METROMIX PTY LIMITED

Air Quality Management Plan

(Incorporating Weather Monitoring)

December 2019

Initially Approved by

the Secretary's nominee, Matthew Sprott,

in December 2019

Document Control

Document Title	Air Quality Management Plan			
Document Number				
Document Owner	Metromix Pty Ltd			
Revision	**Issue Date**	**Originator**	**Reviewed**	**Approved**
Original (Draft 1)	19 August 2013		W Sanderson	W Sanderson
Revision 1 (Final Draft)	22 August 2013		W Sanderson	W Sanderson
Revision 2	20 Dec 2016		W Sanderson	W Sanderson
Revision 3	1 November 2018		W Sanderson	W Sanderson
Revision 4	February 2019	N. Warren (RWC)	M. Yunusa	
Revision 5	October 2019	N. Warren (RWC)	M. Yunusa	
Revision 6	9 December 2019	N. Warren (RWC)	M. Yunusa	M. Yunusa

Next Review Due	Within 3 months of the submission of an: (a) annual review under Schedule 5 Condition 4; (b) incident report under Schedule 5 Condition 7; (c) audit report under Schedule 5 Condition 9:and (d) any modifications to the Project Approval, Note: Metromix will review, and if necessary, also revise the strategies, plans, and programs prepared in accordance with the Project Approval that are referred to in this Strategy.

This Copyright is included for the protection of this document

This page has intentionally been left blank

CONTENTS

Page

CONTENTS

Page

APPENDICES

FIGURES

TABLES

COMMONLY USED ACRONYMS

AHD	Australian Height Datum
AS	Australian Standard
DPIE	Department of Planning, Industry and Environment
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
EPL	Environment Protection Licence
HVAS	High Volume Air Sampler
NATA	National Association of Testing Authorities
PA	Project Approval
PM_{10}	Particulate matter <10μm in diameter
PRF	Primary Raw Feed
SHE	Safety Heath and Environment
SWMS	Safe Work Method Statement
TAPM	The Air Pollution Model
TSP	Total Suspended Particulate Matter

This page has intentionally been left blank

1 INTRODUCTION

This *Air Quality Management Plan* (the Plan) has been prepared by Metromix Pty Ltd (Metromix) for the Teralba Quarry (the Quarry). The Quarry is located west of the suburb of Teralba, beyond the western shores of Lake Macquarie (**Figure 1.1**). The Plan has been prepared in satisfaction of *Condition 3(20)* of Project Approval (PA) 10_0183 (originally approved on 22 February 2013). A modification to PA 10_0183 was approved on 16 April 2018.

Condition 3(20): Air Quality Management Plan

"The Proponent must prepare and implement an Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:

a) be prepared in consultation with Council, and submitted for approval to the Secretary within 4 months of the date of this approval;

b) describes the measures that would be implemented to ensure :

- *best management practice is employed;*
- *the air quality impacts of the project are minimised during adverse meteorological conditions and extraordinary events; and*
- *compliance with the relevant conditions of this approval;*

c) describes the proposed air quality management system; and

d) includes an air quality monitoring program that:

- *is capable of evaluating the performance of the project;*
- *includes a protocol for determining any exceedances of the relevant conditions of approval;*
- *adequately supports the air quality management system; and*
- *evaluates and reports on the adequacy of the air quality management system."*

The Proponent must implement the plan as approved by the Secretary.

The Plan addresses the following elements.

- The activities approved under PA 10_0183.
- The consultation undertaken during preparation of this Plan.
- The legal and other requirements associated with management of air quality emissions from the Quarry.
- The objectives and key performance outcomes for this Plan and the Quarry.

Figure 1.1
LOCALITY PLAN

- Roles and responsibilities in implementing this Plan.
- Competence training and awareness for Metromix's personnel and contractors.
- The proximity of surrounding residences.
- A description of the existing air quality environment and predicted air quality-related impacts.
- Air quality management measures that will be implemented during the ongoing operation of the Quarry.
- Air quality-related monitoring that will be undertaken.
- Evaluation of compliance with air quality criteria.
- Corrective and preventative actions that will be implemented should exceedance(s) of the relevant criteria be identified.
- Complaints handling and response procedures that will be implemented.
- Incident reporting procedures.
- Publication of monitoring information.
- Plan review.

The above elements reflect each of the relevant specific issues outlined in *Condition 5(3)* of PA 10_0183, where relevant.

The approved Quarry and the air quality assessment of the approved extension are fully described in the following documents.

- Environmental Assessment for the Teralba Quarry Extensions, November 2011.
- Specialist Consultant Studies Compendium for the Teralba Quarry Extensions, 20111. Part 7 – Air Quality Assessment.
- *Environmental Assessment of Modification 1 for Project Approval 10_0183 for the Teralba Quarry* – December 2017.

A brief description of the approved activities within the Quarry is provided in Section 2.

This plan is an over-arching document for the management of air quality within the Quarry and is synonymous with the Dust Management Plan referred to in Action 11.15 of the Statement of Commitments for the Quarry (Appendix 3 to PA 10_0183).

2 APPROVED ACTIVITIES

The approved activities within the Teralba Quarry comprise the full range of activities undertaken prior to 22 February 2013 and the extension of extraction operations to the north and south of the

previously approved extraction areas. The approved activities on site comprise the following, the locations of which are displayed on **Figure 2.1**.

- Conglomerate extraction (blasting and excavation).
  - Southern Extraction Area.
  - Mid Pit Extraction Area.
  - Southern Extension.
  - Northern Extension.
- Processing Operations (size reduction, screening and blending).
  - Existing processing plant and pugmill.
- On-site Load and Haul Operations.
  - Off-road trucks on the on-site road network.
  - Conveying primary-crushed rock from the Southern and Northern Extensions to the processing plant (including conveyor beneath Rhondda Road).
- Off-site Transportation of Products.
- Vehicle/equipment maintenance and ancillary activities and stores.
- Administration and product despatch.
- Progressive rehabilitation and maintenance.

The sequence of extraction throughout the life of the Quarry will be consistent with the staging of vegetation clearing and therefore retirement of biodiversity credits specified in Conditions 3(54) to 3(56) of PA 10_0183. It is estimated that extraction activities over approximately the next 15 years, will only take place in the Southern Extension.

The relevant limitations upon the approved activities nominated in conditions within Project Approval 10_0183 are as follows.

- "The Proponent shall not carry out quarrying operations below 20 AHD in the Southern Extension and 24m AHD in the Mid Pit Extraction Area and Northern Extension" (*Condition 2(6)* of PA 10_0183).
- "The Proponent shall not extract more than 1.2 million tonnes of extractive materials from the site in any calendar year" (*Condition 2(7)* of PA 10_0183).

Y:\Jobs 531 to 1000\559\Post April 2004\Reports\55954_Annual Review 2017\CAD\559BaseMGA56.dwg_1.2 Approved Quarry Layout-19.07.2018-10:15 AM

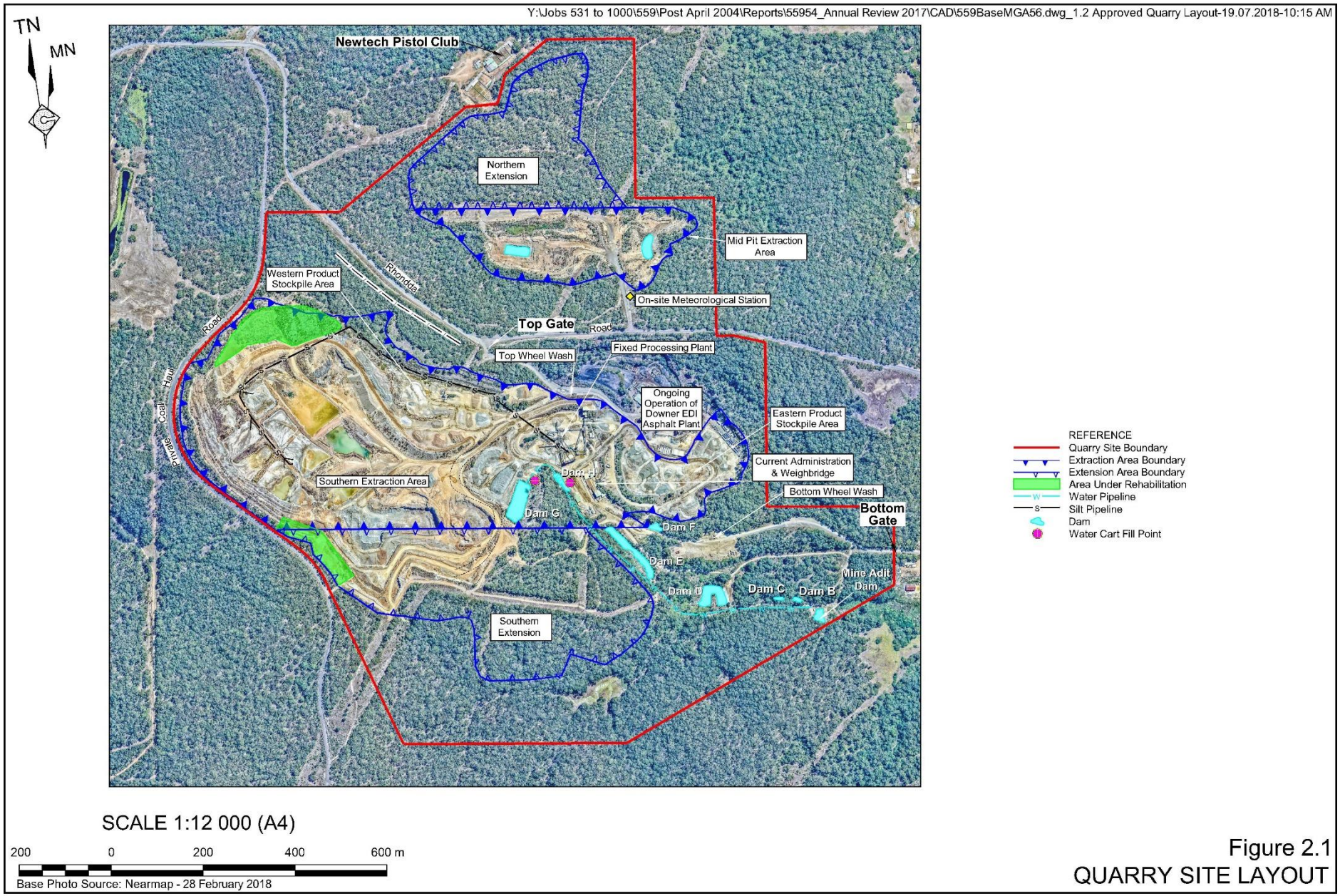


Figure 2.1
QUARRY SITE LAYOUT

- "The Proponent shall not:
    a) transport more than 1 million tonnes of quarry products from the site in any calendar year; or
    b) despatch more than 326 laden trucks from the site on any day; or
    c) despatch more than 241 laden trucks per day or 20 per hour westwards along Rhondda Road;
    d) despatch more than 85 laden trucks per day or 8 per hour eastwards through Teralba;
    e) despatch laden trucks for travel through Teralba between 6:00pm and 6:00am; or
    f) receive unladen trucks via the Railway St entrance between 6:00pm and 7:00am"

    (*Condition 2(8)* of PA 10_0183).

The approved quarry life is until 31 December 2038 (*Condition 2(5*) of PA 10_0183) and the approved hours of operation are set out in *Condition 3(6)* of PA 10_0183 and presented in **Table 2.1**

Table 2.1: Approved Hours of Operation

Day	Receipt of Concrete or VENM	Loading and Despatch of Quarry Trucks	Extraction and Processing Operations
Monday to Friday	7:00am to 5:00pm	4:00am Monday to midnight Friday	7:00am to 7:00pm
Saturday	7:00am to 2:00pm	midnight Friday to 6:00pm Saturday	7:00am to 2:00pm
Sundays and Public Holidays	None	None	None
Note: Maintenance activities may occur at any time provided they are inaudible at privately-owned residences.			

3 CONSULTATION

3.1 GOVERNMENT AGENCY CONSULTATION

A version of this plan prepared and approved in June 2013 was prepared in consultation with Council's Senior Sustainability Officer. The final document reflected the comments provided by Council.

An updated draft of this plan prepared following approval of a modification to PA 10_0183 was provided to Council in February 2019. A response was received from Council in October 2019 noted that it had no further comments. A copy of this correspondence is provided in **Appendix 1**.

A copy of this document was provided to the Department of Planning, Industry and Environment for review on 15 October 2019. Comments from DPIE and where these are addressed in the plan are provided in **Appendix 1**.

3.2 COMMUNITY CONSULTATION

Consultation with the local community with respect to air quality continues to focus on discussions with landholders whose land has been used in the past for the monitoring of deposited dust. Details of the various air quality monitoring sites are provided in Section 9 of this Plan.

Metromix consults with the Community Consultative Committee twice per year with no issues relating to air quality raised by the committee in the past.

4 LEGAL AND OTHER REQUIREMENTS

4.1 PROJECT APPROVAL PA 10_0183 CONDITIONS

This Plan has been prepared to outline how Metromix proposes to satisfy the requirements of *Conditions 3(17)* to *3(21)* of PA 10_0183 relating to air quality.

3(17) Air Quality Criteria

> "The Proponent must ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria in Tables 5 to 7 (reproduced in **Table 4.1**) at any residences on privately-owned land, or more than 25% of any privately-owned land."

Table 4.1: Air Quality Project Approval Requirements

Condition	Requirement				Addressed in Section
AIR QUALITY					
3 (17)	Air Quality Criteria – Long Term Impact Assessment Criteria for Particulate Matter				Section 10
	Pollutant		**Averaging Period**	**[d] Criterion**	
	Total Suspended Particulates (TSP)		Annual	[a] 90 µg/m^3	
	Particulate Matter < 10 um (PM_{10})		Annual	[a] 30 µg/m^3	
	Air Quality Criteria – Short Term Impact Assessment Criteria for Particulate Matter				Section 10
	Pollutant		**Averaging Period**	**[d] Criterion**	
	Particulate Matter < 10 µm (PM_{10})		24 hour	[a] 50 µg/m^3	
	Air Quality Criteria – Long Term Impact Assessment Criteria for Particulate Matter				Section 10
	Pollutant	**Averaging Period**	**Maximum Increase in Deposited dust level**	**Maximum total Deposited dust level**	
	[c] Deposited Dust	Annual	[b] 2g/m^2/month	[a] 4g/m^2/month	

Notes to **Table 4.1**

[a] Total impact (i.e.: incremental increase in concentrations due to the project 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] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580010.1.2003: Methods for Sampling and Analysing Air-Determination of Particulate Matter – Deposited Matter – Gravimetric Method.

[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents, illegal activities or any other activity agreed by the Secretary in consolation with EPA.

3(18) Greenhouse Gas Emissions

"The Proponent must implement all reasonable and feasible measures to minimise the release of greenhouse gas emissions from the site."

3(19) Operating Conditions

"The Proponent must:

a) implement best management practice to minimise the dust emissions of the project;

b) regularly assess air quality monitoring data and relocate, modify and or stop operations on site as may be required to ensure compliance with relevant conditions of this approval;

c) minimise the air quality impacts of the project during adverse meteorological conditions and extraordinary events (see Noted to Tables 5-7)

d) minimise any visible off site air pollution; and

e) minimise surface disturbance of the site, other than as permitted under this approval."

3(20) Air Quality Management Plan

The conditional requirements are outlined in Section 1.

3(21) Meteorological Monitoring

"For the life of the project, the Proponent shall ensure that there is a suitable meteorological station operating in the vicinity of the site that:

- complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and
- is capable of continuous real-time measurement of temperature lapse rate, in accordance with the NSW Industrial Noise Policy, or as otherwise approved by EPA."

4.2 STATEMENT OF COMMITMENTS

Table 4.2 presents the relevant air quality-related commitments from the Statement of Commitments incorporated within this Plan. These and other control measures and the personnel responsible are incorporated in Section 8 of this Plan.

Table 4.2: Air Quality-related Commitments

Page 1 of 2

	Commitment
11.1	Minimise clearing ahead of extraction activities.
11.2	Minimise the construction of minor roads and access tracks for soil stripping, extraction operations and rehabilitation.
11.3	Operate a water truck to manage dust suppression during periods of extended dry weather and/or high winds, or when dust nuisance has the potential to occur as a result of quarrying activities.
11.4	Stockpile material in sheltered locations away from sensitive receptors.
11.5	Shield and/or suppress dust on conveyors and transfer points.

Table 4.2: Air Quality-related Commitments (Cont'd)

Commitment
11.6 Limit internal road dust lift off by: - surfacing (and grading) internal roads with appropriate materials; - enforcing a 30km/hr speed limit on all internal roads - limiting loads sizes to ensure that product does not extend over truck sidewalls; and - avoid spillage during truck loading.
11.7 Minimise dump heights from trucks, front-end loaders and conveyors.
11.8 Schedule blasts so that they do not occur during high wind situations.
11.9 Cease or modify activities on dry and windy days when dust plumes are visible.
11.10 Water exposed areas not covered by gravel under dry and windy conditions when dust plumes are visible.
11.11 Adopt a complaints management system where all complaints are dealt with through investigation and implementation of corrective treatments.
11.12 Minimise truck queuing, unnecessary idling of trucks and unnecessary trips through logistical planning, where possible.
11.13 Ensure the on-site wheel wash reduces mud tracking along Railway Street.
11.14 Remove any mud tracking on Rhondda Road as a result of quarry movements.
11.15 Prepare and implement a Dust Management Plan for the Quarry (i.e. this Air Quality Management Plan).
11.16 Minimise the impacts of greenhouse gases relating from diesel consumption by: - minimising the use of haul trucks through the use of an overland conveyor; - reduce vehicle idling time; - maintaining optimum tyre pressures; and - the optimisation of haul routes to reduce transportation distance from extraction areas.
11.17 Minimise the impacts of greenhouse gases relating from Electricity consumption by: - ensuring the most efficient crusher and other technology is used; - regularly inspecting the daily operations of lighting; and - implementing solar-powered lighting, where possible.
11.18 Continue to monitor dust impacts through; - the existing five deposit dust gauges; and - on-site meteorology monitoring to record relevant parameters.

Table 4.3 presents the relevant air quality-related requirements from the Environment Protection Licence.

Table 4.3: Environment Protection Licence Requirements

Condition Number	Condition
L8.1	No condition of this licence identifies a potentially offensive odour for the purposes of Section 129 of the *Protection of the Environment Operations Act 1997.*
L8.2	The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

5 OBJECTIVES AND OUTCOMES

Table 5.1 presents the objectives and key performance outcomes relating to air quality for this Plan and the Quarry.

Table 5.1: Air Quality Objectives and Key Performance Outcomes

Objectives	Key Performance Outcomes
(a) To ensure compliance with all relevant Project approval and Environment Protection Licence criteria and reasonable community expectations.	(i) Compliance is achieved with all relevant criteria nominated in the Project Approval 10_0183 and Environment Protection Licence 536. Community complaints are minimised and responded to proactively.
(b) To implement appropriate air quality management and mitigation measures during all stages of the Quarry.	(ii) All identified air quality management and mitigation measures are implemented to the extent required.
(c) To implement an appropriate monitoring program to establish compliance or otherwise with relevant criteria during all stages of the Quarry.	(iii) All identified monitoring is undertaken in accordance with the relevant procedures and at the relevant intervals.
(d) To implement an appropriate complaints handling and response protocol.	(iv) Complaints (if any) are handled and responded to in an appropriate and timely manner.
(e) To implement continual improvement for investigating, implementing and reporting on reasonable and feasible measures to reduce air quality emissions.	(v) An appropriate continual improvement program has been implemented.
(f) To implement an appropriate incident reporting program, if required.	(vi) Incidents (if any) are reported in an appropriate and timely manner.

6 PERSONNEL MANAGEMENT

6.1 ROLES AND RESPONSIBILITY

Table 6.1 presents the roles and responsibilities of the personnel within Teralba Quarry for the implementation of this Plan.

Table 6.1: Roles and Responsibilities for Management of Air Quality

ROLES	RESPONSIBILITIES
Risk Manager	• Compliance to Air Quality Management Plan
Quarry Manager	• Training of personnel in Air Quality Management and Dust Management Plans • Ensure the Weather Station is operational • Ensure samples are collected correctly and on time for all deposited dust gauges and the HVAS • Ensure all Air Quality Control Measures (Section 8) are implemented.
Quarry Supervisors	• The operation of a water truck to supress dust (and maintain records of use) • The operation of mist sprays/dust suppression on conveyors and transfer points to suppress dust.
All personnel	• Implement all relevant Air Quality Control Measures as directed by the Quarry Manager.

6.2 COMPETENCE TRAINING AND AWARENESS

All Metromix personnel and contractors and their employees will undergo site specific training incorporating air quality management awareness as part of the Quarry's Safety, Health and Environmental (SHE) program where relevant to their work tasks.

7 EXISTING ENVIRONMENT AND POTENTIAL AIR QUALITY-RELATED IMPACTS

7.1 SURROUNDING RESIDENCES

Figure 7.1 displays the location of residences surrounding the Quarry Site and the existing air quality monitoring sites.

7.2 SITE WIND ENVIRONMENT

Figure 7.2 and **Figure 7.3** present the monthly wind roses calculated from the Teralba Quarry Weather Station for 2017. The wind roses demonstrate annual wind patterns with winds from the southeast quadrant prevalent during warmer months (October to March) and winds from the southwest more prevalent during cooler months (April to September).

7.3 AMBIENT AIR QUALITY

Ambient air quality were estimated for the air quality assessment for the EIS prepared by SLR Consulting in 2011. **Table 7.1** provides the ambient background air quality levels that were adopted for the Quarry based on the following.

- Deposited Dust Gauges in Rhondda Road, Myrtle St and Hillside Cres in the suburb of Teralba, managed by Metromix for the period from June 2004 to June 2011.
- TSP & PM_{10} – Records from the EPA operated monitoring station in Wallsend in Newcastle, approximately 10km from the Quarry Site.

Table 7.1: Ambient Air Quality Levels for Teralba Quarry

Air Quality Parameter	Averaging Period	Assumed Background Quantity	Data Source
TSP	Annual	39.3 µg/m^3	Assumed [a]
PM_{10}	24 Hour Annual	Daily varying with average of 15.7 µg/m^3	EPA Wallsend
Dust Monitoring	Annual	2 µg/m^2/month	Site Monitoring

[a] Assumes that PM_{10} makes up 40% of TSP and the annual average PM_{10} is 15.7 µg/m^3

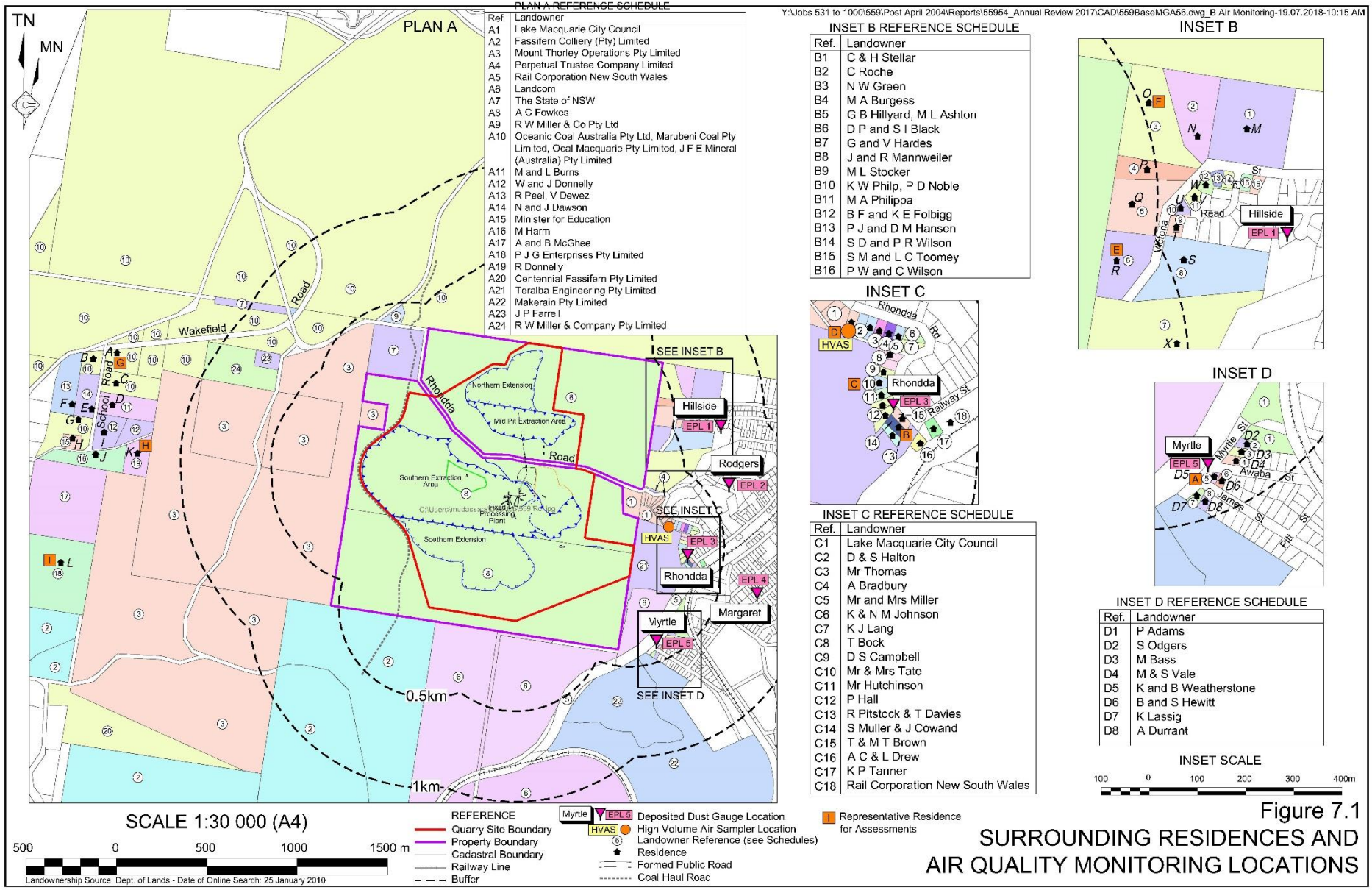


Figure 7.1
SURROUNDING RESIDENCES AND AIR QUALITY MONITORING LOCATIONS

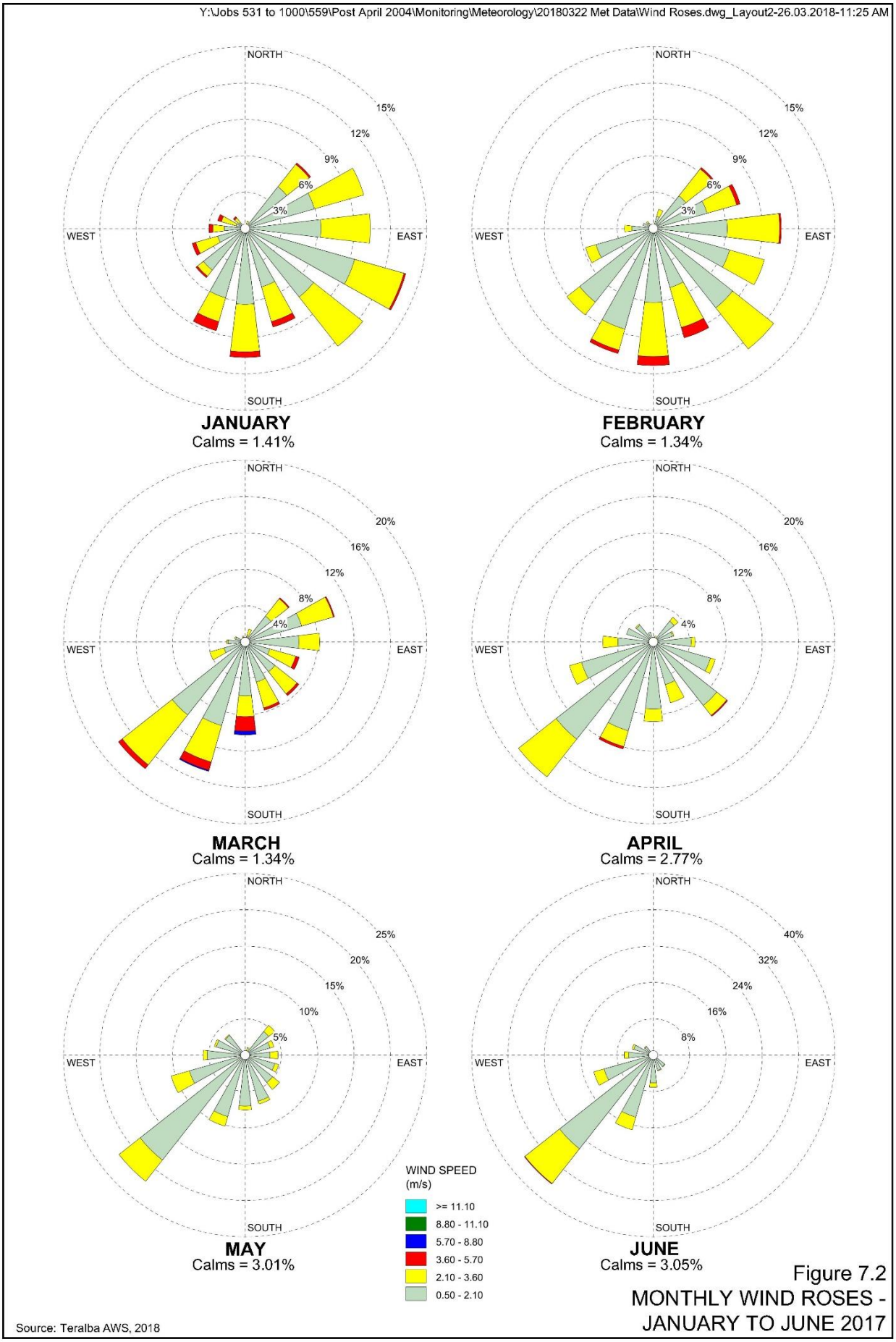


Figure 7.2
MONTHLY WIND ROSES -
JANUARY TO JUNE 2017

Figure 7.3
MONTHLY WIND ROSES -
JULY TO DECEMBER 2017

7.4 GREENHOUSE GASES

Emissions of greenhouse gases within the Quarry are attributed to the following sources.

- Diesel used on site for stationary energy and transport purposes.
- Explosives.
- Electricity consumption.
- Product road transport.
- Employee and contractor travel.

The quantities of diesel used on site, explosives usage and electricity consumption are tracked by Metromix on a monthly basis.

7.5 POTENTIAL AIR QUALITY IMPACTS

Emissions from the following activities within the Quarry are potential sources of air pollutants in the local area (including particulates and greenhouse gases).

- Extraction activities including drill & blast, load and haul as well as crushing and screening;
- Vehicle movements on unsealed roads;
- Product loading and despatch; and
- Wind erosion from disturbed areas and stockpiles.

These particulates, when greater than about 30µm in diameter, are sufficiently large to settle in a comparatively short distance from their source and cause amenity impacts, e.g. dust on window sills, etc. The particulates, when less than about 10µm in diameter, are sufficiently small to remain airborne and are capable of entering a person's airways and contribute to health problems.

7.6 PREDICTED AIR QUALITY IMPACTS

Three modelling scenarios were considered during the air quality assessment prepared by SLR Consulting. The most relevant scenario for this Plan (based on operations for the next 15 years) is Operational Scenario 1B – Extraction in the Southern Extension (Stage A) and Mid Pit Extraction Area (Stage E) only although it is noted that during the next 15 years there will be no further extraction undertaken within the Mid Pit Extraction Area. Incremental and cumulative PM_{10} and deposited dust levels predicted by SLR Consulting are presented in **Table 7.2**.

Table 7.2: Predicted Cumulative Air Quality Impacts

Receptor ID*	PM_{10} Annual Average (µg/m^3)		PM_{10} 24hr Average (µg/m^3)		Deposited Dust (µg/m^2/mth)	
	Incremental	Cumulative	Incremental	Cumulative	Incremental	Cumulative
A	0.4	16	0.6	40	0.2	2.1
B	0.9	16	1.4	41	0.4	2.2
C	0.2	16	1.8	42	0.0	2.0
D	0.9	16	1.2	41	0.3	2.1
E	0.7	16	0.8	40	0.2	2.1
F	0.4	16	0.5	40	0.1	2.0
G	0.1	16	0.0	39	0.0	2.0
H	0.1	16	0.0	39	0.0	2.0
I	0.1	16	0.0	39	0.0	2.0
Guideline	**30**		**50**		**2 incremental or 4 cumulative**	

* See Figure 7.1

Source: SLR Consulting (2011)

7.7 MONITORED AIR QUALITY LEVELS

Metromix has implemented an air quality monitoring program in accordance with the approved Air Quality Management Plan since 2013 (noting that deposited dust monitoring has occurred since 2004). An overview of historic monitoring results under PA 10_0183 are presented in **Table 7.3**. All monitoring has remained generally consistent with the criteria specified in PA 10_0183 and the predicted dust levels presented in **Table 7.2**. It is noted that exceedances of the 24-hr PM_{10} criteria have been recorded in monitoring, however these results have in each case been caused by bush fire smoke or dust storms.

Table 7.3: Historic Air Quality Monitoring Results

Year	Annual Average PM10 (µg/m^3)	Maximum 24-hour PM_{10} (µg/m^3)	Deposited Dust (g/m^3/month)				
			Rhonnda Road	Myrtle St	Hillside Cres	Rodgers St	Margaret St
2013	NM	NM	1.0	0.9	1.3	1.0	1.3
2014	19.0	46	0.9	0.9	1.4	2.0	1.0
2015	14.7	50*	1.0	1.7	1.7	0.7	1.0
2016	14.0	55*	0.9	1.1	1.9	0.9	1.1
2017	14.3	35	0.9	1.5	2.0	1.8	1.2
Criteria	**30**	**50**	**4.0**	**4.0**	**4.0**	**4.0**	**4.0**

NM = Not monitored

* - Noted to have occurred on days during which bush fire smoke was present and influencing results.

8 CONTROL MEASURES

8.1 INTRODUCTION

Condition 3(20) of PA 10_0183 requires that this Plan describe the mitigation measures to be implemented to ensure:

- best practice is employed;
- air quality impacts are minimised during adverse meteorological conditions or extraordinary events; and
- compliance with the criteria listed in **Table 4.1**.

This section presents the likely dust sources and the key control procedures and measures to be adopted to satisfy this requirement. It is noted that the measures adopted by Metromix have been established over many years to be effective in controlling dust. In a number of cases, the measures are consistent with best management practices, whereas in some cases the controls adopted may not necessarily be consistent with best management practice but collectively they are effective in controlling dust emissions from the Quarry Site to acceptable levels.

8.2 DUST CONTROL MEASURES

Table 8.1 presents the dust control measures that will continue to be implemented to mitigate dust emissions from the activities throughout Teralba Quarry. The ongoing measures are generally consistent with those adopted in the Air Quality Impact Assessment conducted by SLR Consulting. It is noted that the bulk of the processing undertaken with the Teralba Quarry is wet processing, i.e. Screens 3, 4, 5 and 6 and No. 3 crusher. Hence, no additional dust control measures are required for these components of the plant.

Table 8.1: Key Dust Control Measures

Dust Source	Control Measure(s)	Personnel Responsible
Soil and Vegetation Stripping (Removal and stockpiling of Biomass and Soils)	• Water cannon on water truck, if required • Minimise clearing ahead of extraction activities to the area required for each stage of development.	Quarry Supervisor
Stripping (Removal and placement of Overburden)	• Water cannon and water truck, if required • Minimise roads/tracks used or created during soil removal	Quarry Supervisor
Drilling Activities	• Dust extraction on drill rig • Addition of water during the drilling process	Driller
Blasting Activities	• Schedule blasts so that they do not occur during forecasted high wind situations	Quarry Manager

Dust Source	Control Measure(s)	Personnel Responsible
Loading PRF (Primary Raw Feed) With Excavator	• Wet fragmented rock from blasts overnight with water cannon, if required • Minimise internal roads used during extraction operations and rehabilitation • No roads and tracks outside the area of approved disturbance	Quarry Supervisor
Hauling PRF on internal haul roads.	• Water truck with sprays capable of achieving 2L/m^2/application • Speed limit of 30km/hr (sign posted around the Quarry) • Loads contained wholly with haul trucks	Quarry Supervisor/Haul Truck Operators
Product Stockpiles, loading and despatch	• Stockpiles only located in nominated areas • Water cannon, if required • Use of minimal heights when loading • Use of wheel wash by all departing trucks, i.e. using the bottom or top wheel washes (see **Figure 2.1**) • Use of street sweeper, if required	Quarry Supervisor
Dumping PRF into Primary Feeder Bin	• Enclosed structure on 3 sides	Quarry Manager
Trafficked Exposed Areas and Internal Roads	• Water truck with sprays • Speed limit of 30km/hr signposted around the Quarry • Use of road sweeper, as required	Quarry Supervisor/Water Truck Operators
Crushing and Screening	• Primary crusher and Dry Screen 1 are enclosed in a building • Cover Dry Screen 2 with canvas/poly flexible cover • Cover and/or use of mist sprays on the three transfer points in the dry section of the plant	Quarry Supervisor/Plant Operator

In addition to the key control measures outlined in **Table 8.1**, Metromix will continue to undertake the following measures under the nominated circumstances.

(i) During periods of high wind speeds (typically from the western quadrant):

- activities capable of generating dust will be curtailed in the higher exposed areas;
- additional water will be applied to internal roads in use for hauling primary raw feed;
- blasts will not be scheduled or initiated; and
- any other open areas capable of generating dust will be watered with the water truck potentially with the water truck's water cannon.

(ii) Dust generating activities in the higher exposed areas will be scheduled, as much as practicable, when winds are not from the western quadrant.

(iii) Once areas within the Quarry Site are no longer required for operational purposes, they will be rehabilitated in accordance with the procedures set out in the Landscape Management Plan.

8.3 ODOUR CONTROL MEASURES

The key odour control measures relate to the prevention/minimisation of blast fumes, particularly those containing oxides of nitrogen. Section 8.2.2 of the Blast Management Plan outlines each of the measures adopted by Metromix to avoid/minimise odorous fumes during blasting.

8.4 GREENHOUSE GAS CONTROLS

The key actions Metromix will adopt to minimise the release of greenhouse gases from Teralba Quarry relate to the following.

- **Diesel Consumption**

  Considerations will be made by the Quarry Manager when executing the pit plan to ensure haul roads are placed to maximise mobile plant efficiency and minimise excessive diesel consumption.

- **Reduce Vehicle Idling Time**

  All operators will be required to operate equipment in such a manner that reduces idling time. This will be achieved through streamlined operations and turning engines off during length periods of inactivity.

- **Maintaining Optimal Tyre Pressures**

  Each tyred vehicle will have optimal type pressures identified for each tyre and noted above its location – daily checks will be undertaken to ensure the optimal tyre pressure is maintained.

- **Optimising Haul Routes**

  Haul routes between the raw feed loading area and either the processing plant or primary crusher will be designed to achieve a route that is ideally of shortest length and suitable grade. The internal haul roads will be progressively re-located to maintain the shortest possible distance and grade for haul truck travel.

- **Electricity Usage**

  Efficient processing Plant Components. Metromix will continue its current practice of optimising the efficiency of the processing plant components which in turn minimises the quantity of electrical power used. Regular checks (at least monthly) are undertaken to ensure that all external lighting is not operational during the day time. This often

involves the use of lumatrol switches that are activated by reduced levels of light. Metromix will investigate the feasibility of introducing solar power panels on remote items of equipment to minimise the use of mains electrical power.

9 AIR QUALITY MONITORING

9.1 INTRODUCTION

Condition 3(20)(d) of PA 10_0183 requires that an Air Quality Management Plan for the quarry include details of air quality performance monitoring. In addition, *Condition 3(21)* of PA 10_0183 requires meteorological data is drawn from a suitable monitoring station operating in the vicinity of the Site. For all data, other than the continuous real-time measurement of the temperature lapse rate, Metromix will rely on its own on-site meteorological station located 70m north Rhondda Road (see **Figure 2.1**). The following sub-sections are presented to satisfy these requirements.

9.2 MONITORING EQUIPMENT AND LOCATION

Dust monitoring equipment will be installed in accordance with the following.

- *AS/NZS 3580.10.1:2003 (R2014) Methods for Sampling and Analysis of Ambient Air, Determination of Particulates— Deposited Matter—Gravimetric method.*
- *AS 2922:1987 Ambient Air - Guide for the Siting of Sampling Units* (NSW DECCW Method AM-1), and the NSW DECCW *Approved methods for the sampling and analysis of air pollutants in NSW* (DECC, 2005).

Table 9.1 lists the air quality-related monitoring locations. Each of the five deposited dust gauges are named based upon the closest street name. All locations are listed alphabetically. The five locations are positioned in and are to the east of the Quarry on the western outskirts of Teralba given the proximity of residences to the active quarry areas.

Table 9.1: Locations of Dust Monitoring Equipment

Monitoring Location	Easting	Northing	Date	Sampling Frequency
Hillside	369422	6352680	June 2004	Monthly
Margaret	369622	6351763	April 2011 – Nov 2018	Ceased
York	3697777	6352013	1 Feb 2019	Monthly
Myrtle	369071	6351492	June 2004	Monthly
Rhondda	369240	6351972	June 2004	Monthly
Rodgers	369467	6352369	April 2011	Monthly
HVAS	369147	6352126	Sept 2013	6 days

Metromix has installed a High Volume Air Sampler (HVAS) with a PM_{10} collection head at Rodgers Street in Teralba (see **Figure 7.1**). The use of the PM_{10} collection head is supported by the EPA given this size of dust is more likely to be generated within the quarry (compared with $PM_{2.5}$). This location was chosen as it is effectively downwind from Teralba Quarry during the most prevalent winds i.e. from the western quadrant. The location will minimise the influence of other known dust sources to the east of Teralba Quarry i.e. Teralba Engineering and Teralba Industrial Estate although it is recognised the proposed location is also downwind from the Teralba Asphalt Plant.

Metromix has chosen to install a HVAS with a PM_{10} collection head in favour of a TSP collection head as it is recognised the concentration of PM_{10} particles is of greater importance given its nexus with health issues. Installation of both a TSP and PM_{10} collection units is unnecessary given the deposited dust monitoring results to date have confirmed that air quality issues related to Teralba Quarry are low risk. This decision has been supported by the EPA.

The Quarry Manager will be responsible for the installation and management of all dust monitoring equipment.

9.3 MONITORING FREQUENCY

Table 9.1 also presents the air quality monitoring sampling frequencies that will be adopted for the deposited dust and HVAS sampling undertaken for the Quarry.

The Quarry Supervisor will be responsible to ensure sampling is undertaken at the relevant frequencies and in accordance with the procedures outlined in Section 9.2.

9.4 METEOROLOGICAL MONITORING

Metromix has installed an automated meteorological station within the Site (**Figure 2.1**). The station complies within the requirements in **Table 1** of the Guideline entitled "*Approved Methods for Sampling of Air Pollutants in NSW*". The meteorological station records:

- temperature;
- humidity;
- air pressure;
- rainfall;
- delta temperature;
- solar radiation;
- sigma theta;
- fire danger index; and
- dew points.

The station is equipped with digital cell phone kit which retrieves data from the logger and transmits it directly to a computer at the site office.

Metromix will ensure that the meteorological station is operated in accordance with the "*Approved Methods for Sampling of Air Pollutants in NSW*" guideline.

9.5 GREENHOUSE GAS RECORDS

The data that is collected annually to record the extent of greenhouse gas production is as follows.

- Diesel usage on site.
- Quantity of explosives initiated.
- On-site electricity consumption.
- Average fuel usage by machines and contractors.
- Average transport distance for company owned product truck deliveries (and fuel usage).

10 EVALUATION OF COMPLIANCE

The tabulated data will include an assessment of the monitoring results against the criteria identified in *Condition 3(17)* of PA 10_0183*.* The tabulated data will be reviewed by the Quarry Manager and a copy included within each *Annual Review*.

In the event that the monitoring results approach the criteria identified in *Condition 3(17)* of PA 10_0183, the Quarry Manager or Quarry Supervisor will review.

i. the meteorological data for the corresponding period;
ii. the locations and duration of activities on site during the corresponding period; and
iii. data on activities at the nearby asphalt plant.

In the event i. and ii. suggest the Quarry is the source of the elevated dust levels, the Manager will initiate the corrective and preventative actions.

11 CORRECTIVE AND PREVENTATIVE ACTIONS

In the event that air quality monitoring identifies an exceedance of the air quality criteria identified in *Condition 3(17*) of PA 10_0183, the exceedance will be investigated to determine the likely cause. All corrective and preventative actions are entered into the Rapid Online Reporting Database. An investigation will then follow to determine:

- what immediate action(s) shall be taken to fix the problem in the short term, if applicable;
- the root causes of the problem (i.e. management system, human factors/behaviour, work environment, training);
- corrective actions required to eliminate the root cause(s);
- action(s) taken to verify effectiveness of corrective action(s) (i.e. what measures and checks are taken to ensure the corrective actions that are in place are effective to prevent any further exceedance).

On completion of the investigation, an electronic copy will be forwarded to Metromix's Risk Manager for review/approval of corrective and preventative actions.

In accordance with Metromix's SHE procedures, if an event or activity occurs within the Quarry Site that has caused, is causing, or is likely to cause harm to the environment, whether the harm occurs on or off the premises, Metromix will report the event to the EPA after it becomes known to any employee or contractor. The reporting will be undertaken in accordance with the Company's Pollution Incident Response Management Plan, i.e. DP&E and EPA will be notified by Metromix as soon as practicable after the incident and a report will be prepared and submitted to the DP&I and EPA within 7 days of the exceedance in accordance with *Condition 5(7*) of PA 10_0183.

The key corrective and preventative actions are likely to focus upon the frequency of road watering and the effectiveness of the controls on the dry section of the processing plant. The Quarry Manager will ensure that the appropriate level of control is re-established as soon as possible after the problem(s) are identified.

12 COMPLAINTS HANDLING AND RESPONSE

Metromix will advertise the community inquires/complaints line 02 4950 6640 as a minimum in the local phone directory and may also consider advertising the number through local media or on newsletters.

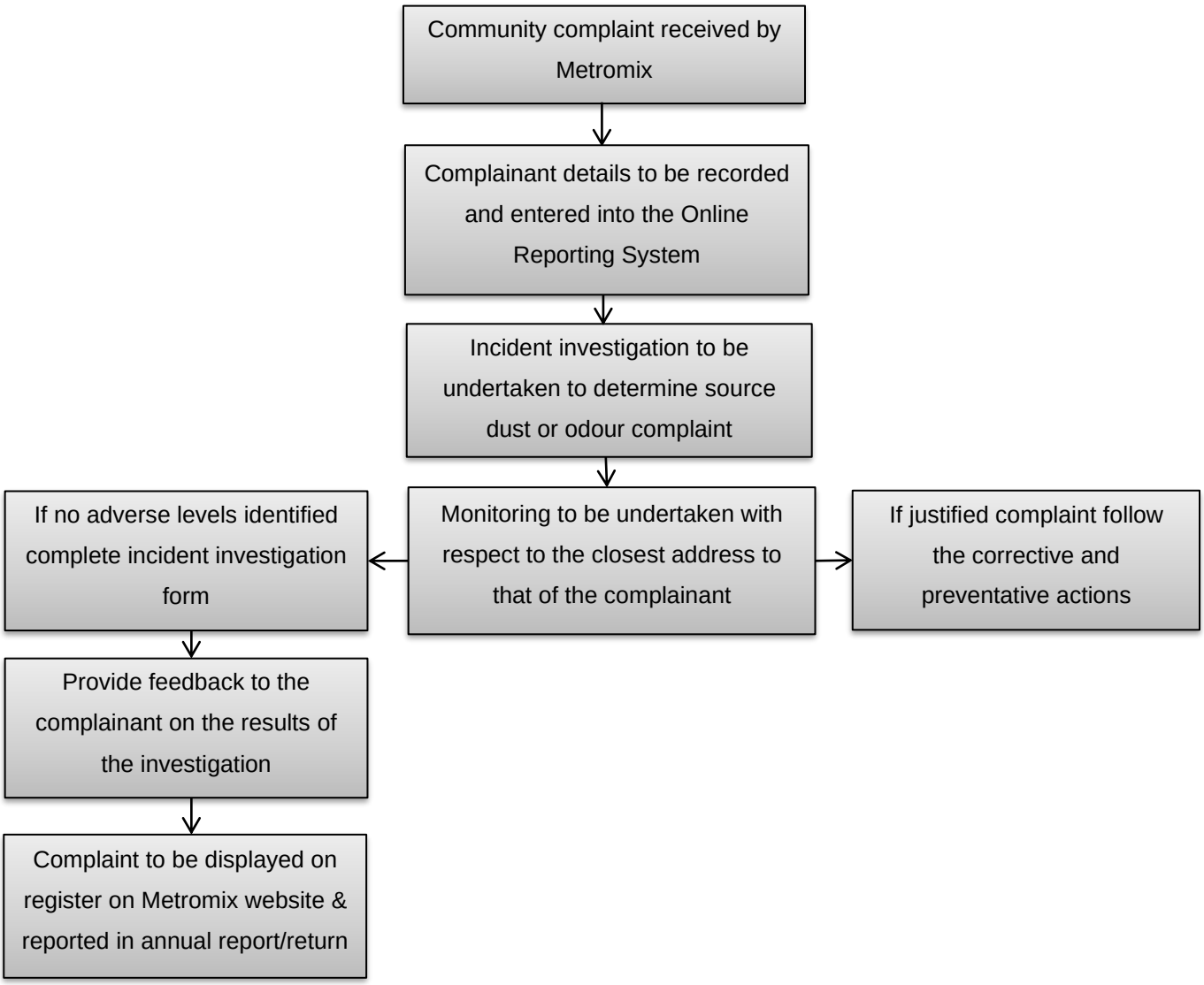
Metromix will respond to any registered community inquiries or complaints received by this number as described in the Rapid Online Reporting System.

The following flowchart shows the process that Metromix will follow in the event a dust or odour complaint is received.

13 INTERNAL INFORMATION AND COMMUNICATION

Key avenues for internal communication on environmental and community aspects/concerns of the Quarry operations are maintained mainly through toolbox meetings. In addition, Metromix has the following methods of communication with its employees and contractors.

- Monthly Safety, Health and Environmental Meetings.
- Internal communiques.
- Distribution internally and externally of Metromix's newsletter "Metronews".
- Formal communication meetings approximately 4 times per year.



14 INCIDENT REPORTING

PA 10_0183 defines an incident is an occurrence or set of circumstances that:

- causes or threatens to cause material harm to the environment; and/or
- exceeds the limits or performance measures/criteria in this approval

where material harm to the environment Is unauthorised harm that:

- involves actual or potential harm to the health or safety of human beings or to ecosystems that is not trivial, or
- results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding $10,000, (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment)

All incidents must be recorded using the “Rapid Online Reporting System” that is available through the Metromix intranet website. The Risk Manager is to be notified as soon as possible to assist in determining corrective actions.

All incidents are to be notified to the Department of Planning, Industry and Environment (DPIE) in accordance with Condition 7 of Schedule 5 of PA 10_0183 and a report detailing at a minimum the time and date of the incident, details of the incident, measures implemented to prevent re-occurrence and discussion of any non-compliance with PA 10_0183 that resulted.

In addition, a summary of all incident reports will be provided to the Community Consultative Committee (CCC), made publicly available on the Metromix website and included in the *Annual Review* for the Quarry.

15 PUBLICATION OF MONITORING INFORMATION

All air quality monitoring reports will be made publicly available on the Metromix website and will be included in the *Annual Report*.

The Quarry Manager will be responsible for publication of all relevant monitoring information.

16 PLAN REVIEW

In accordance with *Condition 5(5)*, this *Air Quality Management Plan* will be reviewed and, if required, revised within 3 months of:

- annual review;
- incident report;
- independent audit report; or
- any modification Project Approval 10_0183.

The Quarry Manager will be responsible for the review of this Plan.

This page has intentionally been left blank

Appendix 1 Consultation Record

This page has intentionally been left blank

From: Glen Mathews <gmathews@lakemac.nsw.gov.au>
Sent: Friday, 11 October 2019 4:33 PM
To: Nicholas Warren
Subject: RE: 559 - Teralba Quarry - Management Plan

Hi Nicholas,

I have received a response for air quality and blast management as below:

Blast Management Plan
I have reviewed the report titled *Metromix Pty Limited, Blast Management Plan (Incorporating a Blast Monitoring Program), November 2016* prepared by Metromix.
The report was initially approved by the Secretary's nominee Howard Reed on 10 October 2013.
The changes to this plan are mostly administrative such as the project approval reference, the Environmental Protection Licence conditions and the relevant legislation. There is also the inclusion of blast monitoring data from 2013 to 2017.
As a result, there are no objections to the updated report.
Air Quality Management Plan
I have reviewed the report titled *Metromix Pty Limited, Air Quality Management Plan (Incorporating Weather Monitoring), February 2019* prepared by Metromix.
The report was initially approved by the Secretary's nominee Howard Reed on 10 October 2013.
The changes to this plan are mostly administrative such as the project approval reference. There is also the inclusion of historic air quality monitoring results from 2013 to 2017.

In relation to traffic management plan the following comment has been received:

Roads maintenance and asset implications
In the Transport Management Plan Page 15 under Clause 4.3 Statement of Commitments –Commitments Table 4.3 - Item 9.4
"Provide a contribution to Lake Macquarie City Council during the ongoing life of the quarry if a suitable project approval is granted. "

In accordance with Lake Macquarie City Council's Contributions Plan- Toronto Contributions Catchment 2016- Part 4 Community Infrastructure and Contributions Item 4.2 Road Haulage - Council will seek road haulage contributions from developments that generate heavy vehicle movements as a significant and integral component of their operations.
A range of factors will be taken into consideration when calculating the haulage contribution rate for each applicable development including:

- The affected road sections and pavement types
- The rehabilitation costs, routine maintenance costs and programmed maintenance costs
- Existing traffic load quantified in terms of the number of equivalent standard axle loads
- Proposed increase in traffic load as a result of the development proposal quantified in:-

✓ terms of ESA
✓ Quantity of goods or materials proposed to be transported along nominated haulage routes as specified in the development proposal.

Council will calculate the haulage contribution rate for each applicable development using the formula as described in the plan, that could be levied on a tonne per kilometre or average rate per tonne that may leave the facility. A review of the agreed levy must be allowable based on any changes to the operation of the plant and impact on surrounding road network.

Truck configuration leaving the facility affects the ESA determination for the haulage levy and details on type and size of trucks may need further clarification. Should new markets, for the products be found, then this will influence production, routes and truck configuration.
Previous discussions held with Metromix regarding the proposed levy will require further work to enable the proposed payment structure to proceed.
All truck movements are to adhere to the approved routes. No truck movements in a Northerly direction along Racecourse Road shall be permitted that runs off Route 3 and Route 4.

Kind Regards,

Glen Mathews
Senior Development Planner

LAKE MACQUARIE CITY

T 02 4921 0399 **M** 0439 647 504
E gmathews@lakemac.nsw.gov.au
lakemac.com.au

From: Nicholas Warren <nick@rwcorkery.com>
Sent: Tuesday, 8 October 2019 10:26 AM
To: Glen Mathews <gmathews@lakemac.nsw.gov.au>
Cc: Mo Yunusa <MoY@metromix.com.au>; Melissa Anderson <Melissa.Anderson@planning.nsw.gov.au>
Subject: RE: 559 - Teralba Quarry - Management Plan

Hi Glen,

I thought to follow up on the Teralba Quarry Air Quality Management Plan, Blast Management Plan and the Transport Management Plan comments from Council.

Please be advised that due to the length of time taken to receive comments, if we do not receive feedback by the end of this week, we will proceed to submit the plans to DPIE for final approval.

Metromix are operating in accordance with approved plans, however have been waiting almost 12 months since these plans were first submitted to Council.

Regards,
Nick

Nick Warren
Principal Environmental Consultant
B.Sc., M. Bus., M. Env.Sc.
Phone: 02 9985 8511
Mobile: 0437 635 975
Email: nick@rwcorkery.com

RW Corkery & Co Pty Limited
Geological and Environmental Consultants

Local Government PROCUREMENT
APPROVED CONTRACTOR

From: Glen Mathews <gmathews@lakemac.nsw.gov.au>
Sent: Friday, 6 September 2019 11:57 AM
To: Nicholas Warren <nick@rwcorkery.com>
Cc: Mo Yunusa <MoY@metromix.com.au>
Subject: RE: 559 - Teralba Quarry - Management Plan

Hi Nick,

I have received feed back from Council's waste section yesterday identifying:

Waste Storage:

- *The plan does not detail waste storage areas on the site to demonstrate that there is sufficient, safely accessible storage space (including routes between waste sources and storage) and communicate where each waste type is to be stored.*

Waste Collection:

- *The waste management plan and transport management plan do not detail waste collection vehicle access routes, turn circles and clearances. Although the transport plan mentions contractors must be provided with competence training, it does not clarify whether this applies to contracted waste collection vehicles.*

Air quality have been in contact and a reviewing currently and I will chase traffic again for their comments on the transport management plan.

Kind Regards,

Glen Mathews
Senior Development Planner

LAKE MACQUARIE CITY

T 02 4921 0399 **M** 0439 647 504
E gmathews@lakemac.nsw.gov.au
lakemac.com.au

From: Nicholas Warren <nick@rwcorkery.com>
Sent: Friday, 6 September 2019 11:44 AM
To: Glen Mathews <gmathews@lakemac.nsw.gov.au>
Cc: Mo Yunusa <MoY@metromix.com.au>
Subject: FW: 559 - Teralba Quarry - Management Plan

Hi Glen,

Can you please give me an update on progress with this review?

Please let me know if you are not intending to review these plans so we can let the Department of Planning know that they can complete their review.

Regards,
Nick

Nick Warren
Principal Environmental Consultant
B.Sc., M. Bus., M. Env.Sc.
Phone: 02 9985 8511
Mobile: 0437 635 975
Email: nick@rwcorkery.com

DPIE REVIEW OF REVISED TERALBA QUARRY MANAGEMENT PLANS (DECEMBER 2019)

DPIE Comment	Response	Section
Comments Generally Applying to all MPs submitted 15 October 2019		
1. Please include the direct consultation with agencies required by conditions of approval in an appendix to each MP. I appreciate that this consultation has been provided in emails accompanying the lodged MPs, but the Department wishes that these comments be included in a single document (the MP). This allows the reviewing officer to check that comments received have not been overlooked, diminished or ignored. It also provides the Company a means to establish compliance with this component of a condition of approval at the time of an environmental audit.	Adjusted as noted	Various
2. Most of the MPs do not correctly describe the effect of modification of the Project Approval. The exception to this is the Waste MP. When a Project Approval or consent is modified, the project approval, as modified, becomes the legal project approval. This means there isn't project approval PA 10_0183 and PA10_0183 MOD 1. There is only PA_0183 which was approved on 22 February 2013 and modified on 16 April 2018. References throughout the MPs to PA 10_0183 MOD 1 should be removed and the surrounding text reconsidered to see if it still makes sense after the MOD 1 component is removed. If you need any further explanation about this matter, please contact me.	Adjusted as noted	Various
3. The name of our Department has changed (again!). We are now the Department of Planning, Infrastructure and Environment or DPIE. Please update all uses in the MPs, including the "Commonly Used Acronyms".	Adjusted as noted	Various
4. The name of the Division of Resources and Energy has changed to Division of Resources and Geosciences (or DRG) with DPIE.	Adjusted as noted	Various
5. Among the matters changed by MOD 1, were the introduction of change to the definitions of "*Incident"* and "*Material harm to the environment".* This means that the procedures in the MPs that relate to Incident reporting and subsequent reporting must be consistent with these definitions and the requirements of condition 7 and 7B of Schedule 5. An incident includes an exceedance of a criteria in the Project Approval and reporting needs to include the Department and within the timeframes and methods set out in conditions 7 and 7B.	Adjusted as noted across each plan.	Various

DPIE REVIEW OF REVISED TERALBA QUARRY MANAGEMENT PLANS (DECEMBER 2019) (Cont'd)

DPIE Comment	Response	Section
Air Quality Management Plan (AQMP)		
6. Please have full regard to the general comments 1 to 5 , as relevant to this AQMP.	Adjusted as noted	Various
7. Page 19, Section 6.2. Who decides, and who are, the "relevant" Metromix personnel to receive training in air quality management awareness?? Please remove the words "if relevant". Consider rewording the introduction to this section to be *"All Metromix personnel, except office personnel,…*	Adjusted to refer to if relevant *to their work tasks*. Some office personnel are responsible for sending off HVAS samples and inserted results in the Quarry records. These staff would be inducted.	6.2
8. Page 19, Table 7.1. Why is the information in this table different to the information is Tables 5 to 7 of the Project Approval? These tables do not contain criteria for $PM_{2.5}$.	This table refers to background dust assumed for assessment and is not in the Project Approval. However, I note reference to $PM_{2.5}$ has no value here so have removed this from the table.	7.3
9. Page 23, section 7.5, last dot point. Please change to " *Wind erosion from disturbed areas and stockpiles".*	Adjusted as noted	7.5
10. Page 23, Section 7.3, last sentence. Please remove the words "*if the amount of <PM10 material exceeds the criteria nominated in Table 4.1."* Reason: NSW Health advises that there is no completely safe level of dust particulates.	Adjusted as noted	7.5
11. Page 24, Table 7.3. The PM10 particulate levels shown in the second column of results (third column of the table) are to be averaged over a 24 hour period. It therefore is difficult to present the results for a particular year, because this then takes the 24 hour results and then averages these for a year. If a column of results is to be use for 24 hour average PM10 values, then the method of presentation that is most meaningful is to present the maximum result for the year of the 24 hour averages. Please contact me if you wish to discuss this matter.	Agreed and adjusted to reflect the maximum record for each year. We have also added a note to reflect the influence of bush fire smoke on the high values.	7.7
12. Page 28, last paragraph, first sentence. Replace "*the Rodger"* with *"Rodgers".*	Adjusted as noted	9.2
13. Page 29, second paragraph. I do not think it correct to claim that air quality issues related to Teralba Quarry are "non-existent". I suggest a better expression would be to claim that they are "low risk", or something similar.	Adjusted to read low risk	9.2
14. As in Item 8 above. Why is this AQMP making reference to PM2.5 monitoring if there is no criteria for this parameter in the Project Approval? (Refer to Tables 5 to 7).	Reference to monitoring of $PM_{2.5}$ has been removed.	9.2

This page has intentionally been left blank