location				Frequency	Parameter
Site ID	General Description	Easting	Northing		
DG1	North-west corner of the mine, west of the northern waste emplacement	536120	6376640	Monthly	Dust deposition
DG2	Northern boundary of the mine, east of the northern waste emplacement	539820	6376970		
DG3	Adjacent the Wanda Bye homestead	540535	6370300		
DG4	Adjacent the accommodation camp	538084	6371511		
PM2	Northern boundary of the mine, east of the northern waste emplacement	539820	6376970	Continuous	PM ₁₀ and PM _{2.5}
PM4	Adjacent the accommodation camp	538084	6371511		
MET	Automatic weather station	538084	6371511	Continuous	Meteorological data

9.1 Air Quality Monitoring Methods

9.1.1 Dust Deposition

Monthly dust deposition monitoring has commenced at four dust deposition gauges around the Project (Figure 3 and Table 9). Deposited dust will 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*.

9.1.2 PM₁₀ and PM_{2.5}

PM₁₀ and PM_{2.5} will be monitored continuously at two locations in the vicinity of the Project and will be in place prior to the commencement of construction activities on Mining Lease 1770, in accordance with Condition M2.2 of EPL 21146. (Figure 3 and Table 9). Monitoring of PM₁₀ and PM_{2.5} will be conducted using Teledyne API T640x monitors (the T640x monitor). Clean TeQ has consulted with the EPA regarding the use of the T640x monitors and the EPA indicated on 5 August 2019 that it “considers the Teledyne API T640x technology as appropriate for monitoring ambient fine particles (PM₁₀ and PM_{2.5}) in NSW”.

9.2 Data Validation and Compliance Assessment

Where monitoring indicates elevated readings above the prescribed criteria (Section 5.1.1), Clean TeQ will initiate an assessment of the data to determine the validity of the elevated reading and whether an exceedance has occurred.

Data validation will be assessed according to the following escalating review and assessment process and will include consideration of prevailing meteorological conditions at the time, where relevant (note Level 2 and 3 validation assessment will be applied as necessary).

- Level 1: First pass data review and evaluation. For example, comparison to trends over a year or similar simple and effective means to identify potentially erroneous or outlier data. At this stage, it is also necessary to establish if an elevated reading has been influenced by one of the following factors:
 - Extreme events, such as:
 - dust storms;
 - bushfires;
 - prescribed burning;
 - fire incidents;
 - illegal activities; or
 - other activities agreed by the Secretary.
 - Irregular activities near monitoring sites, such as:
 - contamination from bird droppings, insects, etc.;
 - adjacent land use activities; and
 - exposed areas of soil around the monitoring site.
 - Reasonableness of data (e.g. is the equipment operating properly, providing reliable data and calibrated correctly?).
- Level 2: Where data is assessed to be potentially invalid, an analysis of the available data (e.g. field records, laboratory notes, calibrations, etc.) will be undertaken, which may include site inspection of the monitoring equipment.
- Level 3: Where anomalous or potentially invalid data is found and the issue is significant (e.g. may indicate an exceedance or equipment fault) and a Level 1 and 2 evaluation cannot determine the cause, engage a professional air quality expert to examine the issue.

In the event that an exceedance of an air quality criterion is considered to have occurred, Clean TeQ will implement the Contingency Plan (Section 10).

9.3 Air Quality Monitoring Data Reporting

Clean TeQ will provide the following regular reporting of air quality monitoring data collected in accordance with the AQMP (including real-time monitoring) on its website:

- publishing of monitoring data in accordance with Section 66(6) of the POEO Act, as required by EPL 21146; and
- review of monitoring results within the Annual Review (Section 11.1).

Clean TeQ considers that reporting of this air quality monitoring data will be useful to provide on the Clean TeQ website.

No real-time reporting of air quality monitoring results on the Clean TeQ website is proposed, given the Air Quality Assessment (Ramboll Environ, 2017) for the Project predicted there would be no exceedances at private receivers in the vicinity of the Project and is not considered to be justified.

10. CONTINGENCY PLAN

In the event that an exceedance of an air quality criterion is considered to have occurred, as per the compliance protocol in Section 9.2, Clean TeQ will implement the following Contingency Plan:

- The Clean TeQ Environmental Superintendent will report the incident in accordance with Section 12.1.
- Clean TeQ will apply adaptive management (Section 10.1).
- Clean TeQ will identify the appropriate course of action with respect to the identified impact(s), in consultation with technical specialists, the DPIE and any other relevant agencies, as necessary. For example, contingency measures, such as, but not limited to, those described in Section 10.2.
- Clean TeQ will, in the event there is a dispute over the proposed remedial course of action or if the actions conflict with current approvals, submit the proposed course of action to the DPIE for approval.
- Clean TeQ will implement the appropriate course of action to the satisfaction of the DPIE.

10.1 Adaptive Management

In accordance with Condition 3, Schedule 5 of Development Consent DA 374-11-00, Clean TeQ will assess and manage risks to comply with the criteria and/or performance measures outlined in Schedule 3 of Development Consent DA 374-11-00.

Where any exceedance of these criteria and/or performance measures occurs, at the earliest opportunity, Clean TeQ will:

- take all reasonable and feasible measures to ensure that the exceedance ceases and does not recur;
- consider all reasonable and feasible options for remediation and submit a report to the DPIE describing these options and preferred remediation measures; and
- implement remediation measures as directed by the Secretary.

10.2 Potential Contingency Measures

Potential contingency measures will be reviewed during revisions of this AQMP. Key potential contingency measures to be implemented (following completion of the compliance assessment protocol as described in Section 9.2) may include the following:

- Clean TeQ will notify (in writing) the affected landowners and tenants of the exceedance at the earliest opportunity and provide them with regular air quality monitoring results, until the results show that the Project is complying with the air quality criteria.
- Clean TeQ will, on request, implement reasonable and feasible at-receiver controls, in accordance with Condition 3, Schedule 5 of Development Consent DA 374-11-00, where a breach of the relevant criteria has occurred.
- Clean TeQ will investigate and implement further air quality controls, if monitoring results indicate this is required.

Clean TeQ will also implement any preferred contingency measures identified to address an incident (Section 12.1).

11. REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE

11.1 Annual Review

In accordance with Condition 5, Schedule 5 of Development Consent DA 374-11-00, Clean TeQ will review the environmental performance of the Project by the end of March each year (for the previous calendar year) to the satisfaction of the Secretary.

In relation to air quality management, the Annual Review will (where relevant):

- describe the development that was carried out in the past calendar year, and the development that is proposed to be carried out over the current calendar year;
- include a comprehensive review of the monitoring results and complaints records of the development over the past year, which includes a comparison of these results against the:
 - relevant statutory requirements, limits or performance measures/criteria;
 - monitoring results of previous years; and
 - relevant predictions in the EIS;
- identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- identify any trends in the monitoring data over the life of the development;
- identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and
- describe what measures will be implemented over the next year to improve the environmental performance of the development.

11.2 Independent Environmental Audit

In accordance with Condition 10, Schedule 5 of Development Consent DA 374-11-00, an independent environmental audit of the Project will be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary.

The independent environmental audit will assess the environmental performance of the Project and review the adequacy of this AQMP. If necessary, appropriate measures or actions to improve the environmental performance of the Project or this AQMP will be recommended.

An independent environmental audit will be conducted within one year of the commencement of the development under this consent, after 6 May 2017.

The independent environmental audit, and Clean TeQ's response to the recommendations in the audit, will be made publicly available on the Clean TeQ website, in accordance with Condition 12, Schedule 5 of Development Consent DA 374-11-00.

12.REPORTING PROTOCOL

In accordance with Condition 4(g), Schedule 5 of Development Consent DA 374-11-00, Clean TeQ has developed protocols for managing and reporting the following:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria.

These protocols are described in detail in Clean TeQ's Environmental Management Strategy.

In accordance with Condition 9, Schedule 5 of Development Consent DA 374-11-00, Clean TeQ will provide regular reporting on the environmental performance of the Project on the Clean TeQ website.

12.1 Incident Reporting

An incident is defined as a set of circumstances that causes or threatens to cause material harm to the environment and/or breaches or exceeds the limits or performance measures/criteria in Development Consent DA 374-11-00.

In the event that review of air quality monitoring data indicates an incident has occurred, the incident will be reported in accordance with Condition 8, Schedule 5 of Development Consent DA 374-11-00. Clean TeQ will notify the Secretary and any other relevant agencies including the relevant Council immediately after it becomes aware of the incident that has caused, or threatens to cause, material harm to the environment. Clean TeQ will also notify any affected landholders of any incident that has caused, or threatens to cause, material harm to the environment.

Within seven days of the date of the incident, Clean TeQ will provide the Secretary and any other relevant agencies with a detailed report on the incident and such further reports as may be requested. The report will:

- describe the date, time and nature of the exceedance/incident;
- identify the cause (or likely cause) of the exceedance/incident;
- describe what action has been taken to date; and
- describe reasonable and feasible options to address the incident and identify the preferred option to address the incident (Section 10.1).

12.2 Complaints

Clean TeQ will maintain a Community Complaints Line (tel: 1800 952 277) and email address (community@cleanteq.com) for the sole purpose of receiving community contacts and complaints. The Community Complaints Line number will be available on the website and included in Clean TeQ's advertising and community communication tools. The Community Complaints line will be staffed 24 hours a day, seven days a week during construction and operations. Clean TeQ will respond to callers on the next business day. If the issue is urgent a member of the leadership team will be contacted immediately.

Clean TeQ has developed a procedure that outlines its commitment to receiving, resolving and recording complaints received from the community. Detailed records of each complaint resolution are kept in Clean TeQ's record management systems.

Complaints will be investigated within 24 hours of receipt. The cause of the complaint will be analysed and actions to resolve the complaint taken as soon as possible. In complex cases where resolution will take more than 48 hours, Clean TeQ will commit to update the community member regularly until the complaint is resolved.

In accordance with Condition 12(a), Schedule 5 of Development Consent DA 374-11-00, a complaints register will be made available on the Clean TeQ website and updated monthly.

12.3 Non-Compliance with Statutory Requirements

A protocol for managing and reporting non-compliances with statutory requirements has been developed as a component of Clean TeQ's Environmental Management Strategy and is described below.

Compliance with all approvals plans and procedures is the responsibility of all personnel (staff and contractors) employed on or in association with Clean TeQ and the Project.

The Clean TeQ Environmental Superintendent will undertake regular inspections, internal audits and initiate directions identifying any remediation/rectification work required, and areas of actual or potential non-compliance.

As described in Section 12.1, Clean TeQ will report incidents in accordance with Condition 8, Schedule 5 of Development Consent DA 374-11-00 and in accordance with the protocol for industry notification of pollution incidents under Part 5.7 of the POEO Act. Clean TeQ will notify the Secretary and any other relevant agencies including the relevant Council, in accordance with the Pollution Incidence Response Management Plan, immediately after the authorised person becomes aware of the incident which causes or threatens to cause material harm to the environment.

Within seven days of the date of the incident, Clean TeQ will provide the Secretary and any other relevant agencies with a detailed report on the incident and such further reports as may be requested.

A review of the Project compliance with all conditions in Development Consent DA 374-11-00, mining leases and all other approvals and licences will be undertaken prior to (and included within) each Annual Review (Section 11.1).

Additionally, in accordance with Condition 10, Schedule 5 of Development Consent DA 374-11-00, an independent environmental audit (Section 11.2) will be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Secretary to assess whether Clean TeQ is complying with the requirements in Development Consent DA 374-11-00, and any other relevant approvals, EPLs, and/or mining leases.

12.4 Exceedances of Impact Assessment Criteria and/or Performance

A protocol for managing and reporting exceedances of impact assessment criteria and/or performance criteria is provided in Section 10.

13. REFERENCES

Department of Environment and Conservation (2007) *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW.*

Environmental Protection Agency (2017) *Approved Methods for the Modelling and Assessment of Air Pollution in NSW.*

ENVIRON Australia Pty Limited (2015) *Air Quality and Greenhouse Gas Assessment for the Proposed Cobbora Coal Project*

Pacific Environment Limited (2015) *Bylong Coal Project Air Quality and Greenhouse Gas Impact Assessment*

Ramboll Environ (2017) *Syerston Project Modification 4 Air Quality Assessment*

APPENDICES

Appendix A: Air Quality Related Development Consent DA 374-11-00 Conditions

Development Consent DA 374-11-00		AQMP Section	
Schedule 3			
AIR QUALITY			
Odour			
18. The Applicant must ensure that no offensive odours are emitted from the development, as defined under the POEO Act.		Section 4	
Air Quality – Mine			
19. The Applicant must ensure that gaseous emissions from the development at the mine comply with the requirements of any EPL or the relevant requirements of the Protection of the Environment Operations (Clean Air) Regulation 2010 and the Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (2016) (or its latest version).		To be included in future versions of the AQMP prior to commencement of operations.	
20. On submission of an application for an Environment Protection Licence, the Applicant must provide an air quality impact assessment to ensure the impacts of the proposal are appropriately assessed and demonstrate compliance with the relevant requirements of the Protection of the Environment Operations (Clean Air) Regulation 2010.		The EPA considered the Modification 4 Air Quality and Greenhouse Gas Assessment during the preparation of EPL 21146.	
Air Quality Criteria – Development			
21. The Applicant must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the development do not cause exceedances of the criteria listed in Tables 6, 7 and 8 at any residence on privately owned land.		Sections 5 and 8	
Table 6: Long term impact assessment criteria for particulate matter			
Pollutant	Averaging Period	d Criterion	
TSP Matter	Annual	a 90 µg/m³	
Particulate matter < 10 µm (PM10)	Annual	a 25 µg/m³	
Particulate matter < 2.5 µm (PM2.5)	Annual	a 8 µg/m³	
Table 7: Short term impact assessment criterion for particulate matter			
Pollutant	Averaging Period	d Criterion	
Particulate matter < 10 µm (PM10)	24 hour	a 50 µg/m³	
Particulate matter < 2.5 µm (PM2.5)	24 hour	a 25 µg/m³	
Table 8: Long term impact assessment criteria for deposited dust			
Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
c Deposited Dust	Annual	b 2 g/m²/month	a 4 g/m²/month
Notes to Tables 6-8:			
a. Total impact (i.e. incremental increase in concentrations due to the development plus background concentrations due to all other sources).			
b. Incremental impact (i.e. incremental increase in concentrations due to the development on its own).			
c. Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method.			
d. Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Secretary.			
Operating Conditions			
22. The Applicant must:		Section 8	
<ul style="list-style-type: none"> minimise: <ul style="list-style-type: none"> dust emissions from the development; the surface disturbance of the development, including implementing interim rehabilitation strategies to stabilise areas prone to dust generation that cannot be permanently rehabilitated; the greenhouse gas emissions of the development; carry out any monitoring required by the EPA, and publish the results of this monitoring on its website. 		Sections 9, 11 and 12	

Table A1 (Continued) – Air Quality Related Development Consent DA 374-11-00 Conditions

Development Consent DA 374-11-00	AQMP Section
Air Quality Management Plan	
23. Prior to carrying out any development under this consent after 6 May 2017, unless otherwise agreed by the Secretary, the Applicant must prepare an Air Quality Management Plan for the development to the satisfaction of the Secretary. This plan must:	
(a) be prepared in consultation with the EPA;	Section 2
(b) outline the procedure for notifying property owners and occupiers likely to be affected by dust from the operations;	Section 10.2
(c) describe the measures that would be implemented to ensure compliance with the relevant air quality criteria and operating conditions of this consent;	Section 8
(d) include an air quality monitoring program that:	
• includes real-time monitoring;	Section 9
• supports proactive and reactive air quality management strategies;	Section 9
• includes monitoring of the sulphuric acid plant stack emissions, including continuous monitoring of in-stack pollutant concentrations;	To be included in future versions of the AQMP prior to commencing operations.
• includes key performance indicators;	Section 6
• evaluates and reports on: <ul style="list-style-type: none"> – baseline monitoring; – compliance against the air quality operating conditions; – compliance against the air quality criteria in this consent; – the effectiveness of the air quality management system; and 	Section 4.1 Section 11 Section 9 Section 11
• considers what real-time and/or regular reporting on air quality monitoring data would be useful to provide regularly on the Applicant's website;	Section 12
(e) defines what constitutes an air quality incident, and includes a protocol for identifying and notifying the Department and relevant stakeholders of any air quality incidents.	Section 12.1
24. The Applicant must implement the approved Air Quality Management Plan for the development.	
Air Quality Verification	
24A. The Applicant must provide an Air Quality Verification Report to the satisfaction of the EPA, that confirms all sulphuric acid plant and power generation facility stack emission discharges will comply with the prescribed concentrations contained in the Protection of the Environment Operations (Clean Air) Regulation 2010 and best practice emissions concentrations.	An Air Quality Verification Report will be provided upon construction of the processing facility.
Meteorological Monitoring	
25. Prior to carrying out any development under this consent after 6 May 2017, the Applicant must ensure that there is a suitable meteorological station operating in the vicinity of the mine site that complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline. Once established, this meteorological station must operate for the remainder of the life of the development.	Section 4.2