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Peppertree Quarry Air Quality Management Plan

April 2017



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2	Wednesday, 18 April 2012	ERM	Sharon Makin (Boral)	Preliminary Final AQMP revision
3	Thursday, 17 April 2012	ERM	Sharon Makin (Boral)	Final AQMP revision
4	Friday 18 May 2012	ERM	Sharon Makin (Boral)	Final AQMP submitted
5	22 nd November 2016	Sharon Makin (Boral)	Angus Shedden (Boral)	Revision based upon Modification 4 requirements
6	8 th April 2017	Sharon Makin (Boral)	Angus Shedden (Boral)	Final AQMP submitted (including DP&E and EPA comments)

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Introduction

1.1 BACKGROUND

Boral Resources (NSW) Pty Ltd (Boral) own and operates Peppertree Quarry (the Quarry), a hard rock quarry located in Marulan South, New South Wales (refer to Figure 1). In February 2007, Boral was granted Project Approval (06_0074) to establish and operate the Peppertree Quarry under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Construction of the Quarry was completed in 2013 with commercial extraction operations having commenced in 2014.

The existing Quarry operations have been constructed and operated in accordance with the Project Approval (with modifications in 2009, 2011, 2012 and 2016) and an Environment Protection Licence (EPL No. 13088).

The 2007 Project Approval required the preparation and implementation of a number of management plans detailing environmental commitment, controls and performance objectives at the Quarry throughout its operational life. In accordance with the Conditions of Approval (CoA), an Air Quality Management Plan (AQMP) was first prepared by ERM for Boral in 2011.

In August 2016, the Project Approval was modified for the fourth time (hereafter referred to as Modification 4) under Section 75W of the EP&A Act, to allow an extension of in-pit operating hours and the establishment of a new overburden emplacement area.

This document is a revised version of the initial 2011 AQMP and incorporates changes associated with Modification 4 and reflects air quality management associated with current quarry activities. The AQMP will continue to remain a dynamic document which will be updated as required over the life of quarry operations until the Project Approval end date of December 2038.

1.2 OVERVIEW OF OPERATIONS

The Quarry has an identified resource area of approximately 250 million tonnes, which dependent upon extraction rates, would allow quarrying for 70 years or more over an area of approximately 104 hectares (ha), within a 650 ha parcel of land owned by Boral.

The Quarry produces granodiorite aggregate products and manufactured sand. All quarry products and materials are transported by rail to a number of Boral rail terminals for distribution by trucks into the Sydney metropolitan area.

Typical quarrying operations involve the stripping of overburden and the extraction of hard rock using open-cut drill and blast techniques.

Overburden is stripped by dozer, loaded onto trucks using excavators and/or front end loaders and transported to the overburden emplacement areas, where it is spread and shaped by dozer.

Traditional drill and blast methods are then used to break up the hard rock. A drill rig stationed on top of each production bench drills a series of holes that are later charged with explosives, detonators and delays. Boral apply standard practice of limiting the maximum instantaneous charge to stay within the relevant noise and vibration criteria.

Blasted rock is then processed on-site using various crushers and screens to obtain the desired product. Material is initially crushed in a primary mobile crusher located within the pit, which is currently fed by an excavator, front end loaders and trucks. In the future in-pit works will avoid the use of trucks, with blasted

rock fed directly into the primary mobile crusher by excavator. After passing through the primary crusher, the crushed material is taken from the pit along a series of conveyors to the first set of screens located to the northwest of the pit and material is stockpiled in a surge pile. Material in the surge pile is reclaimed and conveyed to the main processing area where it undergoes further crushing, screening and shaping. Product material is stored in the various covered storage bins prior to being dispatched off-site by train.

1.3 SCOPE AND OBJECTIVES

This AQMP applies to all activities undertaken by the Quarry including quarrying, crushing, screening, stockpiling and transportation of quarry products, maintenance activities; and associated service and support functions.

The AQMP provides the framework and guidance for the Quarry activities to be conducted in a manner whereby appropriate control measures are implemented to minimise the potential for adverse impacts on air quality and meet compliance requirements of the CoA of the Project Approval.

Specific objectives of the AQMP are to:

- implement best reasonable and feasible management practices to minimise off-site odour, fume and dust emissions for the project;
- minimise visual air pollution generated by the project;
- identify triggers for implementation of additional management response measures where required;
- assess the effectiveness of air quality control measures;
- quantify changes to air quality at residences and private properties near the site;
- ensure dust concentrations and deposition levels remain below relevant air quality criteria at the nearest residences;
- obtain information to provide a basis for assessing the ongoing impact of Peppertree Quarry on air quality; and
- provides data suitable to demonstrate compliance with the CoA of the Project Approval and subsequent modifications.

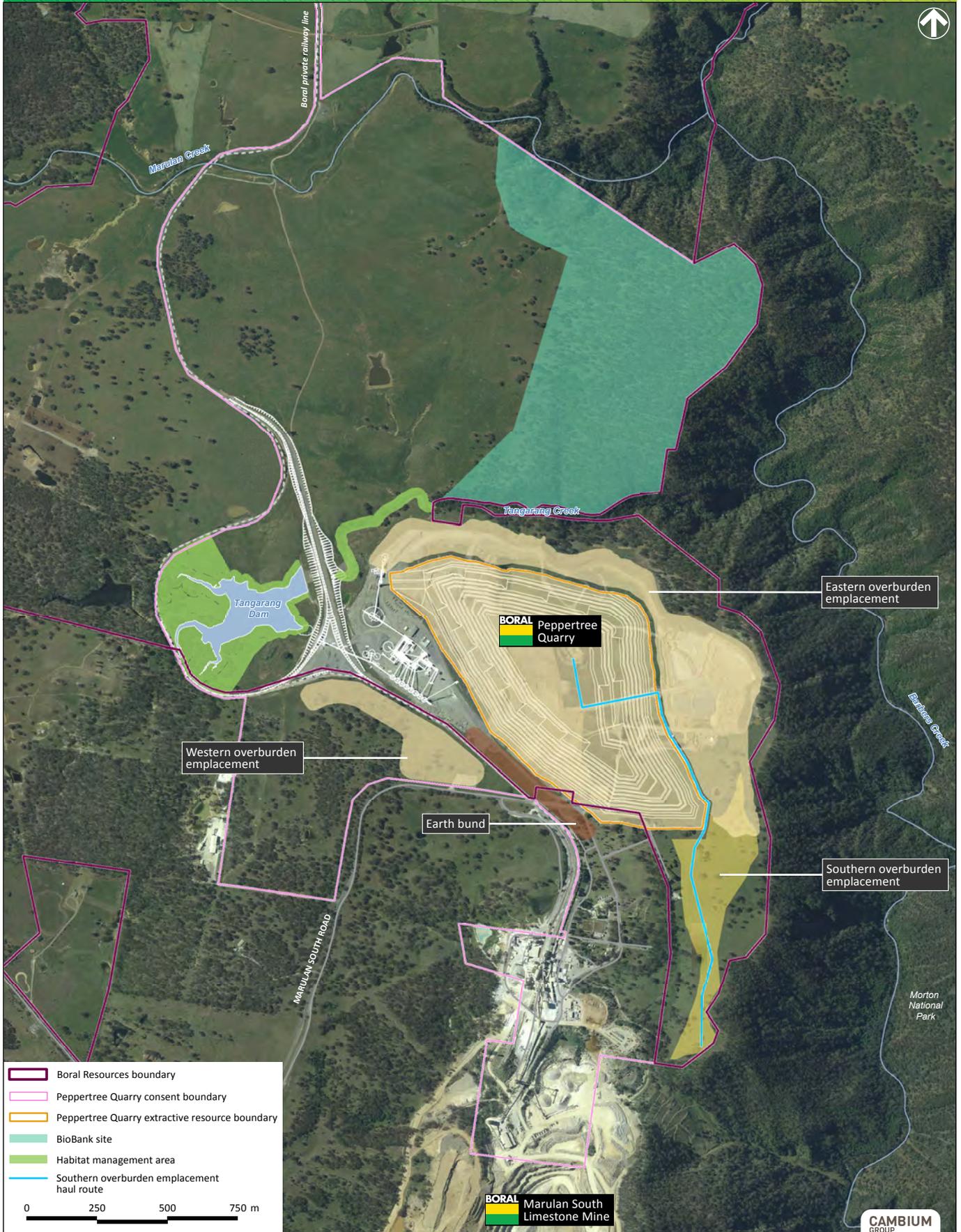
1.4 RESPONSIBILITY FOR IMPLEMENTATION

The Quarry Manager carries ultimate responsibility for the implementation of this AQMP and providing the necessary resources as required. The site Environmental Officer is responsible for carrying out and/or coordinating the monitoring and reporting requirements of this plan.

Operations personnel (Quarry Supervisors) are responsible for responding to adverse site air quality conditions and adjusting quarry operations as appropriate to minimise impacts on neighbouring properties. Other site personnel are responsible for reporting adverse site air quality conditions and reporting them to the shift Supervisor.

Figure 1
Site layout

Air Quality Management Plan / Peppertree Quarry



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1.5 CONSULTATION

In accordance with the requirements of CoA 26(b), consultation has been undertaken with the Environment Protection Authority (EPA), in the revision of this plan.

A meeting was held with EPA, onsite at Peppertree Quarry on the 19th December 2016 to outline the approach to the plan. EPA were satisfied with the approach and undertook to review the plan based on their inspection. Comments were received from the EPA via email on the 1st February 2017.

Comments in regards to the plan were limited to error notices identified in the text of the plan.

The EPA has, however, asked for a review of additional monitoring to be undertaken in light of associated projects being developed in the area.

This will be discussed with the EPA and Boral Marulan South operations.

A copy of the email is in Appendix 1.

1.6 ALIGNMENT WITH OTHER PLANS

This document is a revised version of the AQMP initially prepared by ERM (2011). In support of the AQMP, a Biodiversity and Rehabilitation Management Plan (2017), Noise and Blast Management Plan (2017) and a Dust Management Plan (Boral) have been prepared for the Quarry. These plans have aspects of managing air quality and will be applied in combination with the AQMP where relevant.

This AQMP also incorporates findings of an Air Quality Impact Assessment (Todoroski Air Sciences, 2016) that was undertaken as part of the Modification No.4 application to assess potential air quality impacts associated with the proposed modification, including:

- A background to the Quarry ambient air studies;
- A review of the existing meteorological and air quality environment surrounding the site;
- A description of the dispersion modelling approach used to assess potential air quality impacts; and,
- Presentation of the predicted results and discussion of the potential air quality impacts.

1.7 DOCUMENT STRUCTURE

The structure of the Management plan is outlined in Table 1.

Table 1: Structure of the Management plan

section	Content
1	Provides an overview of the project, and objectives of the plan
2	Details the statutory requirements as outlined in the conditions of consent dated august 2016
3	Describes the existing environment of the site
4	Describes the air quality management actions in place and to be implemented in the operation of the quarry

Peppertree Quarry: Air Quality Management Plan

5	Requirements of modification 4 Air quality management
6	Air quality monitoring protocols
7	Air quality assessment criteria
8	Outlines incident planning and responses
9	Financial provisions for the work required
10	Specifies training requirements
11	Outlines the reporting and review requirements
12	Summaries the management actions to be undertaken
13	Lists references used in the plan preparation

2 STATUTORY REQUIREMENTS

2.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

The project was declared a 'major development' under the provisions of Part 3A of the Environmental Planning and Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (SEPP Major Development) 2005. Since Project Approval was granted in 2007, there have been four approved modifications (with conditions), as detailed below:

- Modification 1 (2009): approved for exploratory blasting and test pitting in order to verify the design of the processing plant;
- Modification 2 (2011): approved for the construction of a new rail line rather than use the existing rail facilities to the Limestone Mine; and
- Modification 3 (2012): approved the construction of a high voltage power line from an existing substation to the processing plant and to provide a rail siding near the junction with the Main Southern Railway Line.
- Modification 4 (2016): approved for the extension of daily in-pit operating hours and Establishment of a new overburden emplacement area.

The quarrying operations will continue to be subject to the provisions of the EP&A Act for any subsequent changes or modifications to the operations. Additionally, the operations will need to be able to demonstrate compliance against the current CoA of the Project Approval relevant to air quality issued under the provisions of the EP&A Act (refer to Table 2).

Table 2: Conditions of Approval (Project Approval – Modification 4)

CoA	Condition of Project Approval	Addressed in Section
17 (Schedule 3)	<p><u>Air Quality Impact Assessment Criteria</u></p> <p>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 listed in Tables 6, 7 and 8 at any residence on privately owned land, or on more than 25 percent of any privately owned land.</p>	Section 4.0 Section 7.0
19 (Schedule 3)	<p><u>Operating Conditions</u></p> <p>The Proponent must:</p>	
	(a) implement best management practice on site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the project;	Section 4.0
	(b) minimise any visible air pollution generated by the project;	Section 4.0
	(c) minimise the surface disturbance of the site generated by the project; and	Section 4.0

	(d) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting and air quality monitoring data to guide the day to day planning of quarrying operations and the implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this approval; to the satisfaction of the Secretary.	Section 4.5
20 (Schedule 3)	Air Quality Management Plan	
	The Proponent must prepare a detailed Air Quality Management Plan for the project to the satisfaction of the Secretary. This plan must:	
	(a) be prepared in consultation with EPA and submitted to the Secretary by the end of March 2012;	Section 1.0
	(b) describe the measures that would need to be implemented to ensure compliance with the relevant conditions of this approval;	Section 4.0
	(c) include a program for the implementation of the measures referred to in (b) above; and	Section 4.0
	(d) include an air quality monitoring program that: <ul style="list-style-type: none"> • uses a combination of high volume samplers and dust deposition gauges to evaluate the performance of the project; • supports the air quality management system; • provides information to evaluate the performance of the project; • includes a protocol for determining exceedances of relevant conditions of this approval; and • provides for the use of real-time monitoring measures, if directed by the Secretary. 	Section 6.0
21 (Schedule 3)	Meteorological Monitoring	
	For the life of the project, the Proponent must ensure that there is a meteorological station in the vicinity of the site that:	
	(a) complies with the requirements in the Approved Methods for Sampling of Air Pollutants in New South Wales guideline; and	Section 6.4
	(b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the NSW Industrial Noise Policy Surface.	Section 6.4
2 (Schedule 5)	Management Plan Requirements	
	The Proponent must ensure that the management plans required under this approval are prepared in accordance with any relevant guidelines, and include:	
	(a) detailed baseline data	Section 3.1

	<p>(b) a description of:</p> <ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the project or any management measures; 	<p>Section 2.0 Section 7.0 Section 4.1</p>
	<p>(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p>	<p>Section 4.0</p>
	<p>(d) a program to monitor and report on the:</p> <ul style="list-style-type: none"> • impacts and environmental performance of the project; and • effectiveness of any management measures. 	<p>Section 6.0</p>
	<p>(e) a contingency plan to manage any unpredicted impacts and their consequences, and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;</p>	<p>Section 8.0</p>
	<p>(f) a program to investigate and implement ways to improve the environmental performance of the project over time;</p>	<p>Section 11.0</p>
	<p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; 	<p>Section 8.0</p>
	<p>(h) a protocol for periodic review of the plan; and</p>	<p>Section 11.0</p>
	<p>(i) a document control table that includes version numbers, dates when the management plan was prepared and reviewed, names and positions of people who prepared and reviewed the management plan, a description of any revisions made and the date of the Secretary's approval.</p>	<p>Document Control Page</p>
<p>3 (Schedule 5)</p>	<p>Revision of Strategies, Plans & Programs Within 3 months of the submission of an:</p> <p>(a) Annual Review under condition 10 (Schedule 5); (b) incident report under condition 8 (Schedule 5); (c) audit report under condition 11 (Schedule 5); and (d) any modifications to this approval.</p>	<p>Section 11.0</p>

<p>8 (Schedule 5)</p>	<p>Incident Reporting</p> <p>The Proponent must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Proponent must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.</p>	<p>Section 8.0</p>
<p>10 (Schedule 5)</p>	<p>Annual Review</p> <p>By the end of March each year, or other timing as may be agreed by the Secretary, the Proponent must submit a report to the Department reviewing the environmental performance of the project to the satisfaction of the Secretary.</p> <p>The Annual Review must address detail required under sub-conditions (a) to (f).</p>	<p>Section 11.2</p>
<p>11 (Schedule 5)</p>	<p>Independent Environmental Audit</p> <p>Within 3 years of the date of the commencement of construction and every 3 years thereafter, unless the Secretary directs otherwise, the Proponent must commission and pay the full cost of an Independent Environmental Audit of the project</p> <p>The Annual Review must address detail required under sub-conditions (a) to (f).</p>	<p>Section 11.3</p>

2.1.1 Statement of Commitments

The EA for Peppertree Quarry recommends a range of measures to avoid, manage, mitigate, offset and/or monitor the environmental impacts of the project, as set out in the Statement of Commitments. Commitments that relate to air quality management are set out in Table 3 below.

Table 3: Statement of Commitments (EA, 2006)

Statement of Commitment	Referenced in AQMP
<p>Measures to minimise and mitigate dust emissions will be put in place to ensure that no significant air quality impacts occur to surrounding residential and recreational receivers as a result of the proposed operations.</p> <ul style="list-style-type: none"> • covering of conveyors; • enclosing the tertiary crushing and screening plant and installing a dust suppression system; • fitting of scraper for cleaning conveyor belts; • operating dust suppression sprays on the primary crusher; • fitting drills with either water sprays or dry dust collection devices; • watering stockpiles of fine material; • confining traffic to identified and watered haul roads; • removal and rehabilitation of unnecessary roads; • keeping exposed areas to a minimum; 	<p>Section 4</p>

<ul style="list-style-type: none"> • cleaning of areas which could become sources of wind erosion dust due to build-up of settled fine material; • reviewing meteorological conditions prior to blasting to minimise the exposure of residences to dust emissions; and • daily assessment of meteorological conditions to identify wind conditions that may be conducive to excessive dust generation – for example, very high winds 	
<p>Air quality monitoring will determine changes to air quality beyond the boundary of the site. This will determine whether mitigation measures are effective in ensuring that annual average dust concentrations and dust deposition levels, and short-term (24-hour average) air quality impacts remain below relevant air quality criteria at the nearest residences.</p>	Section 6

2.1.2 Overview of Modification 4

The building and construction industry in NSW and particularly Sydney has seen a great deal of growth in the last year, with this growth forecast to continue. The NSW Government, together with Federal funding, has committed to significant infrastructure projects, including the Badger’s Creek Airport, new rail lines, and major road construction and upgrading. This has created a significant demand for hard rock aggregates from the main construction material suppliers. Boral is, and will be supplying a number of these projects with concrete and asphalt, that includes aggregates and sand from Peppertree Quarry on rail through terminals at St Peter’s and Enfield.

Modification 4 was approved in August 2016, allowing an increase of in-pit operating hours by 6 hours per day, 7 days a week in order to meet annual production volumes up to the approved limit of 3.5 million tonnes per annum. The modification also incorporates a proposed new Southern Overburden Emplacement that has been designed as an extension to the existing Eastern Overburden Emplacement and is located entirely within both Boral owned land and the quarry’s development consent boundary.

An Air Quality Impact Assessment (AQIA) was conducted as part of the Modification 4 approval application which considered the potential impacts associated with the construction Southern Overburden Emplacement and increased production on nearby sensitive residential receivers. The AQIA concluded that with the implementation of the existing Peppertree Quarry Air Quality Management Plan and associated management measures, all relevant air quality criteria would be met at all identified sensitive receivers.

As such, this revised AQMP remains substantially consistent with the initial 2011 version with additional detail reflecting CoA within Modification 4 and current quarry activities as of 2016.

2.2 PROTECTION OF ENVIRONMENT OPERATIONS ACT 1997

The objectives of the *Protection of Environment Operations Act 1997* (POEO Act) are to protect, restore and enhance the quality of the environment. Some of the mechanisms that can be applied, under the POEO Act, to achieve these objectives include reduction of pollution at source, monitoring and reporting of environmental quality.

Based on annual production volumes, Peppertree Quarry has been determined to be a ‘Scheduled Activity’ under Schedule 1 of the POEO Act which requires site operations to be the subject of an Environmental Protection Licence (EPL No. 13088).

The EPL has the following compliance conditions relevant to air quality management:

- Condition P1.1: Details the locations of two high volume air samplers and three dust deposition gauges across the Quarry.
- Condition O3.1: Requires the premises to be maintained in a condition which minimises or prevents the emission of dust from the premises.
- Condition M2.2: Monitoring requirements associated with the high volume air samplers and dust deposition gauges.

2.3 BORAL COMMITMENTS TO AIR MANAGEMENT

2.3.1 Integrated Management System

2.3.1.1 Continual Improvement

The Quarry operates under a Boral integrated Health, Safety, Environment and Quality Management System (HSEQMS). The HSEQMS has commitments to the Boral Environmental Policy through established standards and procedures which require internal conformance to high levels of environmental performance with continual improvement objectives.

Boral have an established corporate and divisional risk-based audit program that periodically assess operational sites for conformance with HSEQMS requirements. In addition, the Quarry must be the subject of an Independent Audit every three years. An Independent Audit of the Quarry was most recently conducted in 2015 and the next Audit is due in 2018.

The HSEQMS Air Standard (GRP-HSEQ-8-06) requires each Boral operation quarry to undertake activities in accordance with the following commitments in relation to point and fugitive sources of air emissions:

2.3.1.2 Fugitive Sources

- adoption of the best practicable technology when designing new or upgrading existing plant and equipment – apply general principles of emission control and management in the design process;
- air quality impacts and prevention measures are to be considered when preparing and conducting workplace assessments, Job Safety and Environmental Analysis (JSEA), Safe Work Method Statements (SWMS) and site inspections;
- major sources of emissions to air must be included in the site's Environmental Aspects and Impacts Register (also refer to the GRP-HSEQ-8-01 Environmental Aspects and Impacts Standard);
- monitoring of emissions to air is to be carried out according to the requirements specified in the site's Environment Protection Licence and other applicable legislation;
- written calibration procedures for monitoring equipment such as dust monitors and gas analysers are to be maintained to ensure monitoring results are as accurate as possible;
- written operating and maintenance procedures are to be maintained for all plant and equipment to ensure these are operated as efficiently as possible;
- strategies are to be developed and implemented to reduce the frequency of process upsets which could adversely affect emissions to air; and

- adequacy of existing procedures should be verified – where they are not adequate, new procedures should be developed and implemented

2.3.1.3 Point Sources

- selection and installation of bag filters and other dust control devices to reduce solid particulate emissions;
- selection of suitable technologies to reduce emissions of other air contaminants;
- conveyor design to reduce chute drop-height and the number of transfer points to reduce dust emissions; and
- equipment enclosure.

2.3.1.4 Incident Management

The HSEQMS Air Standard (GRP-HSEQ-8-06) has a roles and responsibilities protocol for the management of any air emission related incident that requires the following actions when any incident involving excessive emissions to air occurs:

- Identification and reporting: All personnel are trained to recognise and report excessive air emissions to Quarry Manger, Site Environmental Officer or Shift Supervisor;
- Take immediate action to prevent or minimise the air emission incidents which may involve ceasing operations completely and applying dust minimisation controls (i.e. water cart and Sprays);
- Continue to monitor operations and meteorological conditions to ensure emissions to air are maintained within approved levels;
- If necessary, report the incident to relevant stakeholders in accordance with the site's Pollution Incident Response Management Plan
- Only resume operations when the cause of the incident has been investigated and mitigated; and
- Investigate the contributing factors associated with the incident and apply any learnings through communication, additional controls and revision of management plans/procedures.

2.3.2 Dust Management Plan

In 2015, a Quarry Dust Action Plan was prepared and implemented which comprised of fifty individual improvement objectives. Some of the key completed actions included:

- Introduction of automated Polo Citrus sprays to STQ crushers;
- Re-commissioning of coolfog in the main screenhouse;
- Purchase and commissioning a larger water truck;
- Installation of wash-down water to silos;
- Purchase and installation of loading cone at TLO;
- Implementation of weather monitoring system to forecast extreme weather events so proactive actions can be planned and implemented; and
- Installation of fixed water sprays on road near silos.

3 AIR QUALITY OVERVIEW

3.1 AMBIENT AIR QUALITY

The main sources of air emissions in the wider area of the Quarry include extractive industries, commercial and industrial operations, agricultural activities, emissions from local anthropogenic activities (such as motor vehicle exhaust, dust from dirt roads, and domestic wood heaters) and various other rural activities.

Ambient air quality monitoring has previously been conducted in the vicinity of the site and provides background pre-quarry dust concentrations and deposition levels.

High volume air samplers were operated at two locations, over four months in 2005/2006, to provide information on existing air quality, for the Environmental Assessment (EA) for the project. Concentrations of total suspended particulates (TSP) and particles with an equivalent aerodynamic diameter of less than 10µm (PM₁₀) were monitored. The results are presented in the original project EA (ERM 2006).

As part of its operation at Peppertree quarry, an air quality monitoring network is operated and includes two High Volume Air Samplers (HVAS) measuring TSP or PM₁₀ respectively and three dust deposition gauges (Refer to Figure 2). The monitors have been in operation in the same locations prior to the Quarry being constructed and becoming operational. HVAS and dust deposition data during the years between 2011 and 2015 against relevant criteria is presented in Tables 4, 5 and 6 below.

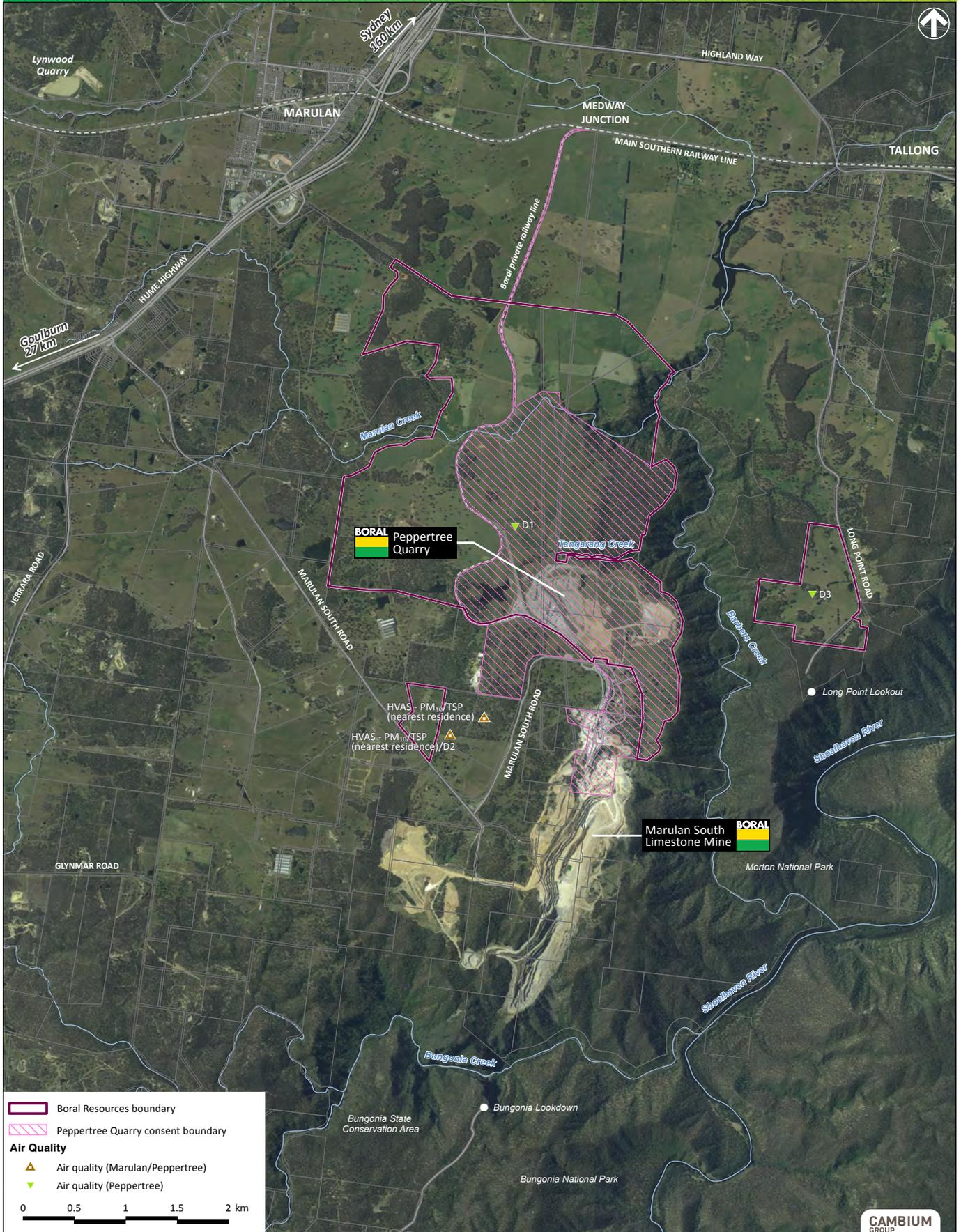
It can be seen from Table 4 that that annual average PM₁₀ levels at these monitors are below the criteria of 30µg/m³ at all sites, the maximum 24-hour average PM₁₀ concentrations were on two occasions above the criteria of 50µg/m³ during the monitoring period. The HVAS is positioned close to mining activities which is likely to influence the results on occasions and it is also possible that events such as bushfires and wind storms may also have contributed to the elevated concentrations in 2012 and 2014.

Table 5 indicates that the available TSP concentrations between 2011 and 2015 measured at the HVAS monitor were considerably below the criterion of 90µg/m³.

PM₁₀ forms a fraction of the Total Suspended Particulates (TSP). When the annual average levels are compared over the 5 years data there is an approximate ratio of 2:1 TSP to PM₁₀ respectively, i.e. PM₁₀ would appear to be 50% of the makeup of the TSP.

Table 6 indicates the majority of dust gauges recorded annual average insoluble deposition levels below the criterion of 4g/m²/month after commencement of quarry operations in 2014. As previously noted, the dust gauges that recorded generally higher levels are likely to be influenced by their close location relative to the mining and quarrying activities and are not likely to be representative of levels beyond the Quarry boundaries. Samples are also often contaminated with bird droppings and/or insects which can increase the insoluble solid content.

Figure 2
Location of dust and high volume air samplers
Air Quality Management Plan / Peppertree Quarry



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Table 4: PM10 levels from HVAS monitoring ($\mu\text{g}/\text{m}^3$)

Year	Annual Average	Criteria	Max 24-hr Average	Criteria
2011	12.7	30	37.5	50
2012	16.2	30	70.4	50
2013	13.8	30	42.2	50
2014	17.9	30	50.5	50
2015	20.5	30	33.2	50

Data sourced from: Air Quality Impacts Assessment – Modification 4 (Todoroski Air Sciences, 2015)

Table 5: TSP levels from HVAS monitoring ($\mu\text{g}/\text{m}^3$)

Year	Annual Average	Criteria
2011	32.1	90
2012	31.8	90
2013	28.3	90
2014	39.5	90
2015	52.0	90

Data sourced from: Air Quality Impacts Assessment – Modification 4 (Todoroski Air Sciences, 2015)

Table 6: Annual average dust deposition (insoluble solids - $\text{g}/\text{m}^2/\text{month}$)

Year	Dust Deposition Gauge - Annual Average			Criteria
	D1	D2	D3	
2011	9.6	7.4	2.4	4
2012	1.9	6.8	2.3	4
2013	2.2	4.6	2.8	4
2014	1.8	4.5	2.8	4
2015	2.6	3.8	3.8	4

Data sourced from: Air Quality Impacts Assessment – Modification 4 (Todoroski Air Sciences, 2015)

4 AIR QUALITY MANAGEMENT CONTROLS

4.1 AIR MANAGEMENT OBJECTIVES AND PERFORMANCE CRITERIA

The primary objectives of this Air Quality Management Plan are to provide guidance and direction for Quarry activities to be conducted in a manner whereby appropriate control measures are implemented to minimise the potential for adverse impacts on air quality and offsite disturbances and to meet compliance requirements of the CoA of the Project Approval.

Due to the nature of the quarry activities odours are not generated.

The performance criteria will be used to assess the success of the management actions and are outlined in Table 7.

Table 7: Air Quality management objectives and performance criteria

Objective	Performance criteria
Compliance with regulatory requirements including Project Approval and EPA Environment Protection Licence	No non compliances
implement best reasonable and feasible management practices to minimise off-site odour, fume and dust emissions	Management controls in the AQMP in place (PTQ-SOP-0032)
minimise visual air pollution generated by the activities	Management controls in the AQMP in place (PTQ-SOP-0032)
identify triggers for implementation of additional management response measures where required	SOP in place regarding dust suppression activities (PTQ-SOP-0031)
implement best reasonable and feasible management practices to minimise off-site odour, fume and dust emissions	Management controls in the AQMP in place (PTQ-SOP-0032)
assess the effectiveness of air quality control measures	Monthly review of air monitoring data including complaints
quantify changes to air quality at residences and private properties near the site	Undertake monitoring as outlined in AQMP
ensure dust concentrations and deposition levels remain below relevant air quality criteria at the nearest residences	Monthly review of air monitoring data including complaints Management controls in the AQMP in place (PTQ-SOP-0032)
obtain information to provide a basis for assessing the ongoing impact of Peppertree Quarry on air quality;	Monitoring undertaken as per the AQMP

4.2 ASPECTS AND IMPACTS

In accordance with HSEQMS requirements, the Quarry has developed an aspects and impacts register which aligns with Australian & New Zealand Standard AS/NZS 31000:2009 Risk Management - Principles and Guidelines. The register has identified, risk assessed and applied appropriate controls to activities with potential for adverse air quality impacts, some of which include.

- drilling and blasting of rock;
- vehicles and plant travelling on unpaved surfaces;
- loading and unloading of material to crushers, stockpiles, trains and trucks;
- crushing and screening of rock; and
- wind erosion from stockpiles and unpaved exposed areas.

The Aspects and Impacts registered is reviewed on an annual basis, when changes are made to the operations or when a non compliance arises.

4.3 PLANNING CONTROLS

Having been constructed and becoming operational between 2011 and 2014 respectively, the environmental aspects of the Quarry have benefited by procurement of modern equipment and controls which align with best practice and ability to plan site layout design to minimise potential for adverse impacts associated with quarry activities. Some examples of these benefits are:

- The ability to progressively relocate the primary crusher into the quarry pit with construction of fixed conveyors, which has significantly reduced the haulage of materials from extraction areas. This results in a reduction of fuel usage and air emissions (i.e. noise, dust and exhaust) due to the reduction in truck movements;
- Reduced dust through fully enclosed conveyors delivering final product sizes to the enclosed silos;
- Use of rail as the primary transport of products into the Sydney market has significantly reduced air emissions impacts and congestion on road networks;
- Use of modern technology in monitoring meteorological conditions for proactive management of operations;
- Purchase of buffer land surrounding prior to commencement of operations.

4.4 ENGINEERED CONTROLS

A range of engineering controls have been incorporated into the design and operation of the quarry to minimise the potential for dust generation resulting in offsite disturbances.

A further review of operations and controls was undertaken in 2015, whereby a Dust Control Action Plan was developed to investigate additional controls to be implemented on site.

The range of engineering controls now available to the operations include:

- Covering of conveyors and transfer points;
- Enclosure of crushing and screening plant with dust extraction system fitted;
- Fitting of scrapers for cleaning conveyor belts;

- Dust suppression sprays on the primary crusher and conveyors such as CV199
- Fitting drills with either water sprays and/or dry dust collection devices;
- Enclosure of train loading facilities;
- Conveyors instead of truck haulage of aggregate from the main pit;
- Haul roads and processing areas to be compacted and suitably constructed
- Reduction in disturbed areas by progressive rehabilitation;
- Location of primary crusher within the pit rather than processing plant area;
- Containment of aggregate materials within silos limiting the need to stockpile materials; and
- Controlling stockpiles of fine material with water sprays.
- Application of dust suppressants in the screening and crushing operations
- Use of Vacuum system and sucker trucks to remove dust build up
- Use of cool fog systems at key locations (main screen house and Train load out)
- Installation and use of a loading cone at the Train load out
- Operation of a pug mill at the filler silo to handle fine dusts

The Boral Electronic Asset Management (EAM) system is utilised to ensure engineering controls are maintained on a regular basis.

4.5 OPERATIONAL PROTOCOLS

In addition to the HSEQMS Standards, the Quarry has developed and implemented a range of site-specific operational management protocols with allocated responsibilities for the 'day-today' control of air emissions (refer to Table 8). The control of air emissions through this range of protocols will minimise disturbances offsite. An air management procedure ((PTQ-SOP-0032) is in place and contained in Appendix 2.

Table 8: Site-Specific Management Protocols

Control Measure	Implementation	Responsibility
Implementation of the requirements of this AQMP	Throughout Operations	Site Manager
Ongoing monitoring and reporting as described in this AQMP	Throughout Operations	Environmental Officer
Reviewing meteorological conditions during each shift to guide quarry operations	Daily	Site Supervisor
Daily overburden haulage and placement will be guided by ambient weather conditions	Daily	Site Supervisor
Reviewing of meteorological conditions prior to blasting and amendment of plans if excessive dust generation is anticipated	Prior blasting	Site Supervisor
Topsoil stripping when moist either naturally or through application of water	Overburden Stripping	Site Supervisor
Traffic restrictions to pre-determined haul routes and laydown areas	Throughout Operations	Site Manager

Exposed areas are to be kept to a minimum	Throughout Operations	Site Manager
Progressive rehabilitation of all noise bunds and spoil dumps wherever practicable	Throughout Operations	Environmental Officer
Watering of haul roads	As required	Site Supervisor
Use of suppressants on haul roads or unsealed areas where watering or rehabilitation is not effective or possible	As required	Site Supervisor
Restrictions on speed of vehicles on site	Ongoing	Site supervisor
Cleaning up of areas which could become sources of wind erosion dust due to build-up of settled fine material	As required	Site Supervisor
Education of staff through inductions	As required	Site Supervisor
Routine audits of pollution control equipment	As required	Site Supervisor
Onsite water cart	As required	Site Supervisor

4.5.1 Extreme weather control

In 2015, the Quarry commenced the utilisation of a commercially available weather forecasting dashboard which uses local weather data in providing predictions of meteorological conditions that may generate extreme dust and rain events (Refer to Figure 3). The Quarry has trained staff and developed procedures to take appropriate levels of action based on the dashboard predictions. Based on the level of an alert the Quarry can ensure controls and contingencies for dust management are effectively and efficiently implemented.

The procedure (PTQ-SOP-0031) for managing windborne dust based on the alert levels is contained in Appendix 3. This procedure has been successfully implemented at the site in periods of high winds.

Figure 3: Weather Forecast and Predicted Impacts on Operations



5 MODIFICATION 4 – AIR QUALITY MANAGEMENT

The Air Quality Impact Assessment conducted for Modification 4, considered the potential impacts of the modification on nearby sensitive residential receivers.

Relative to the existing operations, the proposed modification is unlikely to contribute to any significant change in existing dust levels at identified sensitive receivers. This is supported by the modelling (AQIA) undertaken for the modification, which predicts that there would be no exceedances of NSW EPA air quality criteria at any privately owned receiver due to the modified Quarry operations and background sources (including the Limestone Mine).

Given this, and the demonstrated performance of existing operations via the implemented air quality monitoring regime, it is considered that the continued implementation of the approved *Peppertree Quarry Air Quality Management Plan* and associated management and monitoring measures would be adequate to manage potential air quality impacts from the modified Quarry operations.

However, it was recommended that the *Peppertree Quarry Air Quality Management Plan* be revised to include a simple procedure to follow in the event of any measured exceedance at the air quality monitors in the network. This would outline the procedure for an investigation to be performed into the potential cause of the elevated reading and to make any necessary recommendations to minimise reoccurrence of the elevated reading (refer Section 8.2).

It is also suggested that an investigation be performed to determine the likely cause of the high level of organic matter (e.g. leaves, pollens etc.) recorded by the D1 Dust gauge and if required, to move this monitor to a nearby location less affected by such organic matter.

6 AIR QUALITY MONITORING

This section details the air quality sampling program, including the monitoring sites, equipment and frequency of monitoring.

The Quarry monitors dust deposition and particulate matter (TSP and PM₁₀) concentrations on and in the vicinity of the site in accordance with the Project Approval CoAs and EPL requirements.

Two high volume samplers have been established to monitor TSP and PM₁₀ at a nearby residence. Three dust deposition gauges have been established at site boundaries and at nearby residences, supplemented by Boral Cement limestone mine's dust deposition gauges.

An on-site weather station has been installed to provide real-time monitoring of meteorological conditions throughout the quarry operations. In addition, the Quarry utilises a commercially available weather forecasting dashboard which uses local weather data in providing predictions of meteorological conditions that may generate extreme dust and rain events

A summary of air monitoring to be conducted is provided in Table 9. Siting and operation of air quality monitoring equipment is in accordance with Australian Standard methodology.

Table 9: Summary of Monitoring Program

Site	Parameter	Averaging Period	Sampling Period ¹	Sample Collection	Equipment
D1	Deposited Dust	1 Month	Continuous	Every 30 days (± 2 days)	Dust Deposition Gauge
D2	Deposited Dust	1 Month	Continuous	Every 30 days (± 2 days)	Dust Deposition Gauge
D3	Deposited Dust	1 Month	Continuous	Every 30 days (± 2 days)	Dust Deposition Gauge
HV1	TSP	24 hours	24± 1 hours (for one day in six)	Every 6 days	High Volume Air Sampler
HV2	PM ₁₀	24 hours	24± 1 hours (for one day in six)	Every 6 days	High Volume Air Sampler fitted with size selective inlet
WS1	Meteorological Conditions	n/a	Continuous	n/a – automatic download to PC	Weather Station

1. Continuous monitoring excludes periods for instrument calibrations/ maintenance and extended periods of data downloads.

6.1 DUST DEPOSITION

6.1.1 Introduction

Airborne dust has the potential to cause nuisance impacts by deposition on surfaces. Air dispersion modelling by Holmes (2006) as part of the original Environment Assessment indicated that some increase to off-site dust deposition levels would occur due to operation of Peppertree Quarry. Modelling (AQIA) undertaken by Todoroski Air Sciences (2016), associated with Modification 4 showed there was likely to be no significant change.

As a result, dust deposition criteria to protect against nuisance impacts are set out in Table 11.

6.1.2 Monitoring Equipment

Dust deposition gauges measure the rate at which dust settles onto a surface. The dust deposition gauge consists of a 150 ± 10 mm diameter glass funnel supported by a rubber or plastic stopper in the neck of a glass jar which has a minimum volume of four litres. The stopper has a groove or outlet pipe which allows water to overflow in the event of excessive rain. The gauge is set up on a stand, in such a way that the top of the funnel is horizontal and positioned approximately 2 ± 0.2 m above ground level.

Over the sampling period (usually 30 ± 2 days) dust particles that settle out from the ambient air collect in the jar, together with any rainwater.

The three dust deposition gauges established for Peppertree Quarry (D1 - D3) will be operated and maintained in accordance with *AS/NZS 3580.10.1:2003 Methods for sampling and analysis of ambient air: Determination of particulate matter—Deposited matter—Gravimetric method*.

The sampling inlet should be positioned giving consideration to AS/NZS 3580.1.1:2007, including:

- height above ground level: $2\text{m} \pm 0.2$;
- distance from source: ≥ 5 m;
- clear sky angle above sampling inlet: 120° ;
- unrestricted airflow around sampling inlet: 360° ;
- distance from drip line of trees: 10 m; and
- no extraneous sources nearby.

6.1.3 Sample Analysis

On completion of the sampling period (usually 30 ± 2 days), the jar is removed, sealed, labelled and sent to a NATA accredited laboratory as soon as possible, and within 30 days of collection, for analysis in accordance with *AS/NZS 3580.10.1:2003*. It must be kept in a cool, dark environment prior to analysis.

The mass deposition rate of deposited matter is determined at the laboratory, taking into account the mass of insoluble plus soluble solids collected, the funnel cross-sectional area and the exposure period. The results are reported in $\text{g/m}^2/\text{month}$ or $\text{mg/m}^2/\text{day}$.

6.1.4 Timing

Each dust deposition gauge is to be replaced on the first day of each month (or as near as possible to the first day of each month) i.e. on a 30 ± 2 days cycle.

6.2 PARTICULATE MATTER CONCENTRATIONS

6.2.1 Introduction

Particulate matter has the potential to have nuisance impacts, and small particles can affect visibility and human health. Air dispersion modelling conducted by Holmes (2006) as part of the initial Environment Assessment indicated that some increase to off-site particulate matter concentrations would occur due to operation of the quarry. Todoroski Air Sciences (2016) confirmed the findings in regards to changes in operation for the Modification 4 application.

TSP and PM₁₀ criteria to therefore protect against human health and nuisance impacts are provided in Table 12.

6.2.2 Monitoring Equipment

During quarry operation, particulate matter concentrations will be monitored by two high volume air samplers set up side-by-side at the location identified in Table 10 and shown on Figure 2. One of the high volume samplers (HV1) measures TSP and the other (HV2) is fitted with a PM₁₀ size selective inlet (SSI), to measure PM₁₀.

High volume samplers consist of a filter holder, a motorised fan, a shelter, an air flow measuring device and an elapsed time meter that measures the sampling duration.

6.2.2.1 Total Suspended Particulates

Over the sampling period (usually 24 ± 1 hours), a high volume sampler draws in ambient air through a TSP inlet, which effectively acts as a hood to prevent precipitation and debris from falling onto the filter. The air is drawn in at a constant flow rate through a pre-weighed and conditioned filter, on which TSP collect.

The sampler is operated and maintained in accordance with *AS/NZS 3580.9.3 - 2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – Total suspended particulate matter (TSP) – High volume sampler gravimetric method* and the instrument operating manual.

6.2.2.2 PM10

A high volume sampler is fitted with a size selective inlet operates in the same way as set out above, however the ambient air also passes through a size selective inlet, which only allows the PM₁₀ fraction to pass through to the filter. The PM₁₀ fraction of suspended particulate matter is collected on the prepared filter.

The sampler is operated and maintained in accordance with *AS/NZS 3580.9.6 - 2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM10 high volume sampler with size selective inlet – Gravimetric method* and the instrument operating manual.

6.2.3 Sample Analysis

At the conclusion of the sampling period (24 ± 1 hours), the filters in the high volume samplers are replaced. The removed filters will be individually folded so that only surfaces with collected particulate matter are in contact. They will then be placed in separate, suitably labelled, dustproof containers and sent to a NATA accredited laboratory for preparation and weighing. The TSP and PM₁₀ concentrations will be determined at the laboratory by dividing the mass of collected particulate matter by the total volume of air drawn in the sampling period. The results are reported in $\mu\text{g}/\text{m}^3$.

6.2.4 Timing

The high volume samplers are programmed to operate concurrently and continuously for 24 ± 1 hours on a one-day-in-six cycle. As soon as practical after the completion of a sampling period, the filter will be collected and a new filter inserted. The used filter will be sent to a NATA accredited laboratory for analysis as soon as possible.

6.3 VISUAL AIR POLLUTION

Opportunistic visual inspections are conducted for evidence of site dust moving beyond the site boundary, and is used to formulate reactive management strategies for quarry operations.

6.4 METEOROLOGICAL CONDITIONS

6.4.1 Introduction

Real-time measurements of meteorological conditions will be taken to support dust monitoring and to identify weather conditions which may trigger the need to modify operations. For instance conditions that may be conducive to excessive dust generation and/ or movement of dust onto neighbouring properties, e.g. strong north-easterly winds, may trigger overburden dumping to cease temporarily.

6.4.2 Monitoring Equipment

A solar-powered weather station (WS1) will be maintained at the location identified in Table 10 and shown on Figure 2. This station will consist of solar panels, a weatherproof enclosure which contains a data logger (which reads the sensors) and power supply, and sensors which continuously measure:

- rainfall;
- wind speed and direction (measured at three metres above ground level);
- relative humidity;
- temperature; and
- solar radiation.

The station will be equipped with a digital cell phone kit which retrieves data from the logger and transmits it directly to a computer at the site office. Loggernet software will be used for automatically downloading the data and to create monitoring programs e.g. for calculations of evaporation and temperature inversion. The equipment will facilitate real-time monitoring of weather conditions.

6.5 SITE SELECTION METHODOLOGY AND RATIONALE

The location of air quality monitoring devices are identified in Table 10 and shown on Figure 2. The locations of the devices were selected in consideration of:

- predominant wind directions, as identified by analysis of wind roses presented in Holmes (2006);
- locations of residences and private properties predicted to experience the highest dust concentrations due to operation of Peppertree Quarry, as identified by analysis of air dispersion modelling results presented in ERM (2006) and confirmed in recent modelling associated with Modification 4;
- geographic and logistical considerations e.g. accessibility, security, power supply and setbacks from roads and items which could restrict airflow e.g. trees and buildings, as determined from analysis of aerial photography, site visits and a topographic map; and
- locations of Boral Cement's dust deposition gauges; and
- AS 3580.1.1:2007 and AS 2923-1987.

For ease of access, all three gauges are located on Boral owned land with two sites (D2 and D3) associated with identified sensitive receivers close to operations. These gauges have been sited as near as possible to the residences as identified by ERM (2006) as potentially experiencing the highest dust

deposition rates due to operations at the quarry i.e. Receivers 1 and 3. The gauges have been sited to comply with Australian standards and as such Gauge D2 is located in the adjoining open paddock rather than near the residence.

The dust deposition gauge, D1, is located near to the western boundary of the site and provides general guidance on the Quarry operational activities so that appropriate controls can be undertaken to minimise dust emissions.

Two high volume samples are set up side-by-side to measure TSP and PM₁₀ respectively. These are located in a cleared area near to the residence identified as potentially experiencing the highest TSP and PM₁₀ concentrations due to operations at the quarry (i.e. Receiver 3). Final siting has been determined in consultation with the landholder and giving consideration to power sources, potential noise impacts associated with equipment operation and the requirements of AS/NZS 3580.1.1:2007, including ensuring a minimum clear sky angle of 120° above the sampling inlet and that there are no extraneous sources nearby. As noted above, the Deposition gauge is not located with the High Volume samplers due to location and sampling requirements.

Table 10: monitoring Equipment Locations

Site	Measurement	MGA (Zone 56 H) Coordinates	
		Easting	Northing
D1	Deposited Dust	227541	6150830
D2	Deposited Dust	226908	6148797
D3	Deposited Dust	230520	6150090
HV1	TSP	227224	6149010
HV2	PM ₁₀	227253	6148970
WS1	Meteorological Conditions	2228508	6149621

6.6 CALIBRATION AND MAINTENANCE

Inspection, calibration, cleaning and maintenance of air monitoring equipment is scheduled and performed to NATA requirements and in accordance with AS/NZS 3580.9.3 - 2003 and AS/NZS 3580.9.6 – 2003 and the manufacturer’s specifications as applicable. Dust deposition gauges are checked monthly with any ongoing maintenance of gauge equipment and parts to be undertaken at this time.

Details of any equipment damage, failure and maintenance should be recorded as specified in Section 8.

7 ASSESSMENT CRITERIA

To meet the objectives set out in Section 1.3 and the conditions of Project Approval, monitoring data is analysed as set out in this section. It is noted that monitoring results will include dust contributions from operation of Peppertree Quarry and from other sources. Air quality goals supplied in this section relate to the total dust burden in the area.

7.1 DUST DEPOSITION

Dust deposition monitoring results are assessed by comparison against the Project Approval impact assessment criteria set out in Table 11. The Project Approval does not permit exceedance of these criteria at any residences in existence on the approval date (28 February 2007 and subsequently August 2016), or on more than 25 percent of any privately-owned land.

Table 11: Impact Assessment Criteria – Deposited Dust

Pollutant	Averaging period	Maximum increase in deposited dust level	Maximum total deposited dust level
Deposited dust (insoluble solids)	Annual	2 g/m ² /month	4 g/m ² /month

To assist in determining compliance with the impact assessment criteria in Table 11, assessment of the ‘ash’ component of the dust sample will also be undertaken. Due to the nature and composition of the hard rock resource, and the many pollutants that can make up ‘insoluble solids’, ash will be used as an indicator of quarry dust contribution. This will ensure that organic pollutants such as bird dropping, pollen, wind-blown vegetation and the like will not be confused with the inorganic dust contribution.

Monitoring results will also be assessed against previous monitoring results, including pre-quarry background levels established by ERM (2006), to identify changes or trends to dust deposition over time.

7.2 TSP AND PARTICULATE MATTER CONCENTRATIONS

TSP and PM₁₀ monitoring results will be assessed by comparison against the DECC, now EPA, (2005) impact assessment criteria set out in Table 12. The Project Approval does not permit exceedance of these criteria at any residences in existence on the approval date (28 February 2007 and subsequently August 2016), or on more than 25 percent of any privately-owned land.

It is noted that measured concentrations in the atmosphere are expressed in terms of average concentrations over a given period of time. This is to account for fluctuations in pollutant concentrations in the atmosphere over time e.g. in response to weather.

Table 12: Impact Assessment Criteria - TSP and PM₁₀ Concentrations

Pollutant	Averaging period	Criteria
TSP	Annual average	90 µg/m ³
PM10	Annual average	30 µg/m ³
	24-hour average (short term impact)	50 µg/m ³

Monitoring results will also be assessed against previous monitoring results, including pre-quarry background levels established by ERM (2006), to identify changes or trends to particulate matter concentrations over time.

7.3 LAND ACQUISITION CRITERIA

If particulate matter emissions generated by the project exceed the criteria in Tables 13, at any residence on privately-owned land, or on more than 25 percent of any privately owned land, then upon

written request for acquisition from the landowner, the Proponent must acquire the land in accordance with the procedures in conditions 6-7 of schedule 4 (section 8 in the AQMP).

Table 13: Long and short term land acquisition criteria for particulate matter

Pollutant	Averaging period	Criteria
TSP	Annual average	90 µg/m ³
PM10	Annual average	30 µg/m ³
	24-hour average (short term impact - total)	150 µg/m ³
	24-hour average (short term impact - incremental)	50 µg/m ³
Deposited dust (insoluble solids)	Annual average (maximum total increase)	4 g/m ² /month
	Annual average (maximum increase)	2 g/m ² /month

7.4 VISUAL AIR POLLUTION

Formal analysis of visual monitoring will not be required. However, visual observations of excessive dust generation will feed into site management responses to minimise air quality impacts on privately owned land. Instances of dust observed moving off-site will be documented as set out in *Section 8*.

7.5 METEOROLOGICAL CONDITIONS

Real-time meteorological data will be reviewed regularly by site personnel, including prior to any blasting, to identify triggers for implementing changes to operations e.g. high wind speeds.

Meteorological conditions will be monitored on a daily basis at the commencement of each shift to guide overburden haulage operations. This includes consideration of cessation of overburden haulage to the western overburden dump when the wind direction is from the north-east.

Meteorological data will also be reviewed in conjunction with dust monitoring results, to identify potential influences on monitoring results obtained.

8 AIR QUALITY RESPONSE PLAN

8.1 INTRODUCTION

The objective of this section is to provide procedures for responding to impacts identified by the monitoring program and by routine monitoring of air quality management systems.

It is also designed to act as a response plan for taking action in the unlikely event that an unforeseen incident occurs at the site; eg. Failure of dust suppression equipment, visual wind borne dust

Responding to identified impacts will be the responsibility of the Quarry Supervisor.

Schedule 5, Condition 8 of the Project Approval details the reporting requirements for identified impacts/incidents and the states that:

“The Proponent must immediately notify the Secretary and any other relevant agencies of any incident. Within 7 days of the date of the incident, the Proponent must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.”

An incident as defined in the Approval, Schedule 1 is deemed to be “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 this approval.”

The response plans for incidents are detailed below.

8.2 AIR QUALITY MONITORING EXCEEDANCE RESPONSE

Air quality monitoring exceedances may result due to activities at the quarry or due to the surrounding environmental conditions and other activities. Exceedances are notified once the samples have been analysed and supplied by the NATA accredited laboratory.

Should an exceedance be identified the following actions will be taken:

- the Department of Planning and Environment (DP&E) will be notified of the exceedance within seven days of its identification;
- an investigation will be undertaken to establish the root cause. This will include checking weather conditions at the time of the exceedance, Peppertree Quarry operations and other possible impacts. Other associated data such as Ash content or Calcium carbonate identification should be considered in the investigation;
- subject to the findings of the investigation actions will be taken to minimise any reoccurrence of the exceedance where possible and
- the identified cause of the impact and the selected response will be formally documented in an incident response report and electronically recorded in the Boral incident management system.

8.3 AIR QUALITY LAND ACQUISITION CRITERIA EXCEEDANCE RESPONSE

8.3.1 NOTIFICATION OF LANDOWNERS

1. If the results of monitoring required in Schedule 3 (section 7) identify that impacts generated by the project are greater than the relevant impact assessment criteria, then the Proponent must notify the Secretary and the affected landowners and/or existing or future tenants (including tenants of quarry owned properties) accordingly, and provide quarterly monitoring results to each of these parties until the results show that the project is complying with the relevant criteria.

8.3.2 INDEPENDENT REVIEW

2. If a landowner (excluding quarry owned properties) considers that the operations of the quarry are exceeding the impact assessment criteria in Schedule 3, then he/she may ask the Proponent in writing for an independent review of the impacts of the project on his/her land.

If the Secretary is satisfied that an independent review is warranted, then within 2 months of the Secretary's decision, the Proponent must:

- (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Secretary, to:
 - consult with the landowner to determine his/her concerns;
 - conduct monitoring to determine whether the project is complying with the relevant impact assessment criteria in schedule 3; and
 - if the project is not complying with these criteria then:
 - o determine if the more than one quarry/mine is responsible for the exceedance, and if so the relative share of each quarry/mine regarding the impact on the land;
 - o identify the measures that could be implemented to ensure compliance with the relevant criteria; and
 - (b) give the Secretary and landowner a copy of the independent review.
3. If the independent review determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Secretary.
 4. If the independent review determines that the quarrying operations are not complying with the relevant criteria in Schedule 3, and that the quarry is primarily responsible for this non-compliance, then the Proponent must:
 - (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until the project complies with the relevant criteria; or
 - (b) secure a written agreement with the landowner to allow exceedances of the relevant impact assessment criteria, to the satisfaction of the Secretary.

If the independent review determines that the project is not complying with the relevant acquisition criteria, and that the project is primarily responsible for this non-compliance, then upon receiving a written request from the landowner, the Proponent must acquire all or part of the landowner's land in accordance with the procedures in condition 6-7 below.

5. If the independent review determines that the relevant criteria are being exceeded, but that more than one quarry/mine is responsible for this exceedance, then together with the relevant quarry/mine/s, the Proponent must:
- (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until there is compliance with the relevant criteria; or
 - (b) secure a written agreement with the landowner and other relevant mine/s to allow exceedances of the relevant impact assessment criteria, to the satisfaction of the Secretary.

If the independent review determines that the project is not complying with the relevant acquisition criteria in schedule 3, but that more than one mine is responsible for this non-compliance, then upon receiving a written request from the landowner, the Proponent must acquire all or part of the landowner's land on as equitable a basis as possible with the relevant quarries/mine/s, in accordance with the procedures in conditions 6-7 below.

8.3.3 LAND ACQUISITION

6. Within 3 months of receiving a written request from a landowner with acquisition rights, the Proponent must make a binding written offer to the landowner based on:
- (a) the current market value of the landowner's interest in the property at the date of this written request, as if the land was unaffected by the project the subject of the project application, having regard to the:
 - existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
 - presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the 'additional noise mitigation measures' in condition 7, of Schedule 3; (Mod 3 approval)
 - (b) the reasonable costs associated with:
 - relocating within the Goulburn Mulwaree local government area, or to any other local government area determined by the Secretary; and
 - obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and
 - (c) reasonable compensation for any disturbance caused by the land acquisition process.

However, if at the end of this period, the Proponent and landowner cannot agree on the acquisition price of the land, and/or the terms upon which the land is to be acquired, then either party may refer the matter to the Secretary for resolution.

- Upon receiving such a request, the Secretary will request the President of the NSW Division of the Australian Property Institute to appoint a qualified independent valuer to:
- a fair and reasonable acquisition price for the land and/or the terms upon which the land is to be acquired, having regard to the matters referred to in paragraphs (a)-(c) above;
 - prepare a detailed report setting out the reasons for any determination; and
 - provide a copy of the report to both parties.

Within 14 days of receiving the independent valuer's report, the Proponent must make a binding written offer to the landowner to purchase the land at a price not less than the independent valuer's determination.

However, if either party disputes the independent valuer's determination, then within 14 days of receiving the independent valuer's report, they may refer the matter to the Secretary for review. Any request for a review must be accompanied by a detailed report setting out the reasons why the party disputes the independent valuer's determination. Following consultation with the independent valuer and both parties, the Secretary will determine a fair and reasonable acquisition price for the land, having regard to the matters referred to in paragraphs (a)-(c) above, the independent valuer's report, the detailed report of the party that disputes the independent valuer's determination and any other relevant submissions.

Within 14 days of this determination, the Proponent must make a binding written offer to the landowner to purchase the land at a price not less than the Secretary's determination.

If the landowner refuses to accept the Proponent's binding written offer under this condition within 6 months of the offer being made, then the Proponent's obligations to acquire the land must cease, unless the Secretary determines otherwise.

7. The Proponent must pay all reasonable costs associated with the land acquisition process described in condition 6 above, including the costs associated with obtaining Council approval for any plan of subdivision (where permissible), and registration of this plan at

8.4 AIR QUALITY IMPACT RESPONSE

Adverse air quality impacts are likely to be associated with malfunction of the site air quality engineering controls or operational procedures. This would potentially include:

- Wind borne dust from stockpiles;
- Dust from product in rail wagons;
- Vehicle movements and
- Lack of dust suppression in crushing and screening operations.

If it is identified that air quality may be impacted and result in an offsite disturbance or cause an incident as defined in section 8.1 the following actions will be taken:

- Impacted operations to be stopped if necessary until appropriate control systems can be implemented or repaired;
- the Department of Planning and Environment (DP&E) and NSW EPA will be notified of the incident/impact/potential impact within seven days of its identification;
- an investigation will be undertaken to establish the root cause of the air quality issues.
- subject to the findings of the investigation actions will be taken to repair, replace or change the identified cause of the air quality impacts. These actions will be completed by appropriately qualified personnel or consultants; and

- the identified cause of the impact and the selected response will be formally documented in an incident response report.
- Training will be undertaken, if changes are required to procedures or operations.

9 FINANCING AND PROVISION

Funding of works associated with the AQMP will be from operational and capital budgets associated with the quarry operations.

10 TRAINING

10.1 INDUCTION

Every employee and contractors working onsite must be inducted. The Peppertree Quarry induction covers the controls associated with managing potential impacts to air.

10.2 SITE SPECIFIC TRAINING

Where identified by management representatives, additional site specific training may be developed and implemented and delivered to relevant personnel and contractors.

Appropriate staff will be trained in the standard operating procedures PTQ-SOP-0031 and PTQ-SOP-0032.

11 REPORTING AND REVIEW

11.1 REGULATORY COMPLIANCE

All Boral sites will be aware of regulatory air quality limits to ensure the necessary controls and monitoring is carried out for the purpose of verifying compliance.

Regulatory documents such as the following should be periodically reviewed for site compliance with air quality management obligations:

- environmental licences and
- planning consents

Compliance with relevant air quality criteria will be managed by appropriate operational management, which includes:

- timely clean-up of any spills;
- maintenance and inspection of pollution controls associated with air quality management
- Application of procedures and
- monitoring

11.2 REPORTING

11.2.1 AEMR

The site environmental officer is responsible for managing the environmental reporting program and arranging specialist consultants to prepare reports, as required. The activities and performance outcomes of the AQMP will be presented in the Annual Environmental Management Report (AEMR). This will include detailed assessment of monitoring results collected over the course of the AQMP, an evaluation of any trends occurring across the site, any community/stakeholder complaints or non-conformances with licences/criteria and recommendations for management actions.

By the end of March each year, an AEMR will be submitted to DP&E. This Annual Review must...

a) describe the works (including rehabilitation) that were carried out in the previous calendar year, and the works that are proposed to be carried out over the current calendar year;

b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the:

- relevant statutory requirements, limits or performance measures/criteria;
- requirements of any plan or program required under this approval;
- monitoring results of previous years; and
- relevant predictions in the documents listed in condition 2(a) of Schedule 2;

(c) identify any non-compliance over the past calendar year, and describe what actions were (or are being) taken to ensure compliance;

(d) identify any trends in the monitoring data over the life of the project;

(e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and

(f) describe what measures will be implemented over the current calendar year to improve the environmental performance of the project

11.2.2 EPL Data and Annual Return

In accordance with EPL No. 13088, all data associated with monitoring of dust, noise and blasting events is posted onto the following dedicated website for the Quarry:

http://www.boral.com.au/article/marulan_operations_homepage.asp

In addition, an EPL Annual Return which provides a statement of compliance with the licence conditions within 60-days after the Anniversary Date.

11.2.3 Internal Reporting

In accordance with the HSEQMS and corporate divisional requirements a monthly report on environmental compliance and performance is prepared by the site environmental officer which is presented to the site management team for review for provision of additional resources that may be required to mitigate a significant environmental issue. The Boral Group Environmental Advisor is also provided with a monthly overview of any significant matters which may be escalated to Board level.

11.2.4 Incident Reporting

Incident reporting will be conducted in accordance with Condition 8, Schedule 5, where by

“The Proponent must immediately notify the Secretary and any other relevant agencies of any incident.

Within 7 days of the date of the incident, the Proponent must provide the Secretary and any relevant agencies with a detailed report on the incident, and such further reports as may be requested.”

An incident as defined in the Approval, Schedule 1 is deemed to be “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 this approval.”

Under Part 5.7A of the *Pollution of the Environment Operations Act 1997* (POEO Act), a Pollution Incident Response Management Plan (PIRMP), which also requires immediate reporting of incidents, has been implemented at the Quarry. This PIRMP outlines incidents that have the potential to cause material harm and therefore the actions to prevent and manage such incidents.

The POEO Act requires:

- Identifying and risk assessing the likelihood of hazards;
- Actions for preventing and responding to incidents;
- A site specific inventory of all potential pollutants;
- Equipment to be used in an incident response;
- Plan to minimise environmental and human harm by the implementation of actions to be taken during or immediately after a pollution incident;
- Consideration of how an incident may impact neighbours;
- Immediate reporting and ongoing communication an incident to ARAs and neighbours;
- Staff training on their roles and responsibilities under the PIRMP; and

- Annual testing and review of the PIRMP.

The Quarry Manager (or nominated Boral Authority) has the responsibility of ensuring all PIRMP reviews, revisions, training, testing and internal and external notifications are undertaken in compliance with POEO Act requirements.

The Department of Environment and Planning and EPA representatives will be advised of incidents as per the detail in the PIRMP.

Boral also maintains a safety and environmental incident reporting system. Any incidents relating to air quality will be entered into this system. All logged incidents are dealt with internally and, if necessary, through a NSW regulatory authority. Following reporting, all incidents are investigated and appropriate management recommendations are implemented.

11.3 AUDITING

Boral has an established corporate and divisional risk-based audit program that periodically assess operational sites for conformance with HSEQMS requirements.

In accordance with the requirements of CoA 11 (Schedule 5), within 3 years of the date of the commencement of construction and every 3 years thereafter, unless the Secretary directs otherwise, Boral will commission and pay the full cost of an Independent Environmental Audit of the project. The adequacy of this AQMP will be included in the Environmental Audit. An Independent Audit of the Quarry was conducted in 2015 and the next Audit is due in 2018.

11.4 REVIEW OF MANAGEMENT PLAN

The AQMP is to be reviewed in response to:

- Schedule 5 (Condition 3) of the Project Approval which requires a review within 3 months of:
 - An Annual review under Schedule 5 (Condition 9) of the Project Approval;
 - Submission of an incident report in accordance with Schedule 5 (Condition 8) of the Project Approval;
 - Of an Independent Audit under Schedule 5 (Condition 11) of the Project Approval; and
 - Upon approval of any future Modifications to the Project Approval.

If any of the above reviews result in any revisions, the revised AQMP must be provided to the Secretary within 4-weeks for approval. .

11.4.1 Review Objectives

This AQMP will be reviewed periodically by suitably qualified persons to determine the efficacy of the Plan and ensure it continues to fulfil its intended purpose. This will allow for and promote adaptive management through progressive stages of future quarry operations.

Air quality management actions and performance will be measured through regular environmental performance reviews. These will be based on the measurable outcomes identified in this management plan and key performance criteria outlined in Section 12. The reviews will be used to assess progress in meeting AQMP objectives and performance criteria and will be undertaken by the site environmental officer:

- In response to new or revised Boral Project approvals.
- In response to major changes in site conditions or work methods.

12 SUMMARY OF MANAGEMENT ACTIONS

The primary objectives of this Air Quality Management Plan are to provide guidance and direction for Quarry activities to be conducted in a manner that appropriate control measures are implemented to minimise the potential for adverse impacts on air quality and meet compliance requirements of the CoA of the Project Approval.

A number of management actions have been put in place to assist in meeting these objectives.

These actions are summarised in Table 13.

Table 13: Summary of Management actions

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
AIR QUALITY MANAGEMENT CONTROLS				
PTQ-AQMP-01	Implement a n Air quality management system as per AQMP	ongoing	Quarry Manager	4.0
PTQ-AQMP-02	Implement best reasonable and feasible management practices to minimise odour , fume and dust emissions as per the AQMP	ongoing	Quarry Manager	4.3, 4.4 , 4.5
PTQ-AQMP-03	Minimise visual air pollution generated by the activities	ongoing	Quarry Manager	4.3, 4.4 , 4.5
PTQ-AQMP-04	Ensure dust concentrations and deposition levels remain below relevant air quality criteria at the nearest residences	ongoing	Quarry Manager	4.3, 4.4 , 4.5
PTQ-AQMP-05	Maintain Aspects and Impacts register for the site.	Annual review	Quarry Manager	4.2
AIR QUALITY ENGINEERING MANAGEMENT CONTROLS				
PTQ-AQMP-06	All conveyors and transfer points to be covered	ongoing	Quarry Manager	4.4
PTQ-AQMP-07	Crushing and screening plant to operate with dust extraction	ongoing	Quarry Manager	4.4

Peppertree Quarry: Air Quality Management Plan

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
	system in place and operational			
PTQ-AQMP-08	Scrapers to be fitted to conveyor belts for cleaning	ongoing	Quarry Manager	4.4
PTQ-AQMP-09	Dust suppression sprays to operate on primary crusher and nominated conveyors	ongoing	Quarry Manager	4.4
PTQ-AQMP-10	Drills to have water sprays or dust collection devices	ongoing	Quarry Manager	4.4
PTQ-AQMP-11	Train loading facility to operate with cone in place	ongoing	Quarry Manager	4.4
PTQ-AQMP-12	Limited truck haulage to be used for movement of material from the main pit (fixed conveyors and in pit crusher)	ongoing	Quarry Manager	4.4
PTQ-AQMP-13	Haul roads and processing area to be compacted and suitable constructed	ongoing	Quarry Manager	4.4
PTQ-AQMP-14	progressive rehabilitation to be undertaken to minimise disturbed areas	ongoing	Quarry Manager	4.4
PTQ-AQMP-15	Use of silos for containment of product	ongoing	Quarry Manager	4.4
PTQ-AQMP-16	Water application to manage dust from stockpiles	ongoing	Quarry Manager	4.4
PTQ-AQMP-17	Use of polo citrus in the screening and crushing operations	ongoing	Quarry Manager	4.4

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
PTQ-AQMP-18	Use of Vacuum system and sucker trucks to remove dust build up	ongoing	Quarry Manager	4.4
PTQ-AQMP-19	Use of cool fog systems at key locations (main screen house and Train load out)	ongoing	Quarry Manager	4.4
PTQ-AQMP-20	Operation of a pugmill at the filler silo to handle fine dusts	ongoing	Quarry Manager	4.4
PTQ-AQMP-21	Water cart to be available onsite	ongoing	Quarry Manager	4.4
PTQ-AQMP-22	Boral EAM to be used to ensure maintenance of engineering controls	ongoing	Quarry Manager	4.4
AIR QUALITY OPERATIONAL MANAGEMENT CONTROLS				
PTQ-AQMP-23	Review meteorological conditions as required during each shift to guide quarry operations	ongoing	Quarry Manager	4.5
PTQ-AQMP-24	Daily overburden haulage and placement will be guided by ambient weather conditions	ongoing	Quarry Manager	4.5
PTQ-AQMP-25	Review of meteorological conditions prior to blasting and amendment of plans if excessive dust generation is anticipated	ongoing	Quarry Manager	4.5
PTQ-AQMP-26	Topsoil stripping when moist either naturally or through application of water	ongoing	Quarry Manager	4.5
PTQ-AQMP-27	Traffic restrictions to pre-determined haul routes and laydown areas	ongoing	Quarry Manager	4.5

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
PTQ-AQMP-28	Exposed areas are to be kept to a minimum	ongoing	Quarry Manager	4.5
PTQ-AQMP-29	Watering of haul roads and open areas	ongoing	Quarry Manager	4.5
PTQ-AQMP-30	Use of suppressants on haul roads or unsealed areas where watering or rehabilitation is not effective or possible	ongoing	Quarry Manager	4.5
PTQ-AQMP-31	Restrictions on speed of vehicles on site	ongoing	Quarry Manager	4.5
PTQ-AQMP-32	Cleaning up of areas which could become sources of wind erosion dust due to build-up of settled fine material	ongoing	Quarry Manager	4.5
EXTREME WEATHER EVENT MANAGEMENT				
PTQ-AQMP-33	Weatherzone dashboard system to be in place as forecast for nominated trigger events	ongoing	Environment advisor	4.5
PTQ-AQMP-34	Identify triggers for implementation of additional management response measures where required – implement SOP	ongoing	Quarry manager	4.5
MODIFICATION 4				
PTQ-AQMP-35	Revise Peppertree Quarry Air Quality Management plan to include simple procedure to follow in the event of any	Complete	Environment advisor	8.2

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
	measures non compliance			
PTQ-AQMP-36	Investigate the likely cause of high levels of organic matter in dust gauge D1 and move monitor if required.	March 2017	Environment advisor	5.0
AIR QUALITY MONITORING				
PTQ-AQMP-37	Assess the effectiveness of air quality control measures – reporting of monitoring data	monthly	Environment advisor	11.0
PTQ-AQMP-38	Quantify changes to air quality at residences and private properties near the site	monthly	Environment advisor	11.0
PTQ-AQMP-39	Obtain information to provide a basis for assessing the ongoing impact of Peppertree Quarry on air quality – POEO reporting	monthly	Environment advisor	11.0
PTQ-AQMP-40	Three dust gauges to be in place (D1, D2, D3) and monitored as per standard in AQMP	monthly	Environment advisor	6.0
PTQ-AQMP-41	Two HVAS to be in place and monitored as per standard in AQMP	Every 6 days	Environment advisor	6.0
PTQ-AQMP-42	Weather station to be in place and monitored as per standard in AQMP	ongoing	Environment advisor	6.0
PTQ-AQMP-43	An “incident” will be considered to have occurred where concentrations are above AQMP criteria with further investigation	monthly	Environment advisor	7.0

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
	required			
AIR QUALITY RESPONSE PLAN				
PTQ-AQMP-44	All exceedances or events to be reported within 7 days to the Department of Planning and Environment and any other relevant agencies	ASAP	Quarry Manager	8.0
PTQ-AQMP-45	Written report to be provided as per schedule 5 condition 3 of the project approval	ASAP	Quarry Manager	8.0
PTQ-AQMP-46	Exceedances or equipment failures to be investigated and appropriate remedial action undertaken	ASAP	Quarry Manager	8.0
TRAINING				
PTQ-AQMP-47	All staff and contractors to be inducted. The induction will cover management of potential dust sources	annually	Quarry Manager	10.0
REPORTING AND REVIEW				
PTQ-AQMP-48	Include a AQMP progress report in the AEMR	annual	Environment advisor	11.0

Peppertree Quarry: Air Quality Management Plan

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
PTQ-AQMP-49	Monthly internal report to be prepared which identifies criteria exceedances or equipment failures	monthly	Environment advisor	11.0
PTQ-AQMP-50	In accordance with EPL No. 13088, all data associated with monitoring of dust, noise and blasting events is posted onto the dedicated website for the Quarry.	monthly	Environment advisor	11.0
PTQ-AQMP-51	An EPL Annual Return which provides a statement of compliance with the licence conditions within 60-days after the Anniversary Date.	September	Environment advisor	11.0
PTQ-AQMP-52	Complete an environmental incident report in the event a non compliance is identified during monitoring	As required	Environment advisor	11.0
PTQ-AQMP-53	Undertake a review of the AQMP: <ul style="list-style-type: none"> • Every 3 years • Following an audit • Following approval of a modification • Following an incident • Or as otherwise deemed necessary 	Review required within 3 months	Environment advisor	11.0

Peppertree Quarry: Air Quality Management Plan

Management action ref ID	Environmental management measure	Indicative timeframe	responsibility	Section
PTQ-AQMP-54	Review the adequacy of site specific environmental safe guards and management measures on a regular basis	monthly	Environment advisor	

13 REFERENCES

This AQMP has been prepared in consultation with the Environment Protection Authority and with consideration to:

- Conditions of Project Approval (PA 06_0074) Modification 4;
- ERM (2006) *Marulan South Quarry Environmental Assessment Report*;
- ERM (2007) *Marulan South Quarry Submissions Report*;
- ERM (2011) Boral Peppertree Quarry Section 75W Modification Report and response to submissions;
- EMM (2012) Peppertree Quarry Modification 3;
- Environmental Assessment;
- Holmes (2006) Air Quality Impact Assessment: Proposed Marulan South Hard Rock Quarry;
- Todoroski Air Sciences (2016) Air Quality Impact Assessment Peppertree Quarry Modification 4
- Australian Standards:
 - *AS/NZS 3580.10.1:2003 Methods for sampling and analysis of ambient air: Determination of particulate matter—Deposited matter—Gravimetric method*;
 - *AS/NZS 3580.9.6 - 2003 Methods for sampling and analysis of ambient air – Determination of suspended particulate matter – PM10 high volume sampler with size selective inlet – Gravimetric method*;
 - *AS 3580.1.1:2007 Methods for sampling and analysis of Ambient Air- Guide to Siting Air Monitoring Equipment*;
 - *AS 2923-1987, Guide for the Measurement of Horizontal Wind for Air Quality Applications*;
- National Environment Protection Council (Ambient Air Quality) Measure Guideline Paper No. 8, Annual Reports for AAQ NEPM; and
- DECC (2005) *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*.

14 APPENDICES

Appendix 1 EPA correspondence

Appendix 2 Standard Operating Procedure – PTQ-SOP-0032

Appendix 3 Standard Operating Procedure – PTQ-SOP-0031

APPENDIX 1

EPA CORRESPONDENCE

Hi Sharon

Even less to say about this one.

Page 29, Chapter 7.2, first sentence contains “**Error! Reference source not found.**”

Page 34, Chapter 8.3.3 (6)(a), last sentence in paragraph contains “Error! Reference source not found.”

My only other comment, and it’s for consideration only, is with regard to HVAS sampling. Was there ever any requirement to have a HVAS monitor to the east of the premises, perhaps along Long Point Road? From experience I note that most wind roses for developments in the Goulburn/Marulan area show predominantly westerly/south-westerly winds (annual), as did the initial Holmes (2006) air quality report (I acknowledge the easterlies in summer though).

I wonder whether there is merit in starting a HVAS monitoring program to the east, given the proposed expansion of the Limestone mine overburden which will be placed in close proximity to where the current HVAS monitor are, and which may render their results a little skewed? I understand that the modelling undertaken by Holmes predicted highest impacts around where the monitors are currently located, but those models probably wouldn’t stack up with the likely overburden placement nearby. The other reason to consider this is that with Boral’s acquisition of various properties (mainly to the west of Peppertree?), the nearest uninvolved receivers may be those to the east.

Food for thought/discussion.

Michael

Michael Heinze

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Report pollution and environmental incidents 131 555 (NSW only) or +61 2 9995 5555

APPENDIX 2

STANDARD OPERATING PROCEDURE – PTQ-SOP-0032



Site Standard Operating Procedure (SOP) HSEQ-2-08-F03

Sop Title:	Management of dust and fume	Sop No:	
Sop Location:	Peppertree Quarry	Associated SWMS:	
Date Of Issue:	6 th April 2017	Next Review Date:	6 th November 2017
Issue Version:	Revision 0	Authorised By:	Angus Shedden
Frequency:	Daily		
Purpose:	To manage dust and fume from the Peppertree Quarry operations to minimise off site disturbances as per approval conditions		
Responsibility:	Supervisor	Requirements:	▪ nil
Compliance:	PPE Requirements:		
<ul style="list-style-type: none"> ▪ POEO Act ▪ Planning and assessment act ▪ Conditions of consent ▪ EPA Environment Protection licence 			

Activity	Safety/Quality/Performance Notes	* Lowest repeatable time	Photo
Excavation and Stripping of land (land disturbance)	<p>Disturb only the minimum area necessary for operations.</p> <p>Areas to be progressively rehabilitated including completed overburden embankments</p> <p>Topsoil to be stripped when moist – operations to be ceased if too dry or water tanker to be used</p>	ongoing	

Site Standard Operating Procedure (SOP) HSEQ-2-08-F03

Activity	Safety/Quality/Performance Notes	* Lowest repeatable time	Photo
Stockpile management	<p>Product materials to be stored in designated silos</p> <p>Additional stock materials and scalp products to be compacted and / or wet with water cart as required.</p> <p>Long term topsoil stockpiles, not used for over 6 months will be revegetated, This will be assessed as to regrowth or the need to apply hydro mulch</p> <p>Operators to be trained in loading techniques to minimise dust emissions</p> <p>Cool fog or similar spraysystems installed on identified conveyors.</p>	ongoing	<p>Operations to cease if this occurs. Investigate to understand issue</p>  
Haul road and traffic activities	<p>All roads and traffic areas will be watered using water carts to minimise the generation of dust.</p> <p>Majority of material is to be moved by conveyor with only short haul movements</p> <p>Roads will be graded and maintained on regular basis to allow for effective watering and dust management</p> <p>Traffic movements will be limited to delineated roads., where possible</p> <p>Traffic movements to be restricted to 20kms per hour, or reduced to the weather condition</p>	ongoing	<p>Operations to cease if this occurs. Investigate to understand issue</p> 
Drilling	<p>Drills will be equipped with dust extraction or water injection systems. These systems will be used when the drills are in operation and dust is being generated</p>	ongoing	

Site Standard Operating Procedure (SOP) HSEQ-2-08-F03

Activity	Safety/Quality/Performance Notes	* Lowest repeatable time	Photo
blasting	<p>Stemming will be used at all times.</p> <p>Blasting will occur in accordance with the Blast Management Plan ie blasts are planned to minimise over pressure and ground vibration at identified receivers. This assists in the emission of fume.</p> <p>Meteorological conditions will be reviewed and assessed as part of blast planning to minimise any potential for fume off site.</p>	ongoing	
In pit crushing	<p>Water sprays on crusher and primary conveyors – to be used when the potential for dust arises ie high wind events or hot dry weather.</p>	ongoing	
Secondary and tertiary crushing and screening	<p>conveyors to be covered</p> <p>Dust collection system fitted at transfer points.</p> <p>Building doors to be closed during operations</p> <p>Scrapers are fitted to applicable conveyor belts to clean the belts</p> <p>Dust suppressants - polo citrus to be used at designated transfer points when crushing and screening is occurring</p> <p>Dust build up in Buildings to be removed with regular cleaning and or sucker truck</p> <p>Cool fog or similar system to be used in main screen house as required.</p> <p>Pug mill to be utilised to pelletise filler material.</p>	ongoing	<p>Operations to cease if this occurs. Investigate to understand issue</p>  



Site Standard Operating Procedure (SOP) HSEQ-2-08-F03

Activity	Safety/Quality/Performance Notes	* Lowest repeatable time	Photo
Train load out	<ul style="list-style-type: none">▪ Train loading facility is partially enclosed▪ Loading cone in place to direct material into wagons▪ 2 to 3% water to be applied to automatically loaded materials	ongoing	
High Wind weather event	<ul style="list-style-type: none">▪ Refer to SOP Peppertree Quarry Site dust and stormwater management – forecast and operations		
	Total lowest repeatable time for activities:	ongoing	



Site Standard Operating Procedure (SOP) HSEQ-2-08-F03

Purpose

This SOP is used for:

- **WHS risk controls** - SWMS requirements have been converted into this SOP with the SWMS referenced and maintained as evidence of risk assessment being completed
- **Environmental risk controls** – captured from the site aspects and impacts register for day to day operational activities to minimise impact on the environment
- **Quality Assurance** – evidence that our control procedures conform to essential standards for safety and quality
- **Training** – reference document for trainee and trainer
- **Monitoring** – a means of ensuring that the actual method concurs with the standard and is common across operators and shifts
- **Improvement** – documents and locks in the current best practice and provides the scaffold for future improvement
- **LEAN** - to document the 'lowest repeatable time' taken for the step or activity, that has been observed and signed off by all workers involved in the site based task, allowing identification of efficiency opportunities (muda-free) in work sequences.
 - *(* note: the 'lowest repeatable time' indicated for each task is not a defined or required timeframe, it is only used to identify potential work flow bottlenecks)*

Training record

Once workers have been trained in the tasks or activities of the SOP, a record of training and competency must be completed and the workers skill matrix updated accordingly. The training competency record must also be forwarded to the Learning @ Boral team.

Sop No:	<Insert SOP Name - <Site code>	
Employee / Contractor:	Name	
	Signature	
Date Training Completed:		
Training Recognised By:	Name	
	Signature	
Date Sent To HR:		
CHRIS 21 Training Code:		

Revision History

This section should record all changes to facilitate skill updates of experienced users, to allow back-tracking of changes, and as evidence of continuous improvement. The next full review of this SOP is due no later than three (3) years from the date of issue.

Updates/Improvements Since Last Issue Date			
Change	Page(s)	By	Date

APPENDIX 3

STANDARD OPERATING PROCEDURE - PTQ-SOP-0031



Building something great™

SOP Title: PEPPERTREE QUARRY SITE DUST and STORMWATER MANAGEMENT – FORECAST AND OPERATIONS				SOP # PTQ-SOP-0031	
Date:	28 January 2016	Authorised by:			
Issue:	1	Review Date:	28/10/2017	RISK assessment:	
Safety Full PPE Uniform and Kit Equipment prestart checks			PPE requirements 		
Step	Description	Safety/Quality/Performance Notes	Photo		
1	Access and review Weather forecast http://mining.weatherzone.com.au/user/login username peppertree@boral.com.au password bpqweather	<p>Weather is a significant contributing factor to the release of air borne dust. Understanding the weather forecast across the shift allows dust suppression to be proactively applied and managed</p> <p>Significant storm events can result in environmental degradation and stop operations due to unsafe conditions. Being aware of possible significant rain events particularly East Coast Lows also for the management of high flows of stormwater on the quarry site</p> <p>Operations on a quarry site can be impacted by lightning. A SMS alert will be issued when lightning strikes are identified within a 10km radius of the quarry.</p>			

2	<p>Determine nature of the forecast - view environmental page on dashboard</p> <p>Or SMS alert</p>	<p>Strong Winds</p> <p>RED ALERT – high winds >20km/hr / hot temperatures no or little rainfall in the previous 24 hours</p> <p>AMBER ALERT – Moderate winds / warm to hot temperatures / no or little rainfall in the previous 24 hours</p> <p>GREEN ALERT – no to light winds / cool to cold temperatures / some rainfall in the previous 24 hours</p> <p>Rain</p> <p>RED ALERT – rain >50% chance of 1mm per hour</p> <p>AMBER ALERT – rain > 30% < 50% of 0.5 mm per hour</p> <p>GREEN ALERT – < 30% of 0.5mm per hour</p> <p>Lightning</p> <p>RED ALERT - lightning within 10kms radius</p> <p>AMBER ALERT – lightning within 30 – 10 km radius</p> <p>GREEN ALERT greater than 30kms away</p>			
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3	Initiate management controls based upon the weather forecast	<p>Strong Winds</p> <p>RED ALERT – Peppertree water tanker to be manned and operational for the complete shift. Route to be as per plan.</p> <p>Additional water cart to be brought onsite Water carts to commence watering of site at least 2 hours before forecasted wind.</p> <p>All other water sprays to be operational.</p> <p>Consider ceasing all Non critical HME vehicle movements if dust not able to be contained.</p> <p>AMBER ALERT</p> <p>Peppertree water tanker to be manned and operated on an hourly basis or more regular as needed. Route to be as per plan</p> <p>All other water sprays to be operational.</p> <p>GREEN ALERT – Peppertree water tanker to be manned and operated at the commencement of shift or more regular as needed. Route to be as per plan</p> <p>Prestart check to be undertaken on water tanker prior to commencement of shift.</p>			
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		<p>Water tanker to be left in a condition where it is driveable and useable. The tanker is designated Pollution control equipment and must be in service at all times. Alternative arrangements must be made if this is not possible.</p> <p>Rain events</p> <p>RED ALERT – rain >50% chance of 1mm per hour.</p> <p>For rain events identified greater than 200mm refer to the Flood response plan for specific details.</p> <p>For other red alert events...</p> <p>Site inspection to be undertaken of drains to ensure they are clear of debris and able to take large flows.</p> <p>Stockpiles, in particular scalps and overburden are to be inspected to ensure grades are towards the pit and all drainage is away from the perimeter of the piles. If found that this isn't the case, HME to be utilised to change gradients prior to the rain event.</p> <p>Sediment ponds to the east of the quarry are to be inspected. These should be empty of water. If not pumping is required as soon as possible.</p> <p>Location of equipment in the pit is to be determined and readied should flood evacuation procedures be required</p> <p>Haul roads to be assessed and</p>			
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		<p>graded if necessary.</p> <p>AMBER ALERT – rain > 30% < 50% of 0.5 mm per hour</p> <p>No action.</p> <p>GREEN ALERT – < 30% of 0.5mm per hour</p> <p>No action</p> <p>Lightning</p> <p>Storm events associated with lightning should be tracked on the site through the “stormtracker” page. Direction and intensity of the lightning should be tracked.</p> <p>If lightning is identified at less than 10kms away, consideration should be made to stand down excavators and other equipment as well as remove staff from any high level outdoor activities</p> <p>If blasting is scheduled and shots are loaded consideration should be made to bring blasts forward and evacuate sites when lightning is identified at 30kms from the quarry.</p>			
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	<p>4. provide feedback to Environment advisor as to appropriateness of management controls in regards to alerts so system review can continue.</p>				
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Updates/Improvements since last issue date

Change	Page(s)	By	Date
Additional of rain events	all	S makin	21/4/16

Guidance notes for completion

Purpose

The purpose of this standard operating procedure is to document the current most efficient (muda-free) work sequence to avoid unnecessary motion and wasted effort and to guarantee safety and quality, save time and prevent equipment damage. It is used for:

- Training – reference document of trainee and trainer
- Monitoring – a means of ensuring that the actual method concurs with the standard and is common across operators and shifts
- Improvement – documents and locks in the current best practice and provides the scaffold for future improvement
- Flexibility – provides instruction on dealing with changes in mix, volume and manning
- Record – reference document for tolerances, settings, locations, etc
- Quality Assurance – evidence that our control procedures conform to essential standards for safety and quality

Guide to colour coding

The following formats are used to highlight different types of information on text and photos:

Step	Description Type	Safety/Quality/Performance Notes	Time(s)	Photo Descriptors
1	Safety	Text		 
2	Quality	Text		 
3	Optimal Performance	Text		 
4	General Instruction	Text		 

Revision History

[This section should record all changes within the past six months to facilitate skill updates of experienced users, to allow back-tracking of changes, and as evidence of continuous improvement.]

Updates/Improvements since last issue date			
Change	Page(s)	By	Date

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