BORAL – Peppertree Quarry

ANNUAL ENVIRONMENT MANAGEMENT REPORT

January 2015 – December 2015

Prepared for:

Boral Resources (Metro) Pty Ltd

July 2016

Boral Peppertree Quarry

Annual Environmental Management Report (Jan 2015 – Dec 2015)

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Limitations

Environmental Compliance Services
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1 INTRODUCTION

Peppertree Quarry (the Quarry) is owned and operated by Boral Resources Pty Ltd. The quarry is located 10 kilometres south-east of Marulan in the NSW Southern Tablelands, approximately 175 km south-west of Sydney (refer to **Figure 1**). Construction of the Quarry was completed in 2013 with commercial extraction operations having commenced in 2014.

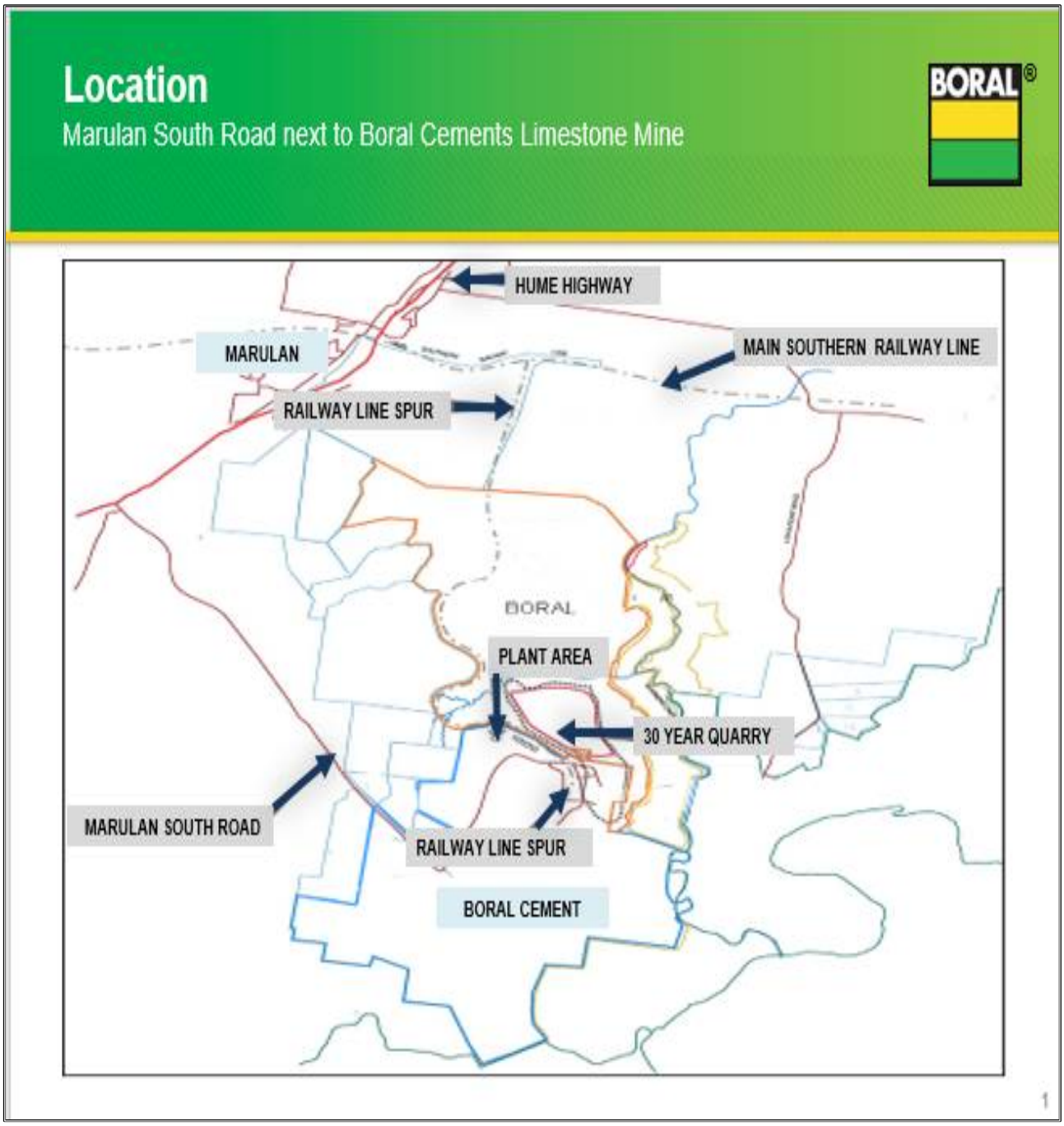
The Quarry produces graniodorite aggregate products and manufactured sand. All quarry products and materials are transported by rail to the Boral Maldon Cement Works, near Picton for ultimate distribution by trucks into the Sydney metropolitan area. The use of rail as part of the distribution chain significantly reduces environmental impacts and congestion on local and regional road networks.

The Annual Environmental Management Report (AEMR) provides a summary of the environmental performance, statutory compliance and community relationships associated with the Quarry operations during the 12-month reporting period between 1st January 2015 to 31st December 2015.

The AEMR has been prepared in the general format described in the *Environmental Guidelines for Industry – The Annual Environmental Management Report* (NSW DPI; V3-2006) and in accordance with the requirements of Condition 4, Schedule 5 of Project Approval (06_0074) which must include:

- Details on development undertaken in the previous calendar year and any proposed development planned for the next 12 months;
- A review of monitoring results and community compliant records;
- Compliance assessment with Statutory requirements in relation to specified limits and performance criteria;
- Corrective actions required to address non-compliances;
- Trends from historic monitoring results;
- Predictions and outcomes associated with environmental impacts and analysis of the potential cause of any significant discrepancies; and
- Measures to be implemented in the next 12 months to improve environmental performance.

Figure 1: Peppertree Quarry Location



1.1 REGULATORY FRAMEWORK

The Quarry operates under the compliance requirements of a number of Statutory approvals, modifications and a NSW EPA Environmental Protection Licence which are detailed further in the following Sections.

1.1.1 Development Approval

The Quarry was granted a Development Consent (06_0074) until the year 2038 by the Minister of Planning in February 2007 under Part 3A of the Environmental Planning and Assessment Act 1979. The Quarry has been classified as a State Significant Development under the Environmental Planning and Assessment Act 1979 (EP&A Act).

The Development Consent has been the subject of the following three subsequent modifications:

- 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.

1.1.2 NSW EPA Environment Protection Licence

The Quarry operations are subject to compliance requirements under a NSW EPA Environment Protection Licence (EPL No. 13088). The EPL is issued for the scheduled activity of Crushing, Grinding, Separation and Extractive activities for tonnages greater than 2 million tonnes per annum. No EPL variation or amendment has been approved by NSW EPA since September 2013.

1.1.3 Water Licences

The Quarry maintains a water licence (10SL056926) granted by the NSW Office of Water for the construction and use of a 110ML dam. In addition, a water bore licence (IOBLl59860) was transferred to the Quarry allowing an annual extraction of up to 15 ML. No extraction of water from this bore occurred during the 2015 AEMR period.

1.1.4 Regulatory Compliance

The key compliance requirements associated with the Development Consent and EPL are respectively summarised in **Tables 1a** and **1b** with references provided to the relevant Sections of the AEMR which provide further detail on environmental management, performance and compliance at the Quarry.

Table 1a: Key Compliance Requirements – Development Consent

Compliance Condition	Compliance Requirement (Development Consent No. 06_0074)	See AEMR Section
Schedule 2: Condition 6	No more than 3.5 million tonnes of product to be transported from site in a year	Sect 2.1
Schedule 3: Condition 2c	Site boundaries to be clearly and permanently marked	Note 1
Schedule 3: Condition 2 to 11	Prescribes maximum noise limits and mitigation measures	Sect 2.7.1 Sect 3.5.1
Schedule 3: Condition 11	Table 3 prescribes operational hours for specified quarry activities	Note 2 Section 3.5.2
Schedule 3: Condition 12 to 16	Prescribes limits and mitigation measures on Blasting Operations	Sect 2.7.2 Sect 3.5.2
Schedule 3: Condition 17	Tables 6, 7 and 8 prescribe Air Quality criteria not to be exceeded	Sect 2.13 Sect 3.4
Schedule 3: Condition 21	Requirement to operate and maintain a meteorological station for the life of the project	Sect 2.13.2 Sect 3.3.1
Schedule 3: Condition 22 to 30	Surface and groundwater management and monitoring requirements	Sect 2.12 Sect 3.6
Schedule 3: Condition 32A	Requirement to report unexpected encounters with archaeological relics	Sect 2.14 Sect 3.10
Schedule 3: Condition 33 to 34	Species (Flora & Fauna) and habitat management	Sect 2.4 Sect 5.0
Schedule 3: Condition 34 to 36	Disturbed land rehabilitation management	Sect 2.4 Sect 5.0
Schedule 3: Condition 37	Visual amenity and off-site lighting	Sect 3.11
Schedule 3: Condition 41	Monitor and minimise waste	Sect 2.9 Sect 3.9
Schedule 3: Condition 42 to 45	Emergency and hazard management	Sect 2.11
Schedule 3: Condition 46	Monitoring and reporting of production data	Sect 2.1
Schedule 3: Condition 47	Quarry exit strategy	Sect 5.0
Schedule 4: Condition 1	Notification of non-compliances with criteria prescribed in Schedule 3	Sect 3.12
Schedule 4: Condition 2 to 5	Requirement for an Independent Review	Sect 6.1 Sect 6.2
Schedule 4: Condition 7	Land acquisition considerations	Note 3
Schedule 5: Condition 1	Implementation of an Environmental Strategy	Sect 1.3

		Sect 3.1 / 3.2 Sect 6.0
Schedule 5: Condition 2	Preparation of a Monitoring Program	Sect 3.0
Schedule 5: Condition 3	Requirement to report incidences and exceedances of criteria	Sect 3.12
Schedule 5: Condition 4	Preparation of an Environmental Review by March each year	Sect 1.0 Sect 1.1
Schedule 5: Condition 5 and 6	Commissioning of an Independent Audit	Sect 6.1
Schedule 5: Condition 7	Review of Strategies, Plans and Programs	Sect 3.1 Sect 3.2
Schedule 5: Condition 8 and 9	Community Consultative Committee	Sect 4.2
Schedule 5: Condition 10	Stakeholder access to information	Sect 4.2.6
Notes: 1: Permanent marking of boundaries were completed during construction stage of the project. 2: Quarry operational hours were conducted within the respective prescribed times for construction works, topsoil/overburden management, blasting and in/out of pit activities. 3: There were no Land acquisition considerations during the 2015 AEMR period.		

Table 1b: Key Compliance Requirements – EPA Environment Protection Licence

Compliance Condition	Requirement (Environment Protection Licence No. 13088 – 23rd Sept 2013)	See AEMR Section
Conditions P1.1, M2.1 and M2.2	Dust Monitoring (EPL discharge points 1 to 5)	Sect 2.13.1
Condition L2 and L2.2	Prescribes maximum noise limits at nominated residential receivers	Sect 3.4.1 / 3.4.2
Condition L3 and L3.1	Prescribes blasting criteria	Sect 2.2 Sect 2.7.2 Sect 3.5.2

1.1.5 AEMR Distribution

Copies of the AEMR will be submitted to:

- NSW Department of Planning and Environment (DPE);
- NSW Department of Trade and Investment (DTI);
- NSW Environment Protection Authority (EPA);
- NSW Office of Water (NOW);
- Goulburn Mulwaree Shire Council (GMSC);
- The Peppertree Quarry Community Consultative Committee (CCC); and
- Aboriginal Heritage Management Committee (AHMC).

The report will also be available at the Boral website:

www.boral.com.au/marulan

1.2 MINE CONTACTS

Key contacts associated with the Management of the Quarry operations, environment, safety and stakeholder relationships are provided in **Table 2**.

Table 2: Key Contact Details – Peppertree Quarry

Contact Person	Position Title	Contact Details
Angus Shedden	Quarry Manager	Tel: (02) 4841 1701 Email: angus.shedden@boral.com.au
Sharon Makin	Stakeholder and Environment Manager	Tel: (02) 4841 1701 Email: sharon.makin@boral.com.au
Robert Lasker	Health, Safety & Environment Advisor	Tel: (02) 4820 3023 Email: robert.lasker@boral.com.au
Paul Jackson	Stakeholder Relations Manager	Tel: (02) 9033 5215 Email: paul.jackson@boral.com.au

1.3 ACTIONS REQUIRED AT PREVIOUS AEMR REVIEW

The 2014 AEMR included specific actions to be undertaken during the 2015 AEMR period (refer to **Table 3**).

Table 3: Actions Required from 2014 AEMR

2014 AEMR Actions	Status
Relocation of crusher into quarry pit which will require construction of fixed conveyors in the pit to reach the quarried rock.	Completed in February 2015.
Production is expected to increase line with market demand. The quarry extraction area will increase to the east with overburden removal continuing.	Production has increased from 257,173 tonnes in 2014 to 1,645,517 tonnes in 2015 (See Appendix 1).
Environmental monitoring will continue to be conducted in compliance with Development Consent, EPL and in accordance with the respective management plans.	All environmental monitoring was conducted as scheduled.
A detailed review of operations at the Train load out. Filler silo and STQ for more efficient dust suppression is to be undertaken.	(i) Train load out – chute system installed to direct flow of material and reduce dust. (ii) Filer silo – pug mill installed to ball dust and remove airborne dust. (iii) STQ – additional polo citrus units installed.

Management of airborne dust from trafficked and open areas to be reviewed and management through either a new water cart or dust suppression products.	A larger capacity and a more efficient water cart has been purchased and is fully operational.
Quarterly noise audits will be undertaken during the 2015 AEMR period. As the results to date have demonstrated compliance, it is not anticipated that additional noise controls will be required.	Operational noise assessments were completed in February, April, July and October 2015.
A review of the weather station will be commissioned in regards to its performance and calibration requirements.	Review of the weather station was completed in September 2015.
An online forecasting system to be investigated to proactively predict rain and wind to allow management prior to the weather pattern occurring.	A commercially available weather forecasting dashboard was purchased and introduced in 2015.
As per Development Condition 37 (Sched 3) a visual assessment will be undertaken of the site to ensure compliance with Australian Standard No. 4282	An independent Compliance Lighting Audit was completed in October 2015.
A review of waste management and disposal to be undertaken.	Review completed resulting in standard operating procedure for oily waste being developed and the establishment of an on-site bio-remediation area to reduce usage and disposal of “absorbent pillows”. The development and implementation of a Waste Management Plan is proposed for 2016.

2 SUMMARY OF 2015 OPERATIONS

2.1 QUARRY PRODUCTION

The Quarry extraction operations are conducted through four main stages which involve:

- Topsoil and overburden removal and emplacement;
- Blasting and crushing of raw feed in-pit;
- Final crushing, screening and stockpiling out-of-pit; and
- Loading, transport and distribution.

Overburden is progressively stripped in layers and hauled to dedicated emplacement areas. The exposed rock is then drilled, blasted and loaded into a mobile primary crushing plant which weighs 285 tonnes and measures 12m in height by 25m in length.

Early in 2015, the mobile crusher was relocated to an area within the quarry pit. This has significant benefits such as reduced fuel consumption and improved air quality compared to conventional fixed crushing plants that require material to be transported greater distances. The mobile crushing plant design also includes a uniquely designed mobile conveying system allows the relocation of crushing operations to new extraction areas further reducing heavy vehicles fuel usage; noise and dust emissions; and exhausts emissions.

Crushed rock from the mobile crushing plant is delivered via conveyors to the out-of-pit processing plant where further crushing, screening and blending is performed to meet various product specifications. The conveyors and processing plant are fully enclosed to control dust and noise.

The final product is then stored in eight silos that have conveyors connected to train loading bins. The loading of product into trains is fully automated and centrally managed from the main control room which monitors the feed and delivery conveyors, crushing and screening plants. Faults are efficiently detected and diagnosed and if required sections of the processing system can be shut down.

In 2015, extraction operations were conducted in the north-western corner of the 30-year quarry footprint and will progressively move in an easterly direction over the next 5 years, after which quarrying is proposed to progress to the south within the approved boundaries.

In 2014 and 2015 the Quarry produced 257,173 tonnes and 1,645,517 tonnes of aggregate respectively (see Appendix 1). The increase in the annual tonnages between 2014 and 2015 reflects the transition from the construction phase to full production at the Quarry. The anticipated production for 2016 is 2.3 million tonnes however, rates will be dependent on market demand and production levels at other Boral hardrock quarries.

2.2 HOURS OF OPERATIONS

The Quarry operational hours are conducted in accordance with the Development Consent, which permits the following times for specific operations:

In-Pit Operations

Including drilling, extraction, processing, and transfer of material out of the pit**:**

- Any Day – 7.00am to 7.00pm

Out-of-Pit Activities

Including processing, stockpiling, train loading and distribution, and maintenance:

- Any Day – 24hrs

Blasting

- Monday to Saturday – 9.00am to 5.00pm
- Sunday and public holidays: Not permitted

Topsoil and Overburden Removal/Emplacement

- Any Day – 7.00am to 7.00pm

2.3 EXPLORATION

No exploration activities were planned or undertaken at the Quarry in 2015.

2.4 LAND PREPARATION

Land preparation prior to the extraction of rock requires planning and implementation of controls associated with clearing of vegetation; erosion and sediment; preserving cultural heritage; and the stripping, stockpiling and reuse of topsoil and overburden.

As a requirement of the Development Consent, the Quarry has developed and implemented the following Management Plans that provide the framework for ensuring land development activities are undertaken in an environmentally and culturally appropriate manner:

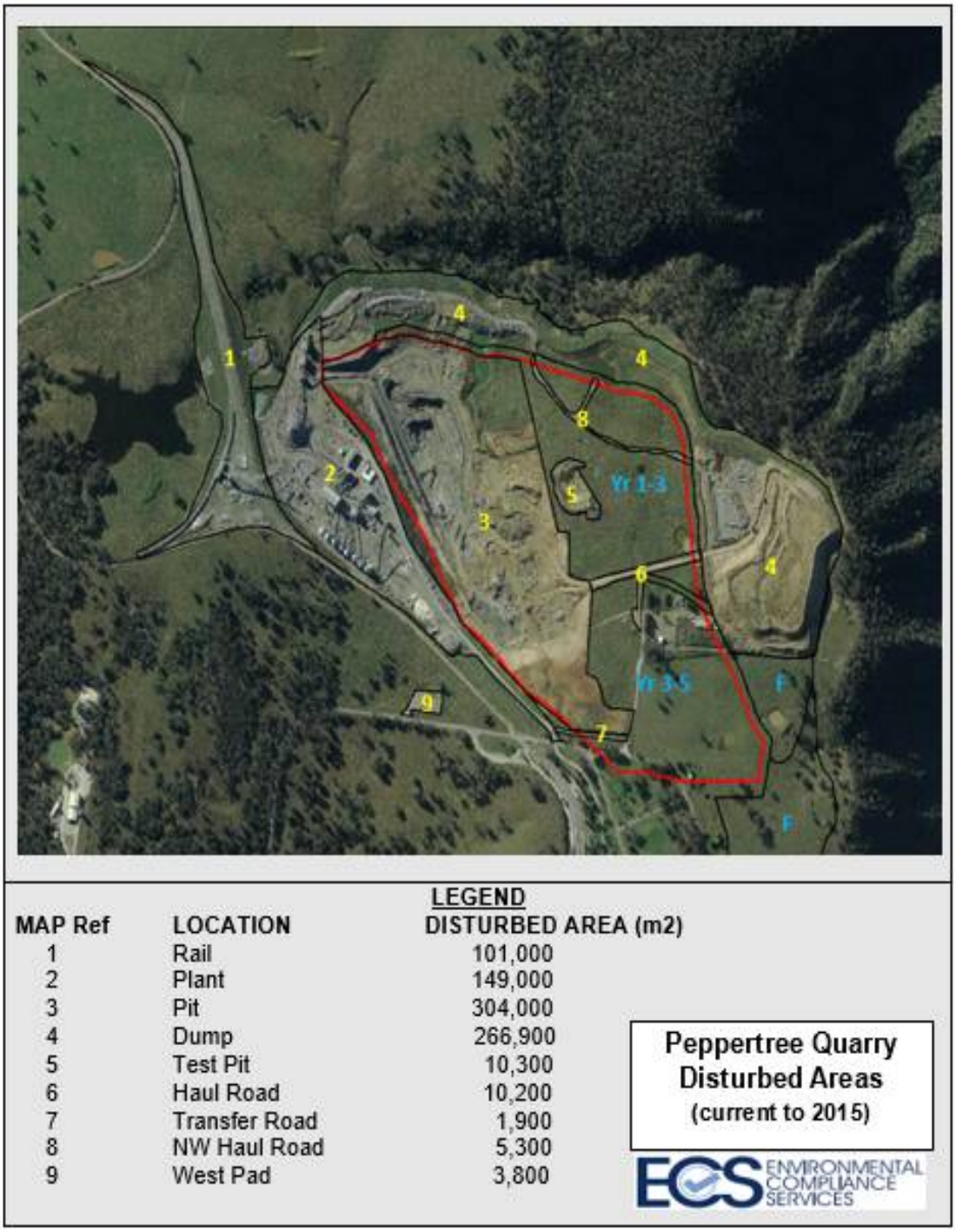
- Landscape and Rehabilitation Management Plan;
- Water Management Plan;
- Aboriginal Heritage Management Plan; and
- Environmental Monitoring Plan.

During the 2105 AEMR period, 83.8 ha of Quarry land was disturbed of which 22.4 ha was rehabilitated (refer to **Table 4**). **Figure 2** presents the locations and total estimated areas of disturbance to the end of the 2015.

Table 4 - Area of Disturbance and Rehabilitation in 2015

Quarry Areas	Disturbed (ha)	Rehabilitated (ha)
Infrastructure area – Primary, STQ and TLO	25.0	No Rehabilitation Activity
Quarry extraction area	30.4	No Rehabilitation Activity
Active overburden emplacement	26.7	No Rehabilitation Activity
Test pit / west pad	1.7	No Rehabilitation Activity
Overburden emplacement / Noise bund (revegetated)	No Disturbance	12.1
Dam and creek rehabilitation area	No Disturbance	10.3
Total area Disturbed / Rehabilitated	83.8	22.4

Figure 2: Disturbed Quarry Areas



2.5 CONSTRUCTION

No major construction activities were undertaken at the Quarry in 2015.

2.6 CRUSHING

The only significant change in crushing operations from the 2014 AEMR period was that in February 2015 the mobile primary crusher was relocated to the 1st bench within the quarry pit. The relocation of the crusher has significantly reduced the haulage of materials from extraction areas which results in a reduction of fuel usage and air emissions (i.e. noise, dust and exhaust).

2.7 NOISE AND BLASTING

2.7.1 Noise

The Quarry completed construction activities between the years 2013 and 2014 after which the Construction Noise Management Plan was largely superseded by the Noise and Blasting Management Plan (NBMP). The NBMP provides guidance and procedures for controlling, monitoring and assessing noise impacts through:

- Identification of temporary or infrequent noise-generating activities and/or sources and mitigation actions if required;
- Presentation of applicable noise criteria to employees and contractors via tool box instructions;
- Ensuring all covers are in place and closed at all times when fixed and mobile plant are in operation;
- Notifying all potentially impacted residents on the nature of potentially high noise generating works, the expected noise levels and duration, as well as contact details to raise any concerns;
- Briefing contractors / employees on the noise operational requirements to minimise noise via and regular inspections and maintenance of equipment to ensure optimum working order;
- Informing truck drivers of designated vehicle routes, parking locations, acceptable entry/exit hours or other relevant practices (for example, minimising the use of engine brakes);
- End on end configuration of diesel locomotives which has been shown to be quieter than being paired together;
- Enclosed processing operations;
- Noise cladding on the major crushing building;
- Operations being undertaken within approved working hours;

- Regularly inspection and maintenance of Plant and equipment with consideration to noise management; and
- Routine monitoring of meteorological conditions (including predictive meteorological forecasting) using the on-site meteorological station in liaison with the Bureau of Meteorology.

2.7.2 Blasting

The Quarry conducted 42 blasts during the 2015 AEMR period. The blasts are performed by approved contractors with supervision and approval from the Quarry Manager to ensure all blasts are undertaken in accordance with Development Consent through the implementation of the NBMP and Boral's integrated Health Safety, Environment and Quality Management System (HSEQ MS), which includes specific requirements in relation to blasting operations.

Monitoring of overpressure and ground vibrations at four nominated sensitive receptors is conducted during every blast. The monitoring results are published on the Boral website in accordance with NSW EPA Licence requirements and section 66(6) of the POEO Act.

Neighbours within two kilometres who have requested to be advised are provided with at least 24hrs notice prior to any blasting event.

2.8 MATERIAL PROCESSING

Extracted rock from the pit is progressively processed through the following facilities:

- Primary in-pit mobile crusher and conveyor system;
- Primary Screen and building enclosure;
- Secondary crushing plant and building enclosure;
- Secondary Screen and building enclosure;
- Final product silos; and
- Train loading facility.

Each component of the above processing facilities requires separate material handling infrastructure including conveyors, drives, loop take-ups, feeders and dust controls. The design which includes a purpose built primary in-pit crusher has minimised the need to transport the material from extraction areas to processing facilities which are a normal feature of most hard rock quarries.

The crushing and screening buildings were purpose built to reduce noise and dust emissions with material being transported through fully enclosed conveyors into and out of each building ultimately delivering final product sizes to the enclosed silos.

The train loading system allows for loading of multiple products and blends from the silos. The train loading system is fully automated with product being delivered by conveyors from the silos to the loading bin. All quarry products and materials are transported by rail to one of three Boral sites including, Maldon rail terminal near Picton, St Peters and Enfield terminals for ultimate distribution by trucks into the Sydney metropolitan area. The use of rail as part of the distribution chain significantly reduces impacts and congestion on local and regional road networks.

2.9 WASTE MANAGEMENT

The Quarry operates in accordance with the Boral waste management HSEQ MS Standard, which commits to managing waste in accordance with the waste hierarchy of best practice avoidance through to the least preferred disposal option. The implementation of the Standard provides the framework for:

- Compliance with Statutory requirements;
- Identification, storage, handling, classification and disposal of wastes;
- Minimising waste generation;
- Reuse and recycling of waste wherever practical; and
- Educating and encouraging site employees in achieving the waste hierarchy objectives.

A waste invoice and docketing system has been implemented which includes the classification, assessment and management of the Quarry's waste stream in accordance with Development Consent requirements (refer to **Table 5**).

Table 5: Peppertree Quarry Waste Stream and Management

Waste Stream	Source	Classification	Management
Oil absorbent pads	Oil spills	Solid general waste	General waste bins – filler silo / workshop
Oil filters	Maintenance on vehicles	Solid general waste once oil has been drained	General waste bins – filler silo / workshop
Oily rags / waste	Workshop	Solid general waste	General waste bins – filler silo / workshop
Paper –Investigating recycling options	Office	Solid general waste	General waste bins
Steel	General maintenance and capital works	Solid general waste	Recycled
Cardboard	Packaging	Solid general waste	Recycled
Food scraps	Lunch room	Solid general waste	General waste bins
Plastic / Glass bottles	Lunch room	Solid general waste	General waste bins
Aluminium cans	Lunch room	Solid general waste	General waste bins
Screen mats – Investigating recycling opportunities	Replacement at screens	Solid general waste	General waste bins – filler silo / workshop
Conveyor belt - recycled	Split conveyor belts	Solid general waste	Stored in primary area
Oil drums	Spent oil	Solid general waste	Farm house depot

2.9.1 Asbestos Management and Disposal

In 2014 asbestos was encountered during stripping operations around the foundations of three former residential buildings which were part of the old Marulan South Village. A licensed asbestos specialist was engaged for further investigation and subsequent removal of the material. An asbestos clearance and removal certificate was issued by the specialist in February 2015.

2.10 STOCKPILE MANAGEMENT

Topsoil and overburden is separately stripped and stockpiled for subsequent use on completed batter slopes and bunding as part of ongoing water and sedimentation controls. Overburden is placed directly on the undisturbed ground surface to minimise any impacts to heritage areas.

Stockpiles and overburden placements are appropriately controlled with consideration to location, stability, geotechnical characteristics, slope and height.

2.11 DANGEROUS GOODS AND HAZARDOUS MATERIALS MANAGEMENT

The Quarry has a Material Safety Data System (MSDS) in place utilising the ChemAlert Program. A Hazardous and Dangerous Goods Register is in place which identifies each chemical stored onsite. The register is physically kept in the "contacts" cupboard within the Site Office and electronically.

In accordance with Development Consent Condition 43 (Schedule 3), all dangerous goods and chemicals are handled and transported in accordance with the AS1940 and AS25956 and the Dangerous Goods Code.

The only Dangerous Goods Licence pertaining to the Quarry is for a 100KL aboveground double skinned and bunded diesel tank for refuelling locomotives. The WorkCover Notification (NDG200221) is on behalf of an on-site contractor who operates and maintains the refuelling facility. The operation and management of the refuelling facility is periodically inspected and audited by Quarry Management.

2.12 WATER MANAGEMENT

2.12.1 Surface Water

A key objective of the Quarry Water Management Plan is to be self-sufficient with no dependence on external sources. A sustainable water management system has been implemented that involves the capture and storage of stormwater run-off for use in quarry processes, dust controls and environmental flows into the Tangarang Creek Catchment.

Where practical, a combination of bunds and drains divert run-off from undisturbed areas from the pit and other operational areas to reduce the potential for flooding and pollution of water. All other water within the current quarry footprint is directed to a series of sediment dams located within the pit and around the site to prevent sediment laden or contaminated runoff leaving the site. Sediment traps and settling ponds form part of the site water management system which improves water quality at various points along both clean and dirty water drainage networks.

Surface water quality is monitored at the discharge point of the main storage dam (Dam 1) and at upstream and downstream locations to confirm site operations are not adversely impacting the Tangarang Creek Catchment.

2.12.2 Environmental Flows

In accordance with Development Consent Condition 24 (Schedule 3) environmental flows to Tangarang Creek, from Dam No.1, should be equivalent to 10% of the average daily flows. The measurement of environmental flows is undertaken by monitoring of water level variations in Dam 1, with a downstream discharge flow meter and referenced against historically calibrated water balance data. Prior to the Quarry operations, Tangarang Creek was ephemeral and the discharged water from Dam 1 has provided more consistent flows which improve downstream ecosystems.

2.12.3 Groundwater

In October 2015, 12 groundwater bores were installed to provide additional baseline data on groundwater levels, flows and water quality. The first sampling event was completed on October 2015 and ongoing monitoring will be undertaken on a quarterly basis from which trends will be monitored and reported in future AEMRs, commencing in 2016.

2.12.4 Potable and Amenity Water

The Quarry has no potable water supply and the Site Office and amenity requirements are met with potable water being imported as required. On-site sewage comprises of a package treatment unit with the treated effluent being pumped to an absorption trench located to the south of the processing plant.

2.13 AIR QUALITY MANAGEMENT

2.13.1 Dust Monitoring

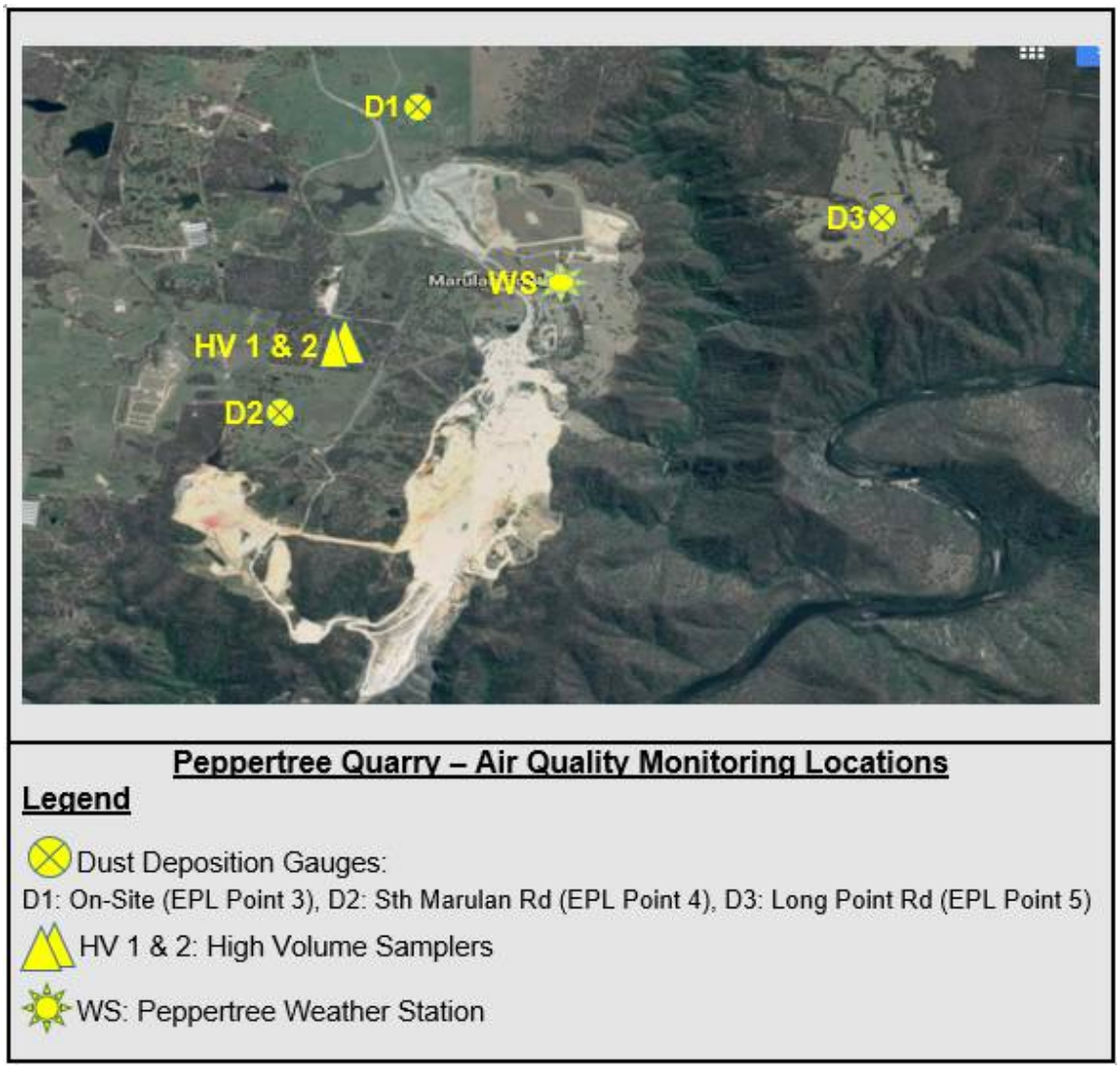
The Quarry manages an air quality monitoring system comprising of three deposition gauges, two side-by-side high volume samplers and an on-site weather station (refer to **Figure 3**) in accordance with the Peppertree Air Quality Monitoring Plan. Two of the dust deposition gauges (D2 and D3) located off-site for statutory compliance verification, the third (D3) is situated on-site for the monitoring and control of quarry operations in minimising dust emissions.

The dust deposition gauges monitor localised dust levels comprising of particles typically larger than 50µg in size. Samples from the three gauges are collected monthly and the mass deposition rate of settled dust is analysed at a NATA accredited Laboratory.

The two high volume samplers are located off-site for the measurement of particulate matter less than 10 microns in diameter (PM_{10}) and Total Suspended Particles (TSP). The high volume samplers are programmed to operate on a continuous 24-hour period on six in seven-day cycle. The high volume sampler flows are subject to bi-monthly calibration. Other parameters such as the time meter and the program of the clock are calibrated on an annual basis.

Any abnormal results from the dust deposition gauges and high volume samplers are subject to an investigation to determine whether quarry operations have potentially been a contributing factor.

Figure 3: Air Quality Monitoring Locations



2.13.2 Meteorological Monitoring

An onsite automated weather station monitors barometric pressure, wind speed and direction, rainfall, relative humidity, temperature at 2m and 10m, as well as solar radiation. Data is uploaded to a secure web page on a weekly basis, however the data can be obtained on an hourly basis if required or in the event of a dust incident where wind speed and direction are readily required.

The maintenance and calibration of the weather station data is undertaken by a contractor, in addition a forecasting system via Weatherzone is in place to provide alerts to relevant site personnel on predicted significant weather events such high winds and extreme rainfalls so that appropriate actions and controls can be proactively implemented.

2.14 HERITAGE CONSERVATION

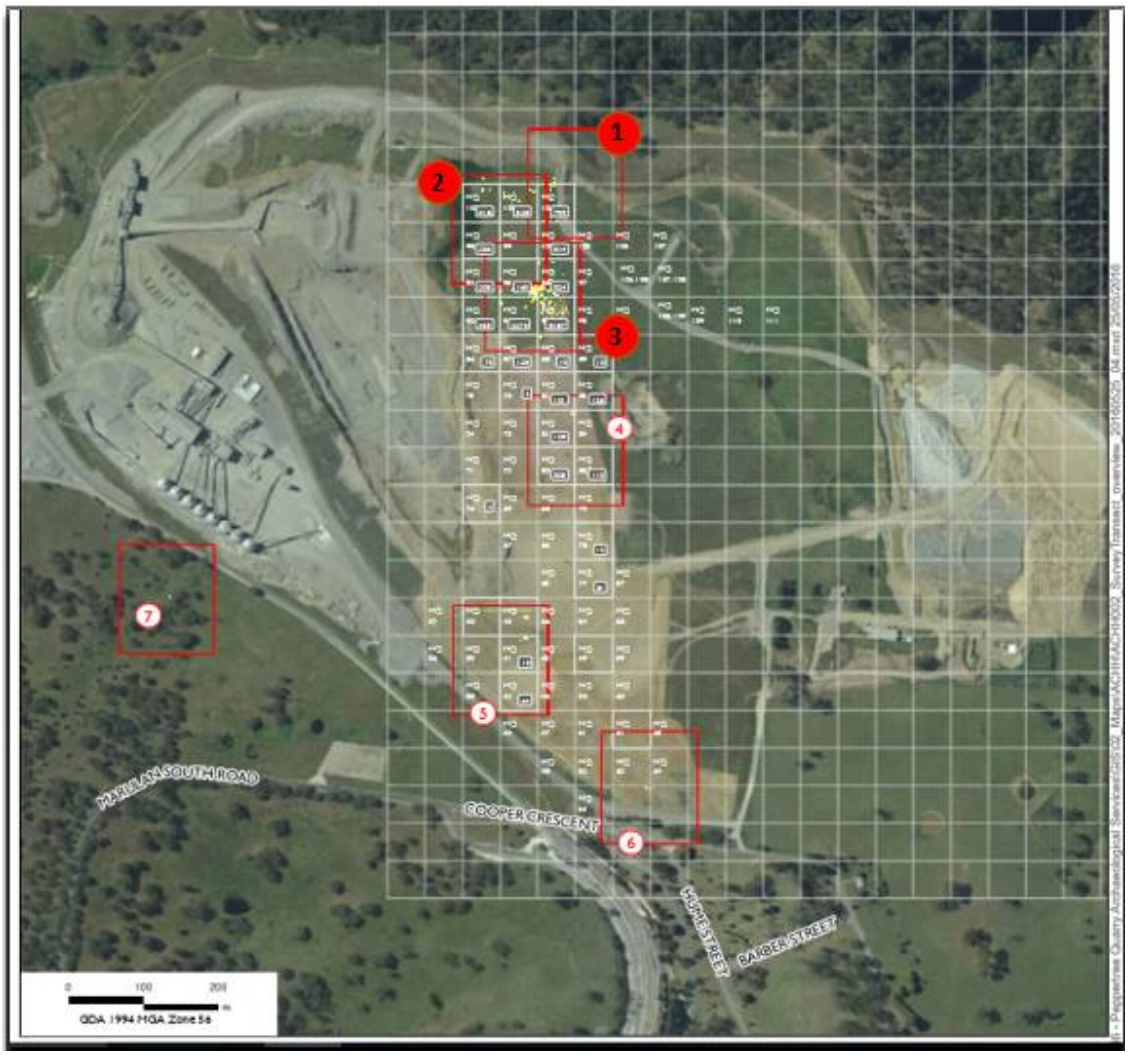
An Environmental Assessment Report (EAR) was prepared in 2006 under Part 3A of the *Environmental Assessment and Planning Act* (1979) as part of the Quarry Development Approval. The EAR included potential impacts upon indigenous cultural heritage. In collaboration with Aboriginal stakeholders, fifteen sites were identified that would be impacted by the construction of the proposed quarry. Subsequently, the Development Consent included a requirement for the implementation of an Aboriginal Heritage Management Plan (AHMP).

The AHMP was developed in January 2011 and continues to provide the framework for the identification, protection, conservation and presentation of Aboriginal cultural values at the Quarry. During the 2015 reporting period and in prior years, members of the Aboriginal Management Committee (AMC) have undertaken topsoil monitoring across a large area of the site. Salvaging of artefacts during topsoil spreading has to the end of 2015 identified and catalogued over 90,000 artefacts from various locations.

A small proportion of the accumulated artefacts will be displayed for future community and tourist viewing with the remainder “returned to country” under the guidance of the AMC.

During 2015, artifact recovery operations were concentrated in Areas 1, 2 and 3 (refer to **Figure 4**).

Figure 4: Aboriginal Heritage Areas



3 ENVIRONMENTAL MANAGEMENT AND MONITORING

The Quarry has a comprehensive monitoring program that collects information and data for the assessment of environmental impacts, compliance and performance against continual improvement objectives. Monitoring is undertaken in accordance with the Environmental Monitoring Program which defines the framework for measuring environmental performance and compliance with statutory requirements.

3.1 INTEGRATED MANAGEMENT SYSTEM

In June 2015, Boral completed a comprehensive review and integration of its existing health, safety, environment and quality management systems. The integrated Health Safety, Environment and Quality Management System (HSEQ MS) comprises of the following nine Environmental Standards:

- Environmental Aspects and Impacts;
- Water Management;
- Land Management;
- Waste Management;
- Noise Management;
- Air Management;
- Spill Management;
- Ecosystem and Biodiversity Conservation; and
- Culture and Heritage Protection.

The identification of environmental risks at the Quarry is undertaken in accordance with the HSEQ MS Aspects and Impacts Standard which aligns with Australian & New Zealand Standard AS/NZS 31000:2009 Risk Management - Principles and Guidelines.

A review of the Aspects and Impacts Standard was undertaken in October 2015 by a collaboration of Quarry Management, operational employees and environmental advisors. The review included risk assessments on 39 environmental elements associated with the Quarry operations, equipment and materials. The review found that all environmental risks were being appropriately identified, controlled and resourced.

3.2 MANAGEMENT PLANS

In accordance with Development Consent requirements, the Quarry has developed and implemented the following Management Plans and Monitoring Program which provide the framework for measuring, monitoring and managing environmental performance and compliance. An Independent Environmental Audit was conducted during the 2015

AEMR period and in accordance with the Development Consent, Condition 7 (Schedule 5), a review of the following Plans and Programs was conducted:

- Air Quality Monitoring Plan (reviewed in October 2015);
- Noise and Blast Monitoring Program (reviewed in October 2015);
- Landscape and Rehabilitation Management Plan (reviewed in October 2015);
- Water Management Plan (reviewed in October 2015);
- Aboriginal Heritage Management Plan (reviewed in October 2015);
- Environmental Monitoring Plan (reviewed in October 2015); and
- Environmental Management Strategy (reviewed and revised version to be submitted to DP&E for approval during the 2016 AEMR period).

As part of the review, the Construction Noise Management Plan and Construction Traffic Management Plan were no longer considered relevant to current quarry operational aspects and are no longer being implemented. However, they may be revised and reintroduced should any future construction activities be undertaken at the Quarry.

During the 2016 AEMR period, a revised version of the Waste Management Plan and a Stakeholder Management Plan will be developed and implemented in addition to those required by the Development Consent.

3.2.1 Dust Management Action Plan

In 2015, a Quarry Dust Action Plan was prepared and implemented which comprised of fifty individual improvement objectives of which 35 were completed by the end of the AEMR period. 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.

3.3 METEOROLOGICAL MONITORING

3.3.1 Weather Forecasting Dashboard

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. The Quarry has trained staff and developed procedures to take appropriate levels of action based on the dashboard predictions.

The implementation of the dashboard and associated procedures has significantly improved the ability of the Quarry to proactively prepare for and manage extreme weather events. Based on the level of an alert the Quarry can ensure controls and contingencies for dust and stormwater management are effectively and efficiently implemented.

Example of the dashboard outputs are presented in **Figure 5** and **Figure 6**. **Figure 5** shows a high level storm approaching the Quarry in real time, while **Figure 6** shows predicted weather in coming days and the potential level of impact on operations.

Figure 5: Storm Warning Alert

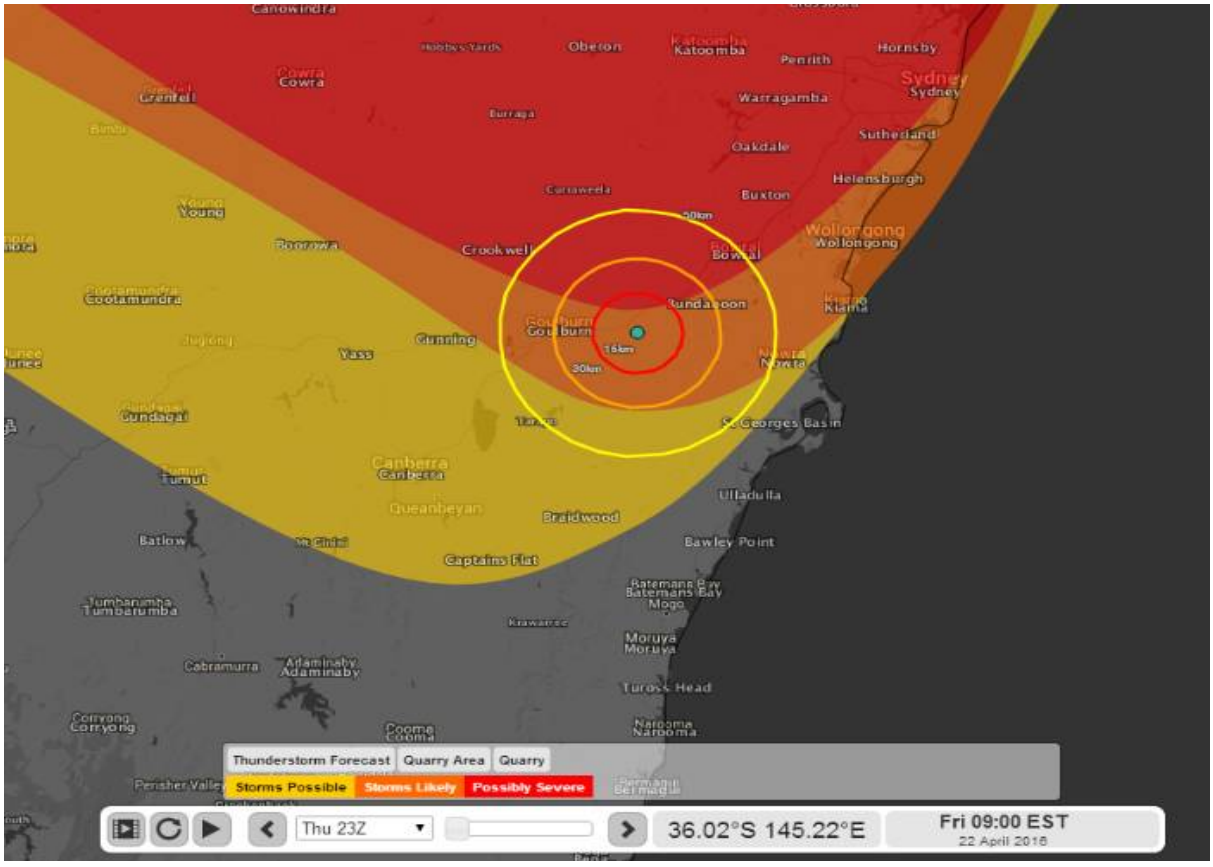
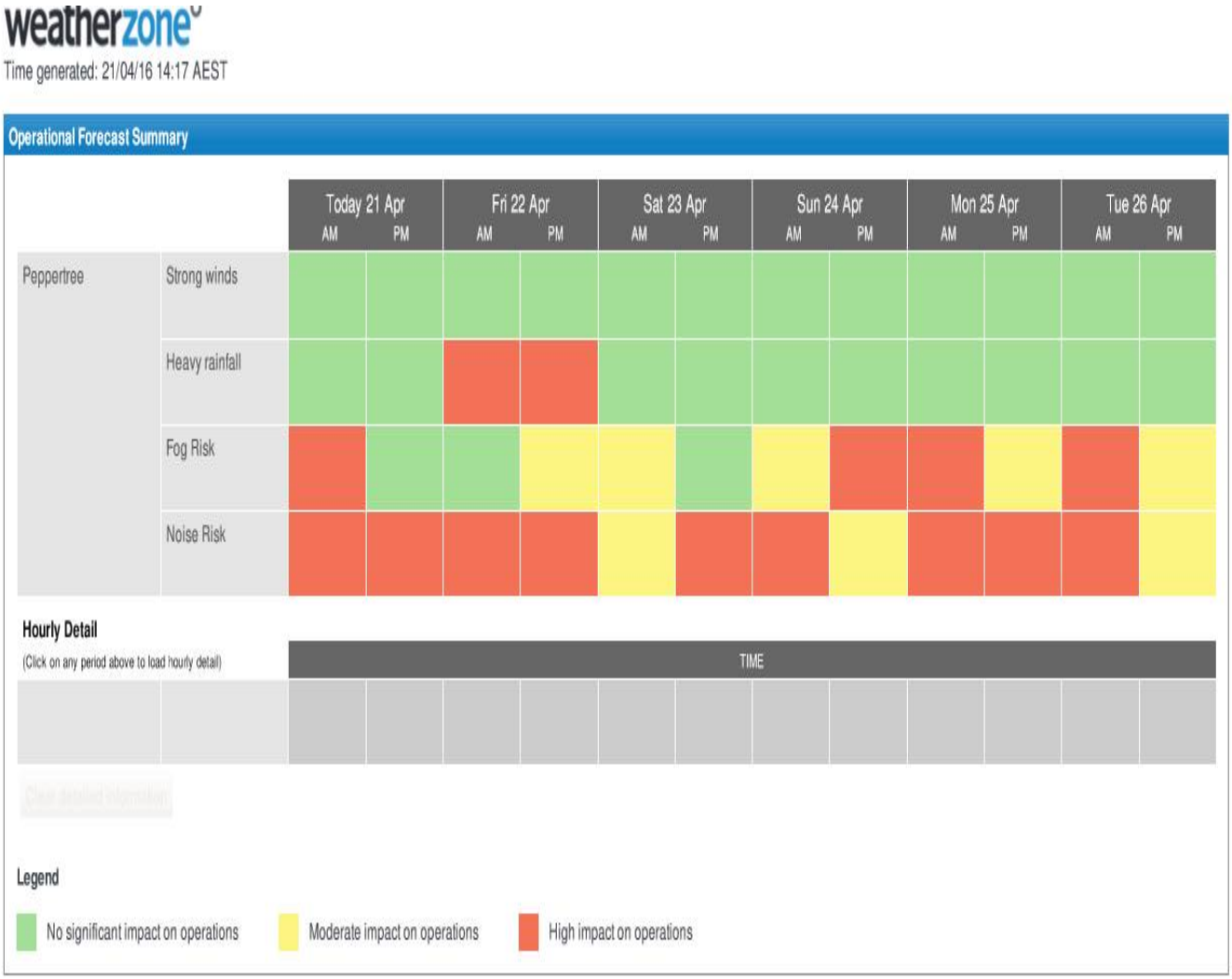


Figure 6: Weather Forecast and Predicted Impacts on Operations



3.3.2 Specialist Review of On-Site Weather Station

An air specialist was engaged during the 2015 AEMR period to undertake a review on the accuracy of data produced by the on-site weather station. The review compared meteorological data collected between June 2012 and March 2015 from the respective weather stations operated at the Quarry and the nearby Marulan South Limestone Mine, some two kilometers to the southwest.

The review concluded that the meteorological data captured by the on-site weather station appeared to be “sensible and generally representative of the local area” and that the data is considered suitable for use in environment assessment modelling. However, the review also provided recommendations for improvements in data handling procedures, calibration and maintenance towards which actions will be considered in 2016.

3.4 AIR QUALITY MANAGEMENT

3.4.1 Dust Deposition Monitoring

In accordance with the EPL, the Quarry operates continuous dust deposition gauges at three locations. Two of the monitoring locations (Sites D2 and D3 refer to **Figure 3** above) are for compliance verification with Development Consent criteria. The third (Site D1) is situated on-site and has no statutory prescribed compliance criteria. However, it provides general guidance on the Quarry operational activities so that appropriate controls can be undertaken to minimise dust emissions.

The Development Consent requires that deposited dust emissions do not exceed an annual average criterion of 4 g/m^2/month at any neighboring residence or privately owned land.

The criterion allows for consideration towards extraordinary events such as fire incidents and dust storms which may cause exceedances beyond the actual dust contribution of activities associated with the Quarry. To account for such events, the ash content of the monthly deposition gauge samples is also analysed to identify organic matter which would not be typically be representative with the Quarry activities.

Table 6 details the monthly results and annual averages of dust deposition from the three gauges. The results from the off-site locations (Sites D2 and D3) were within the Development Consent annual average criterion of 4 g/m^2/month. While Site D2 was only marginally below the criterion, it should be noted that the annual average was significantly skewed by the December results. The annual average from the on-site dust deposition gauge (Site D1) was also significantly skewed by elevated results in May, July and October which based on ash content were unlikely to be representative of quarry dust.

Table 6: Dust Deposition Results

Site	Monthly Dust Deposition (Insoluble Solids g/m2/month)												Annual Average (criteria 4g/m²/m)
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
D1	4.9	3.3	4.2	2.8	**23.8**	2.2	**18.3**	1.9	1.5	**22.6**	2.9	3.2	7.6
D2	2.5	2.1	3.4	2.4	2.9	4.2	1.9	0.8	1.0	3.6	2.4	3.6	2.6
D3	4.7	3.4	3.6	3.5	2.2	2.1	2.7	2.8	0.6	3.0	4.2	14.6	3.9
Note: Ash content reported in these months were representative of significant organic material and results are unlikely to be an accurate representation of deposited dust related to Quarry operations (refer to **Figure 7**).													

Figure 7 presents the monthly trends of dust deposition and ash content at each of the three monitoring locations. The ash content in samples reported during the three months (i.e. May, July and October) where reported deposition rates were abnormally high were also elevated and the reported results are unlikely to accurately represent deposited dust from quarry related operations.

An investigation to into each of the abnormally elevated monthly dust deposition rates could not identify any quarry related concerns during the respective periods and it is considered likely that external factors may have influenced the reported dust deposition results.

Figure 7: Dust Deposition Monthly Trends

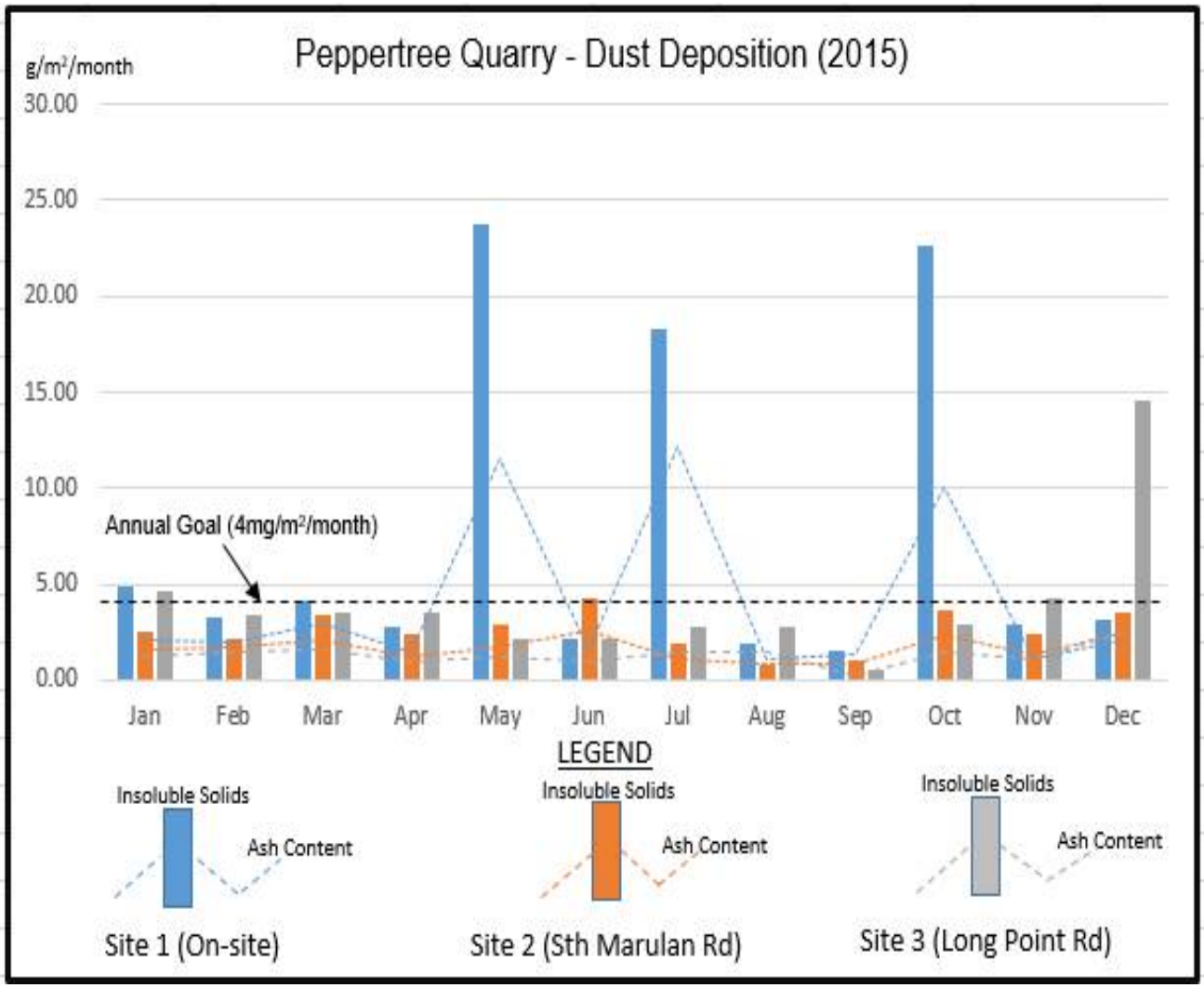
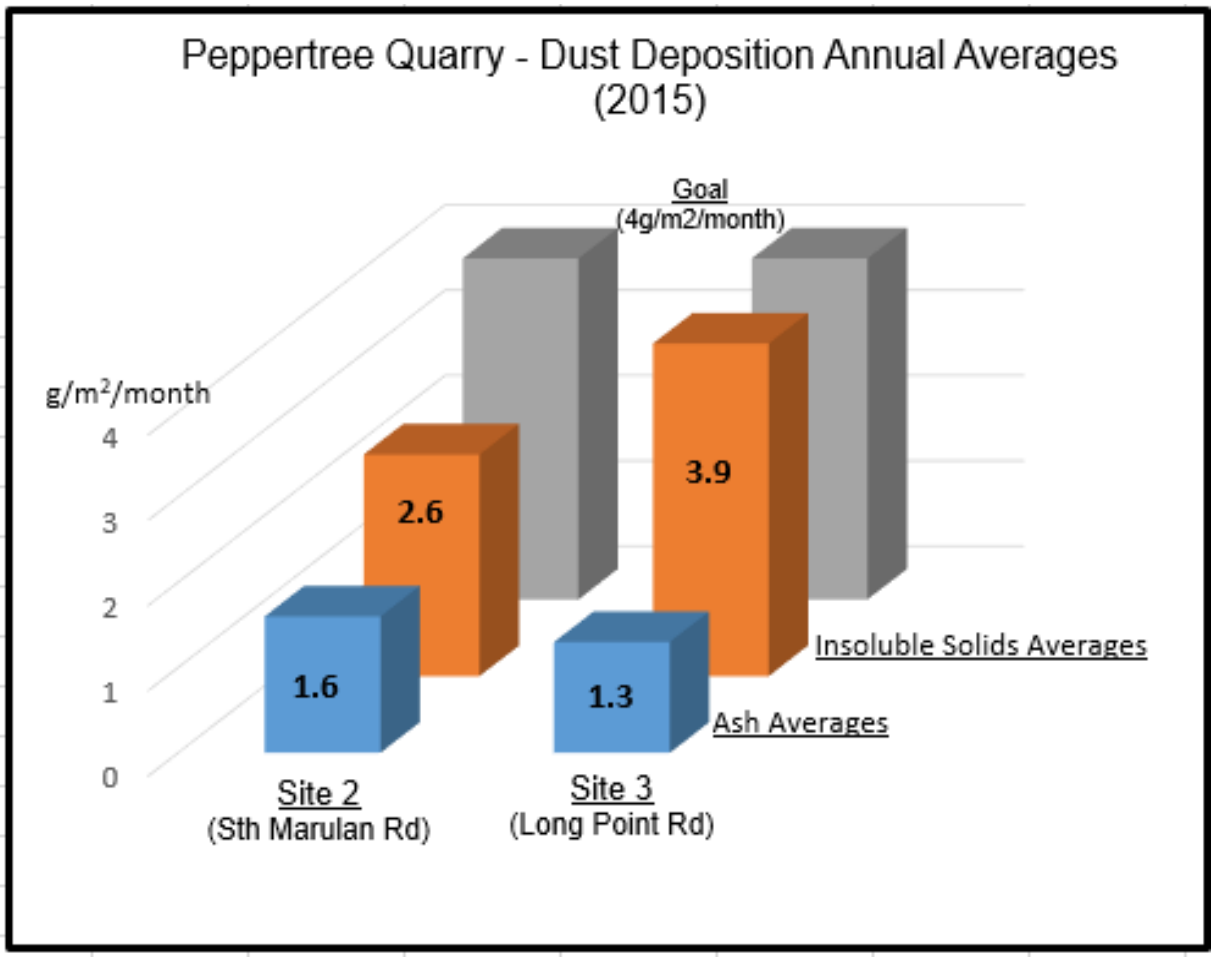


Figure 8 shows that the dust deposition annual averages at the off-site monitoring locations Sites D2 and D3, were in compliance with Development Consent criterion of 4 g/m^2/month during the 2015 AEMR period. The relatively high percentage of ash in comparison to insoluble solids is an indication that some external sources were also contributing to the results.

Figure 8: Off-Site Dust Deposition – Annual Averages



3.4.2 PM10 and TSP Monitoring

In accordance with EPL requirements, the Quarry operates two high volume air samplers that are located side by side for the respective sampling of PM_{10} and TSP over a 24-hr period every six days.

The Development Consent prescribes the following long and short-term PM_{10} and TSP emission compliance criteria:

- PM10 does not exceed an annual average of 30 µg/m^3;
- PM10 does not exceed a 24hr average of 50 µg/m^3; and
- TSP does not exceed an annual average of 90 µg/m^3.

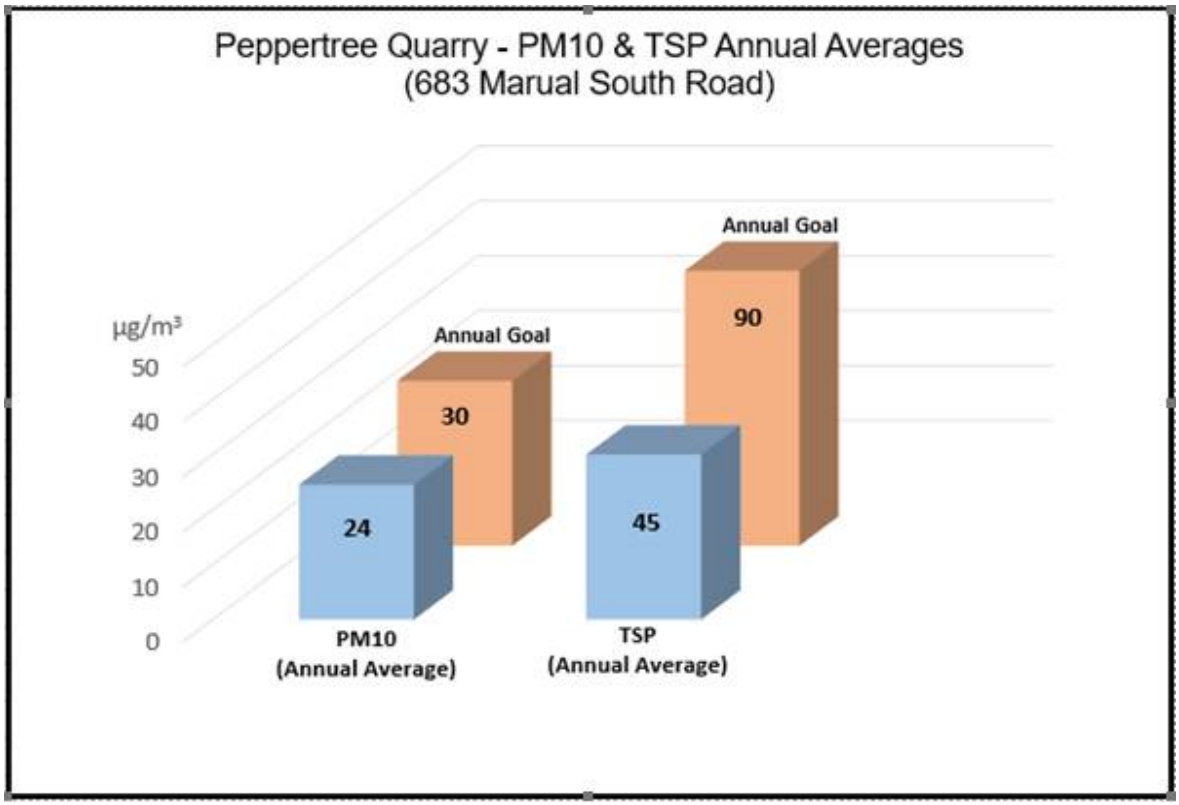
Figure 9 shows that the annual averages for both TSP and PM_{10} were within respective Development Consent criteria.

However, on the following four occasions the short-term criteria of 50 µg/m^3 (i.e. 24-hour average) for PM_{10} emissions were exceeded:

- 23/11/15: PM_{10} recorded as 101.7 µg/m^3;
- 05/12/15: PM_{10} recorded as 158.3 µg/m^3;
- 11/12/15: PM_{10} recorded as 76.0 µg/m^3; and
- 17/12/15: PM_{10} recorded as 63.9 µg/m^3.

Each of the above exceedances were investigated and no quarry operational issues were able to be identified as the cause of the elevated results. However, the investigation noted that a change in practice had occurred in November 2015 where the transport of lime by trucks to the Aglime facility had commenced. Anecdotal evidence from the trucking company involved in transporting the lime indicated that vehicles may not have been adequately covered. Subsequently, all drivers were made aware of the need to cover loads and no further PM_{10} exceedances were reported.

Figure 9: PM_{10} & TSP Annual Averages



3.5 NOISE AND BLASTING

3.5.1 Noise

Operational noise assessments were completed in February, April, July and October 2015. The noise assessments were undertaken at the four residential receiver locations listed in the Development Consent (06_0074) Schedule 3, Condition 4 (Table 1).

Table 7 provides a summary of the maximum day and night time noise assessment measurements against the respective Development Consent compliance criteria for measured L_{Aeq} (15minutes) noise levels at all four receiver locations. The assessment results found that the Quarry L_{Aeq} (15minutes) noise levels were in compliance with the averaged levels being considerably lower than the respective prescribed limits (refer to **Figure 10**).

Night time noise monitoring in October were only able to be partially be completed due to a heavy rain event and consequently no measurements were able to be collected at receiver locations No. 6 (Bartolo) and No. 16 (Pace).

Table 7: Noise Assessment Results (LAeq 15min)

Residential Receiver	Assessment Dates (2015)	Noise Level Assessment (LAeq 15min)		
		Compliance Criteria	Measured Noise Levels dB(A)	Compliance with Criteria
Receiver 2 (Ordasi)	Feb	Day: 39 Night: 35	25 / 29 / 29 28 / 25	Yes Yes
	April	Day: 39 Night: 35	<30 / <30 / <30 <30	Yes Yes
	July	Day: 39 Night: 35	<27 / <35 / <32 / <28 <30	Yes Yes
	October	Day: 39 Night: 35	<30 / <30 <30 / <30	Yes Yes
Receiver 5 (Cooper)	Feb	Day: 35 Night: 35	27 / 27 / 27 <25 / <25	Yes Yes
	April	Day: 35 Night: 35	<30 / <30 31	Yes Yes
	July	Day: 35 Night: 35	<26 / <22 / <22 <30	Yes Yes
	October	Day: 35 Night: 35	<30 / <30 ≤33	Yes Yes
Receiver 6 (Bartolo)	Feb	Day: 39 Night: 35	25 / <25 / <25 <25 / <25	Yes Yes
	April	Day: 35 Night: 35	<30 / <30 <30	Yes Yes
	July	Day: 35 Night: 35	<33 / <30 / <31 <33 / <25	Yes Yes
	October	Day: 35 Night: 35	<30 No Measurement (rain)	Yes Yes
Receiver 16 (Pace)	Feb	Day: 41 Night: 35	28 / 32 / 32 28 / 29	Yes Yes
	April	Day: 41 Night: 35	<30 / <30 / <30 31	Yes Yes
	July	Day: 41 Night: 35	<22 / <27 / <29 <31 / <30	Yes Yes
	October	Day: 41 Night: 35	≤32 / ≤31 No Measurement (rain)	Yes Yes

Figure 10: Off-Site Noise Level Trends (LAeq 15)

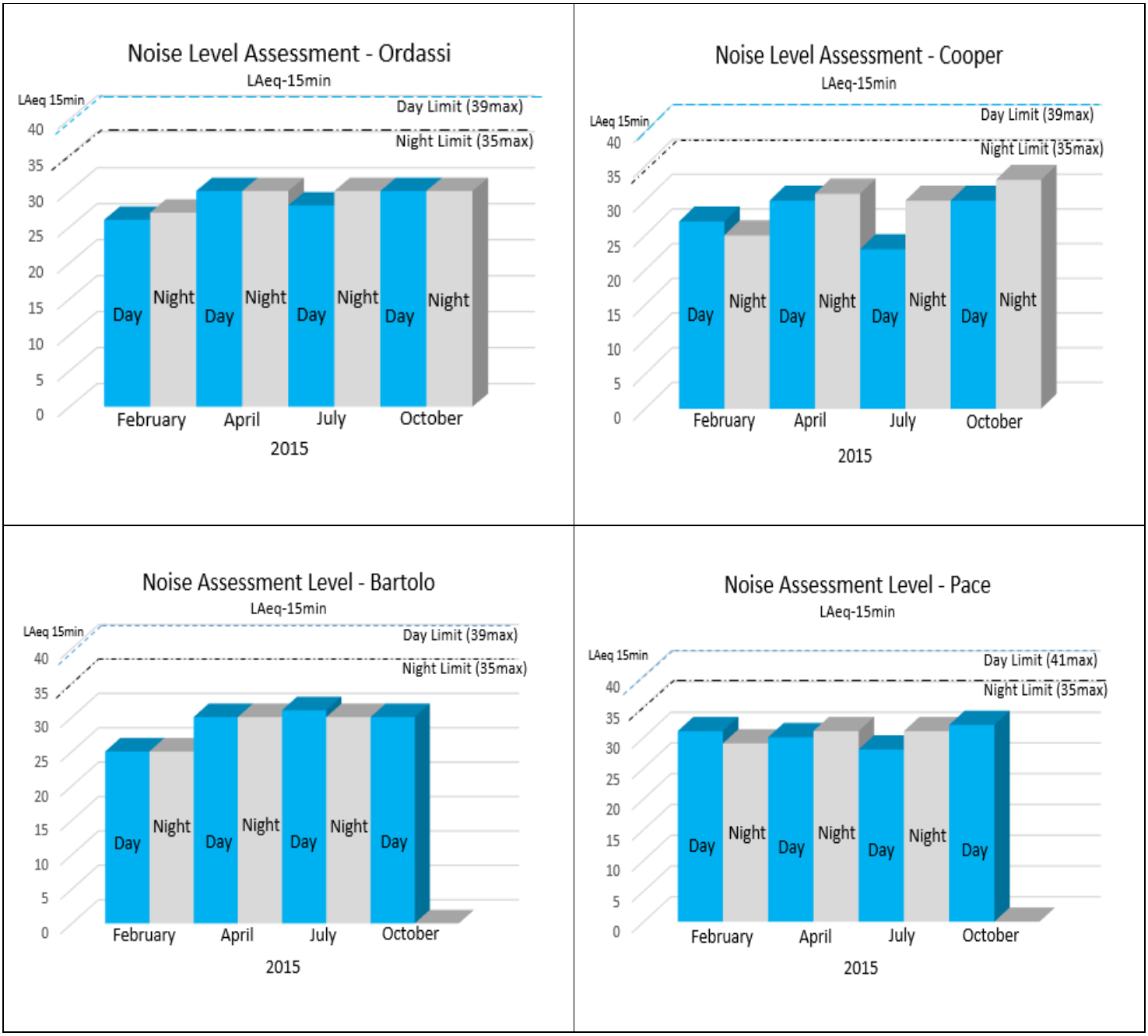
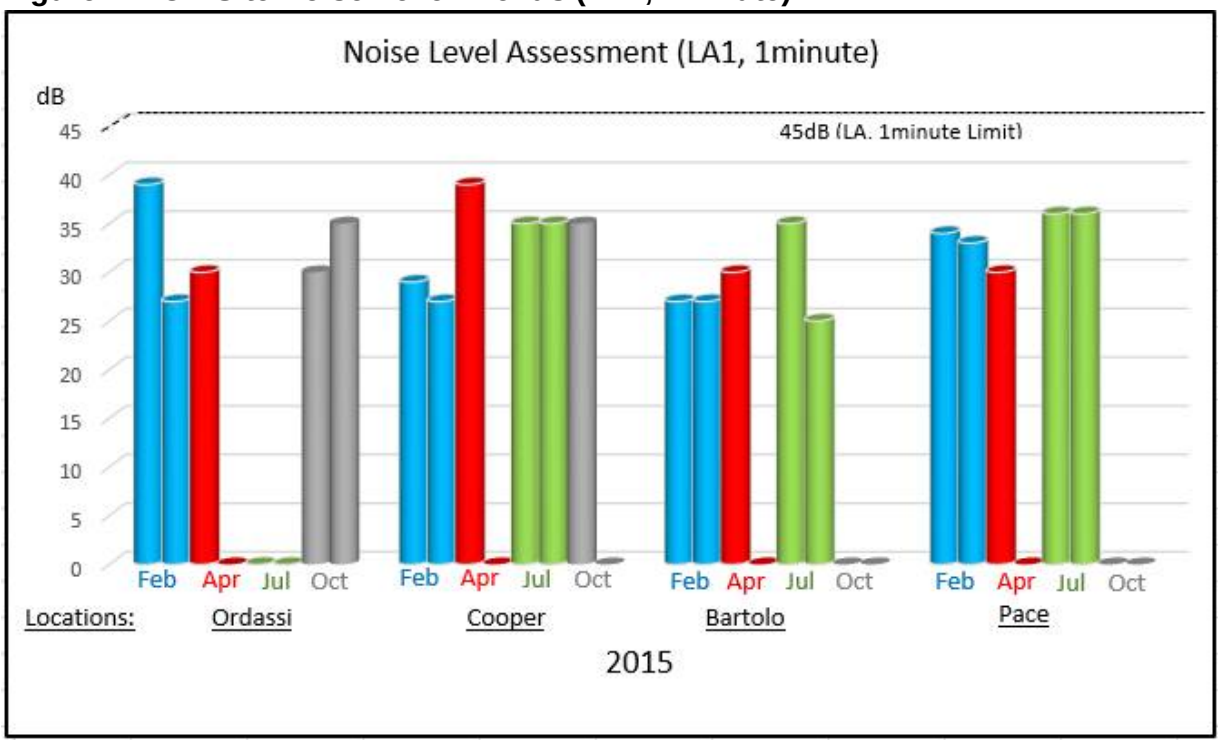


Table 8 provides a summary of the maximum night time noise assessment measurements against the respective Development Consent compliance criteria for measured $L_{A1,\ 1\ minute}$ noise levels at all receiver locations. The assessment results found that the Quarry $L_{A1,\ 1\ minute}$ noise levels were in compliance with the averaged levels being considerably lower than the respective prescribed limits (refer to **Figure 11**).

Table 8: Noise Assessment Results (LA1, 1min)

Residential Receiver	Assessment Dates (2015)	Noise Level Assessment ($L_{A1,\ 1min}$)		
		Compliance Criteria	Measured Noise Levels dB(A)	Compliance with Criteria
Receiver 2 (Ordasi)	Feb	45	39 / 27	Yes
	April	45	<30	Yes
	July	45	No Measurement (rain)	Yes
	October	45	<30 / ≤35	Yes
Receiver 5 (Cooper)	Feb	45	29 / 27	Yes
	April	45	<39	Yes
	July	45	<35 / <35	Yes
	October	45	≤35	Yes
Receiver 6 (Bartolo)	Feb	45	27 / 27	Yes
	April	45	<30	Yes
	July	45	<33 / <25	Yes
	October	45	No Measurement (rain)	Yes
Receiver 16 (Pace)	Feb	45	34 / 33	Yes
	April	45	<30	Yes
	July	45	<36 / <36	Yes
	October	45	No Measurement (rain)	Yes

Figure 11: Off-Site Noise Level Trends (LA1, 1minute)



3.5.2 Blasting

Blast monitoring was undertaken at four locations in accordance with the Development Consent (06_0074) Schedule 3, Conditions 12 (Table 4) and 13 (Table 5).

Blast monitoring result for over pressure and ground vibration during the 2015 AEMR reporting period are presented in **Table 9**. The maximum measurements for over pressure and ground vibration were 112 dB and 2.5 mm/sec respectively. The trends for over pressure and ground vibration were at all times below the Development Consent maximums and the 5% allowable exceedance per annum (refer to **Figure 12** and **Figure 13**)

All blasts were performed in accordance with the following Environmental Performance Conditions under Schedule 3 of the Development Consent:

- Monday to Saturday with no blasts between 9.00am and 5.00pm on Sunday or public holidays (Condition 11);
- Monitored for overpressure and ground vibration levels (Conditions 12 and 13 respectively);
- Best practice considerations associated with safety and minimisation of fumes and dust (Condition 14); and
- Notifications to neighbours and public information (Condition 15).

Table 9: Blast Monitoring Results

Blast Date	Ground Vibration (mm/sec) Max Criteria: 10				Over Pressure (db – Linear) Max Criteria: 120				Compliance
	Monitoring Locations				Monitoring Locations				
	N.West	N.East	Marulan Road	Pace	N.West	N.East	Marulan Road	Pace	
08/01/15	2.00	0.00	0.00	1.35	101.6	0.00	0.00	102.3	YES
20/01/15	0.00	0.00	0.00	1.10	0.00	0.00	0.00	105.3	YES
29/01/15	0.00	0.00	0.00	1.10	0.00	0.00	0.00	109.0	YES
10/02/15	0.00	0.00	0.00	1.60	0.00	0.00	0.00	104.2	YES
25/02/15	1.55	0.00	0.00	2.50	106.8	0.00	0.00	105.8	YES
05/03/15	0.00	0.00	0.00	2.10	0.00	0.00	0.00	0.00	YES
20/03/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	YES
23/03/15	0.00	0.00	0.00	0.00	0.00	100.0	0.00	0.00	YES
27/03/15	0.00	0.00	0.00	0.00	0.00	113.6	0.00	0.00	YES
30/03/15	0.00	0.00	0.00	1.05	0.00	0.00	0.00	0.00	YES
13/04/15	0.00	0.00	0.00	1.05	0.00	0.00	0.00	0.00	YES
17/04/15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	YES
24/04/15	1.50	0.00	1.60	1.40	103.3	0.00	100.3	103.9	YES
01/05/15	1.75	0.00	1.40	0.38	110.0	0.00	112.3	109.0	YES
05/05/15	0.00	0.00	0.95	0.17	0.00	0.00	105.7	97.9	YES
08/05/15	1.05	0.00	1.00	0.00	108.4	0.00	101.7	0.00	YES
14/05/15	1.60	0.00	1.80	0.25	109.4	0.00	108.4	101.1	YES
21/05/15	0.00	0.00	1.35	0.32	0.00	0.00	108.4	102.0	YES
28/05/15	0.00	0.00	1.95	0.47	0.00	0.00	105.0	101.6	YES
05/06/15	0.00	0.00	1.40	0.33	0.00	0.00	104.4	101.5	YES
16/06/15	0.00	0.00	0.19	0.00	0.00	0.00	98.7	0.00	YES
19/06/15	0.00	0.00	0.19	0.00	0.00	0.00	106.7	0.00	YES
26/06/15	0.00	0.00	0.00	0.80	0.00	0.00	0.00	103.4	YES
02/07/15	0.00	0.00	0.38	1.65	0.00	0.00	102.9	101.6	YES
09/07/15	0.00	0.00	0.18	0.00	0.00	0.00	100.0	0.00	YES
15/07/15	0.00	0.00	0.30	1.00	0.00	0.00	106.0	110.7	YES
20/07/15	0.00	0.00	0.26	1.35	0.00	0.00	100.1	105.5	YES
29/07/15	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	YES
07/08/15	1.00	0.00	0.00	1.25	101.8	0.00	0.00	101.6	YES
19/08/15	0.00	0.00	0.00	1.30	0.00	0.00	0.00	103.2	YES
09/09/15	0.00	0.00	0.23	0.95	0.00	0.00	98.7	103.2	YES
16/09/15	0.00	0.00	0.00	1.20	0.00	0.00	0.00	102.5	YES
21/09/15	0.00	0.00	0.00	1.15	0.00	0.00	0.00	100.9	YES
28/09/15	1.20	0.00	0.18	1.25	101.0	0.00	98.6	103.2	YES
09/10/15	0.00	0.00	0.18	0.95	0.00	0.00	96.2	98.3	YES
29/10/15	0.00	0.00	0.00	0.95	0.00	0.00	0.00	103.8	YES
05/11/15	0.00	0.00	0.37	1.40	0.00	0.00	109.0	112.0	YES
13/11/15	0.00	0.00	0.18	0.00	0.00	0.00	96.0	0.00	YES
20/11/15	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	YES
27/11/15	0.00	0.00	0.00	1.05	0.00	0.00	0.00	0.00	YES
30/11/15	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00	YES
04/12/15	0.00	0.00	0.21	0.85	0.00	0.00	97.8	0.00	YES

Figure 12: Blasting Overpressure Trends

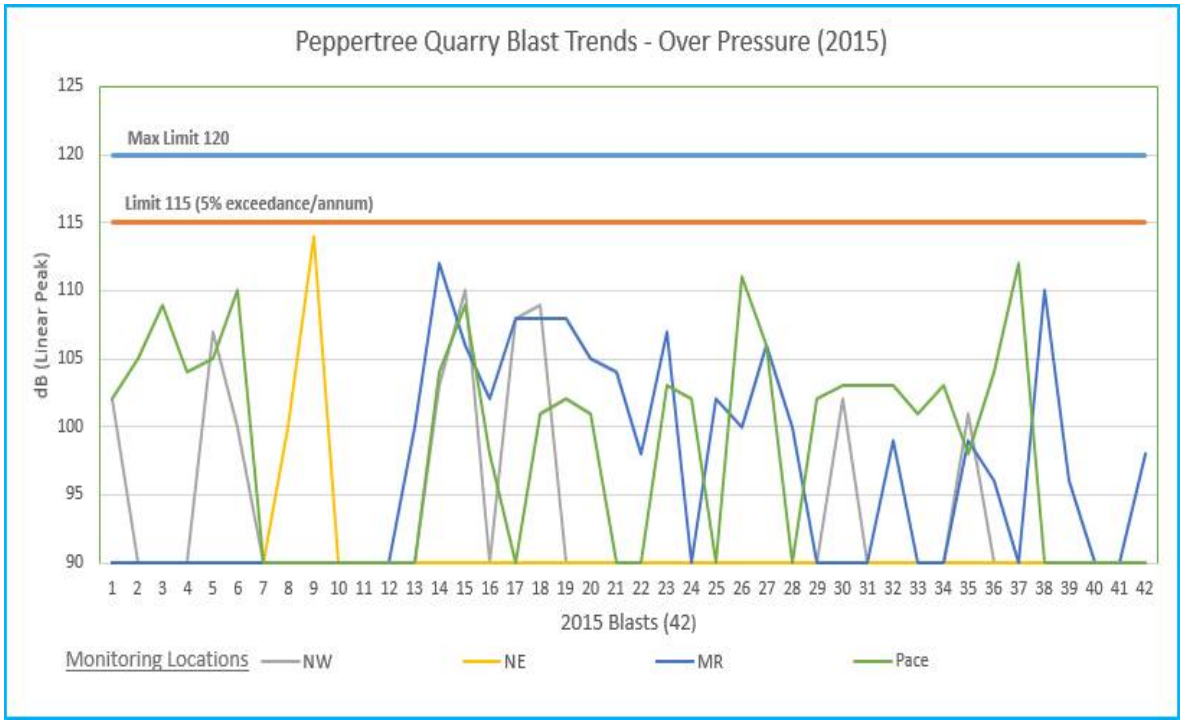
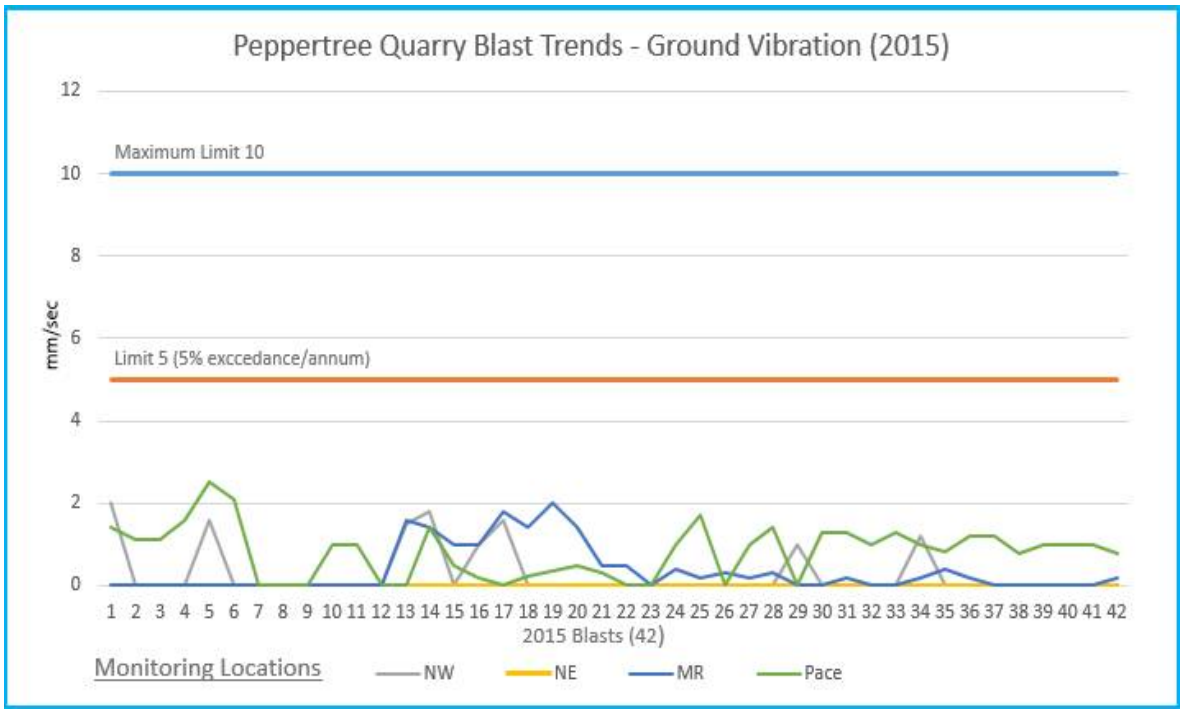


Figure 13: Blasting Ground Vibration Trends



3.6 SURFACE WATER MANAGEMENT

Surface water quality monitoring is undertaken quarterly from Tangarang Creek, Dam 1, upstream culvert, and overflow from sediment ponds T, U, V1, V, W, W1, W2, X and K. The Quarry's main Dam provides environmental flows into the ephemeral Tangarang Creek and as such water quality is largely representative of the discharges with some minor natural variations from the wider catchment influences.

Table 10 present the quarterly surface water quality monitoring data collected from the Quarry dam and Tangarang Creek. Key water quality parameters such as pH, TSS; TDS; and Oil and Grease were below published guidelines values. The consistency in up and own-stream trends reflect efficient water and erosion management practices implemented at the Quarry (refer to **Figures 14, 15, 16** and **17**).

On one occasions during the AEMR period, turbidity values were above ANZECC Guidelines. This was likely due to the storm event between 24th and 26th August 2015, during which the Quarry experienced significant rain falls over 140mm (refer to **Figure 17**).

Table 10: Surface Water Monitoring Results

Parameter	Tangarang Ck				Dam			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
pH	8.2	7.9	7.3	8.0	7.5	7.7	7.6	8.4
Total Suspended solids (mg/l)	<5.0	<5.0	148.0	<5.0	<5.0	<5.0	34.0	<5.0
Total Dissolved solids (mg/l)	393.0	327.0	57.0	448.0	208.0	305.0	72.0	312.0
Ammonia -N (mg/l)	0.08 b	0.03	0.14	<0.01	0.47	0.09	0.06	0.1
Nitrate-N (mg/l)	0.17	1.53	0.24	0.15	0.61	1.87	0.19	0.63
Nitrite-N (mg/l)	<0.01	0.01	<0.01	<0.01	0.09	0.03	<0.01	0.01
Sulphate (mg/l)	5.0	16.0	<10.0	6.0	9.0	17.0	<10.0	12
Chloride (mg/l)	117.0	78.0	4.0	112.0	60.0	73.0	6.0	81.0
Turbidity (NTU)	1.1	3.6	121.0	1.1	2.6	6.3	41.0	8.4
Calcium (mg/l)	65.0	35.0	6.0	52.0	29.0	8.0	22.0	32.0
Potassium (mg/l)	2.0	4.0	3.0	3.0	7.0	6.0	4.0	4.0
Magnesium (mg/l)	41.0	19.0	2.0	33.0	15.0	15.0	3.0	17.0
Sodium (mg/l)	82.0	52.0	5.0	70.0	42.0	49.0	7.0	43.0
Total phosphorus (mg/l)	<0.01	<0.01	0.24	<0.01	0.07	0.04	0.18	0.02
Hardness (CaCo3) (mg/l)	319.0	170.0	32.0	257.0	132.0	130.0	39.0	121.0
TKN (mg/l)	0.2	0.4	1.1	0.2	1.8	1.6	1.3	0.8
Faecal Coliform (cfu/100ml)	4.0	<2.0	5,400	4.3	66.0	150.0	7,000	16,000
TPH C10-C14 (µg/l)	<50	<50	<50	<50	<50	<50	<50	<50
TPH C15-C28 (µg/l)	<100	<100	<100	<100	<100	<100	<100	<100
TPH C29-C36 (µg/l)	<100	<100	<50	<50	<100	<100	<50	<50
TPH C10-C16 (µg/l)	<50	<50	<50	<50	<50	<50	<50	<50
TPH C16-C34 (µg/l)	<100	<100	<100	<100	<100	<100	<100	<100
TPH C34-C40 (µg/l)	<100	<100	<100	<100	<100	<100	<100	<100
Naphthalene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthere	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Flourene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

Parameter	Tangarang Ck				Dam			
	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
Anthracence	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)anthracene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+k)fluoranthene	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0	<2.0
Benzo(a)pyrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Indeno(1,2,3-cd)pyrene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenzo(a,h)anthracene	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0

Figure 14: pH Trends – Quarry Dam Vs Creek

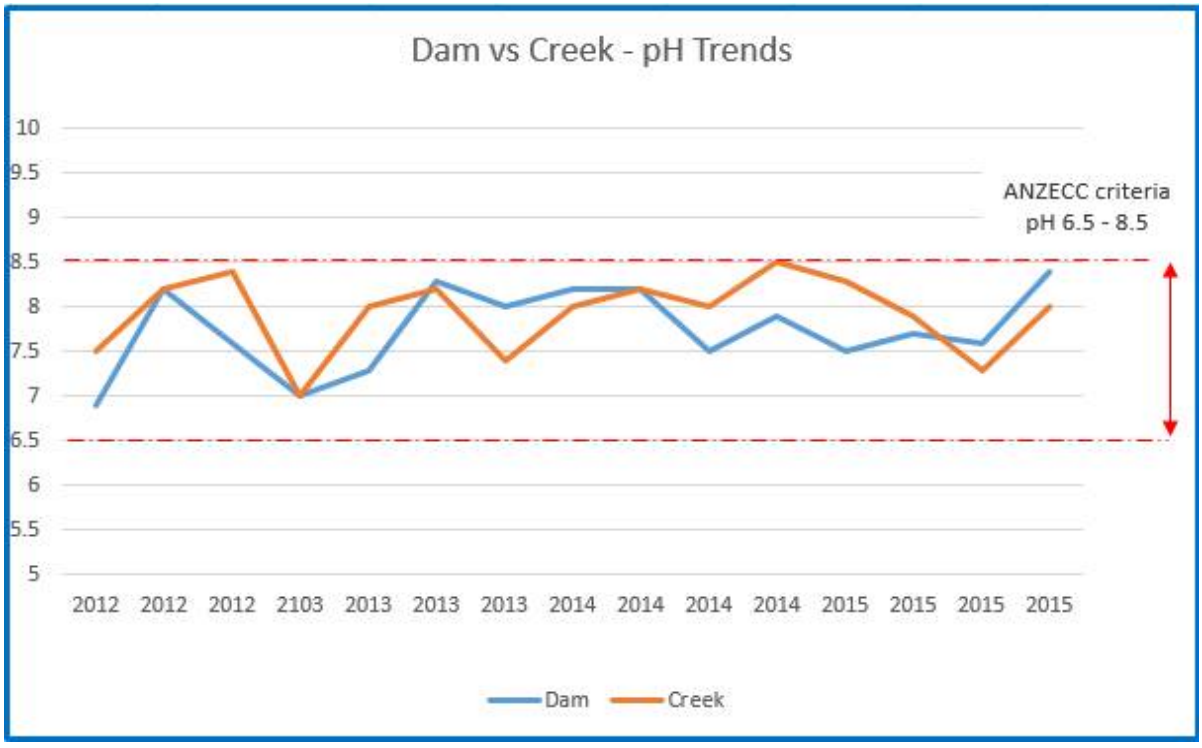


Figure 15: TDS Trends – Quarry Dam Vs Creek

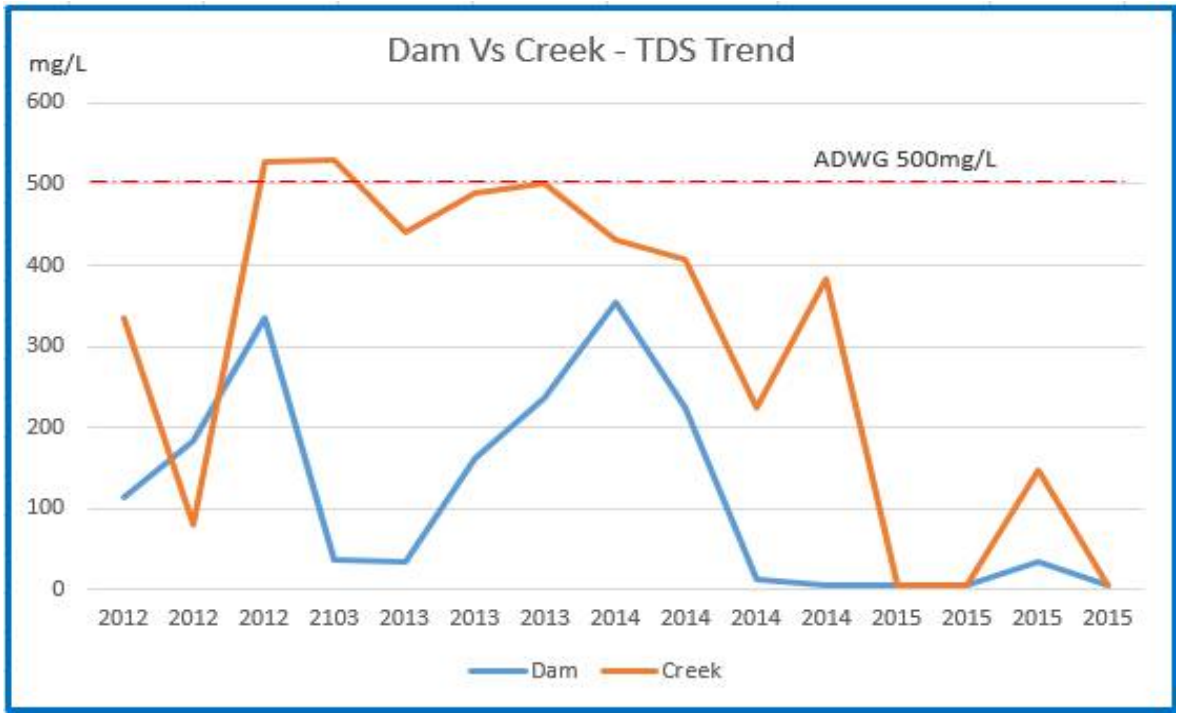


Figure 16: TSS Trends – Quarry Dam Vs Creek

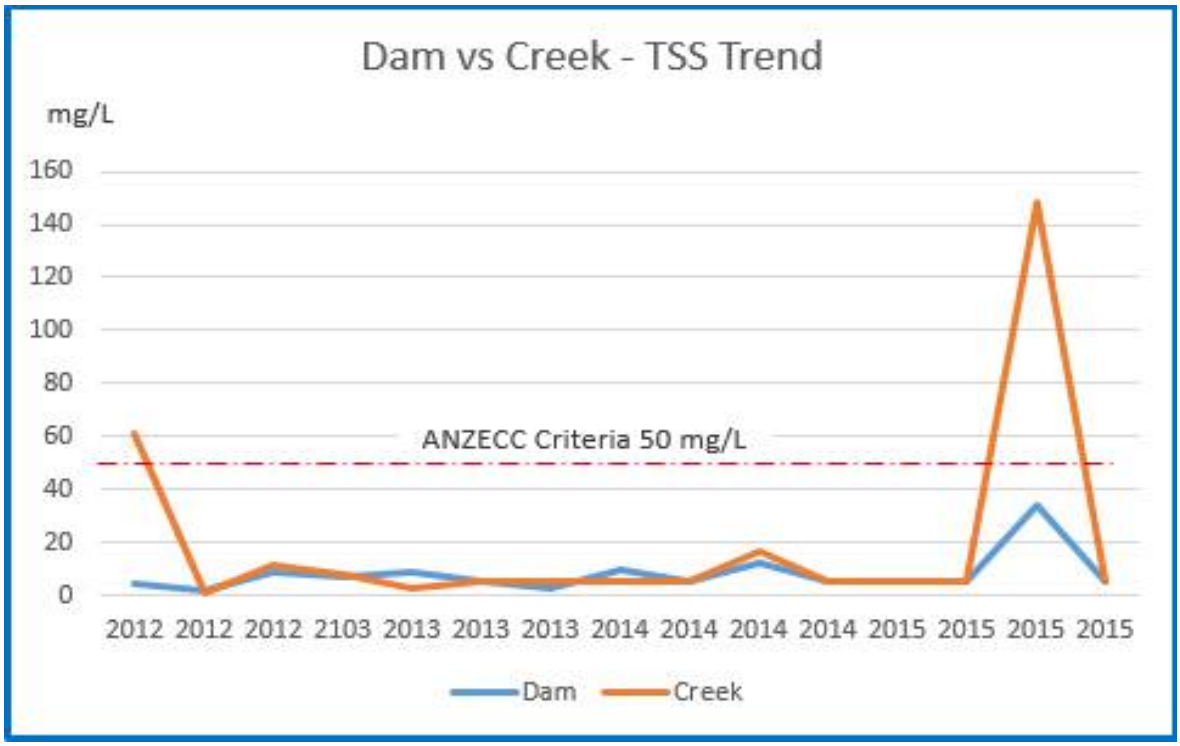
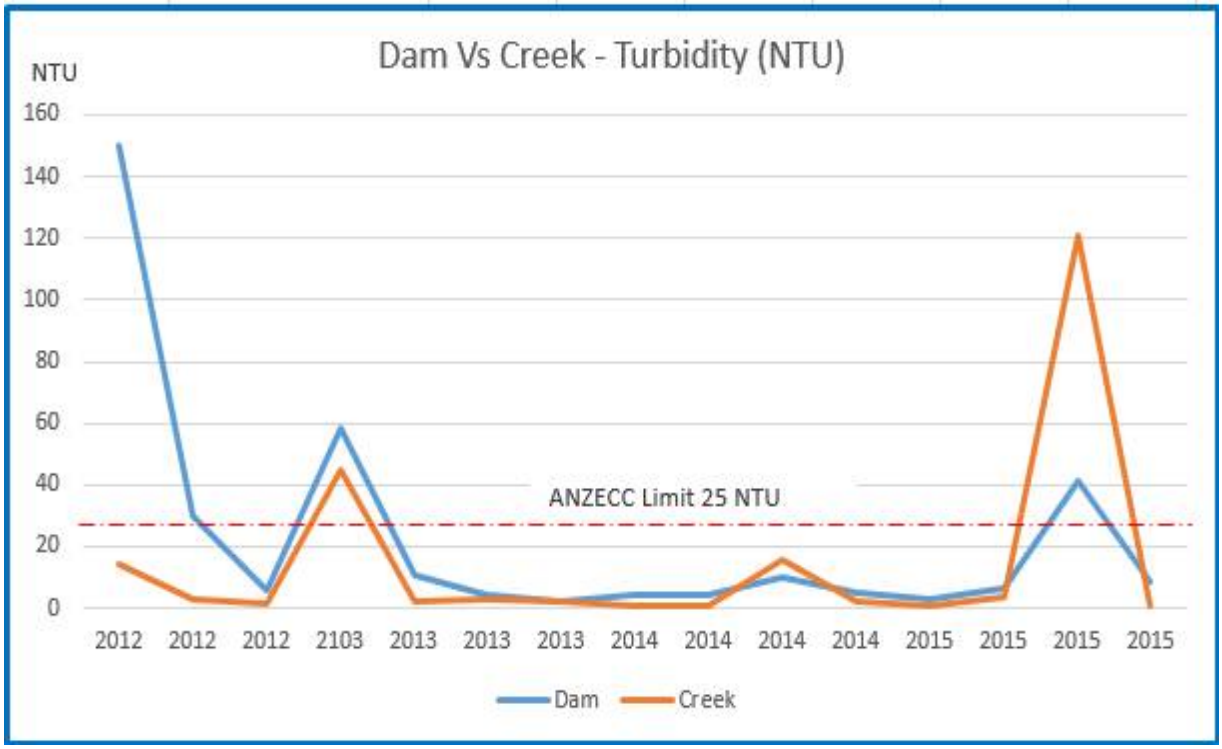


Figure 17: Turbidity Trends – Quarry Dam Vs Creek



3.6.1 Environmental Flows

Under Development Condition 24 (Schedule 3), the supply of an equivalent to an average of 10% of daily flows into the Quarry main dam must be provided as environmental flows to Tangarang Creek. **Table 11** presents the monthly percentage of environmental flows each month with Develop Consent requirements. Environmental flows can benefit aquatic life-cycle events such as spawning and migration, while also improving water quality and the general health of stream ecosystems. Without the supply of water from the Quarry, Tangarang Creek would only experience flows during significant rain events.

Table 11: Environmental Flow Data

Month (2015)	Inflow (Megalitres)	Outflow (Megalitres)	Requirement (10%)	Compliance
January	7.0	7.0	0.7	Yes
February	3.0	2.3	0.3	Yes
March	2.8	1.3	0.3	Yes
April	9.5	9.9	1.0	Yes
May	1.0	4.6	0.1	Yes
June	9.0	5.5	0.9	Yes
July	6.0	9.5	0.6	Yes
August	6.0	1.4	0.6	Yes
September	2.0	24.6	0.2	Yes
October	1.0	18.4	0.1	Yes
November	3.0	5.2	0.3	Yes
December	1.0	4.5	0.1	Yes

3.7 EROSION AND SEDIMENT MANAGEMENT

The Quarry operates in accordance with a Water Management Plan which includes erosion and sedimentation controls that:

- Implement the requirements set out in the publication "Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition, 2004 (Landcom, 2004)", referred to as the *'Blue Book'* and Volume 2E Mines and Quarries (DECC, 2008);
- Identify practices that have potential to cause erosion and generate sediment and what control measures to minimise the impact of these practices; and
- Detail the location function and capacity of erosion and sediment control structures and how they will be maintained.

The Quarry utilises a number of diversion bunds, sediment traps and settling ponds to capture and contain dirty water. The sediment dams and scour protection are situated within the clean water system which pass through the Quarry in order to reduce erosion from high intensity storms.

Sediment fencing is installed around any disturbed areas to contain sediment at the source and minimise the potential for off-site migration. Prior to any land being disturbed, the specific area is clearly marked and no works are permitted to extend beyond the prescribed boundaries.

3.8 GROUNDWATER

Between August and October 2015, a total of 12 groundwater bores were installed which included seven deep monitoring bores and five shallow monitoring bores ranging between 15m to 100m (refer to **Figure 18**). The groundwater bores will provide monitoring coverage in accordance with Development Consent Condition 30 (Schedule 3) requiring the development and implementation of a Groundwater Monitoring Program.

Sampling of the bores was completed on 11th October during which insufficient groundwater for analysis could be obtained from four of the bores. The following provides comments and results from the first round of groundwater sampling:

- Field pH ranged from acidic (4.14) to alkaline (10.52);
- The pH in the majority of bores tended to indicate neutral to slightly alkaline;
- Field measured Electrical Conductivity (EC) ranged from 1.14 to 3.04 mS/cm, indicative of fresh to brackish water quality;
- Laboratory analysed TDS was commensurate with the field EC;
- Elevated suspended solids and turbidity was noted across the majority of the bores;

- Dominant bicarbonate alkalinity, which confirms that pH should range neutral to slightly alkaline;
- Oil & Grease***** was detected in PQ04S (28mg/L) and PQ09D (27mg/L);
- The dominant ions are sodium, chloride and bicarbonate;
- The nitrogen species are low across all samples (<1mg/L);
- Phosphorous is low with results typically below 10mg/L;
- Polynuclear Aromatic Hydrocarbons and Benzene, Toluene, Ethyl Benzene, Xylenes and Naphthalene were all below the laboratory's reporting limits; and
- Total Recoverable Hydrocarbons***** (TRH) were detected in PQ04S, PQ05, PQ06, PQ07 and PQ09D at concentrations below 1,040mg/L.

***Note:** In relation to the reported detection of Oil and Grease and TRH concentrations, there are no quarry operational sources or incidents that could have contributed to such groundwater impacts. It is most probable that the respective concentrations were the source of residual contamination remaining on drilling augers and associated equipment. Once purging is conducted as part of the second round of groundwater sampling, concentrations of Oil and Grease and TRH are unlikely to be detected.

The Groundwater Monitoring Program will involve quarterly sampling for the first 12 months and statistical analysis of trends will determine the frequency of ongoing monitoring.

Figure 18: Groundwater Monitoring Locations

3.9 WASTE MANAGEMENT

A Draft Waste Management Plan, currently being finalised, was developed in 2015 that outlines the procedures for the monitoring, minimisation, classification and disposal of waste generated at the Quarry.

The Draft Waste Management Plan outlines the roles and responsibilities for the:

- Development and maintenance of a waste register;
- Training of employees and contractors on waste objectives and requirements;
- Storage, segregation and classification of waste;
- Reuse and recycling of suitable waste materials;
- Off-site disposal with all necessary documentation on the type/classification of waste, volume, method of transport, waste company details and receiving facility.

3.10 HERITAGE CONSERVATION

The Quarry's Aboriginal Heritage Management Plan (AHMP) provides objectives towards the identification, protection, conservation, presentation and communication of heritage values associated with Quarry land. The AHMP was completed in January 2011 and has since been reviewed (24th October 2013) and satisfies the requirements of Condition 32 of the Project Approval.

During the 2015 AEMR period, members of the Aboriginal Management Committee (AMC) have continued topsoil monitoring across a large area of the Quarry, including salvaging of artefacts during topsoil spreading.

Over 90,000 artefacts have been collected as of the end of the 2015 AEMR period. It is expected that the majority of collected artefacts will be "returned to country" under the supervision of the AMC. A small number of artefacts will also be placed on display in purpose built cabinets with narratives on origin and meaning under the advice of the AMC.

3.11 COMPLIANCE LIGHTING AUDIT

Development Consent Condition 37 (Schedule 3) requires that the Quarry lighting does not impact the amenity of neighbouring residents. To verify compliance with this condition, an independent specialist was engaged to conduct a Compliance Lighting Audit (CLA) in October 2015. The CLA comprised of a qualitative and quantitative assessment of the potential visual impacts of existing lighting at the Quarry on external sensitive receptors.

The CLA adopted the following scope and objectives of the Australian Standard 4282: Control of Obtrusive Effects of Outdoor Lighting as general criteria towards compliance:

- Impact on amenity in an area not previously subjected to light intrusion;

- Reduced ability of transport system users to see essential details of route being travelled due to glare from luminous bright lights; and
- Alteration to night sky viewing conditions (i.e. luminous glow caused by the scattering of light into the atmosphere).

In determining potential off-site impacts from lighting, a number of field measurements were collected at various viewpoints surrounding the Quarry. The field measurements were conducted in periods of darkness when light spill would have had the maximum impact on surrounding dwellings and road users. The key Quarry areas and equipment which the CLA included in the measurements were:

- Conveyor lighting;
- Fixed lighting structures around the workshops and infrastructure areas; and
- Rail related lighting.

The CLA concluded that the Quarry operations were generally meeting the Development Consent approval requirements. To further minimise the potential of lighting disturbing the amenity of neighbouring residents and road users, the CLA recommended that the Quarry review the angle and necessity of lighting associated with buildings and infrastructure. The recommendation will be an action to be completed in 2016.

3.12 SUMMARY OF REPORTABLE INCIDENTS

In accordance with NSW EPA requirements, a Pollution Incident Response Management Plan (PIRMP) has been developed and implemented which details the:

- Risks and hazards associated with quarry operations, equipment and materials;
- Controls in place to reduce the risk in the occurrence of potential incidents;
- Inventory of pollutants and respective volumes stored on-site;
- Safety and incident response equipment;
- Communication strategy for the immediate notification of an incident to relevant government agencies and neighbours;
- Actions to be taken during or immediately after an incident; and
- Training and responsibilities of response staff.

The PIRMP was last reviewed and revised in September 2015 and a copy can be accessed on the Boral website at:

http://www.boral.com.au/Article/nsw_poela_environmental_reporting.asp

3.12.1 Sediment Discharge

Between 24th and 26th of August 2015, the Quarry experienced significant rain falls of over 140mm which resulted in the unintentional release of sediment run-off into an adjoining waterway. The incident was self-reported to the EPA in accordance with the Quarry's EPL and PIRMP requirements. The EPA investigated the incident and concluded there was no long term environmental harm caused by the accidental discharge and elected to issue a Penalty Infringement Notice and a formal warning.

3.12.2 EPL Monitoring

Two non-compliances with EPL dust monitoring requirements were reported to EPA in 2015, both as a result of electrical faults associated with monitoring equipment which prevented data being recorded. Increased monitoring and maintenance has been implemented to minimise the potential of future equipment failures. Neither of the non-compliances had resulted in any adverse environmental effects and EPA considered no regulatory action was warranted.

4.0 COMMUNITY RELATIONS

4.1 ENVIRONMENTAL COMPLAINTS

The Quarry maintains an environmental complaints register that identifies actions required to resolve issues and concerns raised by the community. A 24-hour telephone complaints line has been established and advertised through signage at the Quarry access point on Marulan South Road. The complaints register is also published on the Boral website and records the following information:

- Complainant name and contact details;
- Nature of the complaint (noise, dust, traffic etc);
- Date of the complaint;
- Specifics of the complaint;
- Outcome of the investigation of the complaint; and
- Actions implemented to resolve the complaint.

Complaints received during the 2015 AEMR are presented in **Table 12**.

Table12: Community Complaints Received in 2015

Date	Nature of Complaint	Outcome of investigation
26th November	Dust	Investigations indicated that all of the Quarry dust controls were in operation. There was a bushfire burning at the time and from a distance the plume may have been assumed to be associated with Quarry operations.
17th December	Noise	Early morning operation of loader in the vicinity of stockpile was identified as likely source of the noise.

4.2 COMMUNITY CONSULTATION

The Quarry has actively engaged with the local community since the commencement of the 2006 Environmental Assessment for the project. The program has included:

- The establishment of a Community Consultation Committee;
- Regular community newsletters;
- Active participation in local events;
- Arranging site inspections and one on one consultation;
- Active engagement with key government and non-government organisations; and

- Maintenance of an environmental and community complaints register and actively managing and resolving community issues as they arise.

4.2.1 Community Engagement Plan (2015 – 2017)

In 2015, the Quarry and Marulan South Limestone Community Engagement Plan (2015 – 2017) was implemented which provides the following commitments to ongoing stakeholder engagement and communication:

- Inform and educate stakeholders about the purpose and activities of each operation and how they contribute to the local area, wider region and the community as a whole;
- To identify potential matters of concern to stakeholders and propose ways in which those matters can be discussed and, where possible, resolved to mutual benefit;
- To create opportunities for stakeholders to freely comment on their observation and experience of each operation, and for that feedback to be used as part of continuous improvement;
- To address any compliance obligations each operation may have in regard to community information and engagement; and
- Where appropriate, to identify opportunities for value to be created for the community as a result of Boral's presence as a corporate citizen.

4.2.2 Community Consultative Committee

A Community Consultative Committee (CCC) has been established since 2011 in accordance with Condition 8 of Schedule 5 of the Project Approval. The CCC comprises of:

- Two representatives from Peppertree Quarry including the Environment and Community Adviser;
- One representative from Goulburn Malwaree Council (the Mayor); and
- Three Local Community Representatives

Independently chaired, the role of the CCC is to offer the Quarry input from the community perspective on matters of environmental performance and stakeholder relations. Meetings include the review of environmental data and any feedback provided to the site from local community members. Issues of concern can be raised with the site by the CCC representatives.

The timing of the meetings is determined by the CCC and generally undertaken at least 6 monthly. However, only one meeting in April was able to be conducted during the 2015 AEMR period due to restrictions on the availability of CCC members.

4.2.3 Community Newsletters

Community Newsletters are produced on a regular basis in order to inform local residents of the Quarry operations and activities as well as detailing Boral's involvement in local community events. These are distributed via the "Focus on Marulan" newsletter issued to the local community. The newsletter is also posted on the Boral website. The first newsletter was circulated in 2011 and continued to be frequently issued in the 2015 AEMR reporting period (issued in March, April, May, July, August, September and November).

4.2.4 Community Events

The Quarry staff are actively engaged with community events in the Marulan and Goulburn area.

Community and stakeholder activities during the 2015 AEMR period included:

- Bike Week – Financial sponsorship and promotional goods giveaway;
- Charity Golf Day – Financial sponsorship, Quarry team representation and promotional goods giveaway;
- Tallong Apple Festival – Financial sponsorship;
- Marulan Kite festival – Financial sponsorship and committee involvement; and
- Heritage and sustainability project (HSP) – Meeting and program support.

4.2.5 Blast Liaison

In accordance with the Development Consent, Condition 15 (Schedule 3), landowners and occupiers of residences within 2 kilometres of the Quarry pit are encouraged to register interest in order to be advised of any future blasts at the pit.

4.2.6 Access to Information

Boral has a number of websites for each corporate division. Peppertree Quarry has its own site at:

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

The site contains all public information in relation to Statutory approvals and development including:

- About the Boral Peppertree Quarry;
- Planning and Approvals;
- NSW EPA Licence and Monitoring publications;
- Resource and Products;

- Operations;
- Work Health and Safety;
- Our Environment;
- Our Community (includes Latest News);
- Employment Opportunities at the Boral Peppertree Quarry; and
- Contact Details.

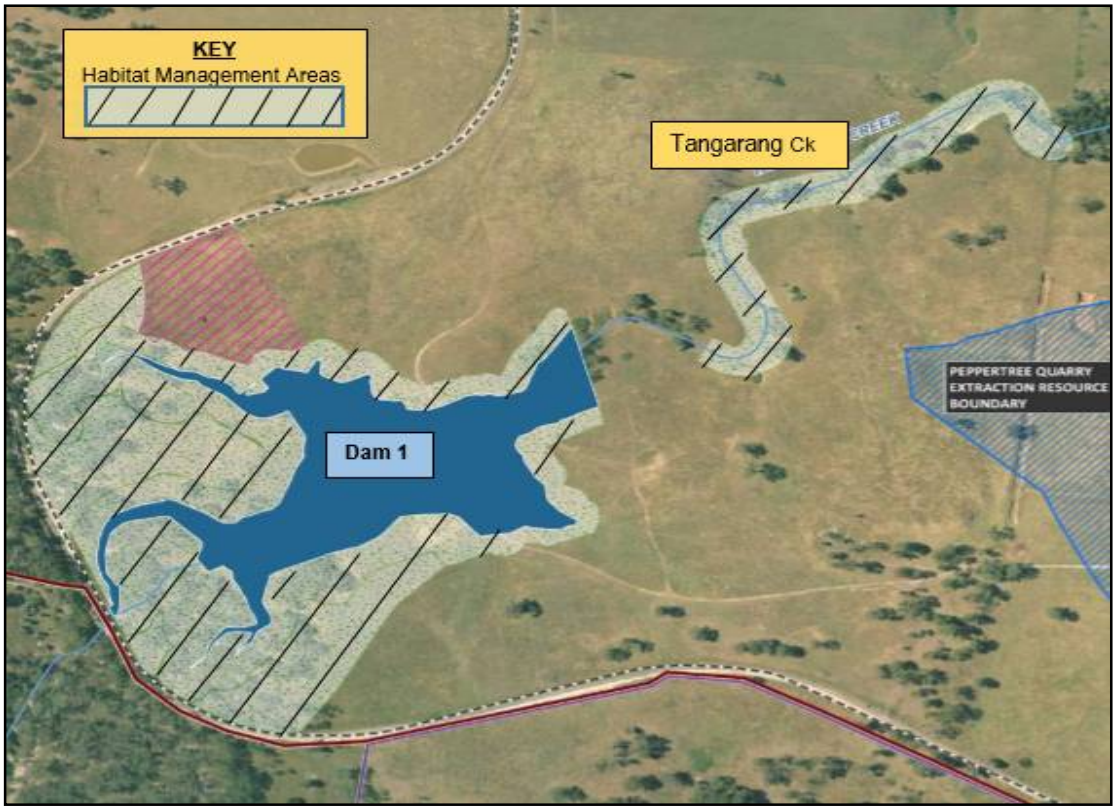
5.0 REHABILITATION

Operational and extraction areas are now established and there were no further disturbances of vegetation in 2015. However, the Quarry continued to conduct the rehabilitation program in accordance with the Landscape and Rehabilitation Plan prepared in accordance with Development Consent Condition 33, Schedule 3.

The rehabilitation and maintenance program is being undertaken on a weekly basis by experienced vegetation contractors. The rehabilitation program includes weed management for the control of serrated tussock, blackberries and thistles to ensure the Quarry does not impact on the surrounding rural pastures.

The construction of the on-site dam (Dam 1) had impacted isolated patches of Endangered Ecological Community (EEC) woodland and off-set planting has been completed in a designated Habitat Management Area (HMA). The HMA includes the establishment of species of Box Gum Grassy Woodland in nominated sections surrounding Dam 1 and 20m of either side of Tangarang creek (refer to **Figure 19**). Planting of these areas was conducted at the end of 2013 and the subject of ongoing maintenance during the 2015 reporting period. Where practical, the HMA is fenced with signage (Environmentally Sensitive Area) to protect planted vegetation from human and vehicular access.

Figure 19: Habitat Management Areas



6.0 ACTIVITIES PROPOSED IN NEXT AEMR PERIOD

The activities proposed to be undertaken during the 2016 AEMR reporting period are presented in **Table 13**. The activities have been selected and prioritised based on:

- Audit findings and recommendations;
- Operational requirements; and
- Continual improvement objectives in accordance with Boral's Environmental Policy and integrated HSEQ management System.

Table 13: Proposed Activities in 2016 AEMR Period

Proposed Activities in 2016	Objectives
Provide outstanding information and documentation listed in Corrective Action Plan not available at time of finalising the Independent Audit Report.	• Finalise Independent Audit Report
Develop and implement a formal maintenance schedule that includes the dams and other water management structures.	• Implement Independent Audit Recommendation
Action recommendations of compliance Lighting Audit (DPE Audit Non-Compliance ID 1.2).	• Ensure quarry lighting does not impact on the amenity and safety of community and drivers • Implement Lighting Audit Recommendation
Action all Non-Compliances (Administrative) identified during DPE Audit (Non-Compliance ID 1.3, 1.4, 1.5, 1.6, and 1.7).	• Compliance with Statutory requirements
Chemical storage and bunding review.	• Ensure all chemicals are being stored with appropriate containment, labelling and separation
Fully implement Groundwater Monitoring Program by completing quarterly monitoring during 2016 (DPE Audit Non-Compliance ID 1.1)	• Implement Independent Audit Recommendation • Implement DPE Audit Recommendation (ID 1.1)
Develop and implement Waste Management Plan to monitor waste minimisation strategies and identify further areas of improvement. Including assessment, classification or management of liquid waste generated/stored on site.	• Formal monitoring and management of waste • Implement Independent Audit Recommendation • Improve SEAT score as part of continual improvement
Develop and implement ongoing maintenance and management plan for fire response equipment required on-site.	• Implement Independent Audit Recommendation
Overburden Removal to be continued to the north-east and in-pit crusher to be sited to the next bench level.	• Ongoing operational management requirements

Water Management Plan to be reviewed.	• Quarry dam water balance to be completed • To ensure efficient and sustainable water usage
Address specialist recommendation from review of weather station.	• Review of weather station data handling, calibration and maintenance procedures
Undertake replanting of disturbed areas, hydromulching of overburden embankments and removal of sediment accumulation in Tangarang Creek.	• Continue to meet Rehabilitation Management plan objectives
Review of the Quarry Aspects and Impacts Register.	• Ensure risks, controls and responsibilities remain representative of Quarry operations
Preparation of 2016 AEMR.	• Regulatory compliance

6.1 INDEPENDENT AUDIT

In 2015 an Independent Audit was conducted at the Quarry in accordance with Development Consent Condition 5 (Schedule 5) which included an assessment of:

- Environmental performance;
- Impacts on the surrounding environment;
- Compliance with the relevant standards, performance measures and statutory requirements; and
- Environmental Strategy, Plan and Programs required under the Development Consent.

The Independent Audit found that the Quarry was compliant with the majority of Development Consent conditions with the following opportunities for improvements, which will be the subject of a corrective action plan proposed to be completed during the 2016 AEMR reporting period (refer to **Table 13**):

- Installation of groundwater monitoring bores in accordance with the Quarry Water Management Plan; and
- Conduct a review of chemical storage and associated bunding.

6.2 DEPARTMENT OF PLANNING AND ENVIRONMENT AUDIT

In August 2015 the quarry was the subject of a compliance audit undertaken by DP&E as part of the NSW-based operating sand quarries audit campaign. The Audit included similar objectives listed above for the Independent Audit with particular focus on the implementation and performance associated with the Quarry:

- Water Management Plan (2011) – specifically groundwater ; and
- Landscape and Rehabilitation Management Plan (2012).

The DP&E Audit scope included inspections of the following operational and non-active operational areas including:

- Quarry pit and associated bunding;
- Raw feed in crusher, conveyors and out of pit aggregate stock piles;
- Processing plant;
- Stockpile management;
- Aggregate blending silos, rail siding and loading area;
- Dam 1 and water management system;
- Habitat Management Area including the fencing of threatened plant (Solanum celatum) locations;
- Overburden emplacement, and sedimentation and erosion control;

- Proposed future southern resource area; and
- Administrative offices and amenities, parking and other facilities.

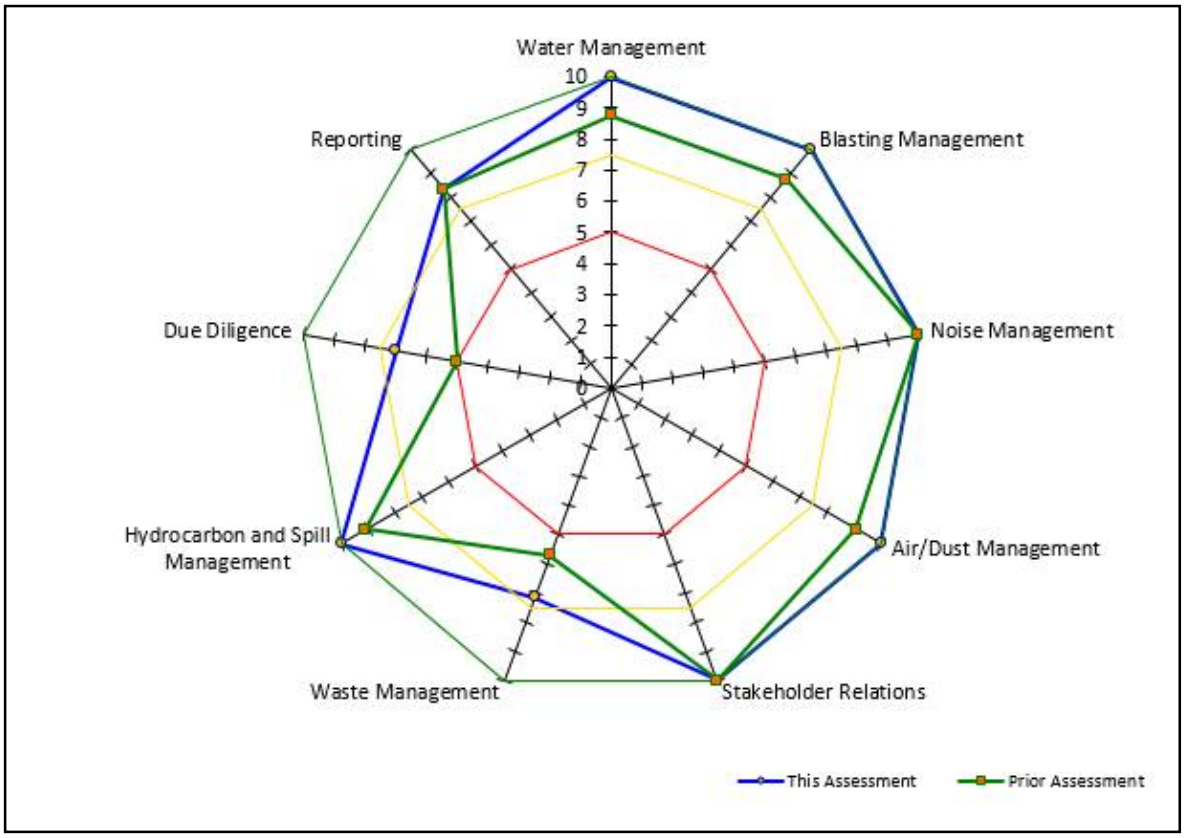
The Audit found the Peppertree Quarry was operating in "general compliance" with the relevant conditions of the Development Consent. A number of administrative and low-risk non-compliances were identified along with some improvement recommendations that are the subject of a corrective action plan proposed to be completed during the 2016 AEMR reporting period (refer to **Table 13**).

6.3 SITE ENVIRONMENT ASSESSMENT TOOL

Boral operational sites are periodically assessed and scored for general compliance and continual improvement with environmental elements using a Site Environmental Assessment Tool (SEAT). The Quarry's environmental performance was assessed through the SEAT during the 2014 and 2015 AEMR periods.

Figure 20 presents the SEAT scores for the respective AEMR reporting periods. The 2015 SEAT scores improved on the 2014 assessment on most of the environmental elements. However, there remain elements such as Reporting, Diligence and Waste Management on which improvements are being prioritised for action during the 2016 AEMR (refer to **Table 13**).

Figure 20: Site Environmental Assessment Scores



7.0 CONCLUSION

Peppertree Quarry has prepared and implemented management plans and programs for the control and monitoring of:

- Air and water quality;
- Noise and blasting;
- Erosion and sedimentation;
- Heritage conservation;
- Vegetation management and rehabilitation; and
- Community and Stakeholder engagement.

These documents provide the framework and objectives for statutory compliance and continual improvement to ensure the environment and the neighbouring community are not adversely impacted by quarry operations.

The extraction and crushing of materials during the 2015 AEMR period has been concentrated within the existing pit, reducing the requirement to disturb soil and vegetation in other areas within the approved quarry boundaries. However, progressive rehabilitation on strategic areas continued as part of the Rehabilitation Management Plan.

Aboriginal artefacts continue to be located with the assistance of members of the Aboriginal Management Committee (AMC). Over 90,000 artefacts have been recovered to the end of the 2015 AEMR period the majority of which either have or will be returned to country under the guidance and supervision the AMC. A small proportion of artefacts will be placed on display at the quarry to create awareness and knowledge of Aboriginal cultural presence in the area.

Information in relation to Quarry operations and development remained readily available through websites and regular newsletters. Stakeholder and community relationships continued to be positive and proactive with Peppertree Quarry having sponsored and participated a number of events.

In 2015, the Quarry has been the subject of a number of internal, independent and Regulatory compliance assessments which found operations have been undertaken in general compliance with Development Consent and EPA Licence conditions. However, a number of opportunities for improvement were identified which will be addressed during the 2016 AEMR period.

8.0 APPENDIX 1: ANNUAL RETURN FOR EXTRACTIVE MATERIALS - 2015

Form S 1

NSW GOVERNMENT Trade & Investment Resources & Energy

RETURN FOR EXTRACTIVE MATERIALS: YEAR ENDED 30 JUNE 2015

Quote Reference No. in all correspondence

Quarry Id: Rims ID:400960

Operators Name: BORAL RESOURCES (NSW) PTY LTD
Address: PO BOX 42
WENTWORTHVILLE
NSW 2145

Email: jon-paul.amodio@boral.com.au

Quarry Name: PEPPERTREE QUARRY
Quarry Address: MARULAN SOUTH RD

Inquiries please telephone:
(02) 4931 6434
Completed or Nil Returns
Fax - (02) 4931 6788
Email –
mineral.royalty@trade.nsw.gov.au
Postal Address (see address below)

Please amend name, postal address and location of mine or quarry if incorrect or incomplete

2014-2015

The return should be completed and forwarded to the **STATISTICAL OFFICER, MINERAL RESOURCES BRANCH, RESOURCES & ENERGY DIVISION, TRADE & INVESTMENT NSW, PO BOX 344 HUNTER REGION MAIL CENTRE NSW 2310 on or before 30 November, 2015**. If completion of the return is unavoidably delayed, an application for extension of time should be requested **before** the due date. If no work was done during the year, a **NIL** return must be forwarded.

The return should relate to the **above quarrying establishment**, and should cover the operations of quarrying and treatment (such as crushing, screening, washing etc.) carried out at or near the quarry. A return is required even if the operations are solely of a developmental nature, and whether the area being worked is held under a mining title or otherwise.

Adrian Delany, Director Industry Coordination

Please complete the following information to assist in identifying the location of the Quarry

Typical Geology _____

Nearest Town to Quarry _____Marulan_____

Local Council Name _____Goulburn Mulwaree Council_____

Deposited Plan and Lot Number/s of Quarry _____

Email Address of Operator _____

Name of Owner or Licensee _____ Boral Resources (NSW) Pty Ltd _____

Postal Address of Licensee _____ PO Box 42, Wentworthville NSW 2145_____

Licence/Lease Number/s (if any)

From Mineral Resources NSW (Industry & Investment NSW) _____

From Department of Lands or other Department _____

If any output was obtained from land NOT held under licence from the above Departments, state the Name/s and Address/es of the Owners of the land _____

- To the best of my knowledge, the particulars which have been entered in this return are correct and no blank spaces have been left where figures should have been inserted.
- **SIGNATURE of PROPRIETOR or MANAGER** _____ **DATE** _____
- **PERSON to be contacted if queries arise regarding this return** _____
- **NAME** (Block letters) _____Jon-Paul Amodio_____ **Telephone** ___02-9033 5418_____

SALES During 2014-2015

Production information may be published in aggregated form for statistical reporting. However, production data for individual operations is kept strictly confidential.

Product	Description	Quantity Tonnes
Virgin Materials		
• **Crushed Coarse Aggregates**		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		982,782
Under 5mm		
Natural Sand		
Manufactured Sand		639,328
Prepared Road Base & Sub Base		
Other Unprocessed Materials		
Recycled Materials		
• **Crushed Coarse Aggregates**		
Over 75mm		
Over 30mm to 75mm		
5mm to 30mm		
Under 5mm		
Natural Sand		
Manufactured Sand		
Prepared Road Base & Sub Base		23,407
Other Unprocessed Materials		
• **River Gravel**		
Over 30mm		
5mm to 30mm		
Under 5mm		

• **Construction Sand**	Excluding Industrial	
• **Industrial Sand**		
Foundry, Moulding		
Glass		
Other (Specify)		
• **Dimension Stone**	Building, Ornamental, Monumental	
Quarried in Blocks		
Quarried in Slabs		
• **Decorative Aggregate**	Including Terrazzo	
• **Loam**	Soil for Topdressing, Garden soil, Horticultural purposes)	
• **TOTAL SITE PRODUCTION**		**257,173**
• **Gross Value ($) of all Sales**		
• **Type of Material**		
• **Number of Full-Time Equivalent (FTE) Employees**	Employees:17	Contractors

Please Note: A return for clay based products can be obtained by contacting the inquiry number.