

Dunmore Quarry



Environmental Management Strategy

March 2014

Dunmore Quarry



Dunmore Quarry Environmental Management Strategy			
Revision Number :	1. Final Draft	2. Review	
Date:	August 2006	March 2014	
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1.0 INTRODUCTION

Boral Resources (NSW) Pty Ltd (Boral) is required under Condition 5(1) of the Development Consent for Dunmore Quarry to prepare and implement an Environmental Management Strategy (EMS). In addition to this, the consent requires the preparation of a range of plans and programs to guide the environmental management of the operation throughout its consented 25 year operational life. Various management plans and monitoring programs have been prepared for the site covering flora and fauna, rehabilitation, noise, air quality and water management.

This EMS forms part of the environmental management framework for Dunmore Quarry, providing the overall strategy for the environmental management of the site. Much of the information required in the EMS has been reported in more detail in the various management plans mentioned above. Where this occurs, reference will be made to the plans giving a general explanation of the strategies to manage each component. This document will:

- provide the strategic context for environmental management of the development;
- identify the statutory requirements that apply to the development;
- describe in general how the environmental performance of the development would be monitored and managed during the development;
- describe the procedures that would be implemented to:
 - keep the local community and relevant agencies informed about the operation and environmental performance of the development;
 - receive, handle, respond to, and record complaints;
 - respond to any non-compliance;
 - manage cumulative impacts; and
 - respond to emergencies
- describe the role, responsibility, authority, and accountability of all the key personnel involved in the environmental management of the development.

2.0 DESCRIPTION OF DUNMORE QUARRY

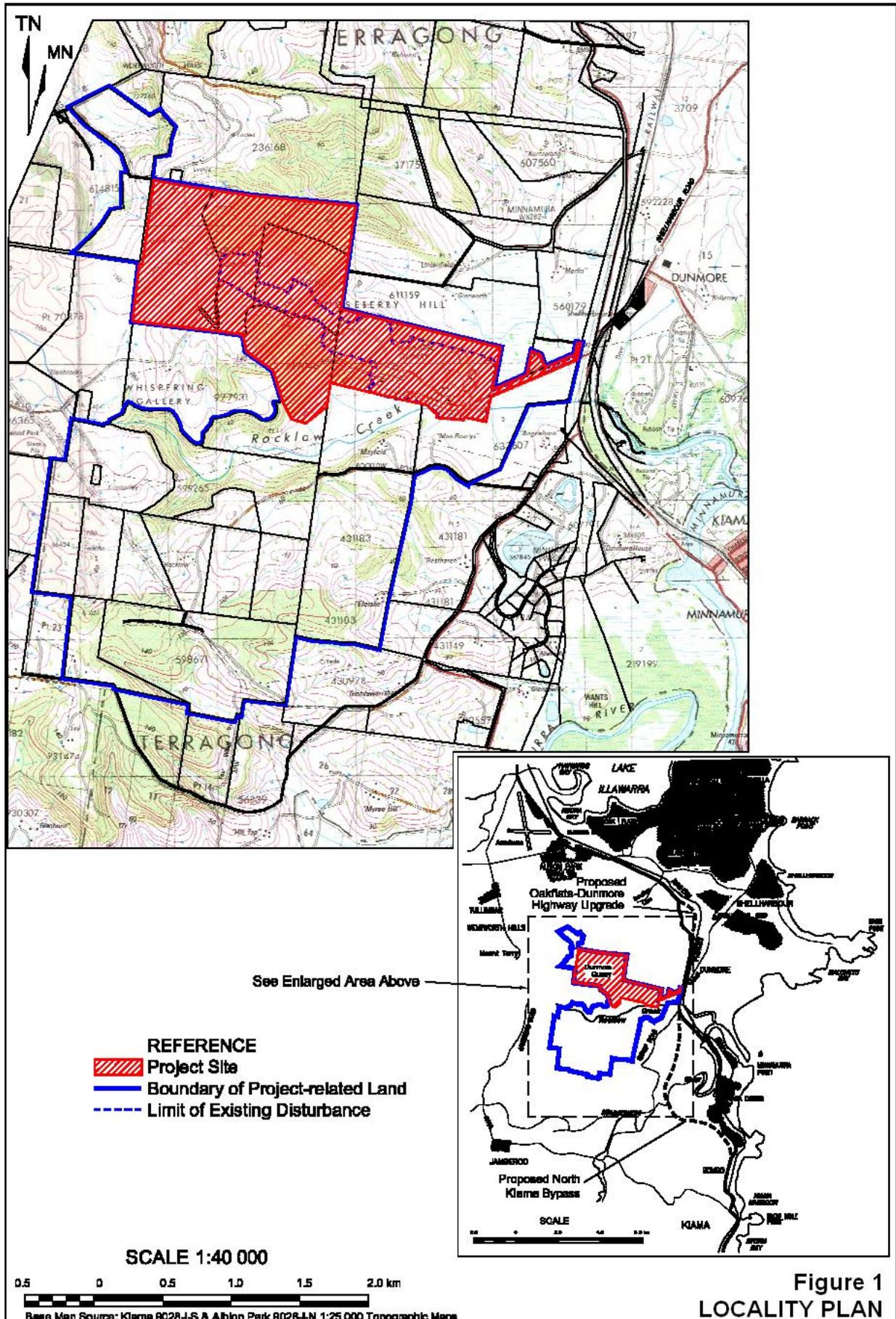
Dunmore Quarry is located on the western side of the Princes Highway, approximately half way between Shellharbour and Kiama. It is located within hills formed by the hard, resistant volcanic rock known as latite which is the rock type being extracted at the quarry. The location of the Dunmore Quarry can be seen in Figures 1 and 2.

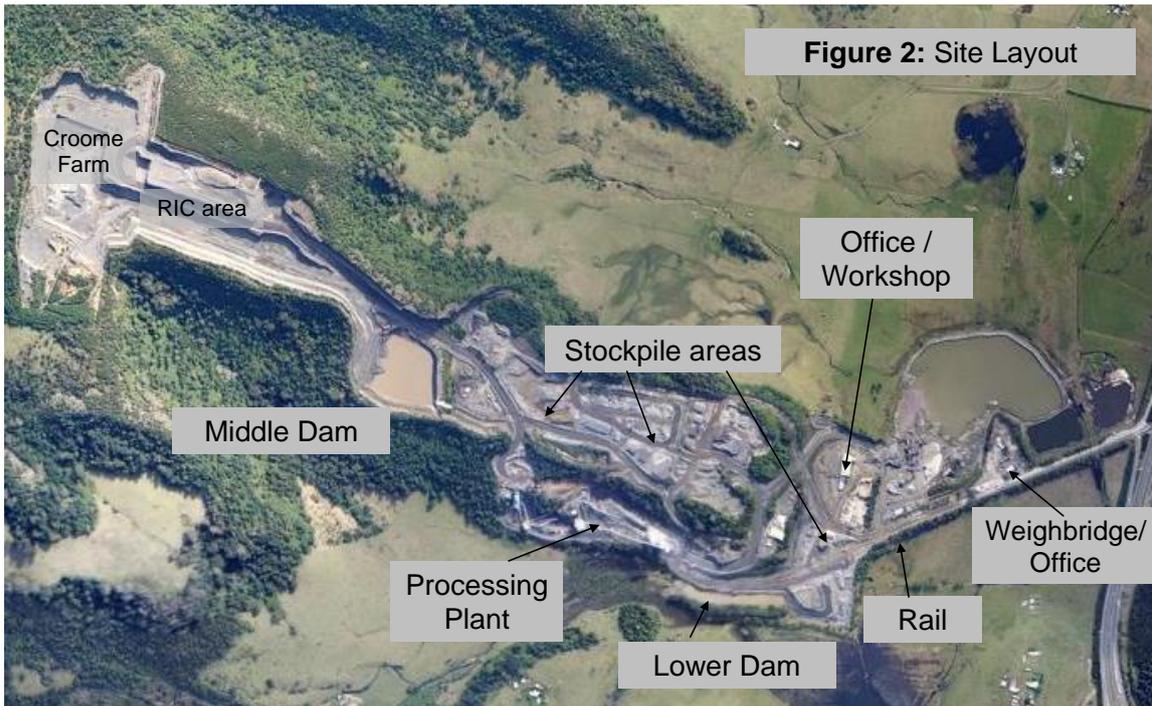
Quarrying first commenced at Dunmore Quarry in 1921, and since that time, Boral and its predecessor companies have progressively expanded the extraction area into the hills to the west. The quarry is divided into three areas, known as the original Dunmore Quarry, the RIC extraction area and the Croome Farm extraction area. Quarrying is currently only being undertaken within the RIC and Croome Farm extraction areas, however, resource is still available within the original Dunmore Quarry.

On 30 September 2004 the Minister Assisting the Minister for Infrastructure and Planning (Planning Administration) granted development consent (Consent No. 470-11-2003) for increasing production at Dunmore Quarry from 1.2 million tonnes per annum (Mtpa) to 2.5 Mtpa. This increase will be achieved by:

- extending the hours of operation for extraction and processing;
- increasing the throughput of the processing plant; and
- use of additional mobile equipment.

The development consent came into effect on 18 November 2004. On this date, Dunmore Quarry's environment protection licence (EPL) was modified to reflect the new consent. Subsequent modifications to the consent have occurred with Modifications 4, 5 & 6.





3.0 STATUTORY REQUIREMENTS

3.1 Approvals, Licences & Permits

The following approvals are required for Dunmore Quarry:

Development Consent No 470-11-2003

The Dunmore Quarry Production increase was recognised as State Significant, Integrated and Designated Development as defined by the *Environmental Planning and Assessment Act, 1979*. The quarry operates in accordance with Development Consent No. 470-11-2003 issued by the Minister Assisting the Minister for Infrastructure and Planning on 18 November 2004.

Environment Protection Licence No. 77

Dunmore Quarry holds Environment Protection Licence (EPL) No. 77 with the Environment Protection Authority (EPA) under the *Protection of the Environment Operations Act, 1997*.

Section 90 Consent

Dunmore Quarry holds a Section 90 Consent under the National Parks and Wildlife Act, 1979 to remove and relocate an Aboriginal Scarred Tree that was located within the Croome Farm extraction area. The Section 90 was issued by the DEC 7 March 2005 and was valid for period of 2 years. This artefact has been relocated to Killalea State Park.

Section 12 Water Licence

Dunmore Quarry holds a surface water extraction licence no.10SL050221 under Section 12 of the Water Act 1912 to extract 227ML of surface water from Rocklow Creek. The approval body is the Department of Natural Resources (DNR).

Part 3A Permit

A Part 3A Permit under the *Rivers and Foreshores Improvement Act, 1948* was obtained to take the pre-existing water storage offline from Rocklow Creek.

3.2 Legislation

The following Acts are relevant to Dunmore Quarry:

Environmental Planning and Assessment Act, 1979

Development Consent for the production increase at Dunmore Quarry was issued under the *Environmental Planning and Assessment Act, 1979*. Further expansion or modification to the consent would be subject to assessment under the Act.

Protection of the Environment Operations Act, 1997

The project has the potential to impact on local air, water and noise environment and as such is subject to the requirements of the Protection of the Environment Operations Act, 1997 (POEO Act). The environmental protection licence for Dunmore Quarry was varied to reflect the Production Increase Development Consent and has undergone other minor modifications to reflect changes onsite or completion of Pollution Reduction Programs.

Water Act, 1912

The surface water extraction licence mentioned above has been issued under Section 12 of the *Water Act, 1912*. The use of the licence is subject to the licence conditions and requirements of the *Water Act, 1912*.

Rivers and Foreshore Improvement Act, 1948

As mentioned above, a Part 3A permit was required to construct the offline dam nominated by Condition 3(33), which required working within 40 metres of Rocklow Creek. The approval will be granted by the Department of Natural Resources under the Rivers and Foreshores Improvement Act, 1948.

3.3 Policy & Guidelines

NSW Industrial Noise Policy

Noise monitoring, measurement and assessment required for the site will be undertaken in accordance with the NSW Industrial Noise Policy.

3.4 Miscellaneous Standards & Guidelines

3.4.1 Standards

The following Australian Standards will be applied where necessary and appropriate:

- Australian Standard 1055-1997: Description and Measurement of Environmental Noise;
- Australian Standard 3580.10.1-2003: Methods for sampling and Analysis of Ambient Air-Determination of Particulates – Deposited Matter – Gravimetric Method;
- Australian Standard 4282-1997: Control of Obtrusive Effects of Outdoor Lighting;
- Australian Standard 1940-2004: The storage and handling of flammable and combustible liquids; and
- Australian Standard/New Zealand Standard 1596-2008: The storage and handling of LP Gas

3.4.2 Guidelines

The following guidelines will be applied where necessary and appropriate:

- Environment and Health Protection Guidelines – On-site Sewage Management for Single Households (1998);
- ISO 19011:2002 – Guidelines for Quality and/or Environmental Systems Auditing; and
- NSW Roads and Maritime Service’s Guide to Traffic Generating Developments.

4.0 ENVIRONMENTAL MANAGEMENT RESPONSIBILITY, PERSONNEL & ROLES

4.1 Context for Environmental Management

Dunmore Quarry operates within a semi-rural environment in close proximity to coastal wetlands, rural acreage, the North Kiama Bypass/Princes Hwy and Stages 1 to 4 of the Dunmore Lakes Sand Extraction Project. The local area also supports two municipal landfills and hard rock quarry’s operated by Holcim, Cleary Bros and Hanson. The context for the environmental management of Dunmore Quarry is to operate in such a way that minimises the site environmental impacts and minimise impacts to external stakeholders and the cumulative impacts that occur from operating within such a diverse and state significant environment.

4.2 Corporate Responsibilities

Dunmore Quarry is part of NSW Boral Construction Materials business which operates a number of quarries, recycling plants and rail terminals throughout NSW. Dunmore Quarry plays an important role for supplying a range of aggregates into the Illawarra and Sydney markets by road and rail.

Boral is committed to the responsible environmental management of Dunmore Quarry and to the managing of cumulative impacts associated with the project operating in close proximity to the Dunmore Lakes Sand Project and other industry mentioned in section 4.1 above.

Boral's Environmental Policy is as follows:



Environmental Policy

As an international resources-based manufacturing company, we acknowledge that our shareholders, employees and the community at large expect responsible environmental practice by Boral's businesses. We will continually work to identify and minimise environmental risk at all our operations and, wherever practicable, eliminate adverse environmental impacts.

Specifically, Boral is committed to:

- Complying with environmental legislation, regulations, standards and codes of practice relevant to the particular business as the absolute minimum requirement in each of the communities in which we operate.
- Reducing greenhouse gas emissions from our processes, operations and facilities, including appropriate use of alternative fuels and/or carbon offsets.
- Eliminating waste in all its forms, by application of LEAN manufacturing principles, leading to:
 - efficient use of energy
 - conservation of water
 - minimisation and recycling of waste production materials and energy
 - prevention of pollution; and
 - effective use of virgin and recovered resources and supplemental materials.
- Open, constructive engagement with communities surrounding our operations.
- Protecting biodiversity values at and around our facilities.

Through communication and training, our employees will be encouraged and assisted to enhance Boral's environmental performance.

A handwritten signature in black ink, appearing to read 'Mike Kane', is written over a thin horizontal line.

Mike Kane
Chief Executive Officer and Managing Director

4.3 Site Responsibilities

The ultimate responsibility for the environmental management of Dunmore Quarry is vested in the Quarry Manager. The Environment Officer will be responsible for analysis and reporting of environmental monitoring results, incident reporting and implementing the requirements of the Development Consent and EPL. Site supervisors and operators have responsibility to notify management of environmental impacts and incidents during the course of their work so that an immediate response can be initiated.

4.4 Internal & External Auditing

The site will receive annual internal environmental audits. The findings of these audits are for internal management purposes only and will not be presented at the Community Consultative Committee.

In accordance with Condition 5 (6), an independent environmental audit will be undertaken by a suitably qualified, experienced and independent person to assess the environmental performance of Dunmore Quarry. A copy of the audit will be forwarded to Department of Planning and Infrastructure within 3 months of commissioning.

5.0 ENVIRONMENTAL PERFORMANCE- MANAGEMENT & MONITORING

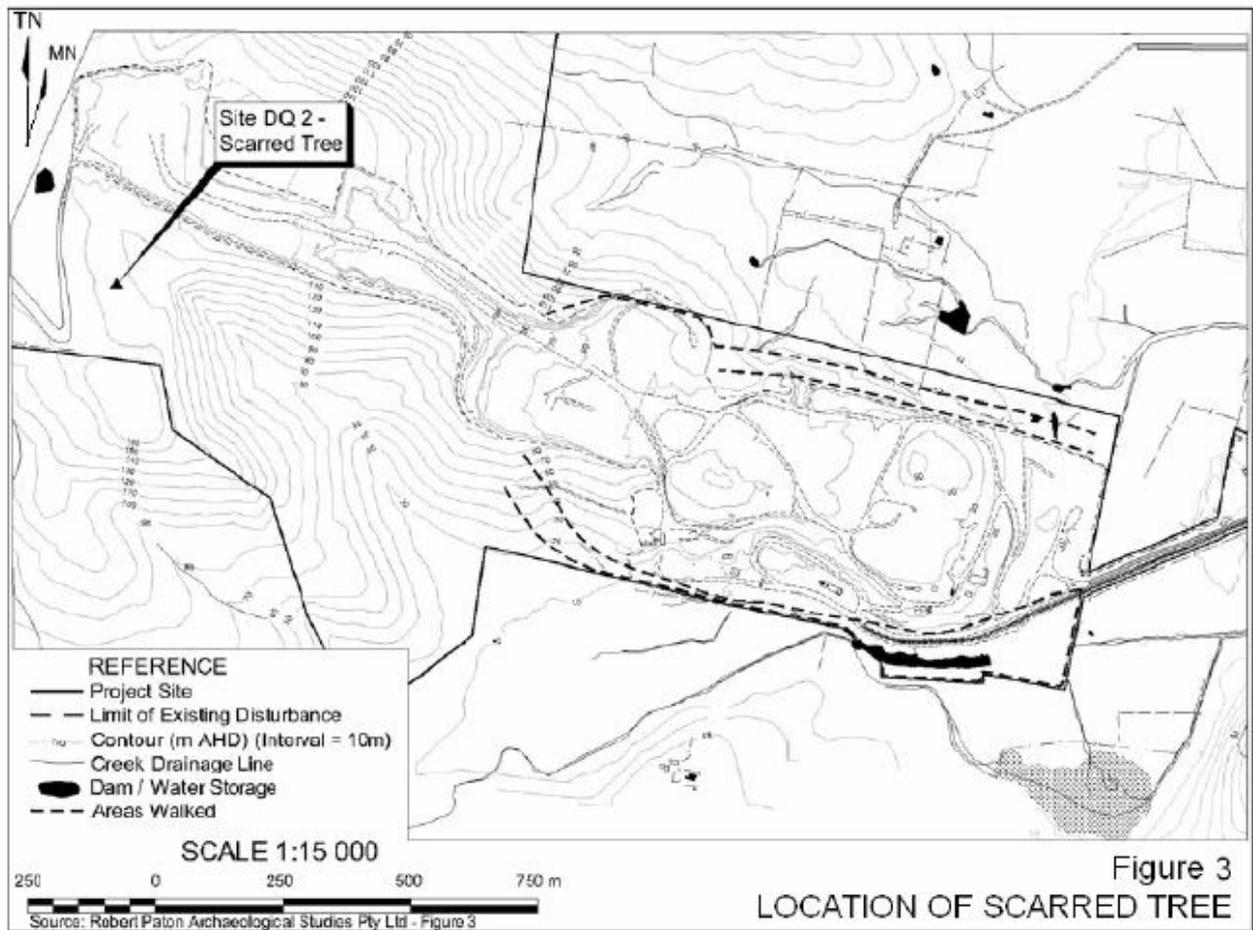
5.1 Aboriginal & Cultural Heritage

The Aboriginal heritage investigation undertaken for the Production Increase Environment Impact Statement (EIS) highlighted one item of Aboriginal heritage that would be disturbed by quarry development. Site DQ2 is an Aboriginal Scarred Tree that is situated in the middle of the southern extension into Croome Farm extraction area. Figure 3 shows the location of the Scarred Tree.

In accordance with the Condition 4(64), a Section 90 application was submitted to the Department of Environment and Conservation (EPA) for Consent to remove the scarred

tree. The Section 90 Consent was granted on 7 March 2005 for a period of 2 years. The scarred tree was relocated to Killalea State Park in 2013 where it can be used as an educational tool for current and future generations.

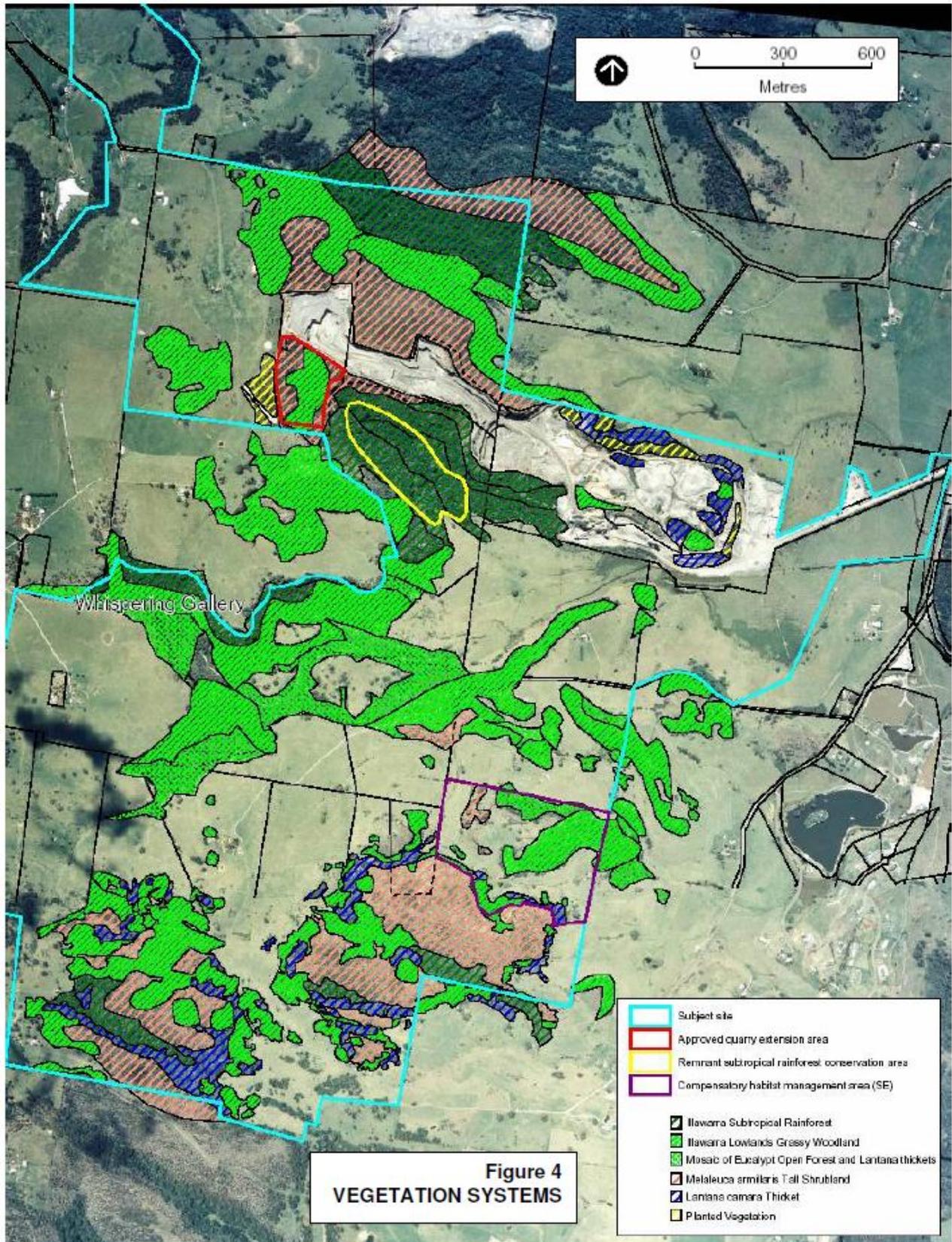
If during the course of quarrying activities, further Aboriginal artefacts are identified, Boral will seek advice from an archaeologist on the significance of the material and contact the EPA if the material is deemed to be of significance.



5.2 Flora & Fauna

The vegetation communities of interest on site are shown in Figure 4. In response to Condition 4(46), a Vegetation Offset Strategy was prepared to set out how the impact of removing the EEC's described in Figure 4 would be offset by re-establishing twice the amount being removed on Boral owned land to the south of the quarry as displayed in Figure 4.

The Vegetation Offset Strategy provides plans and procedures for the protection and management of native fauna through pre-clearance surveys, vegetation clearing protocol and the Compensatory Habitat Management Plan.



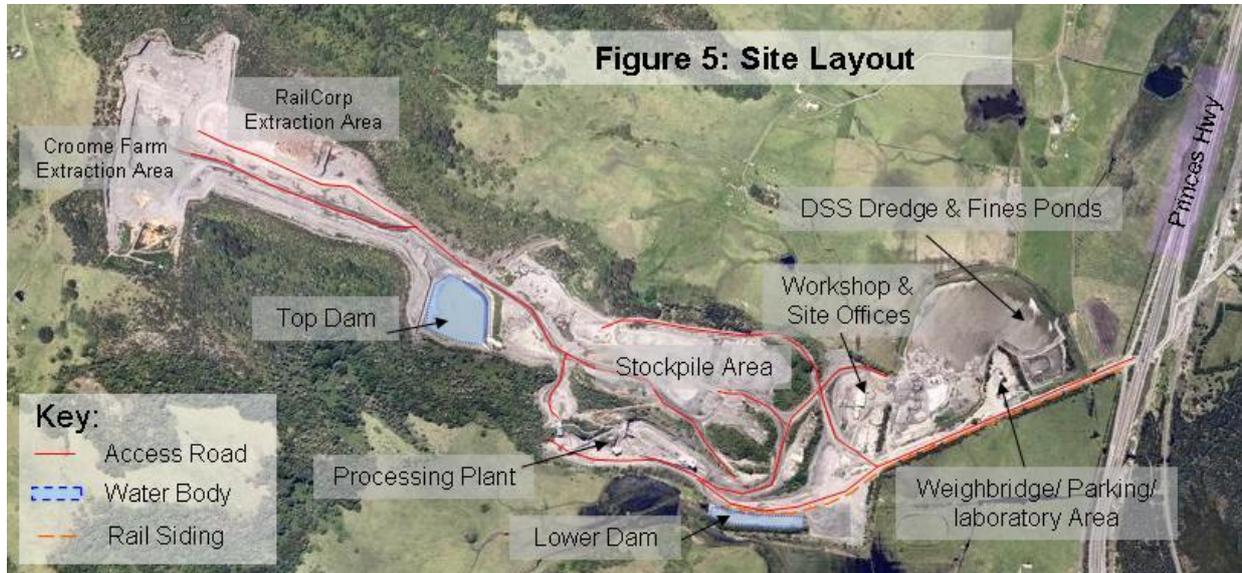


5.3 Water Management

Dunmore Quarry is located within the catchment of the Minnamurra River which drains to the Pacific Ocean at Minnamurra. The site drains in a south easterly direction towards Rocklow Creek (see Figure 5), an ephemeral stream that becomes tidal at its lower reaches near the entrance to the quarry before joining the Minnamurra River.

A Site Water Management Plan is in place that outlines water management, stormwater management, dam upgrades and monitoring. Water is captured onsite between two dams, the lower dam and top dam, with the dams also acting as stormwater management storages to ensure that any water leaving site is of the required water quality. Dunmore Quarry use stored waters for dust suppression ensuring sufficient storages volumes are maintained in dams to allow for stormwater capture and management. A licensed discharge point at the lower dam allows for the transfer of excess water from site to ensure the required stormwater storage capacities are maintained onsite. Further detail

into water management can be found in the sites Water Management Plan prepared by Evans and Peck for the upgrade of water storages and management practises onsite.



5.4 Air Quality

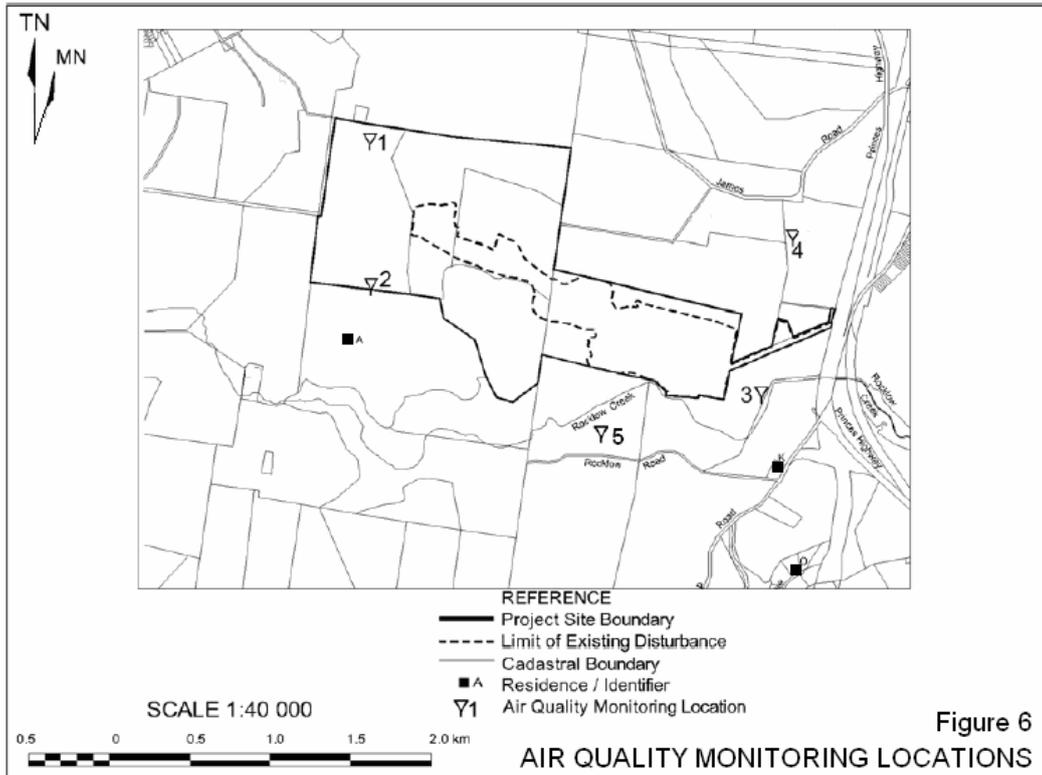
Deposited Dust and PM₁₀

In response to Condition 4(26) an Air Quality Monitoring Program was prepared in consultation with the EPA to monitor the impact of the quarry on the local air quality. The monitoring program includes a network of deposited dust gauges and a high volume air sampler that measures dust of less than 10 micron (PM₁₀). A total of four deposited dust gauges and one high volume air sampler are situated around the quarry as shown in Figure 6.

The monitoring results are collated monthly and compared to the impact assessment criteria for insoluble solids, previous months monitoring results and data collected from the on-site weather station. If annual average deposited dust or PM₁₀ results indicate that dust levels are increasing, a review of the dust mitigation measures will be undertaken.

Deposited dust results from Dunmore Quarry will be compared to the results of the deposited dust gauges established for the monitoring program for Stages 2 to 4 of the Dunmore Lakes Sand Project (Dunmore Sand & Soil). This will be done on a monthly

basis to monitor the cumulative impacts that both operations may have on the local air quality.



Fines Management

Processing of hard rock such as latite produces a by-product of finer material less than 5mm known as dust or quarry fines. In the past this material has been considered as a waste product with little value and has been stockpiled on site and as a result was exposed to prevailing strong winds. Dust material is now a valued product that blended with sand from the Dunmore Lakes Project to generate blended sand products. As a result Dunmore Quarry no longer stockpile large quantities of dust.

In response to Condition 4(24) a Fines Management Plan was prepared to the satisfaction of the EPA. This plan is no longer in use as dust is no longer stockpiled onsite in large volumes. In the event of fines stockpiles increasing in volume the Fine Management Plan will be revisited as required.

5.5 Noise and Blasting

Noise

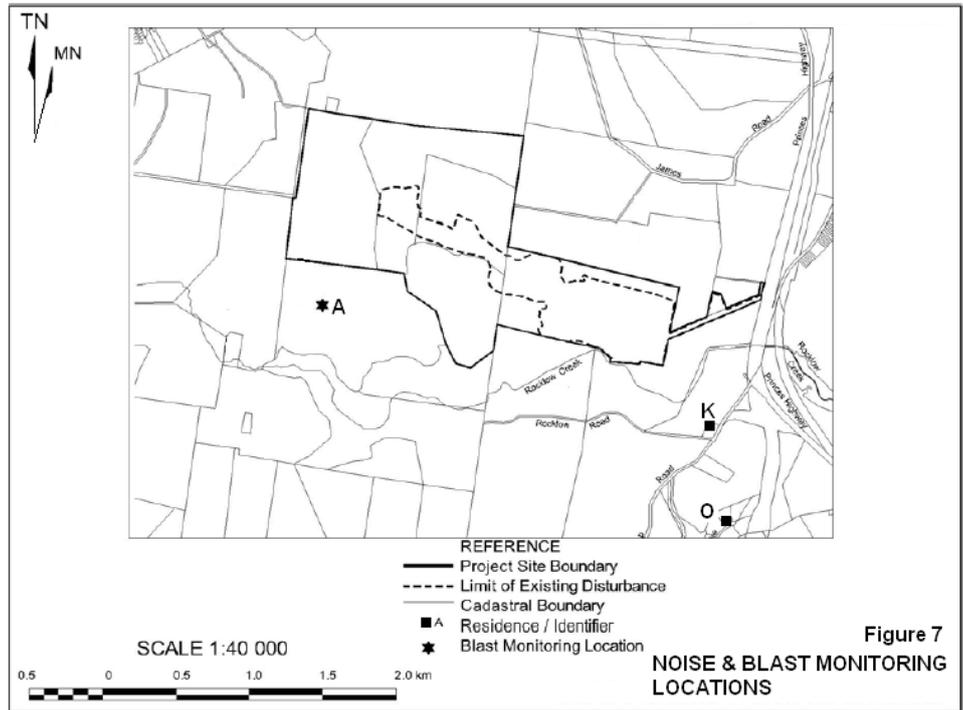
In response to Condition 4(14) a noise monitoring program was prepared and forms part of the sites Environmental Monitoring Plan. The noise monitoring program consists of continuous noise monitoring at Location K (see Figure 7), and annual attended noise monitoring at Locations A, K and O during winter when noise propagation is at its worst. The attended monitoring is undertaken by a suitably qualified acoustic consultant in accordance with the NSW Industrial Noise Policy and compares operational noise levels to the noise limits specified for the site in the Development Consent and Environment Protection Licence.

The results of the annual attended monitoring, the continuous noise monitoring as well as complaints received will; be used to make management decisions to reduce noise levels for surrounding neighbours and facilitate continued compliance with the designated noise limits. This review process and in consultation with the EPA facilitated the cladding of the secondary crusher, a known intrusive noise source.

Blast

In accordance with Condition 4(21), blasting is monitored at the McParland monitoring station as approved by the EPA. Exceedances of the ground vibration and airblast overpressure impact assessment criteria in the Development Consent and EPL will be reported to the EPA and relevant authorities are required. Monitoring results will be reported in the AEMR and Annual Return.

A Blast Management Plan has been prepared in consultation with the landowner(s) of property A (Figure 7) and outlines measures to avoid/minimise impacts of blasting on both the property itself and its uses.



5.6 Wastes

Boral is committed to managing waste in accordance with the waste hierarchy, and reducing the amount of waste going to landfill. Waste is therefore avoided where possible, reused or recycled prior to going to landfill. Table 1 presents the various waste streams generated by Dunmore Quarry and the way in which they are managed. Waste collected at the quarry is collated and kept in a waste register. This enables waste generation to be tracked and monitored throughout the life of the quarry and will be used to formulate waste reduction targets and programs. Waste minimisation initiatives will be reported annually in the AEMR.

Table 1
Dunmore Quarry Waste Streams

Waste Stream	Action/End use
Waste Oils	Recycled by EPA licensed contractors
Steel	Either reused on site by boiler makers or recycled
Vehicle Batteries	Stored on pallets and picked up by contractors for re-use/recycling
Paper and Cardboard	All paper and cardboard waste is recycled by Flagstaff
Heavy Vehicle Tyres	Either re-used on site for such uses as traffic management or delineation of parking area or returned to the tyre fitting contractor for recycling
Conveyor Belt	Stored in a designated area and periodically transported for recycling
Timber Waste	Stored in a designated area and periodically transported for recycling
General garbage	All other municipal waste that cannot be reused or recycled is sent to the Shellharbour Waste Depot

5.7 Rehabilitation

A Rehabilitation Management Plan was prepared to satisfy the requirements of Condition 4(54) providing short, medium and long term measures for on site rehabilitation of areas disturbed by quarrying.

Due to the nature of the layout and sequencing of extraction, very little disturbed area will be available for rehabilitation within the first five years of consent. As extraction within Croome farm and RIC ceases and extraction moves back into the original Dunmore Quarry to the east, larger areas will become available. Figure 8 shows the proposed final landform and rehabilitation of Dunmore Quarry.

The Rehabilitation Management Plan provides relevant species that will be planted to enhance the biodiversity of the vegetation systems already present on site including the two EEC's that have been cleared within Croome Farm and RIC extraction areas. *Mellalueca armillaris* is particularly suited to exposed rocky outcrops and will be used on final quarry benches where possible. The Rehabilitation Management Plan will be revised with annual progress being reported in the AEMR.

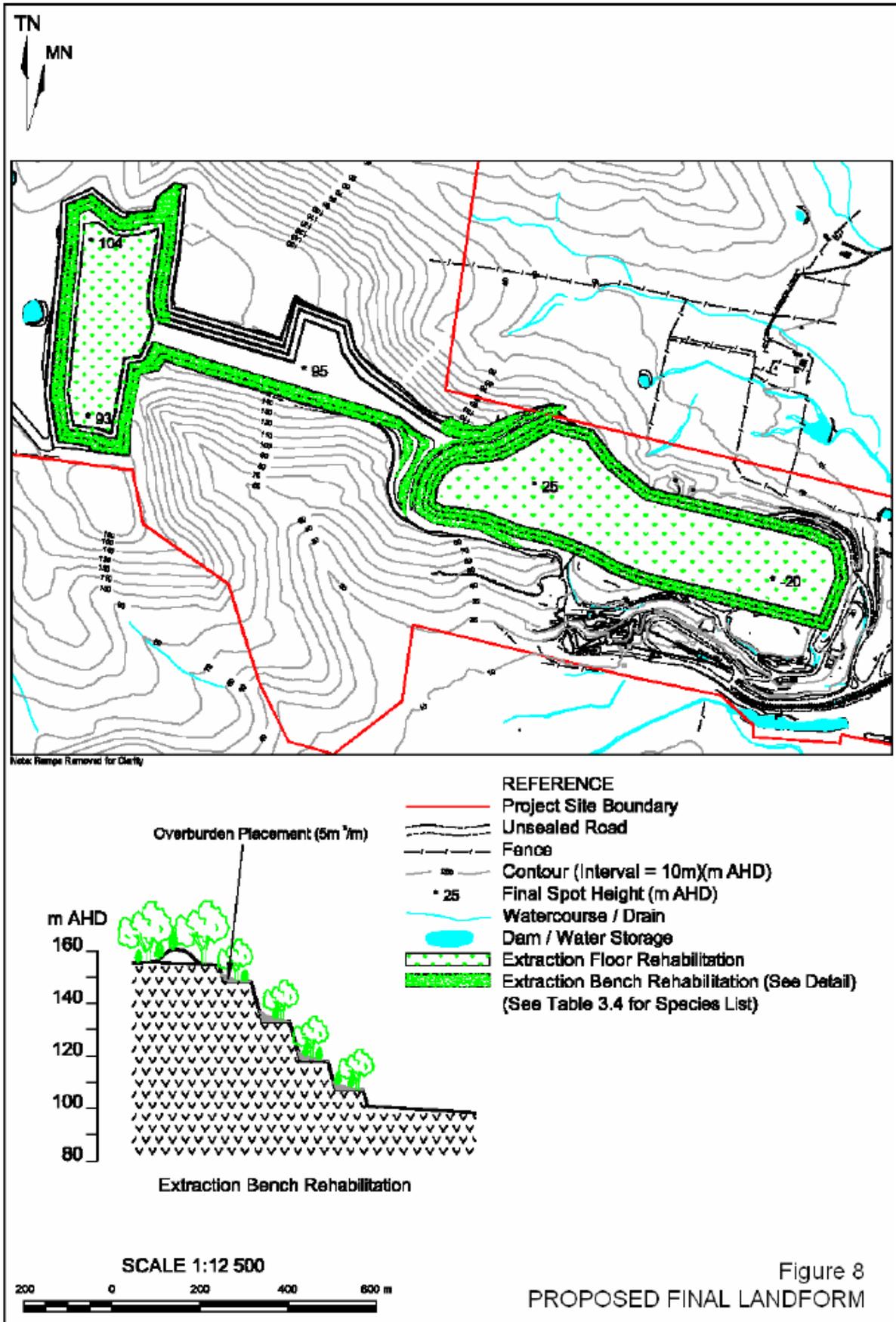


Figure 8
PROPOSED FINAL LANDFORM

5.8 Bushfires

A Bushfire Management Plan was prepared to satisfy Condition 4(77) and to minimise the impact of bushfires from surrounding areas as well as ensure the quarry is suitably equipped to respond to any fires onsite.

The Bushfire Management Plan applies to all of Boral's land at Dunmore Quarry (as shown in Figure 1). The plan was developed following consultation with the NSW Rural Fire Service. The Bushfire Management Plan identifies bushfire control initiatives around the quarry to mitigate potential impacts on company owned and surrounding land. To ensure the effectiveness of these initiatives, and that regulatory obligations are met, Boral will conduct regular audits and inspections as part of the land management process with any improvements reported in the AEMR.

5.9 Community Consultation

Boral is committed to keeping members of the local community informed about quarry operations. In accordance with Conditions 5(7), (8) and (9) expressions of interest were sought for interested persons to be part of a community Consultative Committee (CCC) for Dunmore Quarry.

The CCC meetings are chaired by an independent chairperson and held at least twice a year. The meetings are run in accordance with the Department of Planning and Infrastructure Guidelines for Community Consultative Committees and the Conditions in Schedule 5 of the Consent as mentioned above. Minutes of the CCC meetings are sent to members of the committee and the Department of Planning and Infrastructure within one month of the meeting.

The CCC ensures that members of the local community are informed about the quarry operations and have a level of input and accountability with quarry management. The CCC forms the main component of Boral's strategy to engage and consult with community members who live near the quarry, with the current membership including

representatives from receiver locations from the noise, blasting and air quality monitoring programs.

6.0 COMPLAINTS MANAGEMENT & DISPUTE RESOLUTION

6.1 Complaints Receipt & Response Procedures

Whilst all endeavours will be made by Boral to avoid adverse impacts on the local environment and to local residents, it is acknowledged that such impacts may occur. Complaints regarding Dunmore Quarry operations can be made directly to the quarry by phone or in person at the quarry office. Complaints are recorded in a complaint register and will be reported in the AEMR.

Details included in the complaint register are as follows:

- the date and time of the complaint
- the method by which the complaint was made;
- any personal details of the complainant which were provided by the complainant;
- the nature of the complaint;
- the action taken in relation to the complaint, including any follow-up contact with complainant; and
- if no action was taken, a reason will be given.

Depending on the nature of the complaint, relevant impact assessment criteria will be checked to determine whether an environmental monitoring program indicates an adverse trend in results. If the complaint corresponds with an adverse trend, the complainant will be notified and informed of the corrective action that will be put in place to prevent or mitigate a recurrence.

The level of response and documentation for any complaint will be determined in proportion to potential community and environmental impacts, and the frequency and number of complaints.

6.1 Dispute Resolution

Despite the best endeavours of Boral, it is recognised that throughout the life of the quarry, disputes may arise following actions from day to day operations. If a complainant or local resident is not satisfied with the complaint management process and the matter arises in a dispute, a mutually agreed independent facilitator will be appointed in consultation with the Department of Planning and Infrastructure to reside over the matter.

The independent facilitator will consult relevant experts for advice on technical issues and report the findings to both parties for resolution. Following this process, it is anticipated that an agreed outcome can be reached and the matter resolved, however, if the dispute is not resolved, the facilitator will consult the Department of Planning and Infrastructure to make a final decision and agreed outcome.

7.0 RESPONSE TO NON-COMPLIANCES

If an exceedance of the impact assessment criteria in the Development Consent or Environment Protection Licence is identified, the following protocol will be followed.

1. Confirmation of Exceedance

If an exceedance is found in surface water or air quality monitoring results the analysing laboratory will be contacted to ensure no error has been made in storing, analysing or recording the sample or results. Re-analysis will be ordered in the case of laboratory error. If an exceedance in noise limits is detected the result will be referred to the noise consultant for review. Further investigation will occur including an analysis of weather station data and comparison to quarry activities at the time of exceedance. This information will be used to assist in determining the possible quarry contribution to a recorded exceedance.

2. Notification of Exceedance

In the case where the recorded exceedance is for an objective, eg. Deposited dust goal, a note will be made regarding the site for future reference and comparison and reported in the AEMR and Annual Return. In the case where the recorded exceedance is for a criteria

within either the Development Consent or Environment Protection Licence the exceedance will be reported to the EPA and relevant agencies, with a written report submitted within 7-days. The report will include and follow the general requirements for a written report as outlined in the Environment Protection Licence. If the exceedance is related to a receiver location or a particular complaint, the resident for that location will be notified of the exceedance and any corrective actions.

3. Corrective Action

The written report prepared in response to an exceedance will outline corrective actions out in place to prevent a recurrence, and bring the operation back into compliance. The outcomes from actions resulting from the written report will also be forwarded to the EPA.

4. Reporting

The recording of exceedances will be reported annually within the AEMR and Annual Return and presented at CCC meetings.

8.0 EMERGENCY RESPONSE PROCEDURES

In response to Condition 4(75) and PRP 8 of the Environment Protection Licence and Emergency Contingency Management Plan was prepared to the satisfaction of the EPA. The plan identified and assessed potential threats that quarry's operations might have on the local environment and public health, and presented the measures that will be put in place to respond to emergency situations and mitigate against potential harm.

A Pollution Incident Response Management Plan (PIRMP) supersedes the previously mentioned plan and outlines potential and threats and responses to such threats that should occur in the case of Environmental emergency. The plan also outlines the protocol for reporting of incidents that satisfy the immediate reporting criteria outlined by the EPA.

Emergency response procedures are tested on a 6-monthly basis with emergency response drills performed as part of the sites overall emergency response incorporating both safety and environment.