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Peppertree Quarry Modification 3

Environmental Assessment

Prepared for Boral Resources (NSW) Pty Limited | August 2012

Planning + Environment + Acoustics

Peppertree Quarry Modification 3
Environmental Assessment

Prepared for Boral Resources (NSW) Pty Limited | 20 August 2012

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Peppertree Quarry Modification 3 Environmental Assessment

Final

Report J12053RP1 | Prepared for Boral Resources (NSW) Pty Limited | 20 August 2012

Prepared by	**Rachael Russell**	Approved by	**Brett McLennan**
Position	Environmental Planner	Position	Director
Signature		Signature	
Date	20/08/2012	Date	20/08/2012

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Document Control

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1 Introduction

1.1 Overview

Peppertree Quarry (the Quarry) is a hard rock quarry owned by Boral Resources (NSW) Pty Limited (Boral) in Marulan South, NSW. Project Approval (PA06_0074) for the Quarry was granted by the then Minister for Planning on 28 February 2007 under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Boral, the proponent, seeks approval from the Minister for Planning and Infrastructure to modify PA06_0074 under Section 75W of the EP&A Act to:

- construct a High Voltage (HV) distribution line to the west of the Quarry; and
- construct a minor extension to the existing passing line on Boral's private rail line at its connection to the Main Southern Railway line.

The modifications proposed above constitute Modification 3 to PA06_0074.

1.2 Site description

The Quarry is located in Marulan South, 10 km south-east of Marulan in the Southern Tablelands of NSW (see Figure 1.1). Access is via Marulan South Road which connects the Quarry and Boral's Marulan Limestone Mine with the Hume Highway approximately 9 km to the north-west (see Figure 1.2). Boral's private rail line connects the Quarry and Limestone Mine with the Main Southern Railway approximately 6 km to the north. The Quarry is located on Boral owned land approximately 650 ha in size (shown as Boral Resources Boundary on Figure 1.2), which includes the Quarry site, approximately 70 ha in size, additional granodiorite resources to the south and surrounding land.

The Quarry is located approximately 10 km south of Marulan village, 35 km east of Goulburn and 50 km south west of Moss Vale. The Quarry is bordered to the south by the Limestone Mine, to the east by Morton National Park and by a small number of rural properties to the north and west. Surrounding land uses include mining, grazing, rural properties including poultry farms, Aglime Fertiliser Pty Limited's Agricultural Lime Plant and a fireworks factory located to the south-west on Marulan South Road. Rural residential properties are also located to the east on Long Point Road and are separated by the deep Barbers Creek gorge.

The site of the former village of Marulan South is located between the Quarry and the Limestone Mine on Boral owned land. The village was established principally to service the Limestone Mine and has been uninhabited since the late 1990s. The majority of the village's infrastructure has been removed and only a disused hall and former bowling club remains. The bowling club has been converted into administration offices for the Limestone Mine.

1.3 Purpose of report

The purpose of this Environmental Assessment (EA) is to accompany an application to the Department of Planning and Infrastructure (DP&I) for Modification 3 of PA06_0074, in accordance with Section 75W of the EP&A Act. This document is intended to provide an assessment of the potential impacts resulting from the proposed modifications and detail, monitoring and/or offset measures to manage potential impacts. The EA provides information to allow NSW government authorities to assess the merits of the proposed modifications and make recommendations to decision-makers about whether or not to grant approval.

The purpose of the EA is also to inform the public about the proposed modifications so that they can make submissions on its merits or impacts. Such submissions are a further important information source for the assessment process.

This EA was prepared by EMGA Mitchell McLennan Pty Limited (EMM) on behalf of Boral.

1.4 Matters to be addressed

A meeting was held between Boral and DP&I to discuss Boral's intention to lodge Modification 3 to PA06_0074 on 15 May 2012. This meeting was followed by a briefing letter to DP&I to describe the proposed modifications, the likely impacts and the proposed assessment approach. This letter also requested the issue of Director-General's requirements (DGRs) for Modification 3, if deemed warranted by DP&I. A response was received from DP&I on 12 June 2012 where it was advised that the issue of formal DGRs for Modification 3 would not be required. However, DP&I advised that the following matters should be addressed in the EA for Modification 3:

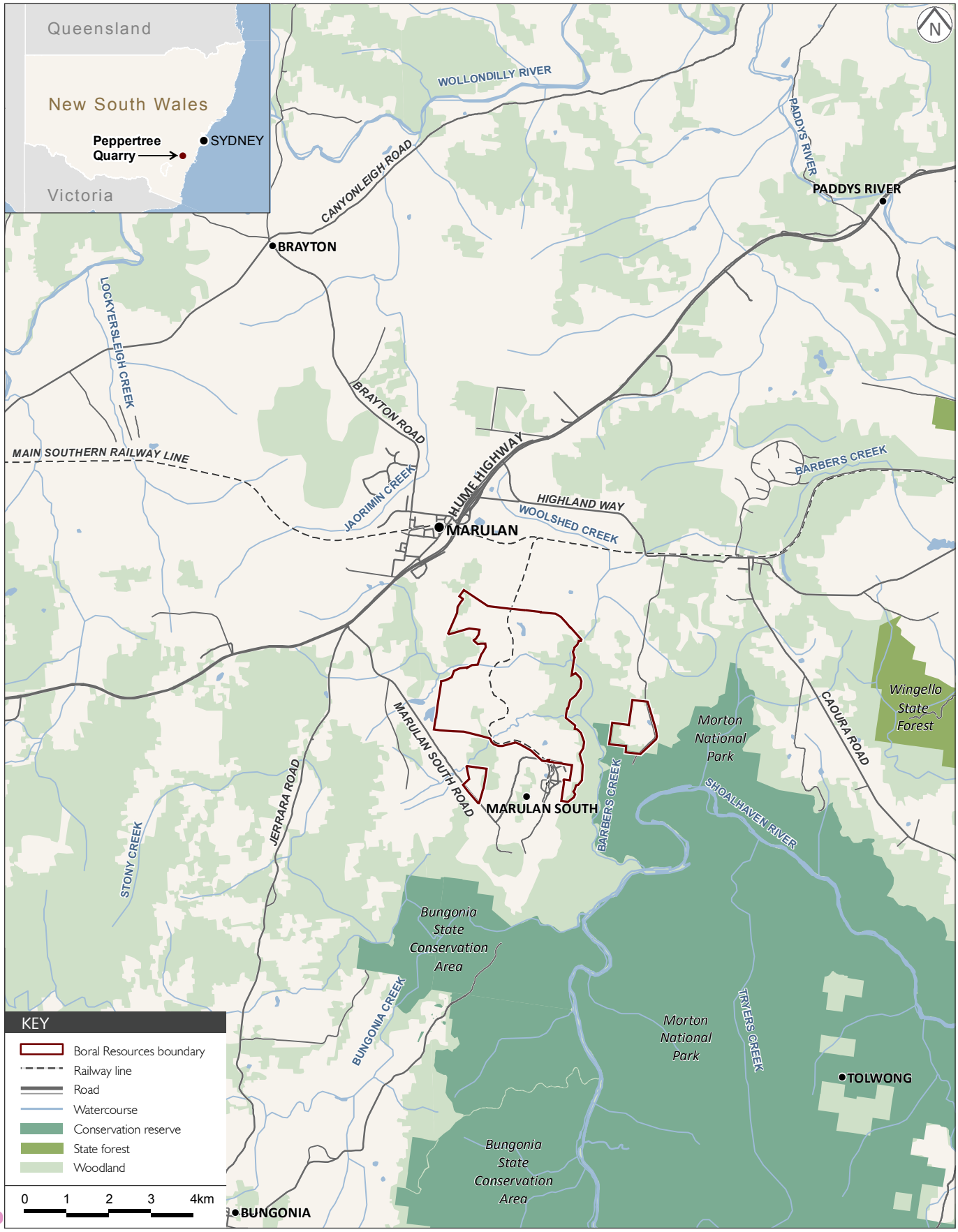
- description of the activities proposed, including a figure showing what is proposed, the options considered and the reasons behind the proposed modifications;
- comparison of the approved project and the project as modified; and
- discussion of the consultation undertaken with the relevant stakeholders.

The above matters are addressed in Chapter 3 of this report.

1.5 Report structure

The EA has the following structure:

- Chapter 1 – Introduction to Modification 3, including a description of the site, the purpose of this report and matters to be addressed.
- Chapter 2 – Description of the approval history and approved operations.
- Chapter 3 – Provides a description of the proposed modifications, a discussion of the need for the modifications and alternatives considered, a comparison against the approved operations, and a description of stakeholder engagement activities undertaken.
- Chapter 4 – Overview of the planning and statutory framework.
- Chapter 5 – Environmental impact assessment for Modification 3.
- Chapter 6 – Summary of the Statement of Commitments.
- Chapter 7 – Conclusion to the report including justification against the objects of the EP&A Act.
- Appendices:
    - Appendix A – PA06_0074
    - Appendix B – Ecology Assessment
    - Appendix C – Aboriginal and Historic Heritage Impact Assessment



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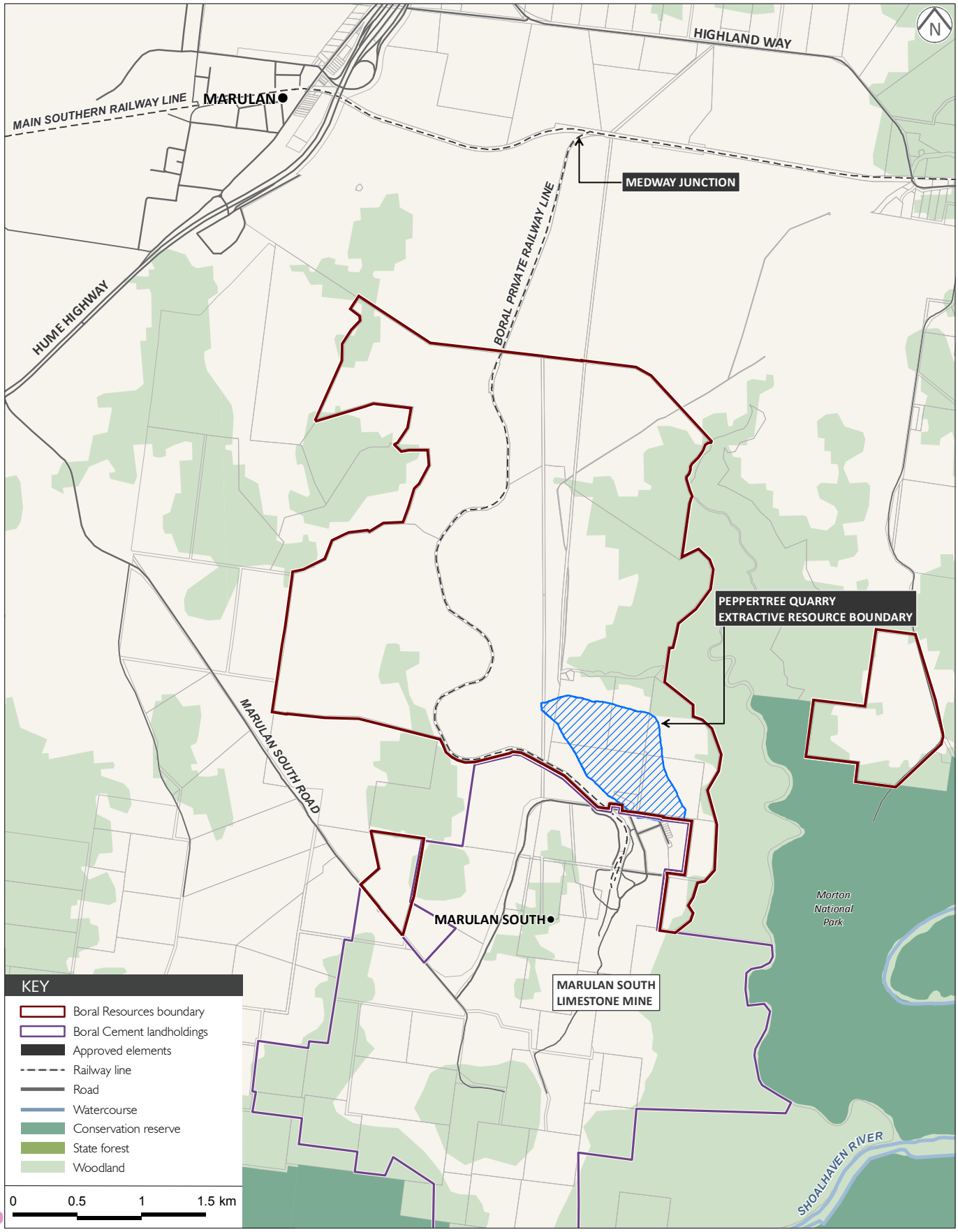
Regional context

Peppertree Quarry - Modification 3

Figure 1.1



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Local context

Peppertree Quarry - Modification 3

Figure 1.2

2 Existing operations

2.1 Approval history

The Quarry was approved under PA06_0074 granted by the Minister for Planning in 2007 under Part 3A of the EP&A Act. Two modifications to PA06_0074 under Section 75W of the EP&A Act have subsequently been approved, namely:

- PA06_0074-Mod 1 approved 17 March 2009: for the construction of an exploratory test pit to extract a suitable amount of granodiorite to test and model rock behaviour and to assist with the design of plant and equipment for the Marulan South Quarry; and
- PA06_0074-Mod 2 approved 3 November 2011: for infrastructure and site layout changes including the:
  - construction of a new rail loop embankment and overburden emplacement;
  - reduction in the water storage dam size; and
  - relocation of loading facilities, processing plant and stockpiling.

The consolidated project approval for the Quarry, as modified by the above applications, is attached to this document as Appendix A.

2.2 Approved project

2.2.1 Quarrying activities and infrastructure

The approved quarrying activities are for extraction of 105 million tonnes of granodiorite over 30 years at an initial rate of 1 – 2 million tonnes per annum (Mtpa) and a maximum rate of 3.5 Mtpa. Granodiorite is an intrusive igneous rock suitable for use as a construction and building material. The hard rock aggregates produced at the site will be of a range of different shapes and sizes for different purposes. Primary production will be of concrete and asphalt aggregates (10 mm) and railway ballast (28 – 50 mm) with potential production of larger aggregates (>100 mm) for rock armour and gabion baskets. Fines (generally <5 mm) produced during crushing of product will be blended with limestone sand from Boral's adjacent Limestone Mine or Penrose Quarry to produce a marketable manufactured sand.

Infrastructure at the Quarry includes a processing plant, rail loop and loading facilities, two water storage dams, an in-pit mobile crushing plant, overburden emplacement areas, noise and visual bunding, product stockpiles, and staff facilities. The location of infrastructure at the Quarry is shown on Figure 2.1.

Boral is currently in the construction stage with the noise and visual bunding, dam, rail embankment and staff facilities already constructed and partial pit development taking place. Infrastructure is expected to be commissioned in early 2013 with full quarrying activities estimated to commence in mid 2013. The Quarry has approval to operate until the end of 2038.

2.2.2 Transport of product

Product from the Quarry is to be transported entirely by rail except in an emergency where it would be transported by road with the written approval of the Director-General. The Quarry has approval to

transport up to 3.5 Mtpa of product from the site. At full production the Quarry will operate up to four trains per day which will transport product north to the Sydney market and other customers. In addition, the Limestone Mine currently operates up to six trains per day transporting product north to Berrima and Maldon and east to Port Kembla.

Trains to the Quarry will access Boral's private rail line from the Main Southern Railway at the Medway Junction (see Figure 2.1) which currently provides access to the Limestone Mine. The rail line is mostly single track with a 1 km length of triple line track used for shunting and train loading. A rail loop will be constructed at the Quarry for separation of rail movements on the rail line between the two Boral sites. Rail loading facilities will also be established on the rail loop adjacent to the Quarry's processing plant.

Loading of product from the Quarry onto trains and train movements will occur 24 hours, seven days a week. This will enable train trips on the Main Southern Railway to be scheduled away from peak commuter times.

2.2.3 Operating hours and workforce

The Quarry will operate 24 hours, 7 days a week with in-pit activities restricted to the hours of 7 am to 7 pm and construction typically taking place between 7 am and 6 pm Monday to Friday and 7 am to 1 pm on Saturdays.

Employment at the Quarry will include 30 full time persons distributed over 2 – 3 shifts. It includes a construction workforce of approximately 20 people.

2.2.4 Environmental management and monitoring

Boral has prepared and implemented a number of management plans and monitoring programs at the Quarry in accordance with PA06_0074. They include the following:

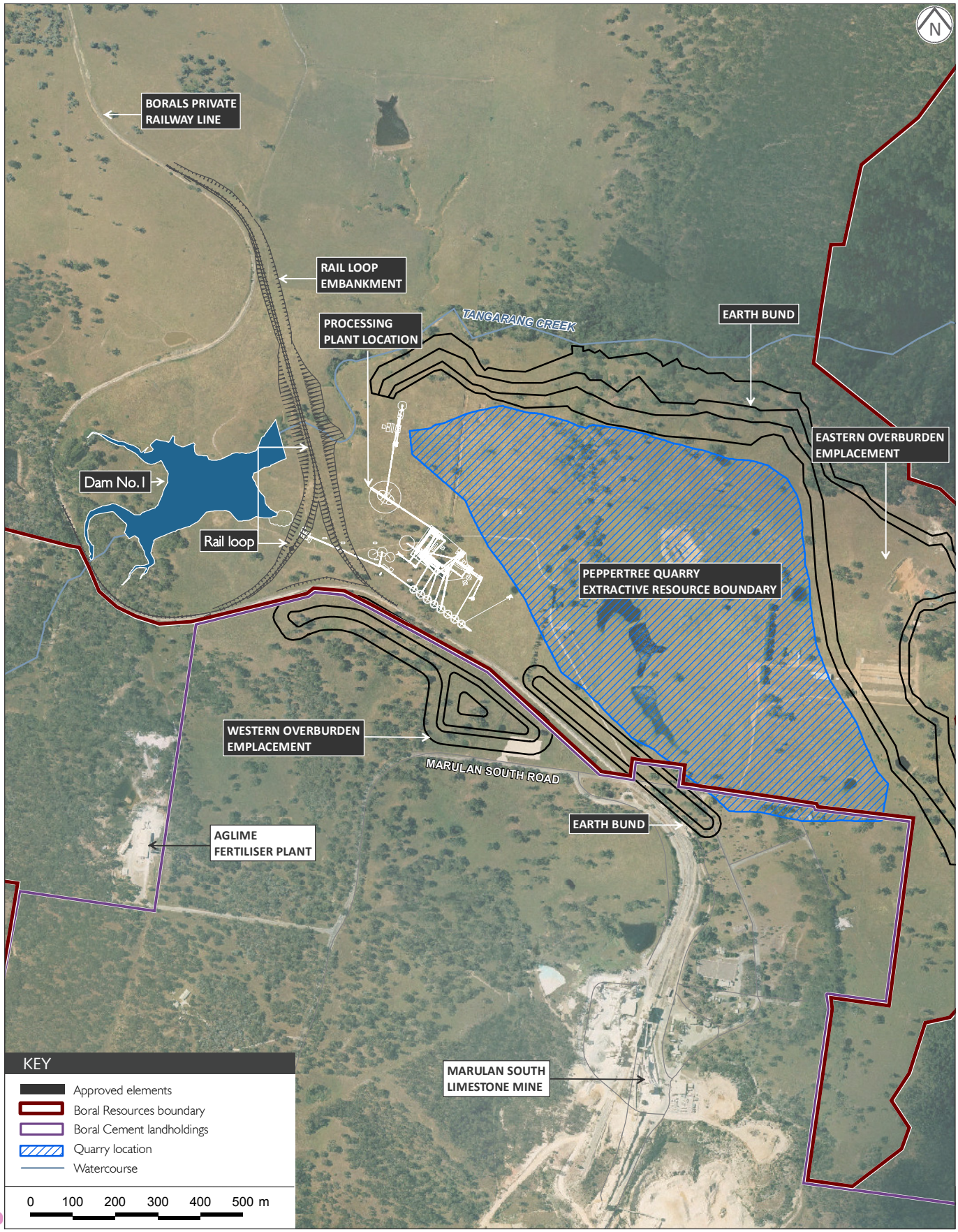
- Construction Noise Management Plan (CNMP);
- Noise Management Plan;
- Blast Monitoring Program;
- Air Quality Management Plan;
- Water Management Plan which includes:
    - Site Water Balance;
    - Erosion and Sediment Control Plan;
    - Surface Water Monitoring Program;
    - Ground Water Monitoring Program; and
    - Surface and Ground Water Response Plan;
- Construction Traffic Management Plan;
- Aboriginal Heritage Management Plan; and

- Landscape and Rehabilitation Management Plan.

In accordance with PA06_0074, Boral has also prepared and implemented an Environmental Management Strategy, which is an overarching strategy for implementation of environmental management measures at the Quarry, and an Environmental Monitoring Program, which consolidates all the various monitoring requirements at the Quarry.

If amendments to the above documents are required as a result of the proposed modifications they will be undertaken within three months of a notice of approval and submitted to DP&I for endorsement in accordance with Schedule 5, Condition 7 of PA06_0074.

Schedule 3, Condition 33 of PA06_0074 requires that a Habitat Management Area (HMA) be established in the area to the west and south of Dam No. 1 on Tangarang Creek (see Figure 2.1). The purpose of the HMA is to protect at least 12 ha of Box Gum Woodland and Aboriginal heritage items located around the dam. Management of the HMA is undertaken in accordance with the Quarry's Landscape and Rehabilitation Management Plan, as required under Schedule 3, Condition 34 of PA 06_0074.



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Approved project

Peppertree Quarry - Modification 3

Figure 2.1

3 Proposed modifications

3.1 Description of modifications

Modification 3 to PA06_0074 includes the following elements as shown on Figure 3.1:

- construction of a HV line approximately 1 km in length; and
- construction of an extension to the existing passing line at Medway Junction.

This section provides a detailed description of the proposed modifications. Environmental impacts of the proposed modifications are assessed in Chapter 5.

3.1.1 HV Line

There is an existing Essential Energy line which distributes electricity to the Limestone Mine and the Agricultural Lime Plant from a substation located on Marulan South Road. The proposed HV line will follow the route shown on Figure 3.1, connecting to the Essential Energy line at the corner of Boral and Aglime Fertiliser Pty Limited's property boundaries (see Figure 3.2). The HV line will then extend in a north-westerly direction for approximately 170 m and then in a northerly direction for 830 m where it will connect with the processing plant at the Quarry. The HV line will be located within Lot 22 DP 867667; Lot 23 867667 and Lot 1 DP 1124189 owned by Boral Resources and Boral Cement.

A total of 13 poles will be installed, ranging from between 14.5 m and 20 m in height. Trenches will be dug around each of the poles and laid with earth conductor wire and electrodes. The designs of the trenches to be constructed are shown on Figure 3.2.

A 25 m corridor, 12.5 m either side of the centre line, will be established along the length of the HV line. The corridor will be cleared of trees and tall shrubs for safety purposes and will also provide access for use during construction and for ongoing maintenance of the line. A total of 15 trees will be removed as shown in Figure 3.2.

Construction of the HV line will take between four to six weeks. The works will be undertaken by up to five contractor employees with equipment transported to the site by truck.

3.1.2 Passing line extension

The junction of Boral's existing private rail line and the Main Southern Railway is referred to as Medway Junction. There is a passing line, or siding, at the junction which currently runs approximately 333 m (shown as No. 2 Siding in Figure 3.3). It is proposed to construct an extension to the passing line increasing its total length to 1,235 m thereby creating standing room of 1,200 m.

The construction plans for the passing line extension are shown in Figure 3.3 and Appendix D. The following works will be undertaken as part of the extension:

- No. 1 Siding: re-railing approximately 548 m, reconditioning approximately 170 m, increase ballast depth by lifting track approximately 75 mm and tamping, remove existing turnout and replace with No. 2 Siding turnout;
- No. 2 Siding: re-railing and rebuilding of existing length and install new track, remove existing turnout and replace with No. 1 Siding turnout;

- both sidings: install a 4 X 2.4 m span box culvert and replace the existing timber sleepers with concrete sleepers (20);
- remove existing staff hut and poles (five in total);
- construction of 3 m wide access track;
- remove and realign existing property boundary fence;
- load and transport the ballast and capping material from the central stockpile location at the Quarry; and
- disturbance of approximately 1,000 m^2 of pasture and previously disturbed land.

The extension will not result in an increase in the approved annual volumes of material transported or the number of approved train movements from the Quarry.

The passing line extension will also require minor alterations to the boundary between the existing rail corridor owned by Boral (Lot 1 DP 1124189) and the neighbouring eastern property "Glenrock" (Lot 204 DP 870194). Two areas of land, approximately 302 m^2 on the northern boundary and 658 m^2 on the southern boundary are sought to be deducted from Lot 204 DP 870194 and added to Lot 1 DP 1124189 (see Appendix D for changes to property boundaries). These proposed alterations are the subject of a Deed currently being negotiated between Boral and the owners of Glenrock. For the purposes of this modification, a letter of owners consent has been provided from the owners of Glenrock for the land affected by the passing line extension works.

Construction of the passing line extension will take approximately six weeks. The works will be undertaken by up to 10 contractor employees with equipment transported to the site by truck.

3.2 Need for modifications

The processing plant is to be commissioned in early 2013 in order for extraction activities to commence in mid-2013. There is currently no suitable electricity supply to the processing plant location and construction of the HV line is necessary to provide a sufficient energy supply to this area for operation of the plant.

The existing passing line at Medway Junction provides standing room of 330 m. The trains currently used by Boral to transport product from the Limestone Mine are already too long for the passing line, however, the current train paths do not require trains to pass each other. Once extraction at the Quarry commences and the train movements increase, it will be necessary for trains travelling to the Quarry or Limestone Mine to wait at the Medway Junction for loaded trains on the line to pass them. The proposed extension to the passing line will create standing room of 1,200 m which will facilitate this.

3.3 Alternatives considered

A number of alternative alignment options for the HV line route were considered for Modification 3. The factors considered in choosing a route alignment included engineering requirements, economic efficiency and impact to Aboriginal heritage and biodiversity. The proposed route, which is presented in Figure 3.1, achieves the necessary engineering design requirements whilst being economically efficient. The proposed route requires the clearance of low density native vegetation, approximately 0.5 ha of Box Gum woodland, and a small area of potential fauna habitat which is currently in low condition (see Section 5.2 and Appendix B for further discussion on the ecological impacts of the proposed HV line route). The

proposed route also avoids, where possible, areas of archaeological sensitivity (see Section 5.3). Other alignment options were considered to have more significant environmental impact due to the removal of high density native vegetation and large areas of potential fauna habitat, and the potential disturbance of archaeologically sensitive items. The proposed route was considered to provide the best environmental outcome whilst still achieving the necessary engineering requirements and being economically efficient.

Alternatives considered for the rail extension included using trains of shorter length to transport product. This was not considered to be a suitable alternative as this would substantially increase costs for Boral and require more train movements to transport material which would have associated noise, vibration and rail network capacity impacts.

3.4 Comparison against approved project

The proposed modifications will **not** result in a change to the following aspects of the approved project:

- the maximum extraction rate or total resource to be extracted;
- hours of operation, in-pit activities or transport;
- volumes of material transported;
- number of train movements; and
- number of full-time employees.

The proposed modifications will result in a minor increase in construction employment numbers and related traffic movements. These levels will be minor in comparison to approved construction employment numbers and related traffic movements and will only experienced for a short period of time.

The changes in approved environmental impacts resulting from the proposed modifications are discussed in Chapter 5 of this report.

3.5 Stakeholder engagement

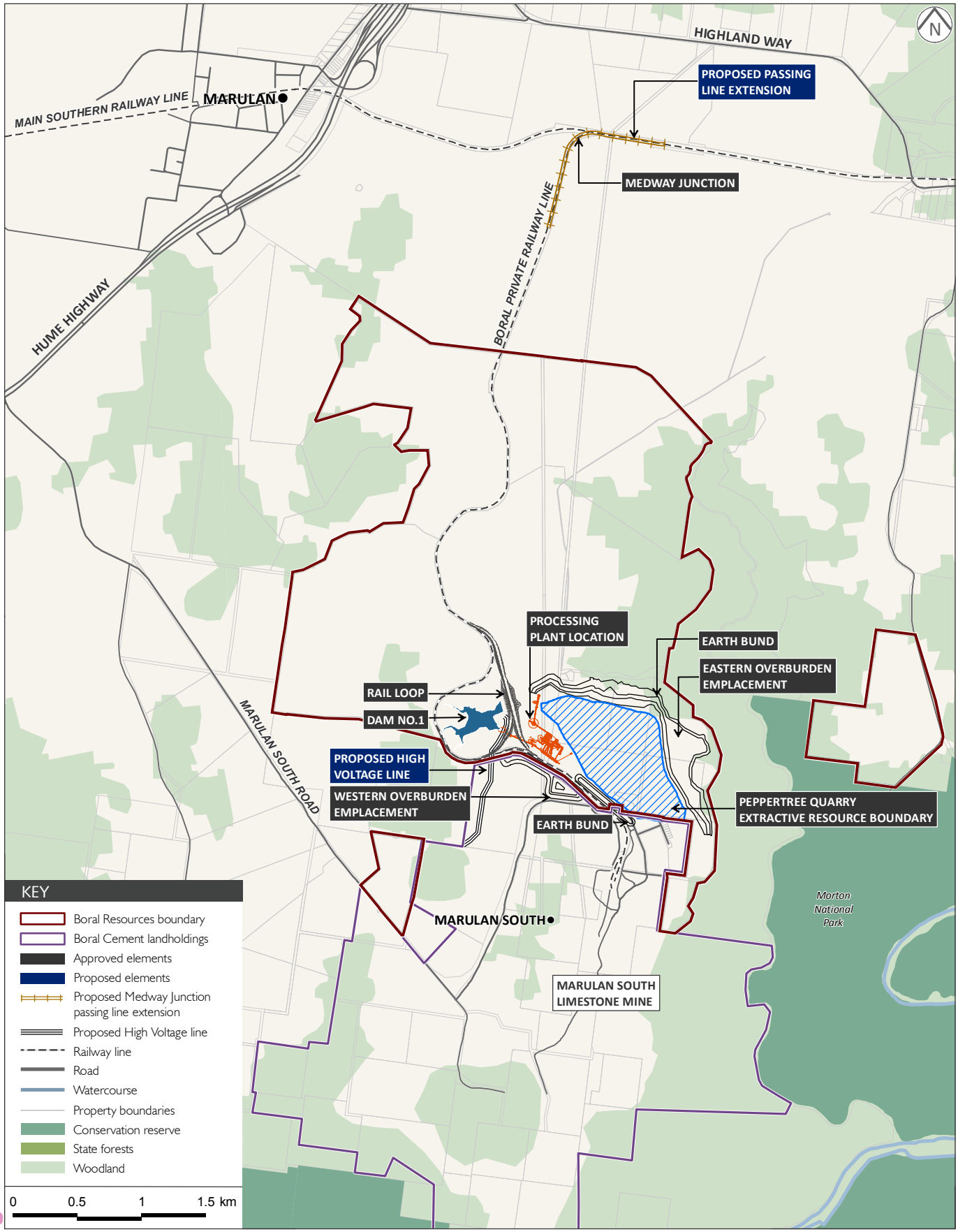
The stakeholder engagement activities undertaken for Modification 3 are summarised in Table 3.1. The outcomes of these meetings and the sections of this report where matters raised during consultation are addressed are also provided.

Table 3.1 Stakeholder engagement activities and outcomes

Stakeholder	Engagement activity	Outcomes	EA reference
DP&I	Meeting with DP&I and Boral representative 15 May 2012. Briefing letter dated 12 June 2012.	See Section 1.4	Chapter 3
Office of Environment and Heritage (OEH)	Meeting with OEH and Boral representative 24 July 2012.	OEH were briefed on the proposed modifications and will provide comments during adequacy review.	N/A
Environment Protection	Meeting with EPA and Boral	The EPA requested clear explanation of	Sections 5.4 –

Table 3.1 Stakeholder engagement activities and outcomes

Stakeholder	Engagement activity	Outcomes	EA reference
Authority (EPA)	representative 24 July 2012	the minor nature of the noise, dust and water impacts and why quantitative assessments were not required.	5.6
Sydney Catchment Authority (SCA)	On site meeting and tour with representatives of the SCA on 9 July 2012.	The SCA considered the modifications to be minor in context with the approved project, however, sought for appropriate controls for soil and water management during the construction phase for the modifications.	Section 5.5.
Australia Rail Track Corporation (ARTC)	Briefing letter sent to ARTC along with request for land owners consent.	ARTC have been briefed on the proposed modifications and, to date, have not provided further comment.	N/A
Peppertree Quarry Community Consultative Committee	Newsletter which outlines the proposed modifications to be distributed to CCC.	N/A	N/A
Peppertree Quarry Aboriginal Management Committee (AMC)	Participation in Aboriginal heritage field survey on 25 June 2012. Review of draft EA on 10 July 2012.	Letters from AMC members confirming agreement with the findings in the Draft Heritage Assessment are provided in Appendix C.	Sections 5.3.3 and 5.4 and Appendix C.
Boral employees	Newsletter which outlines the proposed modifications to be distributed to employees.	N/A	N/A
Local community	Newsletter which outlines the proposed modifications to be distributed to local community.	N/A	N/A
Neighbouring residences	Newsletter which outlines the proposed modifications to be distributed to neighbouring residences. Ongoing consultation with Glenrock property owner including provision of passing line extension plans and copy of Draft EA.	Boral to enter into Deed of Agreement with Glenrock property owner in relation to the property boundary changes and construction works for the passing line extension.	N/A



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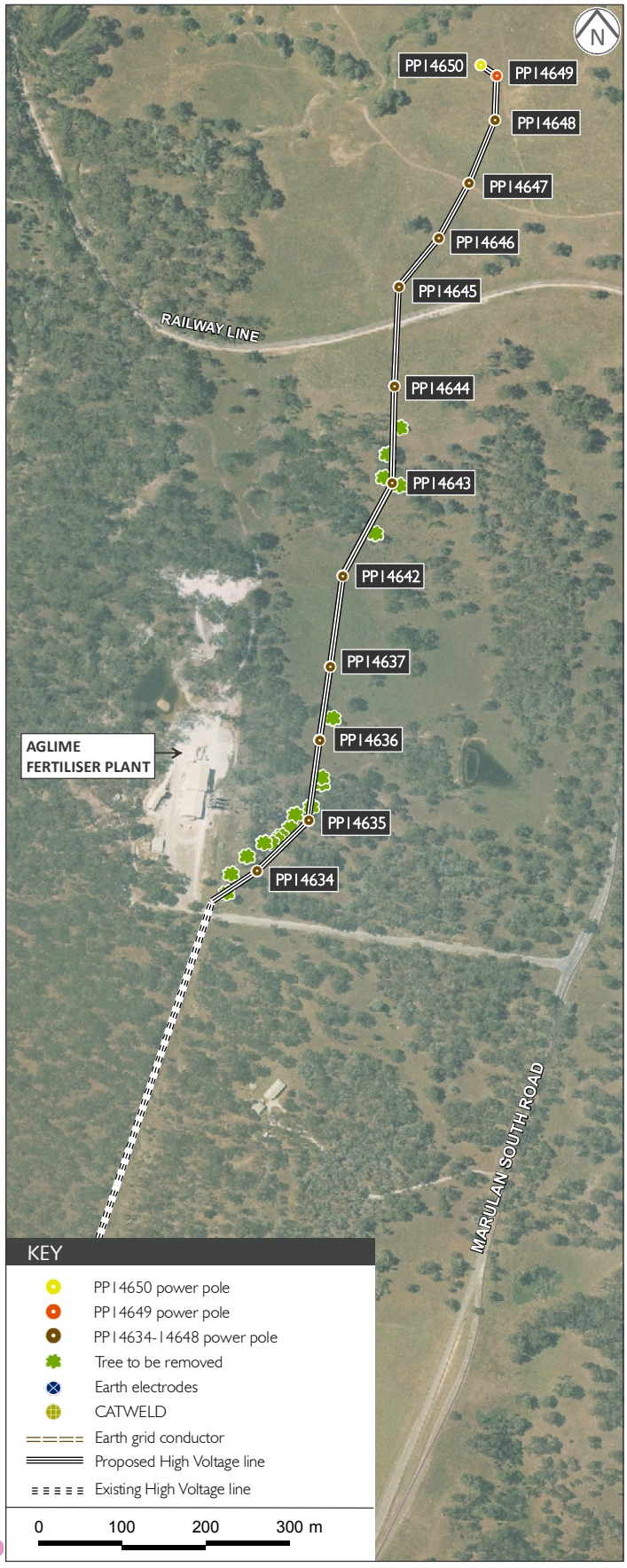
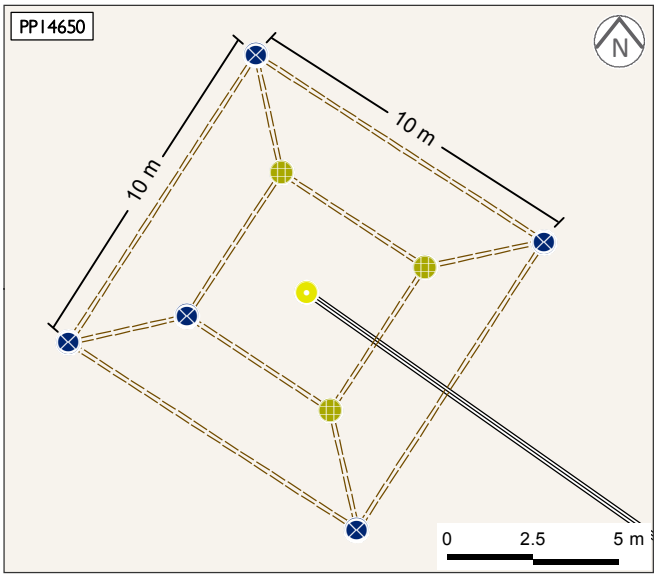
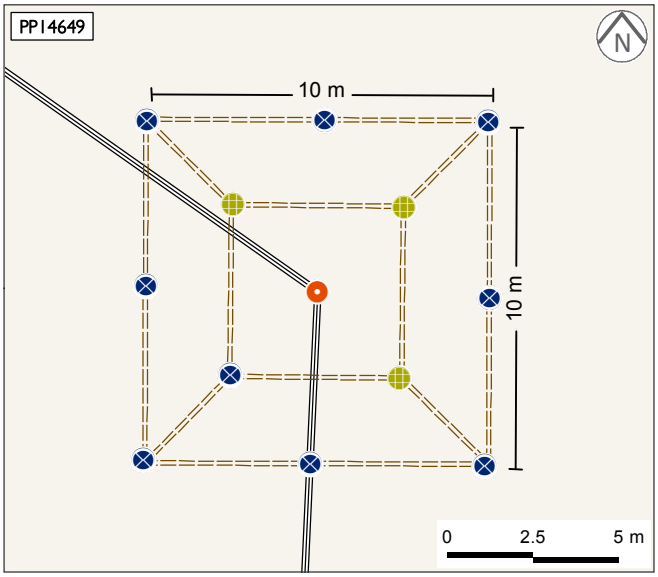
Proposed modification elements

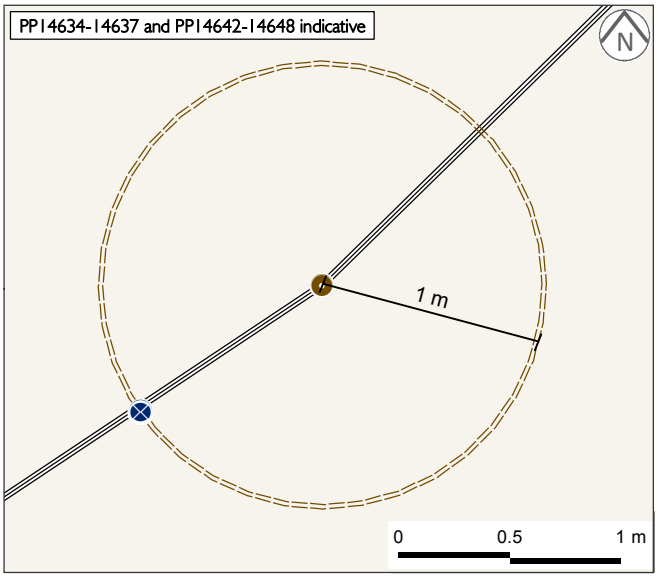
Peppertree Quarry - Modification 3

Figure 3.1









HV line construction works

Peppertree Quarry - Modification 3

Figure 3.2

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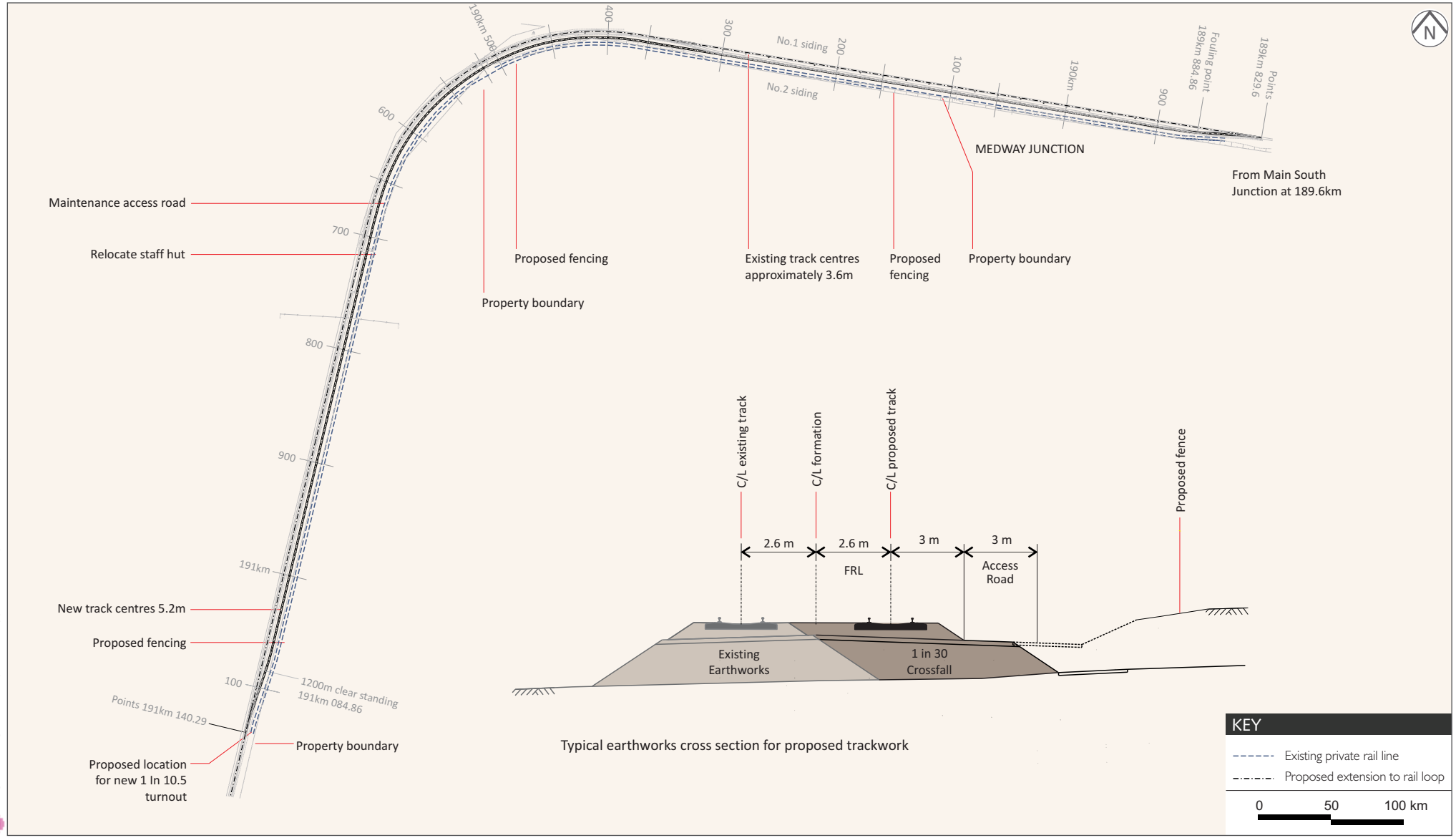

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Passing line extension plans

Peppertree Quarry - Modification 3

Figure 3.3

4 Planning and statutory framework

Boral seeks to modify PA06_0074, as described in Section 3.1, under Section 75W of the EP&A Act.

4.1 Environmental Planning and Assessment Act 1979

Part 3A was recently repealed by the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Act 2011* (Part 3A Repeal Act) which commenced on 1 October 2011. Under the Part 3A Repeal Act, projects deemed to be 'transitional Part 3A projects' will continue to be subject to Part 3A of the EP&A Act (as in force immediately before the repeal and as modified by the Part 3A Repeal Act). Transitional Part 3A projects include certain projects that were the subject of an existing approval under Part 3A.

As the Quarry has a Project Approval that was granted under Part 3A of the EP&A Act, it is understood to be a transitional Part 3A project. The provisions of Part 3A (as in force immediately prior to its repeal) continue to be applicable to the proposed modifications.

The following repealed sections of the EP&A Act, in accordance with the provisions of Schedule 6A, remain applicable to a transitional Part 3A project:

- Section 75R which provides that environmental planning instruments (EPI), other than state environmental planning policies (SEPPs), do not apply to an approved project.
- Section 75J(3) which states that, in deciding whether to grant project approval, the Minister for Planning and Infrastructure may (but is not required to) take into account the provisions of any EPI that would apply but for Section 75R if approved.
- Section 75U provides that there are a number of authorisations that do not apply to a Part 3A approval. The relevant authorisations include:
    - *National Parks and Wildlife Act 1974* (NPW Act): Aboriginal heritage impact permit under Section 90.
    - *Native Vegetation Act 2003* (NV Act): authorisation to clear native vegetation.
- Section 75V provides that there are a number of authorisations that must be issued in terms consistent with the Part 3A approval. The relevant authorisations include:
    - An environment protection licence (EPL) under Chapter 3 of the *Protection of the Environment Operations Act 1997* (POEO Act) (for any of the purposes referred to in Section 43 of that Act).
- Section 75W of the EP&A Act enables the Minister to modify a project approval granted under Part 3A of the EP&A Act. In determining whether changes to a Part 3A project can be modified under Section 75W of the EP&A Act, consideration is given to the proposed modifications and any possible change in potential associated environmental impacts.

Based on the scope and scale of the proposed modifications, the proposed modifications are not predicted to result in significant environmental consequence beyond the current Project Approval and are proposed to be assessed under Section 75W. Detailed assessments provided in Chapter 5 quantify these impacts.

4.2 Other NSW legislation and policies

4.2.1 Legislation

The following NSW Acts of legislation are relevant to the proposed modifications:

- NPW Act;
- NV Act;
- POEO Act; and
- *Threatened Species Conservation Act 1995* (TSC Act).

A discussion of the relevance of the above legislation to the proposed modifications is provided below.

i National Parks and Wildlife Act 1974

The NPW Act provides for nature conservation in NSW including the conservation of places, objects and features of significance to Aboriginal people. A person must not harm or desecrate an Aboriginal object or place without an Aboriginal heritage impact under Section 90 of the NPW Act. However, a Section 90 permit is not required for Part 3A approvals under Section 75U of the EP&A Act. Potential impacts to Aboriginal heritage objects resulting from the proposed modifications are detailed in Section 5.3.

ii Native Vegetation Act 2003

The NV Act provides for the management of native vegetation in NSW. Approval to clear native vegetation in NSW is required under the NV Act. Under Section 75U of the EP&A Act, Part 3A projects are exempt from an authorisation to clear native vegetation under the NV Act. Potential impacts to native vegetation resulting from the proposed modifications are detailed in Section 5.2.

iii Protection of the Environment Operations Act 1997

The POEO Act requires that scheduled premises, which are defined in Schedule 1 of the Act, are required to obtain and operate under an Environment Protection Licence (EPL). The Quarry is a scheduled premise and has an EPL (EPL 13088) administered by OEH. The license authorises the carrying out of scheduled activities: crushing, grinding or separating and extractive activities. If required, the Quarry's EPL will be varied.

iv Threatened Species Conservation Act 1995

The TSC Act aims to protect biological diversity of NSW and lists threatened or endangered flora and fauna species and ecological communities. The potential ecological impacts of the proposed modifications are detailed in Section 5.2 and includes any potential impacts on the TSC Act listed species and communities.

4.2.2 State Environmental Planning Policies

The following SEPPs are relevant to the proposed modifications:

- State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP);

- State Environmental Planning Policy (Infrastructure) 2007 (Infrastructure SEPP);
- State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007 (Mining SEPP); and
- State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (Sydney Catchment SEPP).

The Infrastructure SEPP aims to protect and maintain the structural integrity of existing or proposed rail infrastructure and ensure their safe and effective operation. Division 15 'Railways' of the Infrastructure SEPP applies to the proposed rail siding extension. Rail corridors are defined under Division 15 and include land in respect of which the Minister has granted approval under Part 3A of the EP&A Act for carrying out of development for the purpose of a railway or rail infrastructure facilities. Applicable provisions include Clause 85 'Development immediately adjacent to rail corridors' and Clause 86 'Excavation in, above or adjacent to rail corridors'. Clauses 85 and 86 include matters that the consent authority is to consider when determining a development application for applicable development.

The Mining SEPP aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. The policy establishes appropriate planning controls to encourage ecological sustainable development (ESD). The proposed modifications are consistent with the aims and controls of this policy.

The Major Development SEPP previously defined classes of development to which Part 3A of the EP&A Act applied. This SEPP was amended by State Environmental Planning Policy (State and Regional Development) 2011 in accordance with the repeal of Part 3A, though it is still relevant to the proposed modifications as it continues to apply to transitional Part 3A projects. Clause 6 of the Major Development SEPP previously stated that:

> (1) Development that, in the opinion of the Minister, is development of a kind:
>
> (a) That is described in Schedule 1 or 2, or
>
> ....
>
> is declared to be a project to which Part 3A of the Act applies.

Schedule 1 of the Major Development SEPP includes development for the purposes of extractive industry that:

> (a) Extracts more than 200,000 tonnes of extractive materials per year or,
>
> (b) Extracts from a total resource (the subject of the development application) of more than 5 million tonnes.

The Quarry as approved will extract from a total resource of approximately 150 million tonnes and will extract up to 3.5 Mtpa. Accordingly, the Quarry achieves the requirements of Major Development SEPP and is a project to which Part 3A of the EP&A Act applies.

The Sydney Catchment SEPP aims to provide for healthy water catchments that will deliver high quality water while permitting development that is compatible with that goal. Prior to granting consent to a proposed development, the Catchment SEPP requires that a consent authority must be satisfied that the proposed development will have a neutral or beneficial effect on water quality. It is submitted that the

proposed modifications can be managed to provide a neutral effect on water quality within the Shoalhaven catchment as discussed further in Section 5.5.

4.2.3 Goulburn Mulwaree Local Environmental Plan 2009

The project is located within the Goulburn Mulwaree local government area (LGA). Under the provisions of the Goulburn Mulwaree Local Environmental Plan 2009 (Goulburn Mulwaree LEP), the majority of the project site is zoned RU1 Primary Production. Extractive industries are permissible in this zone with development consent. This modification is consistent with the provisions of the Goulburn Mulwaree LEP.

4.3 Commonwealth legislation

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) aims to protect matters deemed to be of national environmental significance (NES), specifically:

- world heritage properties;
- places listed on the National Heritage Register;
- Ramsar wetlands of international significance;
- threatened flora and fauna species and ecological communities;
- migratory species;
- Commonwealth marine areas; and
- nuclear actions (including uranium mining).

If an action (or project) will, or is likely to, have a significant impact on any of the matters of NES, it is deemed to be a Controlled Action and requires approval from the Commonwealth Environment Minister or the Minister's delegate. To determine whether a proposed action will or is likely to be a Controlled Action, an action may be referred to the Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC).

The proposed modifications will not have a significant impact on any matters of NES, see Section 5.2, and, accordingly, approval from the Commonwealth is not required under the EPBC Act.

5 Impact assessment

5.1 Overview

This chapter examines the change in the potential impacts of Modification 3 to PA06_0074 as compared to the approved Project. It recommends, where required, mitigation and monitoring measures to manage potential impacts.

5.2 Ecology

5.2.1 Introduction

Potential ecological impacts may occur from the clearance of certain vegetation within the HV line 25 m wide corridor and disturbance of ground cover during the installation of the HV line poles and the extension of the passing line. An ecology assessment was undertaken by EMM and is included with this EA as Appendix B. A summary of the methodology and results of this assessment is provided below.

5.2.2 Existing environment

Land to the west, east and south of the Quarry and Limestone Mine are identified as 'Environmentally Sensitive Land – Biodiversity' under the Goulburn Mulwaree LEP and includes the Morton National Park and Bungonia State Conservation Area located to the east and south respectively.

The majority of the Quarry site has been previously used for grazing purposes and is predominantly cleared of native vegetation. Vegetation types are predominantly pasture with some isolated stands of trees and some remnant and regrowth vegetation.

5.2.3 Impact assessment

i Methodology

Ecological impacts of Modification 3 were determined through a desktop assessment and a field investigation of the HV line route. The desktop assessment reviewed relevant literature and databases including:

- OEH's Wildlife Atlas – to obtain records of species listed as threatened under the TSC Act within 10 km of the study area;
- DSEWPaC's Protected Matters database – to obtain records of species listed under the EPBC Act that have the potential to occur within the locality;
- Tozer et al. (2006) Southeast NSW – Native Vegetation Classification and Mapping – SCIVI vegetation map files; and
- unpublished reports provided by Boral that included ecological assessments of proposed impact areas and immediate surrounds.

An ecological field investigation was undertaken on 22 May 2012 and 6 August 2012. The preferred HV line route was walked and assessed for previous disturbance, presence of fauna habitat and the condition of vegetation communities. Two vegetation plots were surveyed within the route using the Biobanking

methodology, one was undertaken in a wooded area (woodland site) in the southern section of the proposed HV line, and the other was completed within a cleared patch in the centre of the route. Opportunistic sightings of birds and other fauna species were also recorded.

ii Results

a. Ecological communities

The vegetation within the HV line route has been mapped as *GW P24 Tableland Grassy Box Gum Woodland* as shown in Figure 5.1 (Tozer et al 2006). This community is described as Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, which is considered to be representative of White Box Yellow Box Blakely's Red Gum Woodland as listed as an endangered ecological community (EEC) under the TSC Act and may also be representative of the White Box - Yellow Box - Blakely's Red Gum grassy woodlands and derived native grasslands critically endangered ecological community (CEEC) listed under the EPBC Act (Tozer et al 2006; DECCW 2008). This community is generally described as Box-Gum Grassy Woodland EEC.

The following environments were recorded within the proposed HV line route during the field investigation:

- areas with mature and over-mature trees forming grassy woodland vegetation;
- areas with no canopy or shrub layer;
- regrowth native vegetation (estimated to be less than 25 years of age);
- small patches of eucalypt regeneration; and
- disturbed areas.

Disturbances recorded within the proposed HV line route included historical clearing, weed invasion, previous agricultural use, roadways and railway lines, dense infestation of Serrated Tussock (*Nassella trichotoma*), limestone dust from an adjacent agricultural limestone plant, and barbed wire fencing.

The passing line extension area includes pasture that has been subjected to agricultural practices, and previously disturbed land within the rail corridor. There is no native vegetation to be impacted in this area.

b. Flora

Of the two vegetation plots that were surveyed, the cleared area contained low diversity and a high cover of exotics (greater than 90%) and only the woodland site was assessed further. The species recorded in the woodland site were compared to the characteristic species of the aligned vegetation type within the Biometric database; Yellow Box - Blakely's Red Gum grassy woodland on the tablelands (DECCW 2008). The vegetation data for the woodland site is summarised in Table 5.1.

Native over storey cover and native ground cover (shrubs) in the wooded site were within the benchmark for the vegetation type. However, all other vegetation measurements were below the lower benchmark indicating reduced diversity and cover of native species generally expected in this vegetation type. According to the Biobanking assessment methodology, the vegetation was in moderate to good condition, but the understorey and ground cover were considered depleted.

Table 5.1 Vegetation data on site compared to vegetation type benchmark

Measurement	Benchmark for Yellow Box - Blakely's Red Gum grassy woodland on the tablelands*	Woodland site (within proposed HV line route) data	Comparison with benchmark
Native plant species richness	20	17	Below
Native over-storey cover	Lower = 17, Upper = 27	24	Within
Native mid-storey cover	Lower = 7.5, Upper = 12.5	4	Below
Native ground cover (grasses)	Lower = 24, Upper = 30	5	Below
Native ground cover (shrubs)	Lower = 0, Upper = 5	0	Within
Native ground cover (other)	Lower = 12.8, Upper = 18.8	6	Below
Total length of fallen logs	0	0	Within
Number of trees with hollows	0	0	Within

** Source: Biometric database; Yellow Box - Blakely's Red Gum grassy woodland on the tablelands (DECCW 2008)*

There are previous records of 16 threatened flora species within, or having potential to occur in, the HV line corridor. There is no potential for threatened flora species to occur in the passing line extension area. No threatened flora species were recorded during the field investigation.

c. Fauna

There are previous records of 32 threatened fauna species (16 birds, 12 mammals, two reptiles and two amphibians) within, or having potential to occur in, the HV line corridor. There is no potential for threatened fauna species to occur in the passing line extension area.

No threatened fauna or flora species were recorded during the field investigation. An assessment of threatened species that have previously been recorded, or with the potential to occur, in the locality identified that the woodland of the proposed HV line could provide some marginal foraging and sheltering habitat and connectivity within the local area for threatened birds, arboreal mammals, reptiles and bats. However, there is no suitable habitat for amphibians, suitable roost or nesting sites for owls, arboreal mammals, bats or other hollow-dependent bird species.

iii Discussion

a. HV line construction impacts

The installation of the line will result in the removal of less than 1 ha of woodland vegetation and adjacent disturbed and weedy pasture areas which include 0.475 ha of Box-Gum Grassy Woodland EEC and a small number of trees. None of these trees contain hollows or bird nests and were selected for preferential removal due to their smaller size. Some additional tree branches may require trimming or lopping where the HV line passes near larger trees. None of the branches to be removed contain hollows or bird nests.

Ground cover vegetation within the community will be disturbed during construction and will be removed from around the base of the HV line poles. No threatened flora or fauna species of conservation significance were recorded within these areas, and it is considered that habitat for such species will not be impacted as a result. The proposed HV line has the potential to increase the spread of weeds in disturbed areas following construction.

The potential for impacts to this community have been assessed under Part 5a of the EP&A Act (seven part test) and under the EPBC Act (assessment of significance) (see Appendix B). The potential impacts of the HV line are not considered to be significant in accordance with the assessments, provided the mitigation measures outlined in this document are implemented.

b. HV line operation impacts

Potential operational impacts from the HV line relate to the maintenance of the cleared easement, which will impact canopy species and will create some ground layer disturbance from vehicles and pedestrian traffic. The maintenance of a cleared 25 m easement is considered unlikely to impact arboreal fauna such as gliders, which can navigate such distances. Other fauna expected to utilise the area include highly mobile species such as bats and birds, which would be unaffected by the maintenance of the easement.

c. Passing line extension

The proposed extension to the passing line will disturb an area of pasture and is not expected to impact on native flora and fauna species. Further, no operational impacts to native flora and fauna species are expected as a result of the passing line extension.

5.2.4 Avoidance, mitigation and management

i Avoidance

The proposal was designed to avoid ecological values within the site. This was achieved by line route selection being undertaken in conjunction with Boral personnel, and a preferred route being selected. This achieved the following outcomes:

- all large over-mature have been avoided and will not require removal;
- all hollow-bearing trees have been avoided;
- fauna habitat such as woody debris and drainage lines have been avoided;
- cleared areas have been preferentially selected;
- the area to be affected is considered depleted with respect to native species; and
- the design results in the smallest area of woodland possible being affected by the proposal (when considering engineering requirements).

ii Management

The following management measures will be implemented during works to minimise the potential for ecological impacts:

- all disturbance areas and access routes will be clearly delineated and flagged in the field so that no areas outside of those assessed will be affected by machinery or personnel;
- no hollow bearing limbs or trees are to be impacted;
- if bird nests are identified these will be avoided by personnel and machinery;

- machinery will not drive over any woody ground debris and where debris is encountered, it will be moved into adjacent native vegetation by hand;
- all machinery will be inspected for weed seeds and clods of soil prior to entering vegetated areas;
- ground disturbance will be minimised wherever possible;
- all waste and materials used on site will be removed at the conclusion of the works;
- all holes and trenches will be filled or capped overnight to prevent fauna from injuring themselves or becoming trapped/drowned;
- sites will be monitored and managed for noxious weeds in the 12 months following works and until native species have regenerated the site; and
- a clearing maintenance protocol will be established for the ongoing maintenance of the easement and will include protocols for the management of weeds such as Serrated Tussock and St John's Wort.

If required, the Quarry's Landscape and Rehabilitation Management Plan will be updated to reflect the works to be undertaken under Modification 3.

iii Improvement

The greatest threat to the ecological integrity of the woodland of the site and immediate surrounds is the invasion by Serrated Tussock and St John's Wort. The clearance of vegetation to occur as part of the proposed HV line route is considered to be minor in comparison to the potential effects of these weeds on the Box Gum Woodland within the locality and the greater region. It is, therefore, considered that the removal and control of these weeds, would more than offset the impacts of the project on the woodland within the local area and the region. In addition, other measures to improve the ecological function of the site can also be contributed by the proposal.

The following measures have been identified to ensure an improved ecological outcome as a result of the proposal:

- Serrated Tussock and St John's Wort will be removed and continuously controlled from the weed management area shown in Figure 5.2, allowing for continued natural regeneration of the woodland; and
- all woody material removed from the proposed HV Line route will be placed in surrounding woodland areas to be utilised as fauna habitat.

Natural regeneration of the woodland canopy species was recorded adjacent to the proposed route and, therefore, planting in cleared areas is not considered to be required, if weeds are adequately controlled in the area. It is likely that if appropriately managed into the future, adjacent pasture areas would naturally regenerate into a functioning component of the Box Gum Woodland community.

5.3 Aboriginal heritage

5.3.1 Introduction

Potential heritage impacts may occur from ground disturbance activities and clearance of certain vegetation under Modification 3. A heritage assessment of the study area, being areas of disturbance within the HV line route and the passing line extension, was undertaken by EMM and is included with this EA as Appendix C. A summary of the methodology and results of this assessment is provided below.

5.3.2 Existing environment

The terrain of the study area is predominantly flat with some gently undulating areas. Generally the study area has been disturbed by the processes of European occupation and clearing of the landscape for agricultural activities. Historically the area has been used for cattle and sheep grazing with some sowing of fodder crops. Previous archaeological salvage excavation has also occurred in this area prior to commencement of quarry activities.

Tindale (1974) identified four major language groups in the region the Gandangara to the north-west, the Ngunawal to the south-west, the Wodi Wodi to the north-east and the Wandandian to the south-east. On the basis of Tindale's mapping, the Quarry site is most likely to have been within the boundary of the Gandangara group.

European explorers first visited the southern tablelands as early as 1798 when John Wilson was sent to the area by Governor Hunter (Chisholm 2006). It was officially found by James Meehan in 1818 (Firth 1983). Stock and cattle stations were established in the 1820s throughout the Goulburn plains and the wool industry dominated the area during the 1800s and through the early twentieth century (Firth 1983). Sir Richard Bourke chose the area of the town of Goulburn in 1832. The railway was built to Goulburn in 1869. Major towns included Marulan, which was established first in 1834 and then moved approximately 2 km away in 1868 when the Great South Railway Line was constructed. Other towns established in the area included Tallong (1869), Wingello (1871) and Bungonia (1836).

5.3.3 Impact assessment

i Historic heritage

Desktop searches were conducted of the National, Commonwealth, and State Heritage Registers and relevant heritage studies. The National Heritage List, Commonwealth Heritage List, Australian Heritage Database, State Heritage Register, NSW Heritage Inventory and the Goulburn Mulwaree LEP did not identify any historic heritage items within the study area. The Goulburn Heritage Study (Firth 1983) and the Mulwaree Community Heritage Study (Heritage Archaeology 2004) also did not identify any historic heritage items within the study area.

A locally listed heritage item, the Glenrock homestead, stone outbuildings, grounds and trees was identified on Lot 204 DP 870194, the property adjoining the proposed rail corridor. Approximately 960 m^2 of this property will be incorporated into the rail corridor to facilitate the proposed passing line extension. The passing line will not affect the pastoral setting of Glenrock or impact on its ability to contribute to our understanding of pastoral life in the area. No trees which are part of the Glenrock property will be removed. Train movements will not increase and there are no predicted increases in vibration which may impact the homestead. Therefore, no heritage impact is predicted on the Glenrock homestead outbuildings, grounds and trees from the proposed modifications.

Archaeological potential was investigated using aerial photographs and topographic maps of the study area. No areas of archaeological potential were identified.

Due to the factors detailed above the area is not considered sensitive for historic heritage. Therefore, it is submitted that no heritage items will be adversely affected by the proposed modifications.

ii Aboriginal heritage

An extensive search of OEH's Aboriginal Heritage Information Management Systems (AHIMS) was conducted on 6 June 2012 for an area approximately 5 km X 3 km surrounding the study area. The search revealed a total of 59 registered sites with indicative locations shown on Figure 5.2. The most common site type recorded was open camp site (artefact scatter) (56%), isolated finds (41%) and one scarred tree and one burial. Previous archaeological investigations, relevant to the study area, have been undertaken by Haglund in 1986, Lance and Koettig in 1986, Umwelt in 2005 and 2006, ERM in 2006, and AMBS in 2012.

Based on the results of previous archaeological investigations, AHIMS search results and landscape features of the study area, the following predictions were made of the study area:

- there is limited potential for rock shelter sites;
- if sites occur, they are likely to consist of flaked stone artefact scatters and isolated finds;
- silcrete from local and regional sources would be the most commonly used raw material;
- scarred trees are rare, but may be present where mature native trees remain in the study area.

The landscape has been disturbed by agricultural practices and clearing of natural vegetation and any artefacts discovered are likely to be in disturbed contexts.

An archaeological inspection of the study area was undertaken by EMM's archaeologist, a Boral representative, and members of the Quarry's Aboriginal Management Committee on 25 June 2012. No Aboriginal sites were identified during the survey of the passing line extension. One Aboriginal site, an artefact scatter designated PTQ 1, was located in the northern section of the HV line route approximately 2 m from the location of power pole PP14648. The heritage significance of PTQ 1 was determined to be low as it does not have significant research potential as it has been disturbed and the artefacts identified do not have evidence of rare features and are consistent with the artefacts identified and salvaged previously at the site.

The northern section of the HV line route will pass through areas where Aboriginal objects are predicted to occur, identified as being archaeological sensitive, predominantly within close proximity to Tangarang Creek and the HMA (see Figure 3.3). Furthermore, previous excavation of this area under the Aboriginal Heritage Management Plan has recovered a large portion of artefacts in controlled conditions providing a rich research sample of the Tangarang Creek and its surrounds. The construction corridor for the HV line will affect a minor proportion of the sensitive area (0.45%) and, therefore, impacts to Aboriginal heritage are considered low. However, at the request of the Aboriginal Management Committee, the location of poles in the northern section of the HV line route have, where possible, been moved away from the archaeologically sensitive area and closer to previously disturbed areas.

The passing line extension will not have a substantial impact on Aboriginal heritage as it is not predicted that Aboriginal objects will occur in this context. The survey did not reveal any evidence of Aboriginal objects and the rail passing line is being constructed predominantly in the heavily disturbed rail line

corridor and in two small sections of adjoining paddock. Further, these areas do not contain landscape features which may predict the location of Aboriginal objects or sites.

A copy of EMM's draft Aboriginal and historic heritage impact assessment was provided to the members of the Quarry's Aboriginal Management Committee on 10 July 2012, including the results of the draft assessment and draft measures proposed to manage Aboriginal heritage during construction works (see below). A copy of each member's response is provided in Appendix C of this report. As can be seen from the responses, each member of the committee supports the assessment and, in particular, measures proposed to manage Aboriginal heritage.

5.3.4 Management

As a result of the desktop study, survey and subsequent response from survey participants, the following measures for management of heritage impacts will be implemented:

- monitoring during construction of the HV line will be undertaken by members of the Aboriginal Management Committee and in accordance with the AHMP; and
- any artefacts identified during monitoring will be collected, bagged, tagged and stored with the artefacts already excavated from the quarry area and reburied in an area to be determined by the AMC.

5.4 Noise

5.4.1 Introduction

Noise emissions will be associated with the construction of the passing line extension and the HV line. The construction works associated with Modification 3 are described in Section 3.1. Operational noise emissions are not expected to increase from that approved under PA06_0074 as a result of Modification 3.

5.4.2 Existing environment

The Quarry is located within a rural setting with surrounding land uses including rural residential, industrial, and agricultural. Sensitive receivers are located predominantly to the west of the Quarry off Marulan South Road.

Construction activities for the Quarry are currently ongoing with the noise bunds to the north and east of the future pit already completed. Current construction activities include the rail loop and loading facilities, the processing plant and preliminary pit development. Construction noise is managed in accordance with Conditions 3 and 4 of Schedule 3 of PA06_0074 and the Quarry's CNMP.

The main objectives of the CNMP are to:

- ensure that, as far as practicable, construction activities meet construction noise and vibration goals across the allowed hours of operation; and
- implement reasonable and feasible best practice noise controls to minimise noise emissions and/or exposure duration at affected receptors where noise and vibration levels are above relevant goals.

5.4.3 Impact assessment

i Construction impacts

The proposed construction works are relatively removed from the Quarry and works will occur prior to quarrying activities commencing at the Quarry. Therefore, any potential impacts will be discrete and isolated from quarrying activities as received at the closest residences. This is particularly applicable to the passing line extension which is some 5 km north of the site. It is, therefore, considered reasonable to address potential noise impacts in accordance with Schedule 3, Condition 2 of the PA06_0074 which applies to construction of noise bunds at the Quarry.

Schedule 3, Condition 2 of the PA06_0074 nominates the *Environmental Noise Control Manual* (ENCM) *1994* for noise associated with construction work of the noise bunds at the Quarry for the first three months of construction. This guideline has since been superseded by the *Interim Construction Noise Guidelines* (ICNG). For a three month or less construction scenario, the ICNG provides similar noise guideline values to the former ENCM, but also provides further management and mitigation recommendations that will better protect the community.

For major commercial type construction developments, the ICNG recommends a quantitative noise assessment approach. Table 5.2 is an extract from the ICNG and relates to residential receivers only.

Table 5.2 ICNG residential criteria

Time of day	Management level $L_{Aeq\ (15\ min)}$*	How to apply
Recommended standard hours: Monday to Friday 7:00 am to 6:00 pm, Saturday 8:00 am to 1:00 pm, No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq (15 min) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: - times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences - if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see Section 7.2.2 of the ICNG.

From a noise perspective, the plant and equipment to be used are consistent with typical rail track works and transmission line installations. These include truck mounted cranes, winches and road trucks as well as purpose specific equipment. Importantly the duration of the works is expected to be between four to six weeks and all works are to be undertaken during daytime hours only. Therefore, there will be relatively limited noise exposure to residences and a detailed quantitative noise impact assessment of the proposed works is not considered warranted.

All reasonable and feasible noise mitigation will be adopted for the project and, where practical, will be made to satisfy the ICNG criteria.

ii Operational impacts

In terms of operational rail noise from the passing line, it is considered that the change in noise environment from what is already approved would not be discernable and a quantitative assessment is not required to assess operational noise impacts. This is based on the following factors:

- the extension to the passing line will run parallel to the existing private rail line approximately 2 – 3 m to the east; and
- there will be no change in approved train movements.

The representative receivers assessed for the original project are located west and south of the passing line and the minor extension to the east is unlikely to result in an increase in existing train noise levels at these locations. Therefore, the operational noise impacts resulting from the passing line extension are expected to be as per the previous assessment of the existing line.

Operational noise impacts resulting from the HV line are also expected to be negligible as the HV line would not be a significant contributor of noise.

5.4.4 Management

Activities will be managed using the site's existing CNMP that will be adapted to the proposed construction works under Modification 3.

Key aspects of the CNMP that would be implemented for the modifications are:

- notify surrounding neighbours of the construction works;
- use of mobile equipment that complies with the Sound Power Levels in Table 3.1 of the CNMP; and
- fitting mobile equipment with Broadband reversing alarms.

The primary management measure is to undertake construction during daytime hours only, which will be adopted for construction of the passing line extension and HV line. The ICNG recommends works are restricted to:

- Monday to Friday, 7.00 am to 6.00 pm;
- Saturday, 8:00 am to 1:00 pm; and
- no construction work to take place on Sunday and public holidays.

5.5 Surface water

Surface water drains to ephemeral creeks located within the Quarry site. The main ephemeral creek is Tangarang Creek which flows along the northern edge of the Quarry site to Barbers Creek approximately 500 m to the east of the Quarry. Barbers Creek was considered by the Health Rivers Commission (1999) to have a high ecological value despite being in poor condition, relative to the rest of the Shoalhaven catchment, due to the effects of variable quality runoff from agricultural sub-catchments. Barbers Creek flows into the Shoalhaven River 6.5 km to the south of the Quarry and 30 km upstream of Tallowa Dam which supplies raw water to the Sydney and Illawarra drinking water systems.

Potential surface water impacts may occur during construction of the passing line extension and the HV line where ground disturbance works may increase sediment loads in surface runoff. Sediment and erosion measures have been proposed for implementation during construction and include the use of sediment fences or filter sausages as shown in Figures 5.4 and 5.5. The sediment fencing or filter sausages will capture any sediment generated during rain events and are to be located downhill of proposed disturbance areas. Soil displaced during construction will be removed and not be stockpiled on site thereby reducing potential for sediment laden runoff. Implementation of these sediment and erosion measures during construction is expected to result in a neutral effect on local catchment water quality and the water quality of Tangarang Creek and Barbers Creek.

Following construction, all disturbed areas will be stabilised and rehabilitated to limit the generation of sediment. No surface water impacts are considered likely during operation of the passing line or HV line.

5.6 Air quality

Construction works associated with Modification 3 would generate minor levels of dust emissions through the clearing of vegetation and operation of construction machinery. The likely levels of dust generated are minor and will only occur intermittently during the six week period of construction. It is considered that the levels of dust generated by the construction will be imperceptible compared to dust emissions from approved quarrying activities, and surrounding industrial and agricultural land uses.

Soil displaced during construction will be removed and not stockpiled on site thereby minimising the potential for dust generation.

Dust generated through construction traffic movements are also considered to be minor and imperceptible from approved traffic movements from the Quarry and other vehicle movements on Marulan South Road.

5.7 Visual

The visual impacts of the HV line will be negligible with the line unlikely to be visible from key view points in the locality. The HV line will be screened by vegetation from views on Marulan South Road.

The passing line extension will be at the same grade as the existing rail line and not visible from key view points in the locality.

Visual impacts during construction will not be significant due to the minor levels of works and the relatively short construction period.

5.8 Hazards

The HV line is to be constructed to the required safety standards. Vegetation 12.5 m either side of the centre line is to be cleared to reduce the potential for hazards such as bush fire. The HV line is entirely within a fenced private property and will be inaccessible to the public.

The passing line extension will require works to be conducted within a rail corridor and in and above rail tracks. Safety precautions will be implemented during construction works to minimise the potential for injury or death of personnel.

5.9 Traffic and transport

Traffic movements generated by Modification 3 relate entirely to construction related traffic. Construction related traffic includes construction staff movements and truck deliveries of equipment and materials.

Construction traffic for the original project was assessed by ERM Australia Pty Limited (2006), and assumed worst case construction movements as up to 10 heavy vehicle movements and 40 individual construction contractor movements per day. This accounted for less than 12% of average daily traffic flows and less than 25% of total approved vehicle movements on Marulan South Road.

Traffic movements relating to construction of the HV line will result in a minor and relatively short-term increase in the number of construction related traffic movements on Marulan South Road which will remain well within capacity.

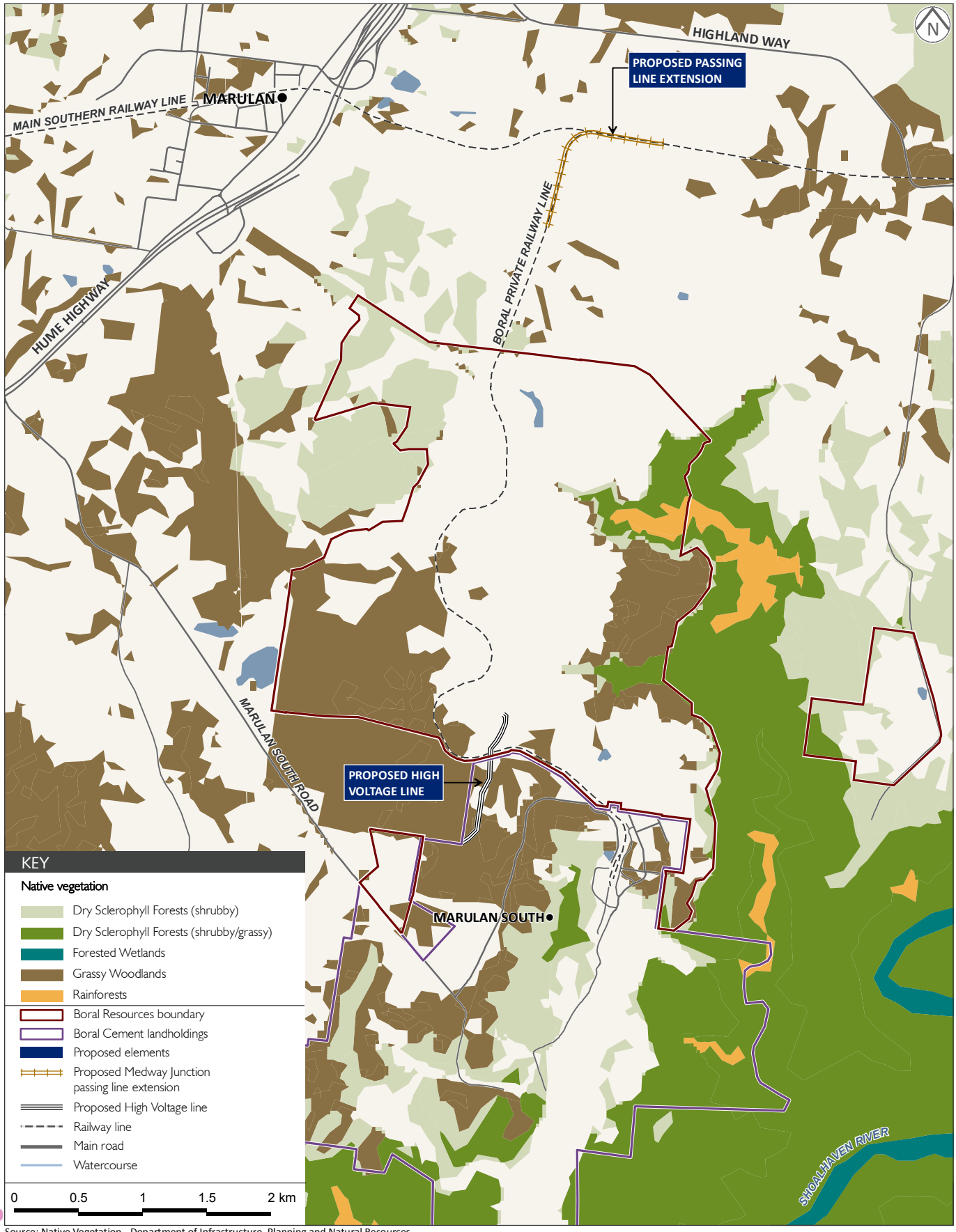
Traffic movements relating to construction of the passing line extension will access the site via Highland Way and will not increase the Quarry related traffic movements on Marulan South Road.

5.10 Wastes

The types of waste generated by Modification 3 will include the following:

- ‘green’ waste such as removed trees and cleared ground cover;
- disused wastes from the rail sidings such as timber sleepers and steel beams; and
- general construction wastes.

All waste and materials used will be removed from the disturbed areas at the conclusion of the works and disposed of appropriately. Green wastes may be used for rehabilitation purposes elsewhere on site, if possible.



Source: Native Vegetation - Department of Infrastructure, Planning and Natural Resources.

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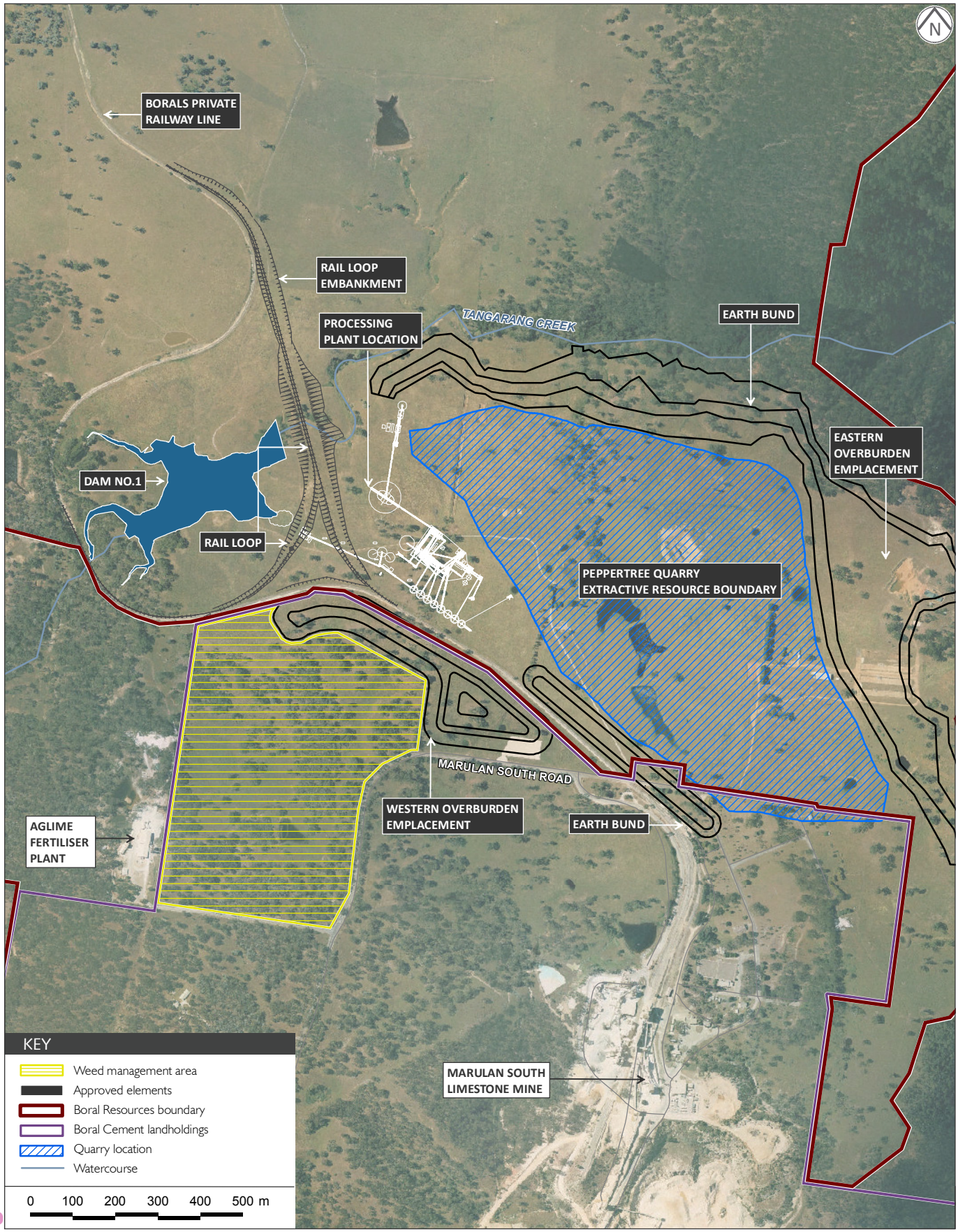
EMM

Vegetation map of the locality

Peppertree Quarry - Modification 3

Figure 5.1



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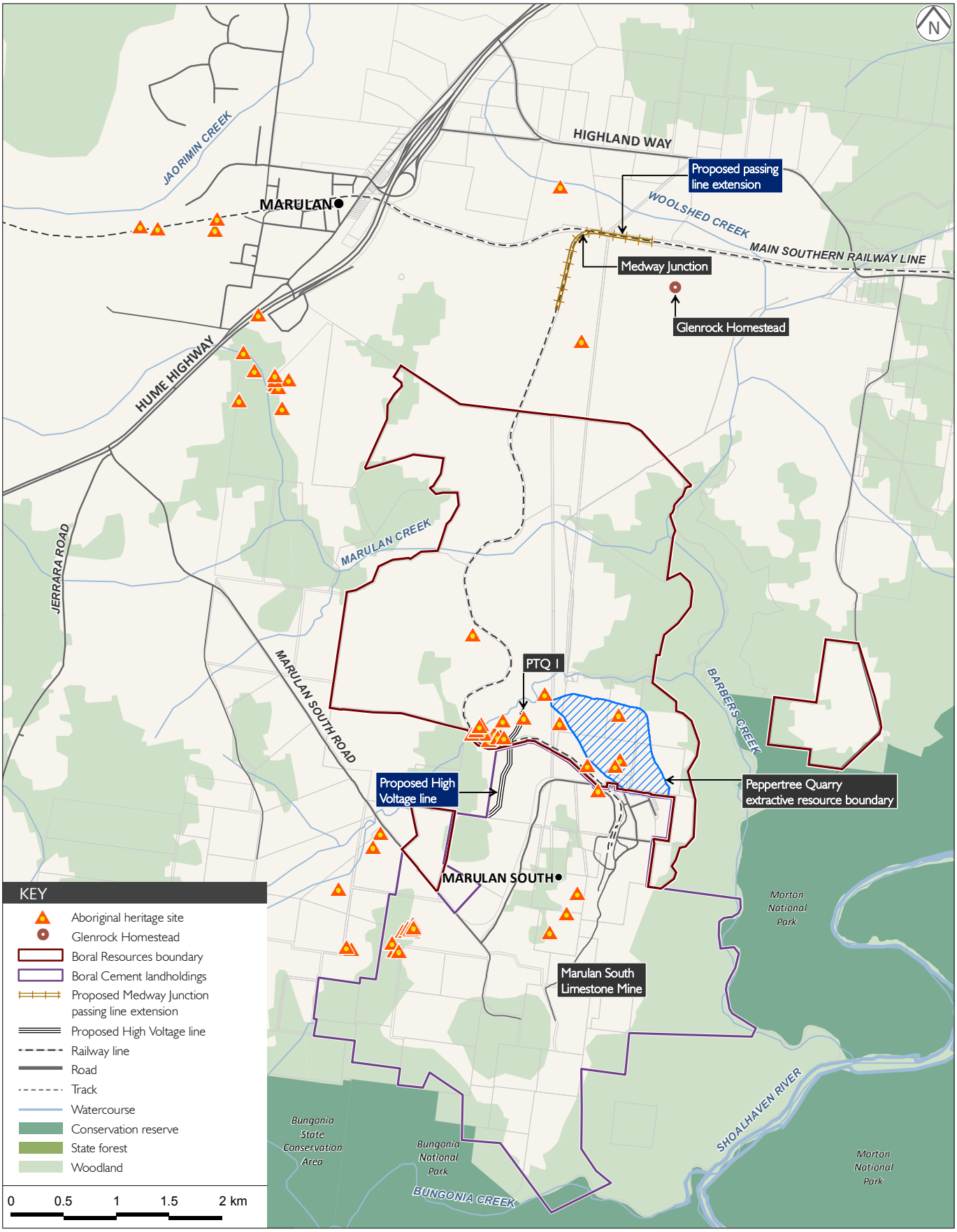
Weed management area

Peppertree Quarry - Modification 3

Figure 5.2



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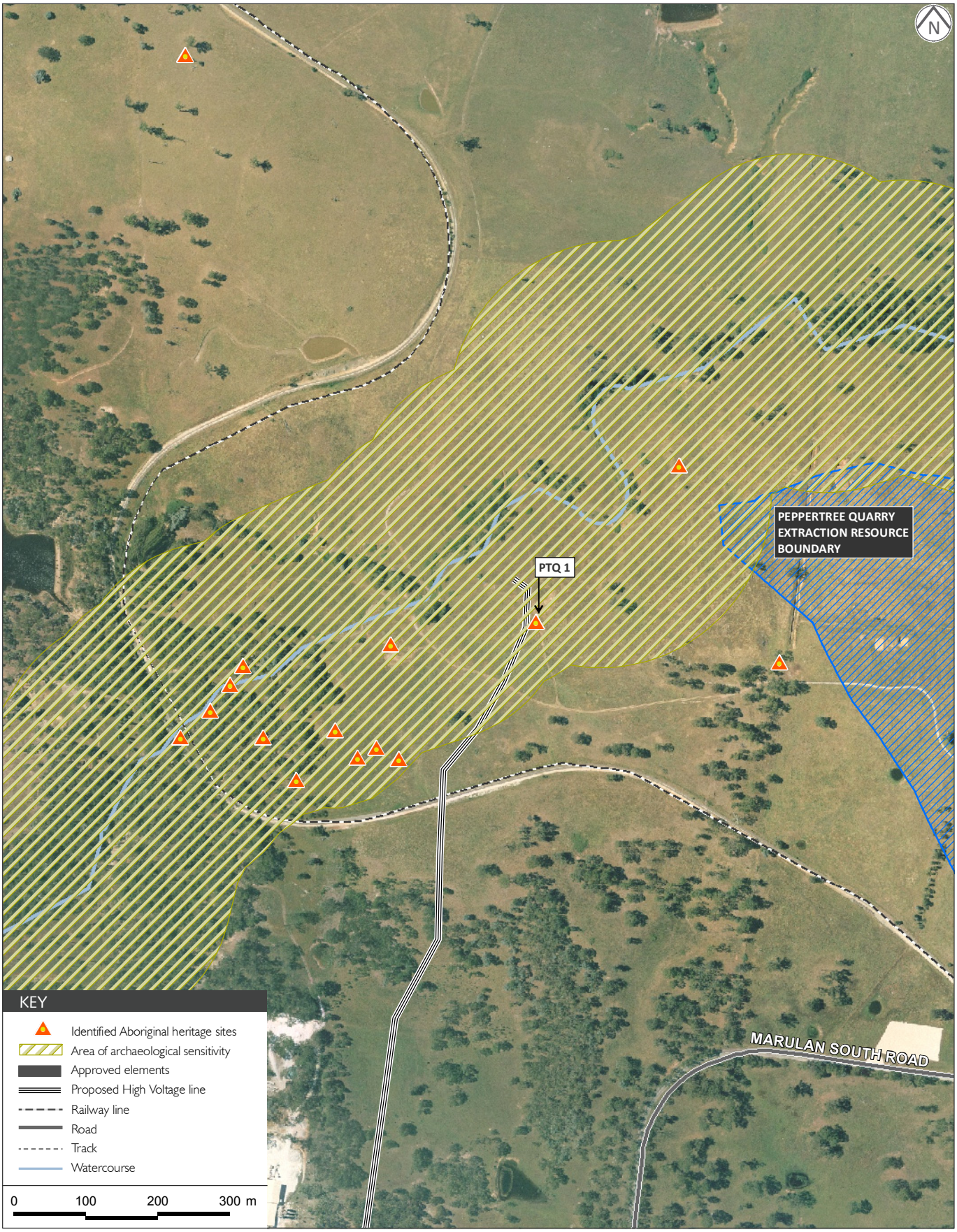
Heritage database analysis

Peppertree Quarry - Modification 3

Figure 5.3



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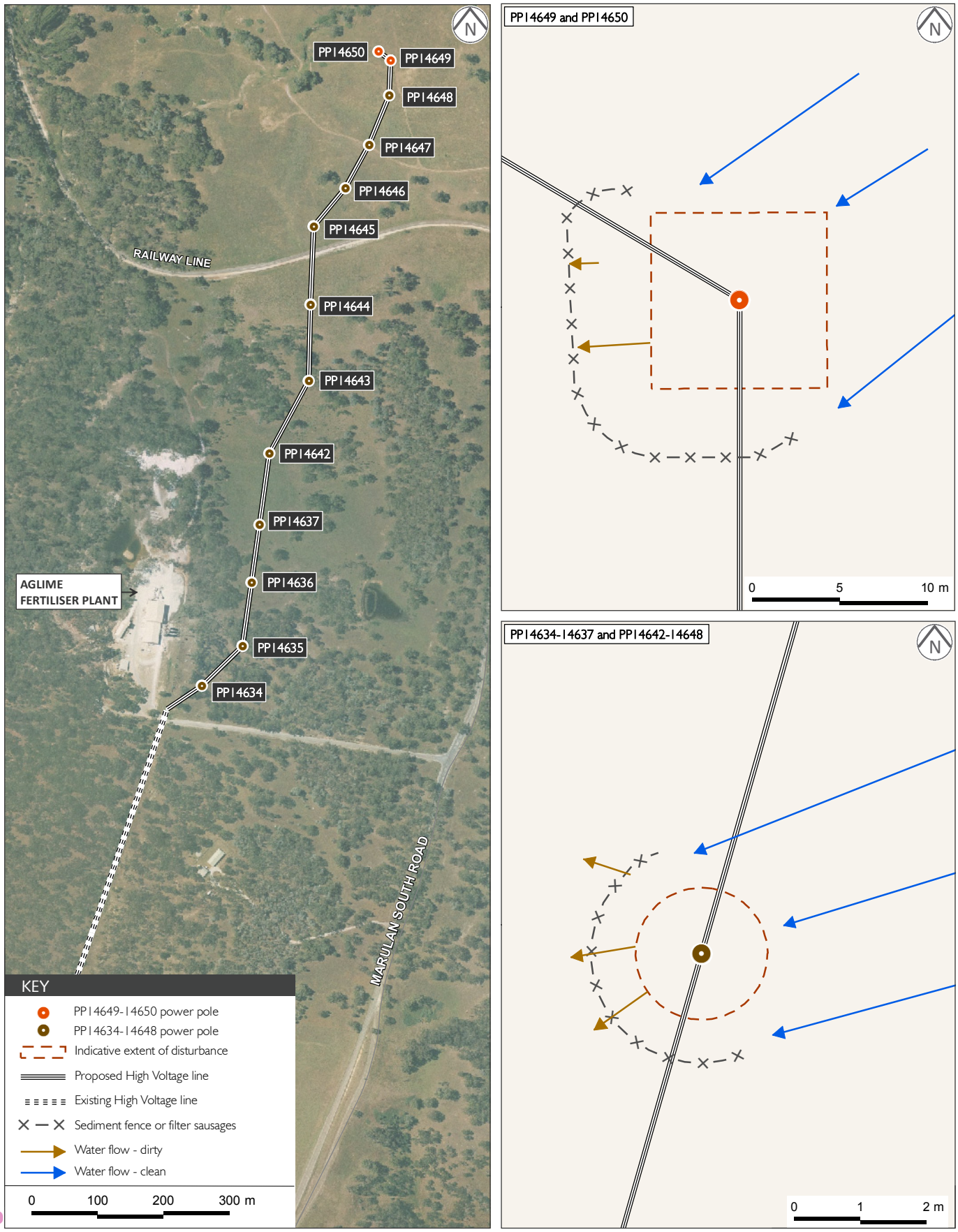
EMM

Archaeologically sensitive area

Peppertree Quarry - Modification 3

Figure 5.4



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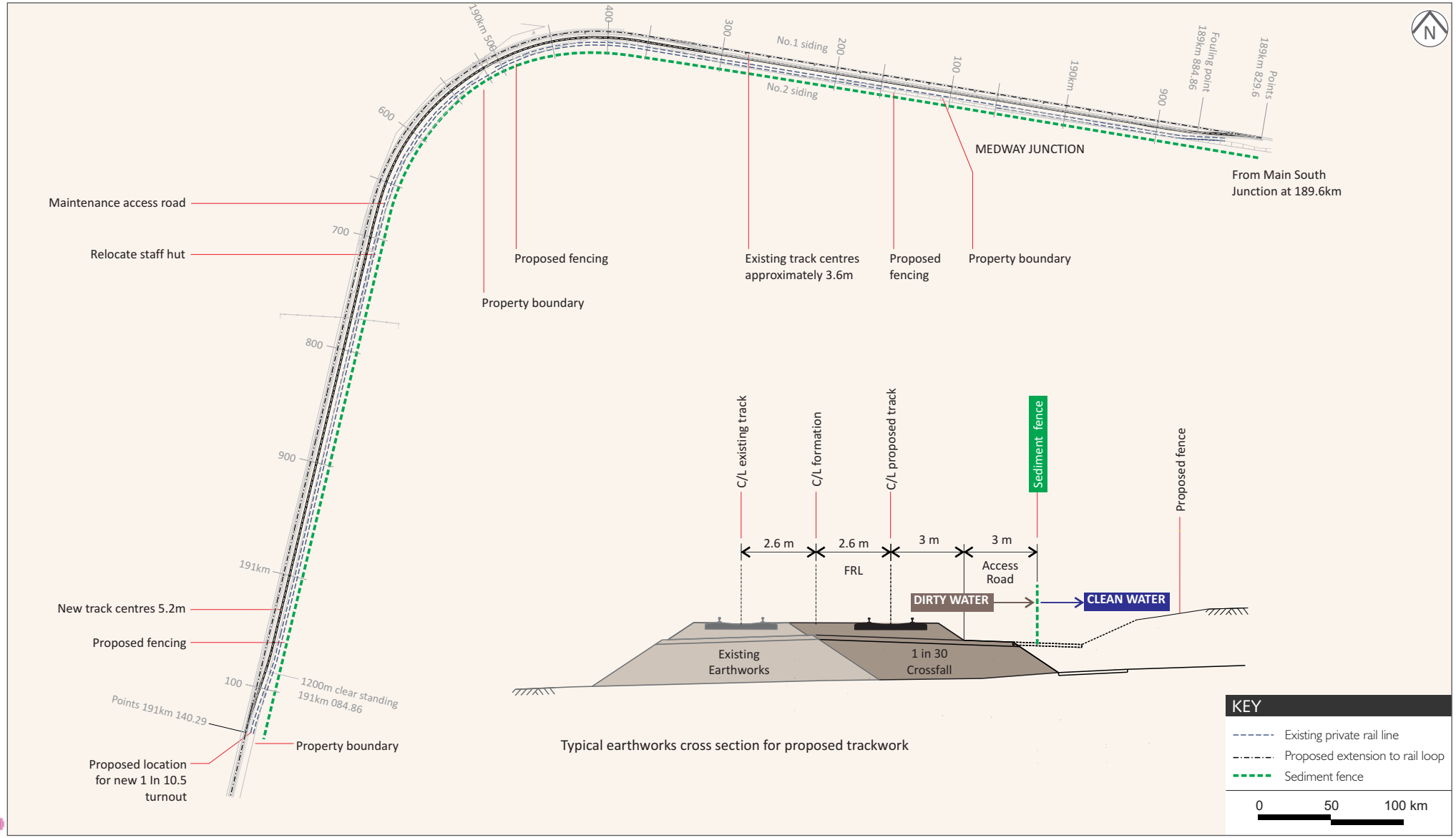
Conceptual sediment and erosion plan - HV line

Peppertree Quarry - Modification 3

Figure 5.5



Typical earthworks cross section for proposed trackwork

* Note: Sediment fence should only be required in fill areas (ie. where runoff can actually leave site)

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EMM

Conceptual sediment and erosion plan - passing line extension

Peppertree Quarry - Modification 3

Figure 5.6

6 Statement of commitments

The proposed mitigation and monitoring measures to manage the potential impacts resulting from Modification 3 to PA06_0074 are summarised in Table 6.1. The statement of commitments details those controls that are specific to the proposed modifications.

Table 6.1 Statement of commitments

Environmental attribute	Commitment
Ecology	• All disturbance areas and access routes will be clearly delineated and flagged in the field so that no areas outside of those assessed will be affected by machinery or personnel. • No hollow bearing limbs or trees are to be impacted. • If bird nests are identified these will be avoided by personnel and machinery. • Machinery will not drive over any woody ground debris and where debris is encountered, it will be moved into adjacent native vegetation by hand. • All machinery will be inspected for weed seeds and clods of soil prior to entering vegetated areas. • Ground disturbance will be minimised wherever possible. • All waste and materials used on site will be removed at the conclusion of the works. • All holes and trenches will be filled or capped overnight to prevent fauna from injuring themselves or becoming trapped/drowned. • Sites will be monitored and managed for noxious weeds in the 12 months following works and until native species have regenerated the site. • A clearing maintenance protocol will be established for the ongoing maintenance of the easement and will include protocols for the management of weeds such as Serrated Tussock and St John's Wort. • If required, the Quarry's Landscape and Rehabilitation Management Plan will be updated to reflect the works to be undertaken under Modification 3.
Aboriginal heritage	• Monitoring during construction of the HV line will be undertaken by members of the Aboriginal Management Committee and in accordance with the AHMP. • Any artefacts identified during monitoring will be collected, bagged, tagged and stored with the artefacts already excavated from the quarry area.
Noise	• Activities will be managed using the site's existing CNMP that will be adapted to the proposed construction works under Modification 3. • Construction works are to be undertaken during the hours of 7 am to 6pm Monday to Friday and 8 am to 1 pm on Saturday with no construction works on Sunday and public holidays.
Sediment and erosion	• The control measures identified in the conceptual sediment and erosion control plans (Figures 3.4 and 3.5) will be implemented. • Following construction all disturbed areas will be stabilised and rehabilitated.
Hazards	• Safety precautions will be implemented during construction works to minimise the potential for injury or death of personnel.
Wastes	• All waste and materials used will be removed from the disturbed areas at the conclusion of the works and disposed of appropriately. • Green wastes will be used for rehabilitation purposes elsewhere on site, if possible.

7 Conclusion and justification

Boral seeks approval from the Minister for Planning and Infrastructure to modify PA06_0074 under Section 75W of the EP&A Act. The proposed modifications include:

- construction of a HV line to provide electricity supply to the approved processing plant; and
- extension of the existing passing line on Boral's rail line to allow standing room for trains to pass other trains on the line.

This chapter considers the potential impacts of the proposed modifications against applicable objects of the EP&A Act and determines whether the proposed modifications are justified from a public interest perspective.

7.1 Objects of the Environmental Planning and Assessment Act 1979

The consistency of the proposed modifications with key relevant objects of the EP&A Act is considered below.

"To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment".

The Quarry is an approved operation with a substantial extractive resource. The proposed modifications would enable the continued operation of the Quarry and efficient extraction of this valuable natural resource.

"The promotion and co-ordination of the orderly and economic use and development of land."

The proposed modifications allow for the continued orderly and economic development of land and resource already approved for extractive purposes.

"The protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats."

The impacts of the Quarry, as originally proposed, have been fully assessed and were determined to be acceptable by the then Minister for Planning. The environmental assessment presented in this document has examined the potential impacts of the proposed modifications and determined that no significant impacts to *threatened species, populations and ecological communities, and their habitats will occur.*

"Ecologically sustainable development"

The principles of ESD are outlined in section 6 of the NSW *Protection of the Environment Administration Act 1991* and Schedule 2 of the EP&A Regulation 2000. The consistency of the proposed modifications with each of these principles is discussed below.

Each of the individual principles of ESD is considered below.

Precautionary Principle: in practice this means that development should not cause serious or irreversible environmental impact. Such impact can be avoided by, firstly, understanding the potential for environmental impact to occur by undertaking a full environmental assessment and, secondly, ensuring

effective mitigation or compensation measures are incorporated into development proposals. The approved operations of the Quarry have fulfilled both of these requirements and incorporate the full range of necessary safeguards. This EA has been prepared on the basis of the most recent and accurate scientific data relevant to the modification. Technical studies have adopted conservative assumptions to enable the upper limit of potential impacts to be determined. The Minister will impose any necessary additional conditions to address the proposed modifications. Thus, the proposed modifications are consistent with the precautionary principle.

Social equity including intergenerational equity: the proposed modifications will ensure that existing employment, both direct and indirect, is ongoing and secure which contributes towards social and intergenerational equity.

Conservation of biological diversity and maintenance of ecological integrity: the approved operations of the Quarry include measures to conserve biological diversity and maintain ecological integrity through the provision of the HMA. The preferred route for the HV line was chosen to provide the most beneficial and enduring ecological outcome.

Improved valuation and pricing of environmental resources: the Quarry was granted project approval in 2007 and, to this extent, the government has valued and priced the environmental resources relevant to the Quarry. The proposed modifications would have a minimal or neutral effect in the application of this principle.

While the modifications alone would be of little consequence in terms of ESD, they would ensure the future use of a significant natural resource and provide for future employment opportunities.

7.2 Conclusion

The proposed modifications can be managed under the Quarry's existing environmental management systems which will be revised as necessary, subject to approval of the proposed modifications. It is considered that, on balance, the overall potential impacts of the proposed modifications are consistent with the approved development and the objects of the EP&A Act.

References

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Peppertree Quarry Modification 3

Appendix A: Project Approval 06_0074

Planning + Environment + Acoustics

Project Approval

Section 75J of the *Environmental Planning & Assessment Act 1979*

I, the Minister for Planning approve the project referred to in schedule 1, subject to the conditions set out in schedules 2 to 5.

The reason for these conditions is to:

- prevent, minimise, and/or offset adverse environmental impacts;
- set standards and performance measures for acceptable environmental performance;
- require regular monitoring and reporting; and
- provide for the on-going environmental management of the project.

Frank Sartor MP
Minister for Planning

Sydney 2007 File No. 9040608

SCHEDULE 1

Project Application:	06_0074
Proponent:	Boral Resources (NSW) Pty Ltd
Approval Authority:	Minister for Planning
Land:	See Appendix 1
Project:	Marulan South hard rock quarry and associated infrastructure

TABLE OF CONTENTS

Red type represents March 2009 Modification
Blue type represents November 2011 Modification

DEFINITIONS

Annual Review	The review required by condition 4 of schedule 5
BCA	Building Code of Australia
CCC	Community Consultative Committee
Council	Goulburn Mulwaree Council
Day	Day is defined as the period from 7.00am to 6.00pm, Monday to Saturday and 8.00am to 6.00pm Sundays and Public Holidays
Department	Department of Planning and Infrastructure
Director-General	Director-General of the Department of Planning and Infrastructure (or delegate)
DPI	Department of Primary Industries
EA	Environmental Assessment for the project titled *Marulan South Quarry Environmental Assessment Report* Volumes 1 and 2 dated October 2006 prepared by ERM
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000*
EPL	Environment Protection Licence under the *Protection of the Environment Operations Act 1997*
Evening	Evening is defined as the period from 6.00pm to 10.00pm
Land	Land means the whole of a lot, or contiguous lots owned by the same landowner, in a current plan registered at the Land Titles Office at the date of this approval
Night	Night is defined as the period from 10.00pm to 7.00am Monday to Saturday and 10.00pm to 8.00am Sundays and Public Holidays
Noise Bund	Bunds built for noise and visual mitigation purposes and which do not exceed 10 metres in height
NOW	NSW Office of Water, within the Department of Primary Industries
OEH	Office of Environment and Heritage
Project	Development to which the Project Approval applies
Proponent	Boral Resources (NSW) Pty Ltd
RTA	Roads and Traffic Authority
Site	Land to which the Project Approval applies (see Appendix 1)
Submissions Report	*Marulan South Quarry Submissions Report* dated December 2006

SCHEDULE 2
ADMINISTRATIVE CONDITIONS

Obligation to Minimise Harm to the Environment

1. The Proponent shall implement all practicable measures to prevent or minimise any harm to the environment that may result from the construction, operation, or rehabilitation of the project.

Terms of Approval

2. The Proponent shall carry out the project generally in accordance with the:
   (a) EA;
   (b) submissions report; and
   (c) modification application 06_0074 – MOD 1 and accompanying Statement of Environmental Effects entitled *Marulan South Quarry Statement of Environmental Effects for a Pre-commencement Exploratory Test Pit* dated 13 November 2008, and letter from Boral Resources Pty Ltd to the Department dated 13 February 2009;
   d) modification application 06_0074 – MOD 2 and the accompanying EA titled *Boral Peppertree Quarry Section 75W Modification Report*, dated June 2011, prepared by ERM Australia, and the responses to issues raised in submissions, including those titled *Peppertree Quarry Submissions Report*, dated 24 August 2011, *Response to OEH Submission*, dated 12 October 2011, and *Response to Armitt Submission*, dated 25 October 2011; and
   e) conditions of this approval.

   Note: The general layout of the project is shown in the figure in Appendix 2.

3. If there is any inconsistency between the above, either the most recent document or the conditions of this approval shall prevail to the extent of the inconsistency.

4. The Proponent shall comply with any reasonable requirement/s of the Director-General arising from the Department's assessment of:
   (a) any reports, plans, programs or correspondence that are submitted in accordance with this approval; and
   (b) the implementation of any actions or measures contained in these reports, plans, programs or correspondence.

4A. The proponent shall be permitted to undertake pre-construction exploratory test pit activities as described in modification application 06_0074 MOD 1.

   Note: The commencement of test pit activities as described in modification application 06_0074 MOD 1 is not subject to the preparation of management plans.

Limits on Approval

5. This approval shall lapse at the end of 2038.

6. The Proponent shall not transport more than 3.5 million tonnes of product from the site in a year.

7. All extractive materials and products shall be transported from the site by rail. However, the Proponent may transport some product by road in an emergency with the written approval of the Director-General.

Structural Adequacy

8. The Proponent shall ensure that all new buildings and structures on the site are constructed in accordance with the relevant requirements of the BCA.

   Notes:
   - *Under Part 4A of the EP&A Act, the Proponent is required to obtain construction and occupation certificates for any building works.*
   - *Part 8 of the EP&A Regulation sets out the detailed requirements for the certification of development.*

Demolition

9. The Proponent shall ensure that all demolition work on site is carried out in accordance with *AS 2601-2001: The Demolition of Structures,* or its latest version.

Protection of Public Infrastructure

10. The Proponent shall:
    (a) repair, or pay all reasonable costs associated with repairing any public infrastructure that is damaged by the project; and

(b) relocate, or pay all reasonable costs associated with relocating any public infrastructure that needs to be relocated as a result of the project.

Operation of Plant and Equipment

11. The Proponent shall ensure that all plant and equipment used at the site is:
    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient condition.

12. With the approval of the Director-General, the Proponent may prepare and submit any management plan or monitoring program required by this approval on a progressive basis.

SCHEDULE 3
ENVIRONMENTAL PERFORMANCE CONDITIONS

GENERAL EXTRACTION AND PROCESSING PROVISIONS

Identification of Boundaries

1. Prior to the commencement of construction, or as otherwise agreed by the Director-General, the Proponent shall:
   (a) engage an independent registered surveyor to survey the boundaries of the approved limit of extraction;
   (b) submit a survey plan of these boundaries to the Director-General; and
   (c) ensure that these boundaries are clearly marked at all times in a permanent manner that allows operating staff and inspecting officers to clearly identify those limits.

Note: The limit of extraction is shown conceptually on the plan in Appendix 2.

NOISE

Construction of Bunds

2. In carrying out the construction of the noise bunds, the Proponent shall:
   (a) comply with the construction noise criteria in the *Environmental Noise Control Manual 1994* for the first three months of the construction work; and
   (b) thereafter, comply with the daytime operational noise criteria in condition 4.

Construction Noise Management Plan

3. The Proponent shall prepare and implement a Construction Noise Management Plan for the project to the satisfaction of the Director-General. This plan must be submitted to the Director-General for approval prior to the commencement of construction, and include:
   (a) a detailed description of the measures that would be implemented to achieve the construction noise limits in the *Environmental Noise Control Manual 1994* and the operational noise criteria in condition 4*;*
   (b) a community notification protocol for the proposed construction activities;
   (c) a description of the measures that would be implemented where the construction noise limits and/or operational noise limits are unlikely to be achieved or are not being achieved; and
   (d) details of who would be responsible for monitoring, reviewing and implementing the plan.

Operational Noise Impact Assessment Criteria

4. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1.

Residential Receiver	***Day Shift***	***Night Shift***		
	Day $L_{Aeq(15\ minute)}$	*Evening* $L_{Aeq(15\ minute)}$	*Night*	
			$L_{Aeq(15\ minute)}$	$L_{A1(1\ minute)}$
1	35	35	35	45
2	39	35	35	45
3	42	35	35	46
4	37	35	35	46
5	35	35	35	45
6	35	35	35	45
16	41	35	35	45
Any other noise sensitive location	35	35	35	45

Table 1: Noise Impact Assessment Criteria

Notes:

- *The identified "Day" noise criteria apply throughout the period of the site's Day Shift (ie 7.00am to 7.00pm) on all days, despite the general definitions of Evening and Night otherwise applying to the approval. The*

identified "Evening" and "Night" criteria apply only during the period of the site's Night Shift (ie 7.00pm to 7.00am).

- *Noise generated by the project is to be measured in accordance with the relevant procedures and exemptions (including certain meteorological conditions) of the NSW Industrial Noise Policy.*
- *Residential receiver locations are shown in Appendix 2A.*

Land Acquisition Criteria

5. If the noise generated by the project exceeds the criteria in Table 2, the Proponent shall, upon receiving a written request for acquisition from the landowner, acquire the land in accordance with the procedures in conditions 6-8 of Schedule 4.

Residential Receiver	***Day*** $L_{Aeq(15\ minute)}$	***Evening / Night*** $L_{Aeq(15\ minute)}$
1	41	40
2	44	44
3	44	44
4	41	41
5	40	40
6	40	40
16	44	44

Table 2: Land Acquisition Criteria

Note: The notes under Table 1 apply equally to Table 2.

Cumulative Noise Criteria

6. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other extractive industries does not exceed the following amenity criteria on any privately owned land, to the satisfaction of the Director-General:
   - $L_{Aeq(11\ hour)}$ *50 dB(A) – Day;*
   - $L_{Aeq(4\ hour)}$ *45 dB(A) – Evening; and*
   - $L_{Aeq(9\ hour)}$ *40 dB(A) – Night.*

Additional Noise Mitigation Measures

7. Upon receiving a written request from the owner of residential receiver 3 (except where a negotiated noise agreement is in place) the Proponent shall implement additional noise mitigation measures such as double glazing, insulation, and/or air conditioning at any residence on the land in consultation with the owner. These additional mitigation measures must be reasonable and feasible. If within 3 months of receiving this request from the landowner, the Proponent and the owner cannot agree on the measures to be implemented, or there is a dispute about the implementation of these measures, then either party may refer the matter to the Director-General for resolution.

8. Within 3 months of this approval, the Proponent shall notify the owner of residential receiver 3 that he/she is eligible for additional noise mitigation measures.

Operating Conditions

9. The Proponent shall:
   (a) implement best practice noise management, including all reasonable and feasible noise mitigation measures to minimise the noise generated by the project;
   (b) investigate ways to minimise the noise generated by the project;
   (c) operate a comprehensive noise management system that uses a combination of predictive meteorological forecasting and noise monitoring data to guide the day to day planning of quarrying operations and the implementation of both proactive and reactive noise mitigation measures to ensure compliance with the relevant conditions of this approval;
   (d) minimise noise impacts during adverse weather conditions; and
   (e) report on these investigations and the implementation and effectiveness of these measures in the Annual Review,

   to the satisfaction of the Director-General.

Noise Management Plan

10. The Proponent shall prepare and implement a Noise Management Plan for the project to the satisfaction of the Director-General. This plan must be prepared in consultation with OEH and submitted to the Director-General for approval by the end of March 2012, and must:

(a) describe the measures that would be implemented to ensure compliance with the relevant conditions of this approval;
(b) describe the noise management system;
(c) include a noise monitoring program that:
- supports the noise management system;
- provides information to evaluate the performance of the project;
- includes a protocol for determining exceedances of relevant conditions of this approval; and
- provides for the use of real-time and/or supplementary attended monitoring measures, if directed by the Director-General;

(d) include a community notification protocol for the proposed construction activities; and
(e) detail who would be responsible for monitoring, reviewing and implementing the plan.

Hours of Operation

11. The Proponent shall comply with the hours of operation in Table 3.

Activity	*Day*	*Time*
Construction works	Monday-Friday	7.00am to 6.00pm
	Saturday	8.00am to 1.00pm
	Sunday and public holidays	None
Topsoil/overburden removal/emplacement	Any day	7.00am to 7.00pm
Blasting	Monday-Saturday	9.00am to 5.00pm
	Sunday and public holidays	None
In-pit activities (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	24 hours

Table 3 – Hours of Operation

BLASTING AND VIBRATION

Airblast Overpressure Criteria

12. The Proponent shall ensure that the airblast overpressure level from blasting at the project does not exceed the criteria in Table 4 at any residence on privately-owned land.

Airblast overpressure level (dB(Lin Peak))	*Allowable exceedance*
115	5% of the total number of blasts over a period of 12 months
120	0%

Table 4: Airblast Overpressure Impact Assessment Criteria

Ground Vibration Criteria

13. The Proponent shall ensure that the ground vibration level from blasting at the project does not exceed the criteria in Table 5 at any residence or sensitive receiver on privately-owned land.

Peak particle velocity (mm/s)	*Allowable exceedance*
5	5% of the total number of blasts over a period of 12 months
10	0%

Table 5: Ground Vibration Impact Assessment Criteria for Residences on Privately-owned Land

Operating Conditions

14. The Proponent shall implement best blasting practice to:
(a) ensure that no flyrock leaves the site;
(b) protect the safety of people, property, and livestock; and
(c) minimise the dust and fume emissions from blasting on the site,
to the satisfaction of the Director-General.

Public Notice

15. The Proponent shall:
    (a) notify the landowner/occupier of any residence within 2 kilometres of the quarry pit who registers an interest in being notified about the blasting schedule on site;
    (b) operate a blasting hotline, or alternative system agreed to by the Director-General, to enable the public to get up-to-date information on blasting operations at the project; and
    (c) keep the public informed about this hotline (or any alternative system),
    to the satisfaction of the Director-General.

Monitoring

16. The Proponent shall prepare and implement a Blast Monitoring Program for the project to the satisfaction of the Director-General. This program must:
    (a) be submitted to the Director-General for approval prior to the commencement of construction;
    (b) be prepared in consultation with the OEH; and
    (c) monitor the performance of the project against the relevant blasting criteria.

AIR QUALITY

Air Quality Impact Assessment Criteria

17. The Proponent shall ensure that all reasonable and feasible avoidance and mitigation measures are employed so that particulate matter emissions generated by the project do not exceed the criteria listed in Tables 6, 7 and 8 at any residence on privately owned land, or on more than 25 percent of any privately owned land.

Table 6: Long term impact assessment criteria for particulate matter

Pollutant	***Averaging period***	***[d] Criterion***
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 7: Short term impact assessment criterion for particulate matter

Pollutant	***Averaging period***	***[d] Criterion***
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 50 µg/m^3

Table 8: Long term impact assessment criteria for deposited dust

Pollutant	***Averaging period***	***Maximum increase[2] in deposited dust level***	***Maximum total[1] deposited dust level***
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes to Tables 6-8

[a] Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to all other sources);

[b] Incremental impact (i.e. incremental increase in concentrations due to the project on its own);

[c] Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and

[d] Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Director-General.

Land Acquisition Criteria

18. If particulate matter emissions generated by the project exceed the criteria in Tables 9, 10, and 11 at any residence on privately-owned land, or on more than 25 percent of any privately owned land, then upon written request for acquisition from the landowner, the Proponent shall acquire the land in accordance with the procedures in conditions 6-7 of schedule 4.

Table 9: Long term land acquisition criteria for particulate matter

Pollutant	***Averaging period***	***[d] Criterion***
Total suspended particulate (TSP) matter	Annual	[a] 90 µg/m^3
Particulate matter < 10 µm (PM_{10})	Annual	[a] 30 µg/m^3

Table 10: Short term land acquisition criteria for particulate matter

Pollutant	Averaging period	[da] Criterion
Particulate matter < 10 µm (PM_{10})	24 hour	[a] 150 µg/m^3
Particulate matter < 10 µm (PM_{10})	24 hour	[b] 50 µg/m^3

Table 11: Long term land acquisition criteria for deposited dust

Pollutant	Averaging period	Maximum increase[2] in deposited dust level	Maximum total[1] deposited dust level
[c] Deposited dust	Annual	[b] 2 g/m^2/month	[a] 4 g/m^2/month

Notes to Tables 9-11

[a] *Total impact (i.e. incremental increase in concentrations due to the project plus background concentrations due to all other sources);*

[b] *Incremental impact (i.e. incremental increase in concentrations due to the project on its own);*

[c] *Deposited dust is to be assessed as insoluble solids as defined by Standards Australia, AS/NZS 3580.10.1:2003: Methods for Sampling and Analysis of Ambient Air - Determination of Particulate Matter - Deposited Matter - Gravimetric Method; and*

[d] *Excludes extraordinary events such as bushfires, prescribed burning, dust storms, sea fog, fire incidents or any other activity agreed by the Director-General.*

Operating Conditions

19. The Proponent shall:
    (a) implement best management practice on site, including all reasonable and feasible measures to minimise the off-site odour, fume and dust emissions generated by the project;
    (b) minimise any visible air pollution generated by the project;
    (c) minimise the surface disturbance of the site generated by the project; and
    (d) operate a comprehensive air quality management system that uses a combination of predictive meteorological forecasting and air quality monitoring data to guide the day to day planning of quarrying operations and the implementation of both proactive and reactive air quality mitigation measures to ensure compliance with the relevant conditions of this approval;

    to the satisfaction of the Director-General.

Air Quality Management Plan

20. The Proponent shall prepare and implement a detailed Air Quality Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be prepared in consultation with OEH and submitted to the Director-General by the end of March 2012;
    (b) describe the measures that would need to be implemented to ensure compliance with the relevant conditions of this approval;
    (c) include a program for the implementation of the measures referred to in (b) above; and
    (d) include an air quality monitoring program that:
        - uses a combination of high volume samplers and dust deposition gauges to evaluate the performance of the project;
        - supports the air quality management system;
        - provides information to evaluate the performance of the project;
        - includes a protocol for determining exceedances of relevant conditions of this approval; and
        - provides for the use of real-time monitoring measures, if directed by the Director-General.

METEOROLOGICAL MONITORING

21. For the life of the project, the Proponent shall ensure that there is a meteorological station in the vicinity of the site that:
    (a) complies with the requirements in the *Approved Methods for Sampling of Air Pollutants in New South Wales* guideline; and
    (b) is capable of continuous real-time measurement of temperature lapse rate in accordance with the *NSW Industrial Noise Policy*.

SURFACE AND GROUND WATER

Water Supply

22. Prior to the commencement of construction, the Proponent shall obtain the necessary approvals for the project under the *Water Act 1912*.

Note: The Water Management Act 2000 may apply to the project. The Proponent shall consult with the NOW on the relevant approvals at the time the application is made.

Discharges

23. Except as may be expressly provided for by an EPL, the Proponent shall not discharge any dirty water from the quarry or ancillary operational areas.

23A. The Proponent shall prepare an onsite wastewater report for the proposed effluent management system consistent with the requirements of *Sydney Catchment Authority – "Developments in Sydney's Drinking Water Catchment" – Water Quality Information Requirements, 2011.* The effluent management system must be designed and constructed to be in accordance with this onsite wastewater report and its design must be approved by Council prior to construction.

Tangarang Creek Environmental Flow

24. The proponent shall provide an environmental flow to Tangarang Creek equivalent to 10% of average daily flows. Details of the management of these environmental flows shall be included in the Site Water Balance for the project (see below).

Sediment Dams

25. The Proponent shall ensure that:
    (d) critical structures such as "dirty water" dams are designed, constructed and maintained to a accommodate a 1 in 100 year ARI 24-hour event; and
    (e) other dams and water management structures are designed, constructed and maintained to accommodate a 1 in 20 year ARI 24-hour event.

Management and Monitoring

26. The Proponent shall prepare and implement a Water Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (a) be submitted to the Director-General for approval prior to the commencement of construction;
    (b) be prepared in consultation with the NOW, OEH and Sydney Catchment Authority; and
    (c) include a:
        - Site Water Balance;
        - Erosion and Sediment Control Plan;
        - Surface Water Monitoring Program;
        - Ground Water Monitoring Program; and
        - Surface and Ground Water Response Plan to address any potential adverse impacts associated with the project.

Site Water Balance

27. The Site Water Balance shall
    (a) include details of all water extracted (including make up water), dewatered, transferred, used and/or discharged by the project; and
    (b) describe measures to minimise water use by the project.

Erosion and Sediment Control

28. The Erosion and Sediment Control Plan shall:
    (a) be consistent with the requirements of *Managing Urban Stormwater: Soils and Construction, Volume 1, 4th Edition, 2004* (Landcom);
    (b) identify activities that could cause soil erosion and generate sediment;
    (c) describe measures to minimise soil erosion and the potential for the transport of sediment to downstream waters;
    (d) describe the location, function, and capacity of erosion and sediment control structures; and
    (e) describe what measures would be implemented to maintain (and if necessary decommission) the structures over time.

Surface Water Monitoring

29. The Surface Water Monitoring Program shall include:
    (a) detailed baseline data on surface water flows and quality in Tangarang Creek and Barbers Creek;
    (b) surface water impact assessment criteria;
    (c) a program to monitor surface water flows and quality;
    (d) a protocol for the investigation of identified exceedances of the surface water impact assessment criteria; and
    (e) a program to monitor the effectiveness of the Erosion and Sediment Control Plan.

Ground Water Monitoring Program

30. The Ground Water Monitoring Program shall include:
    (a) detailed baseline data on ground water levels, flows, and quality, based on statistical analysis;
    (b) groundwater impact assessment criteria for monitoring bores;
    (c) a program to monitor regional ground water levels and quality; and
    (d) a protocol for the investigation of identified exceedances of the ground water impact assessment criteria.

TRAFFIC AND TRANSPORT

31. The Proponent shall prepare and implement a construction traffic management plan for the project to the satisfaction of the RTA and Council.

ABORIGINAL HERITAGE

32. The Proponent shall prepare and implement an Aboriginal Heritage Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (f) be submitted to the Director-General for approval prior to the commencement of construction;
    (g) be prepared in consultation with the OEH and relevant Aboriginal communities; and
    (h) include a:
        - description of the measures that would be implemented for the mapping, and salvage or relocation of the archaeological relics in the Tangarang Creek Dam 1 area;
        - description of the measures that would be implemented if any new Aboriginal objects or relics are discovered during the project; and
        - protocol for the ongoing consultation and involvement of the Aboriginal communities in the conservation and management of Aboriginal cultural heritage on the site.

FLORA AND FAUNA

33. The Proponent shall:
    (a) rehabilitate the site in a manner that is generally consistent with the conceptual rehabilitation principles in Chapter 2.8 of the EA; and
    (b) implement the Habitat Management Area in a manner that is generally consistent with the proposal outlined in the Submissions Report (and shown conceptually in Appendix 3), including the establishment, conservation and maintenance of at least 12 hectares of vegetation species characteristic if Box Gum Woodland,

    to the satisfaction of the Director-General.

Threatened Species Protection

33A. The Proponent shall:
    (a) prior to clearing of vegetation and site preparation on the site of the Western Overburden Emplacement and extension, clearly and securely mark out the proposed boundary of the emplacement and extension;
    (b) avoid disturbance of *Box Gum Woodland* Endangered Ecological Community and other native vegetation adjacent to the site of the Western Overburden Emplacement and extension;
    (c) only undertake clearing of vegetation on the site of the Western Overburden Emplacement and extension following a recent fauna survey undertaken by a suitably qualified expert who has been approved by the Director-General; and
    (d) seek to avoid clearing of native vegetation on the site of the Western Overburden Emplacement and extension during the period August to November of any year.

Landscape and Rehabilitation Management Plan

34. The Proponent shall prepare and implement a Landscape and Rehabilitation Management Plan for the project to the satisfaction of the Director-General. This plan must:
    (e) be submitted to the Director-General for approval prior to the commencement of construction;
    (f) be prepared in consultation with the OEH and Council;
    (g) describe in general the short, medium, and long-term measures that would be implemented to:
        - rehabilitate the site;
        - implement the Habitat Management Area;
        - manage the remnant vegetation and habitat on the site; and
        - landscape the site (including the bunds and overburden emplacement areas) to mitigate any visual impacts of the project;
    (h) describe in detail the measures that would be implemented over the next 5 years to rehabilitate and manage the landscape on the site;
    (i) describe how the performance of these measures would be monitored over time; and
    (j) set completion criteria for the rehabilitation of the site.

Rehabilitation Bond

35. Within 3 months of the first Independent Environmental Audit the Proponent shall lodge a rehabilitation bond for the project with the Director-General. The sum of the bond shall be calculated at $2.50/m^2 for the total area to be disturbed in each 5 year period, or as otherwise directed by the Director-General.

Notes:

- *If the rehabilitation is completed to the satisfaction of the Director-General, the Director-General will release the rehabilitation bond.*
- *If the rehabilitation is not completed to the satisfaction of the Director-General, the Director-General will call in all or part of the rehabilitation bond, and arrange for the satisfactory completion of the relevant works.*

36. Within 3 months of subsequent audits, the Proponent shall review, and if necessary revise, the sum of the bond to the satisfaction of the Director-General. This review must consider:
    (a) the effects of inflation;
    (b) any changes to the total area of disturbance; and
    (c) the performance of the rehabilitation against the completion criteria of the Rehabilitation and Landscape Management Plan.

VISUAL IMPACT

Visual Amenity and Lighting

37. The Proponent shall:
    (a) *minimise the visual impacts, and particularly the off-site lighting impacts, of the project;*
    (b) *revegetate overburden emplacements, emplacement extensions and bunds as soon as practicable;*
    (c) *take all practicable measures to further mitigate off-site lighting impacts from the project; and*
    (d) *ensure that all external lighting associated with the project complies with* Australian Standard AS4282 (INT) 1995 - Control of Obtrusive Effects of Outdoor Lighting,
    to the satisfaction of the Director-General.

38. *(Deleted)*

39. *(Deleted)*

Advertising

40. The Proponent shall not erect or display any advertising structure(s) or signs on the site without the written approval of the Director-General.

Note – This does not include business identification, traffic management and safety or environmental signs.

WASTE MANAGEMENT

41. The Proponent shall:
    (a) monitor the amount of waste generated by the project;
    (b) investigate ways to minimise waste generated by the project;
    (c) implement reasonable and feasible measures to minimise waste generated by the project; and
    (d) report on waste management and minimisation in the Annual Review.
    to the satisfaction of the Director-General.

42. The Proponent shall ensure that all waste generated or stored on site is assessed, classified and managed in accordance with the OEH's *Environmental Guidelines: Assessment Classification and Management of Liquid and Non-Liquid Wastes*.

EMERGENCY AND HAZARDS MANAGEMENT

Dangerous Goods

43. The Proponent shall ensure that the storage, handling, and transport of dangerous goods are conducted in accordance with the relevant *Australian Standards*, particularly AS1940 and AS1596, and the *Dangerous Goods Code*.

Safety

44. The Proponent shall secure the project to ensure public safety to the satisfaction of the Director-General.

Bushfire Management

45. The Proponent shall:
    (a) ensure that the project is suitably equipped to respond to any fires on-site; and
    (b) assist the rural fire service and emergency services as much as possible if there is a fire on-site.

PRODUCTION DATA

46. The Proponent shall:
    (a) provide annual production data to the DPI using the standard form for that purpose; and
    (b) include a copy of this data in the Annual Review.

QUARRY EXIT STRATEGY

47. The Proponent shall prepare and implement a Quarry Exit Strategy for the project to the satisfaction of the Director-General. This strategy must:
    (a) be submitted to the Director-General for approval at least 5 years prior to the cessation of the project;
    (b) be prepared in consultation with the relevant agencies;
    (c) define the objectives and criteria for quarry closure;
    (d) investigate options for the future use of the site, including any final void/s;
    (e) describe the measures that would be implemented to minimise or manage the ongoing environmental effects of the project; and
    (f) describe how the performance of these measures would be monitored over time.

SCHEDULE 4
ADDITIONAL PROCEDURES

NOTIFICATION OF LANDOWNERS

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

INDEPENDENT REVIEW

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

   If the Director-General is satisfied that an independent review is warranted, then within 2 months of the Director-General's decision, the Proponent shall:

   (a) commission a suitably qualified, experienced and independent expert, whose appointment has been approved by the Director-General, to:
   - consult with the landowner to determine his/her concerns;
   - conduct monitoring to determine whether the project is complying with the relevant impact assessment criteria in schedule 3; and
   - if the project is not complying with these criteria then:
     - determine if the more than one quarry/mine is responsible for the exceedance, and if so the relative share of each quarry/mine regarding the impact on the land;
     - identify the measures that could be implemented to ensure compliance with the relevant criteria; and

   (b) give the Director-General and landowner a copy of the independent review.

3. If the independent review determines that the quarrying operations are complying with the relevant criteria in Schedule 3, then the Proponent may discontinue the independent review with the approval of the Director-General.

4. If the independent review determines that the quarrying operations are not complying with the relevant criteria in Schedule 3, and that the quarry is primarily responsible for this non-compliance, then the Proponent shall:

   (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until the project complies with the relevant criteria; or

   (b) secure a written agreement with the landowner to allow exceedances of the relevant impact assessment criteria,

   to the satisfaction of the Director-General.

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

5. If the independent review determines that the relevant criteria are being exceeded, but that more than one quarry/mine is responsible for this exceedance, then together with the relevant quarry/mine/s, the Proponent shall:

   (a) implement all reasonable and feasible mitigation measures, in consultation with the landowner and appointed independent expert, and conduct further monitoring until there is compliance with the relevant criteria; or

   (b) secure a written agreement with the landowner and other relevant mine/s to allow exceedances of the relevant impact assessment criteria,

   to the satisfaction of the Director-General.

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

LAND ACQUISITION

6. Within 3 months of receiving a written request from a landowner with acquisition rights, the Proponent shall make a binding written offer to the landowner based on:

(i) the current market value of the landowner's interest in the property at the date of this written request, as if the land was unaffected by the project the subject of the project application, having regard to the:
- existing and permissible use of the land, in accordance with the applicable planning instruments at the date of the written request; and
- presence of improvements on the land and/or any approved building or structure which has been physically commenced at the date of the landowner's written request, and is due to be completed subsequent to that date, but excluding any improvements that have resulted from the implementation of the 'additional noise mitigation measures' in condition 7 of Schedule 3;

(j) the reasonable costs associated with:
- relocating within the Goulburn Mulwaree local government area, or to any other local government area determined by the Director-General; and
- obtaining legal advice and expert advice for determining the acquisition price of the land, and the terms upon which it is required; and

(k) reasonable compensation for any disturbance caused by the land acquisition process.

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

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

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

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

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

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

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

8. *(deleted)*

SCHEDULE 5
ENVIRONMENTAL MANAGEMENT AND MONITORING CONDITIONS

ENVIRONMENTAL MANAGEMENT STRATEGY

1. The Proponent shall prepare and implement an Environmental Management Strategy for the project to the satisfaction of the Director-General. This strategy must be submitted to the Director-General for approval prior to the commencement of construction, and:
   (a) provide the strategic context for environmental management of the project;
   (b) identify the statutory requirements that apply to the project;
   (c) describe in general how the environmental performance of the project would be monitored and managed;
   (d) describe the procedures that would be implemented to:
      - keep the local community and relevant agencies informed about the construction, operation and environmental performance of the project;
      - receive, handle, respond to, and record complaints;
      - resolve any disputes that may arise during the life of the project;
      - respond to any non-compliance;
      - manage cumulative impacts; and
      - respond to emergencies; and
   (e) describe the role, responsibility, authority, and accountability of the key personnel involved in the environmental management of the project.

ENVIRONMENTAL MONITORING PROGRAM

2. The Proponent shall prepare an Environmental Monitoring Program for the project to the satisfaction of the Director-General. This program must be submitted to the Director-General prior to the commencement of construction, and consolidate the various monitoring requirements in Schedule 3 of this approval into a single document.

INCIDENT REPORTING

3. Within 7 days of detecting an exceedance of the goals/limits/performance criteria in this approval or an incident causing (or threatening to cause) material harm to the environment, the Proponent shall report the exceedance/incident to the Department and any relevant agencies. This report must:
   (a) describe the date, time, and nature of the exceedance/incident;
   (b) identify the cause (or likely cause) of the exceedance/incident;
   (c) describe what action has been taken to date; and
   (d) describe the proposed measures to address the exceedance/incident.

Annual Review

4. By the end of March each year, the Proponent shall prepare and submit a review of the environmental performance of the project to the satisfaction of the Director-General. This review must:
   (a) describe the development that was carried out in the previous calendar year, and the development that is proposed to be carried out over the next year;
   (b) include a comprehensive review of the monitoring results and complaints records of the project over the previous calendar year, which includes a comparison of these results against the
      - the relevant statutory requirements, limits or performance measures/criteria;
      - the monitoring results of previous years; and
      - the relevant predictions in the EA;
   (c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
   (d) identify any trends in the monitoring data over the life of the project;
   (e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
   (f) describe what measures will be implemented over the next year to improve the environmental performance of the project.

INDEPENDENT ENVIRONMENTAL AUDIT

5. Within 3 years of the date of the commencement of construction, and every 5 years thereafter, unless the Director-General directs otherwise, the Proponent shall commission and pay the full cost of an Independent Environmental Audit of the project. This audit must:
   (a) be conducted by a suitably qualified, experienced, and independent person(s) whose appointment has been approved by the Director-General;
   (b) include consultation with the relevant agencies;
   (c) assess the environmental performance of the project, and its effects on the surrounding environment;
   (d) assess whether the project is complying with the relevant standards, performance measures and statutory requirements;

(e) review the adequacy of any strategy/plan/program required under this approval; and, if necessary,
(f) recommend measures or actions to improve the environmental performance of the project, and/or any strategy/plan/program required under this approval.

6. Within 1 month of completion of each Independent Environmental Audit, the Proponent shall submit a copy of the audit report to the Director-General and relevant agencies, with a response to any of the recommendations in the audit report.

REVISION OF STRATEGIES, PLANS AND PROGRAMS

7. Within 3 months of:
- the submission of an incident report under condition 3 above;
- the submission of an Annual Review under condition 4 above;
- the submission of an audit report under condition 5 above; and
- any modification to the conditions of this approval, (unless the conditions require otherwise),

the Proponent shall review, and if necessary revise, the strategies, plans, and programs required under this approval to the satisfaction of the Director-General.

Note: This is to ensure the strategies, plans and programs are updated on a regular basis, and incorporate any recommended measures to improve the environmental performance of the project.

COMMUNITY CONSULTATIVE COMMITTEE

8. Prior to the commencement of construction, the Proponent shall establish a Community Consultative Committee (CCC) for the project. The CCC shall:
(a) be comprised of:
- 2 representatives from the Proponent, including the person responsible for environmental management at the quarry;
- 1 representative from Council (if available); and
- at least 3 representatives from the local community,

whose appointment has been approved by the Director-General;
(b) be chaired by an independent chairperson, whose appointment has been approved by the Director-General;
(c) meet at least twice a year;
(d) review the Proponent's performance with respect to environmental management and community relations;
(e) undertake regular inspections of the quarry operations;
(f) review community concerns or complaints about the quarry operations, and the Proponent's complaints handling procedures; and
(g) provide advice to:
- the Proponent on improved environmental management and community relations, including the provision of information to the community and the identification of community initiatives to which the Proponent could contribute;
- the Department regarding the conditions of this approval; and
- the general community on the performance of the quarry with respect to environmental management and community relations.

Notes
- *The CCC is an advisory committee. The Department and other relevant agencies are responsible for ensuring that the Proponent complies with this approval.*
- *The membership of the CCC should be reviewed on a regular basis (every 3 years).*
- *If possible, an alternate member should be appointed for each of the representatives from the local community.*

9. At its own expense, the Proponent shall,:
(a) ensure that 2 of its representatives attend CCC meetings;
(b) provide the CCC with regular information on the environmental performance and management of the project;
(c) provide meeting facilities for the CCC;
(d) arrange site inspections for the CCC, if necessary;
(e) take minutes of the CCC meetings;
(f) make these minutes available to the public;
(g) respond to any advice or recommendations the CCC may have in relation to the environmental management or community relations; and
(h) forward a copy of the minutes of each CCC meeting, including a response to any recommendations from the CCC, to the Director-General within a month of the CCC meeting.

ACCESS TO INFORMATION

10. By 31 January 2012, the Proponent shall:
    (a) make copies of the following publicly available on its website:
        - the documents referred to in condition 2 of schedule 2;
        - all current statutory approvals for the project;
        - all approved strategies, plans and programs required under the conditions of this approval;
        - the monitoring results of the project, reported in accordance with the specifications in any conditions of this approval, or any approved plans and programs;
        - a complaints register, updated on a monthly basis;
        - minutes of CCC meetings;
        - the annual reviews of the project;
        - any independent environmental audit of the project, and the Proponent's response to the recommendations in any audit;
        - any other matter required by the Director-General; and
        - keep this information up-to-date,

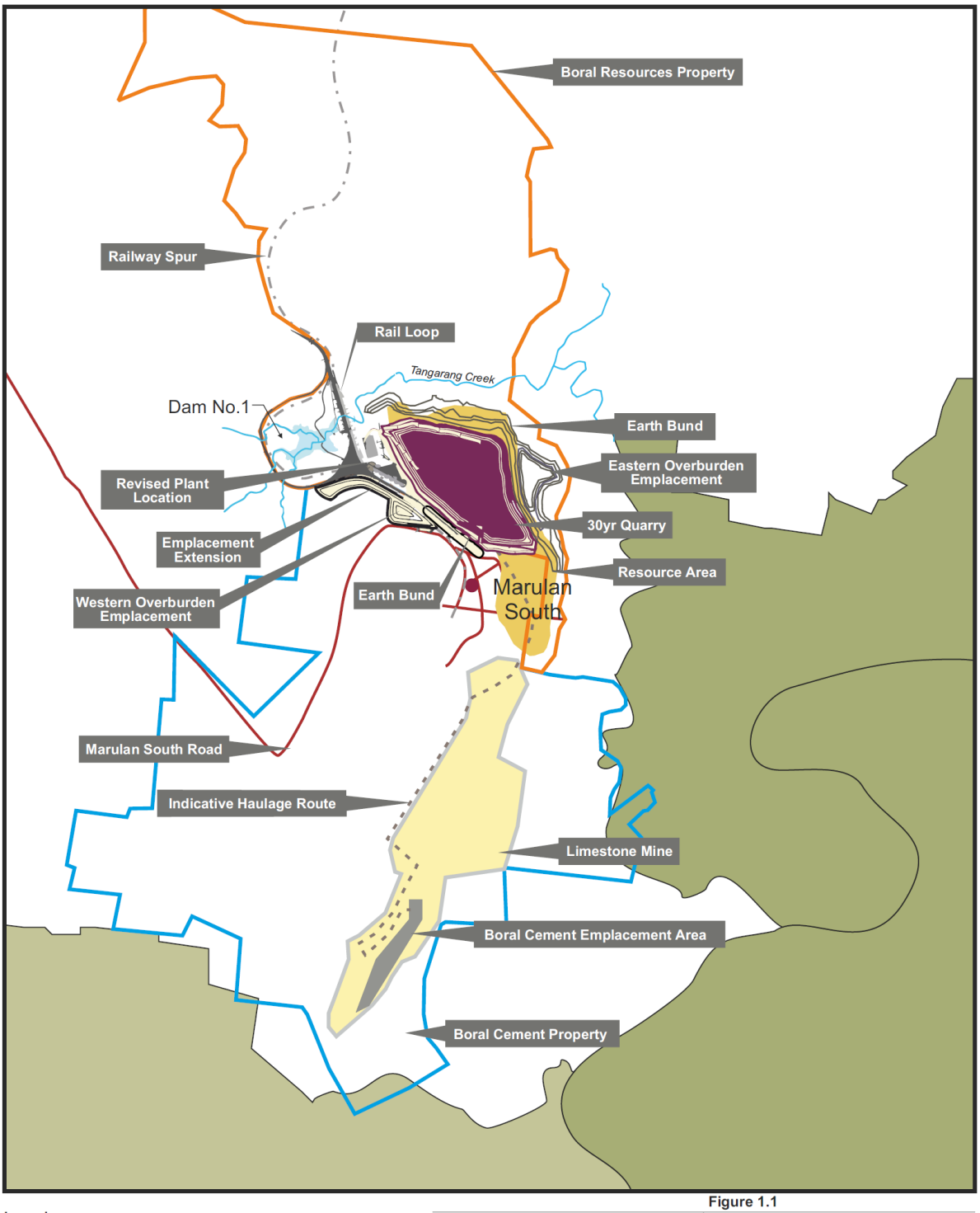
    to the satisfaction of the Director-General.

13. *(deleted)*

APPENDIX 1
SCHEDULE OF LAND

Lot	*DP*
23	867667
5	203290
95	750029
24	867667
109	750029
1	371167
1-6	261615
1	557562
143	750029
12	570616
2	557562
21	657523
100	1064794
4	106569
1-9	216767
11	570616
5	111641
22	867667
1	1124189
2	106569

APPENDIX 2
PROJECT SITE



Legend
- Morton National Park
- Bungonia State Conservation Area

Figure 1.1
Peppertree Quarry - Proposed Site Layout

Client:	Boral	
Project:	Peppertree Quarry	
Drawing No:	0118026s_Sect75W_C001_R4.cdr	
Date:	27/10/2011	Drawing size: A4
Drawn by:	SQW	Reviewed by: RS
Scale:	Refer to Scale Bar	

N
0 0.25 0.5 1.0km

Maps and figures contained within this document may be based on third party data, may not be to scale and is intended for use as a guide only. ERM does not warrant the accuracy of any such maps or figures.

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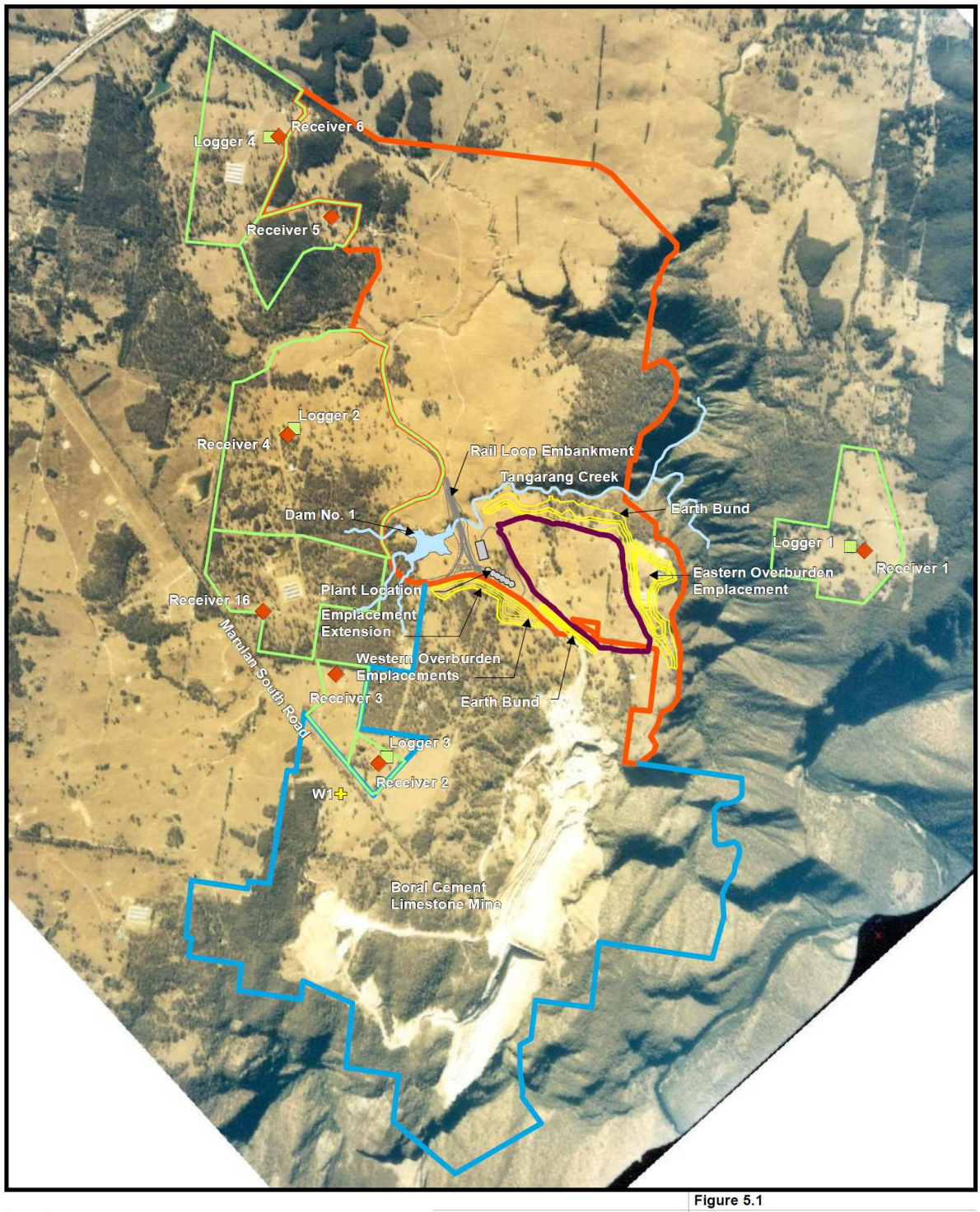
ERM

APPENDIX 2A
NOISE RECEIVER LOCATION PLAN



Legend

- Receiver Locations
- Noise Logger Locations
- Weather Station
- Quarry Location
- Boral Cement Property Boundary
- Boral Peppertree Property Boundary
- Proposed Dam Location
- Proposed Plant Location
- Cadastre
- Tangarang Creek

Client:	Boral		
Project:	Peppertree Quarry		
Drawing	0118026s_Sect75W_G016_R0.mxd		
Date:	27/10/2011	Drawing Size:	A4
Drawn By:	SQW	Reviewed By:	RS
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to scale bar		

N

0 250 500 750m

Maps and figures contained within this document may be based on third party data, may not be to scale and is intended for use as a guide only. ERM does not warrant the accuracy of any such maps or figures.

Figure 5.1
Location of Noise Receivers

Environmental Resources Management Australia Pty Ltd

Brisbane, Canberra, Hunter Valley, Melbourne, Perth, Port Macquarie, Sydney

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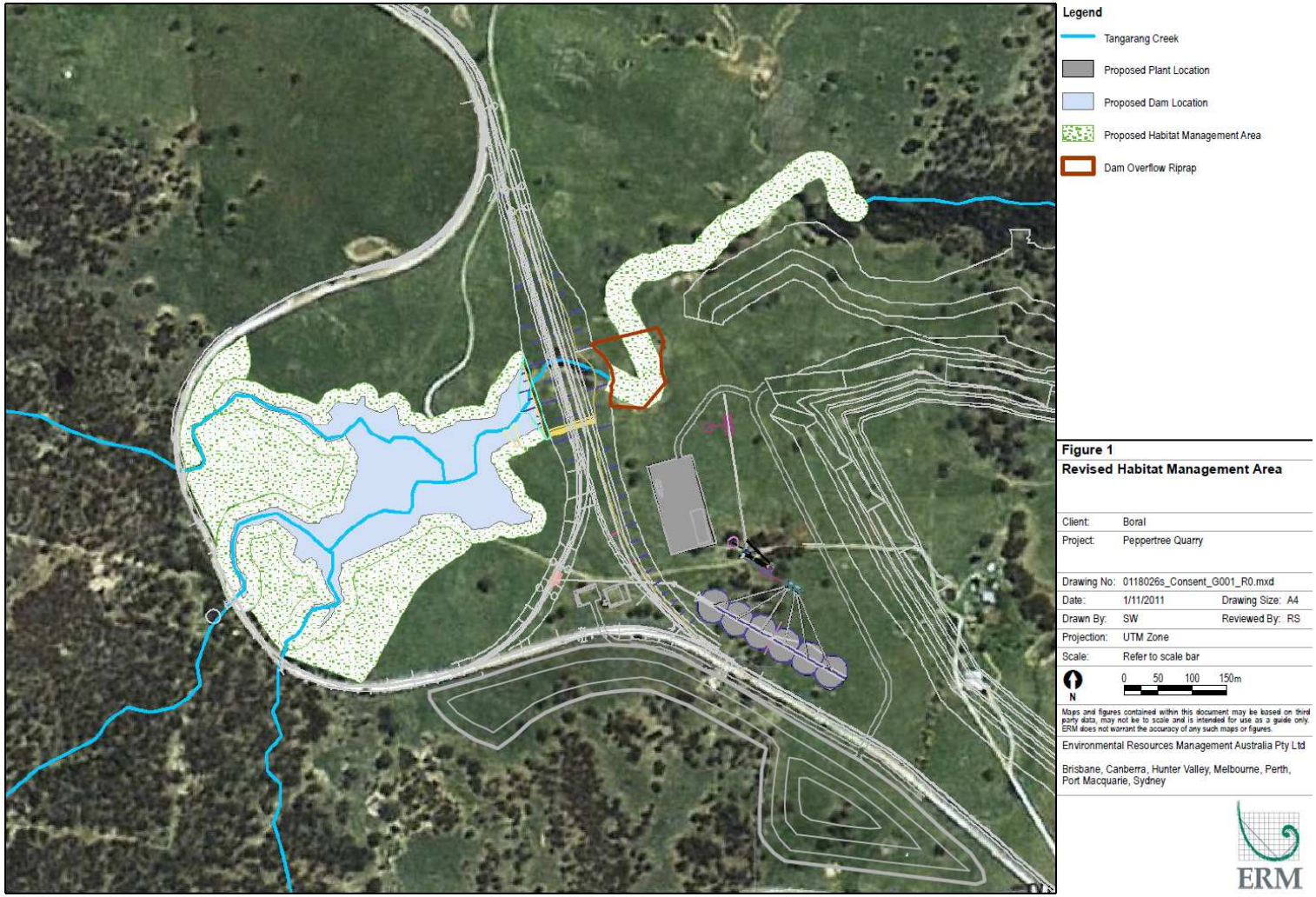
APPENDIX 3
HABITAT MANAGEMENT AREA



Peppertree Quarry Modification 3

Appendix B: Ecology Assessment

Planning + Environment + Acoustics

Peppertree Quarry Modification 3

Ecology Assessment

Prepared for Boral Resources (NSW) Pty Limited | 8 August 2012

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Peppertree Quarry Modification 3 Ecology Assessment

Final

Report J12053RP2 | Prepared for Boral Resources (NSW) Pty Limited | 8 August 2012

Prepared by	**Renae Baker**	Approved by	**Brett McLennan**
Position	Senior Technical Advisor	Position	Director
Signature		Signature	
Date	8/08/2012	Date	8/08/2012

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Document Control

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1 Introduction

1.1 Project background

Peppertree Quarry (the Quarry) is a hard rock quarry owned and operated by Boral Resources (NSW) Pty Limited (Boral) in Marulan South NSW. Approval for the Quarry was granted on 28 February 2007 under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Boral, the proponent, seeks approval from the Minister for Planning and Infrastructure to modify PA06_0074 under Section 75W of the EP&A Act to:

- construct a High Voltage (HV) distribution line approximately 1 km in length to the west of the Quarry; and
- construct a minor extension to the existing passing line on Boral's private rail at its connection to the Main Southern Railway Line.

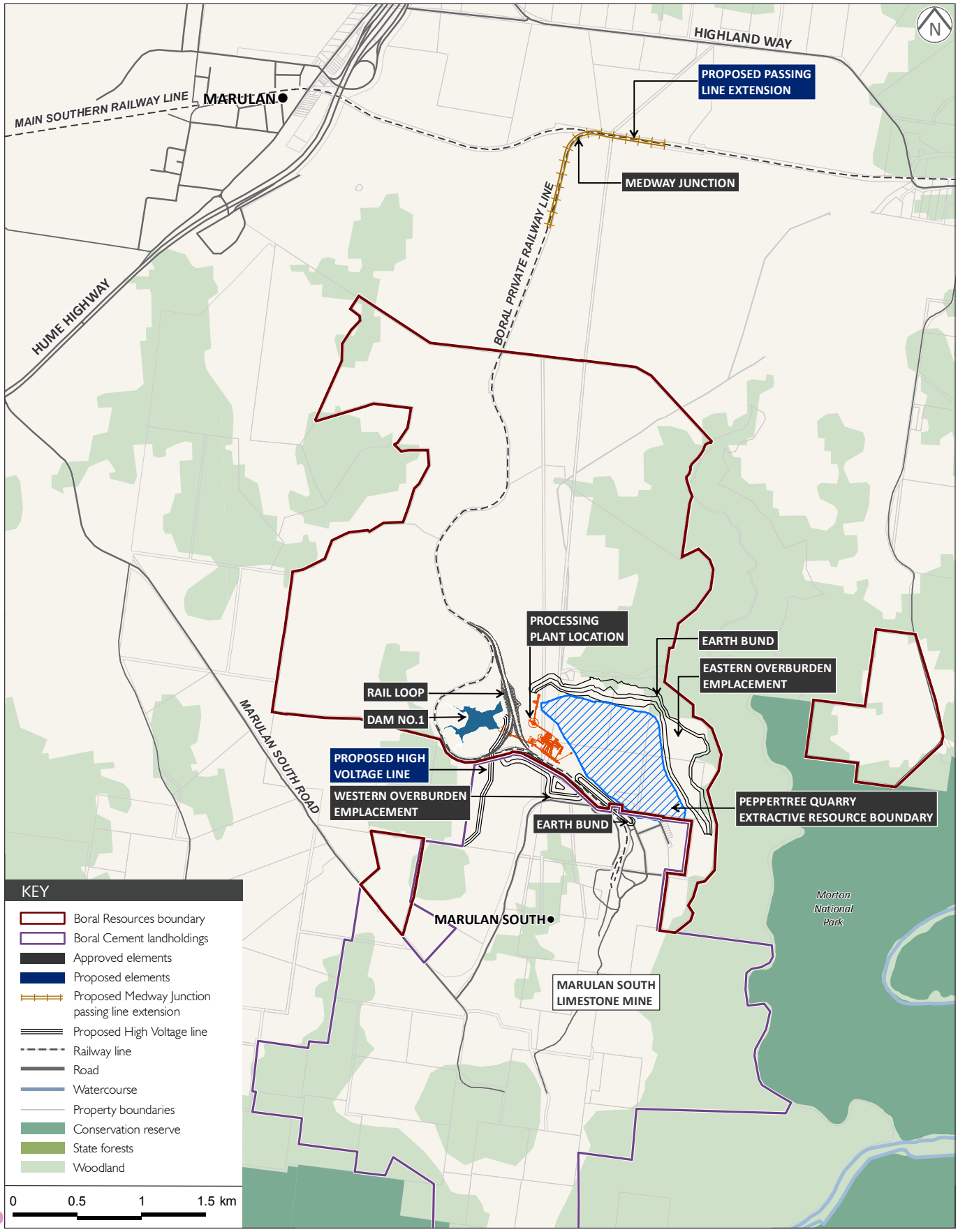
The modifications proposed above constitute Modification 3 to PA06_0074 and are shown in Figure 1.1.

The construction of the HV line will require the clearance of vegetation within a corridor up to 25 m wide (12.5 m either side of the centre line) for the length of the line. The extension to the rail passing line will require disturbance of approximately 1,000 m^2 of pasture and already disturbed land within the rail corridor. These disturbance areas and their immediate surrounds define the study area for this assessment.

1.2 Objectives

This ecology assessment aims to:

- describe the ecology of the study area;
- determine the likelihood that threatened species, populations and communities occur within the study area;
- determine the potential impacts as a result of the proposed modifications and assess the significance of impacts to threatened species, populations, communities and habitat; and
- provide recommendations to ameliorate or compensate for any potential impacts.



Integrated Design Solutions | 030751 Peppertree Quarry M3 - Rev B - 14 August 2012

Proposed modification elements

Peppertree Quarry - Modification 3 - Ecology Assessment

Figure 1.1

2 Methods

An ecological assessment of the proposed HV line route, passing line extension area and immediate surrounds was undertaken to assess the potential impacts of the proposed works on native flora and fauna. This section describes the methods for the ecological assessment.

2.1 Desktop assessment

A desktop assessment and field investigation were undertaken to assess the ecology of the study area. The desktop assessment included a review of literature pertaining to the study area and to the region, and a review of available databases. The following sources of information were reviewed:

- the NSW Office of Environment and Heritage (OEH) Wildlife Atlas – reviewed to obtain records of species listed as threatened under the NSW *Threatened Species Conservation Act* (TSC Act) previously recorded within 10 km of the study area (within the locality);
- the Commonwealth Department of Sustainability, Environment, Water, Populations and Communities (DSEWPaC) Protected Matters database - reviewed to obtain records of species listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) that have the potential to occur within the locality;
- Tozer *et al.* (2006) Southeast NSW – Native Vegetation Classification and Mapping – SCIVI vegetation map files; and
- unpublished reports provided by Boral that included ecological assessments of the study area and its surrounds.

2.2 Field investigations

Ecological field investigations were undertaken on 22 May 2012 and 6 August 2012. In conjunction with Boral representatives, a HV line route was selected in the field that would result in the least disturbance to native vegetation and fauna habitats, whilst meeting engineering requirements. In selecting the preferred route the following selection criteria were applied:

- cleared areas (areas without canopy) were selected over wooded areas;
- where the route could impact either a number of small trees (generally Diameter at Breast Height (DBH) less than 20 cm) or one large tree, the small trees were selected for removal/ trimming; and
- all fauna habitat of significance, such as hollow-bearing trees, were identified and avoided.

The preferred route was then walked along its length and assessed in greater detail for previous disturbance, presence of fauna habitat and the condition of vegetation communities. Two vegetation plots were surveyed within the route. Opportunistic sightings of birds and other fauna species were recorded. The location of the proposed new electricity poles and the extent of clearing was identified onsite with the engineer and recorded using a hand-held GPS and pegs for later on-site survey.

3 Results

3.1 Desktop assessment

The Tozer *et al*. (2006) vegetation map of south-eastern NSW shows the vegetation within the proposed HV line route as map unit *GW P24 Tableland Grassy Box Gum Woodland* (see Figure 2.1). This community is described by the Biometric database (DECCW 2008) as Yellow Box - Blakely's Red Gum grassy woodland on the tablelands and is considered to be representative of White Box Yellow Box Blakely's Red Gum Woodland as listed as an endangered ecological community (EEC) under the TSC Act. Tozer *et al.* (2006) consider that some areas of map unit GW P24 may also be representative of the White Box - Yellow Box - Blakely's Red Gum grassy woodlands and derived native grasslands critically endangered ecological community (CEEC) as listed under the EPBC Act.

3.2 Field investigation

In general, the study area has been subject to a range of disturbances. Disturbances recorded included historical clearing, weed invasion, previous agricultural use, roadways and railway lines, dense infestation of the noxious weed Serrated Tussock (*Nassella trichotoma*), limestone dust from an adjacent agricultural limestone plant, and barbed wire fencing. The ecological characteristics of the HV line and passing line extension area are discussed in the following sections.

3.2.1 HV line

Remnant environments recorded during the field investigation within the proposed HV line route included:

- areas with mature and over-mature trees forming grassy woodland vegetation;
- areas with no canopy or shrub layer, dominated by pasture grasses and weeds;
- regrowth native vegetation (estimated to be less than 10 years of age);
- small patches of eucalypt regeneration; and
- disturbed areas.

Photographs of sections of the proposed HV line route are provided as Photograph 3.1 and Photograph 3.2

The HV line route contains cleared areas characterised by either a mixture of native and exotic grass species, exotic pasture or weed species. Within the centre of the HV line route, exotic and native grasses were prevalent with occasional exotic herbaceous species. Dominant species included Redleg Grass (*Bothriochloa macra*), Speargrass (*Austrostipa* specie(s), Serrated Tussock and Slender Rats Tail Grass (*Sporobolus creber*). Other weed species common in the area were Plantain (*Plantago lanceolata*) and Catsear (*Hypochaeris radicata*). Towards the railway in the northern section of the route, the cleared area was dominated by Serrated Tussock and Fleabane (*Conyza bonariensis*).

Canopy species recorded in the alignment were Apple Box (*Eucalyptus bridgesiana*), Narrow-leaved Stringybark (*E. eugenioides*), Yellow Box (*E. melliodora*) and Blakely's Red Gum (*E. blakelyi*), with occasional Argyle Apple (*E. cinerea*) in surrounding areas. Areas where canopy species were present had a

greater diversity of native species in the ground layer than cleared areas. However, diversity was still considered to be low for the vegetation communities present (Table 3.1). Native grasses dominated in these areas including Speargrass, Wallaby Grass (*Danthonia* species), Weeping Grass (*Microleana stipoides*), Purple Wiregrass (*Aristida ramosa*) and occasional Kangaroo Grass (*Themeda australis*). Occasional forbs and shrubs included Peach Heath (*Lissanthe strigosa*), Guinea Flower (*Hibbertia* species), Sifton Bush (*Casinia arcuata*) and Pennywort (*Hydrocotyle laxiflora*).

Two vegetation plots were surveyed using the Biobanking methodology, one was undertaken in a wooded area (woodland site) in the southern section of the HV line route, and the other was completed within a cleared patch in the centre of the route. However, as the cleared area contained low diversity and a high cover of exotics (greater than 90%), only the woodland site was assessed further (Table 3.1).

The species recorded in the woodland site were compared to the characteristic species of the aligned vegetation type within the Biometric database; Yellow Box - Blakely's Red Gum grassy woodland on the tablelands (DECCW 2008). Native over storey cover and native ground cover (shrubs) in the wooded site were within benchmark benchmark for the vegetation type. However, all other vegetation measurements were below the lower benchmark (Table 3.1) indicating reduced diversity and cover of native species generally expected in this vegetation type. According to the Biobanking assessment methodology the vegetation was in moderate to good condition, but the understorey and ground cover were considered depleted.

Table 3.1 Vegetation data on site compared to vegetation type benchmark

Measurement	Benchmark for Yellow Box - Blakely's Red Gum grassy woodland on the tablelands	Woodland site (within proposed HV line route) data	Comparison with benchmark
Native plant species richness	20	17	Below
Native over-storey cover	Lower = 17, Upper = 27	24	Within
Native mid-storey cover	Lower = 7.5, Upper = 12.5	4	Below
Native ground cover (grasses)	Lower = 24, Upper = 30	5	Below
Native ground cover (shrubs)	Lower = 0, Upper = 5	0	Within
Native ground cover (other)	Lower = 12.8, Upper = 18.8	6	Below
Total length of fallen logs	0	0	Within
Number of trees with hollows	0	0	Within

Fauna species recorded during the field investigation were common to the locality and included the Eastern Grey Kangaroo (*Macropus giganteus*), Wombat (*Vombatus ursinus*), Australian Magpie (*Gymnorhina tibicen*), Eastern Rosella (*Platycercus eximius*), Australian Raven (*Corvus coronoides*), Wedge-tail Eagle (*Aquila audax*), Yellow-faced Honeyeater *(Lichenostomus chrysops),* Grey Fantail (*Rhipidura albiscapa)* and Willie Wagtail (*Rhipidura leucophrys*). In general, bird observations were lower than anticipated for the area, perhaps as a result of high wind on both days of field survey (up to 65 km/hr (BOM 2012)). Evidence of the presence of the exotic European Rabbit (*Oryctolagus cuniculus*) was also recorded onsite.

Fauna habitat resources recorded onsite included:

- native and exotic grasses in cleared areas;
- accumulation of leaf litter;

- small areas of dense eucalypt regeneration;
- canopy foraging resources that included four species of eucalypt; and
- sparse scattered shrubs that included *Acacia* and *Cassinia* species.

Suitable foraging resources for woodland birds and sheltering opportunities for reptiles and small mammals, such as woody debris, was generally absent from the site. However, this resource was observed in surrounding areas where larger trees and canopy cover was greater. A low diversity and cover of shrubs occurs within the proposed HV line route, providing limited areas for shelter for smaller mammals.

No suitable habitat was available within the site for amphibians and no hollow-bearing trees suitable as sheltering and nesting habitat for bat species or arboreal mammals were present. Hollows and large trees with decorticating bark were observed in adjacent woodland areas and, therefore, the site may provide some limited foraging opportunities for these species within the locality.

Photograph 3.1 **Previously cleared area in the centre of the proposed HV line route, dominated by weeds and pasture grasses**

Photograph 3.2 Grassy woodland in southern section of the proposed HV line route showing areas of thick regrowth of eucalypts in some areas (the proposed line goes through this juvenile vegetation to retain the remnant taller habitat trees)

Photograph 3.3 Proposed site for passing line extension

3.2.2 Passing line extension

The area that will be subject to the proposed passing line extension is pasture that has been subjected to agricultural practices or has previously been disturbed within the rail corridor. No native vegetation remains within this proposed impact area. Photograph 3.3 shows the area to be impacted.

3.3 Threatened species and endangered ecological communities

Table 3.2 discusses the likelihood for occurrence and potential impacts on threatened species previously recorded within the locality of the study area or considered to have the potential to occur. This assessment is based on the habitat values identified within the study area during the field surveys.

No threatened fauna or flora species were recorded during the field investigation. The assessment of likely occurrence identified that the grassy woodlands within and surrounding the proposed HV line could provide some marginal foraging habitat and connectivity for threatened birds, arboreal mammals and bats (Table 2.1). However, there is no suitable roost or nesting sites for large hollow-dependent fauna species and hollow-bearing trees being a limiting factor for fauna species in the area. All hollow-bearing trees have been avoided by the project.

The grassy woodland vegetation recorded within the proposed HV line route was assessed against the White Box Yellow Box Blakely's Red Gum Grassy Woodland identification guidelines, as this community is listed under the TSC Act as an endangered ecological community (EEC). The assessment found that the areas with remnant canopy cover met the description of the EEC, however the understorey was disturbed and where the canopy and regeneration was absent, the community onsite was not considered to meet the EEC description. The remnant woodland also represents the White Box Yellow Box Blakely's Red Gum grassy woodlands and derived native grasslands community listed as critically endangered under the EPBC Act. The grassy woodland community onsite is referred to as Box Gum Woodland throughout the remainder of this document.

Table 3.2 Assessment of threatened species previously recorded within the locality or considered to have the potential to occur

Scientific Name	Common Name	Legal Status*		Likelihood of occurrence	Potential for Impact	Further assessment required?
		TSC Act	EPBC Act			
Plants						
Caladenia tessellata	Thick-lipped Spider-Orchid	E	V	Favours low, dry sclerophyll woodland with healthy/ grassy understorey. Unlikely to occur.	No potential for impact.	No
Genoplesium plumosum	Plumed Midge-Orchid	E	E	Occurs on the margins of dry sclerophyll forest and heath in shallow moss covered soils over sandstone sheets. Although surveys were not undertaken within this species flowering time (March/April), it is considered that suitable habitat for this species does not occur within the study area.	No potential for impact.	No
Haloragis exalata subsp. exalata (preliminary determination to remove from TSC Act listing)	Square Raspwort	V	V	Preferred habitat in wet sclerophyll forest/edge of lakes. Suitable habitat for this species was not recorded on site.	No potential for impact.	No
Eucalyptus aggregata	Black Gum	V	-	Not recorded on site and suitable habitat is unlikely.	No potential for impact.	No
Eucalyptus macarthurii	Camden Woollybutt	V	-	Not recorded on site and suitable habitat is unlikely.	No potential for impact.	No
Genoplesium plumosum	Tallong Midge Orchid	E	E	This species occurs on sandstone and no suitable habitat was recorded within the study area.	No potential for impact.	No
Grevillea molyneuxii	Wingello Grevillea	V	-	Not recorded on site, species only known from Moss Vale and habitat is not available within the study area.	No potential for impact.	No
Kunzea cambagei		V	V	Not recorded on site, grows in heath which is not present within the study area.	No potential for impact.	No
Leucochrysum albicans var. tricolor	Hoary Sunray	-	E	Potential habitat in grassy woodland, but not recorded on site. Unlikely to occur.	No potential for impact.	No
Pelargonium sp. striatellum	Omeo Stork's Bill	-	E	Potential habitat but not recorded on site. Unlikely to occur.	No potential for impact.	No
Pomaderris cotoneaster	Cotoneaster Pomaderris	E	E	Prefers dry sclerophyll forest, often on skeletal soil, Not recorded on site and considered unlikely to occur.	No potential for impact.	No

Table 3.2 Assessment of threatened species previously recorded within the locality or considered to have the potential to occur

Scientific Name	Common Name	Legal Status*		Likelihood of occurrence	Potential for Impact	Further assessment required?
		TSC Act	EPBC Act			
Pomaderris pallida	Pale Pomaderris	V	V	Found in open forests and dry shrub communities. Not recorded on site and considered unlikely to occur.	No potential for impact.	No
Solanum celatum		E	-	Grows on hills and slopes in eucalypt woodland; commonly found after fire or disturbance. Habitat is available within the study area but this species was not recorded on site and is considered unlikely to occur.	No potential for impact.	No
Pimelea axiflora subsp. pubescens	Bungonia Rice-flower	E	-	Known from a single population in the Bungonia Gorge area. This species was not recorded on site and is considered unlikely to occur.	No potential for impact.	No
Thelymitra sp. Kangaloon		CE	CE	Species grows in swampy areas with no such habitat present in the study area.	No potential for impact.	No
Thesium australe	Austral Toadflax	V	V	Potential habitat in nearby grassy woodland areas amongst Kangaroo Grass but not recorded on site. Considered unlikely to occur.	No potential for impact.	No
Birds						
Botaurus poiciloptilus	Australasian Bittern	E	E	Small drainage structures and dams nearby provide potential habitat for this species in the wider study area.	No potential for impact as the works occur away from potential habitat.	No
Hieraaetus morphnoides	Little Eagle	V	-	May forage within the woodland areas of the study area. No nests were observed.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-	May forage within the site and surrounds. No suitable nesting resources available.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	No suitable nesting or preferred foraging resources available within the site.	Minimal potential for impact.	No
Tyto novaehollandiae	Masked Owl	V	-	No suitable nesting habitat available. May forage over the sites and	Minimal potential for impact due to	No

Table 3.2 Assessment of threatened species previously recorded within the locality or considered to have the potential to occur

Scientific Name	Common Name	Legal Status*		Likelihood of occurrence	Potential for Impact	Further assessment required?
		TSC Act	EPBC Act			
				surrounds.	the large amount of more suitable habitat in the locality.	
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	Was not recorded during the surveys. May forage within the site and surrounds. No nesting resources will be affected.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Chthonicola sagittata	Speckled Warbler	V	-	Was not recorded during the surveys. May forage within the site and surrounds. No nests recorded within site.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Anthochaera phrygia	Regent Honeyeater	E	E	May forage within the site and surrounds. Not within or in proximity to a known nesting area.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Daphoenositta chrysoptera	Varied Sittella	V	-	Was not recorded during the surveys. May forage within the site and surrounds. No nests recorded within site.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Lathamus discolor	Swift Parrot	E	E	Was not recorded during the surveys. May forage within the site and surrounds.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Leipoa ocellata	Malleefowl	E	V	No potential habitat available, no mounds known from the area.	Minimal potential for impact.	No
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V	-	Was not recorded during the surveys. May forage within the site and surrounds. No nests recorded within site.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Petroica boodang	Scarlet Robin	V	-	Was not recorded during the surveys. May forage within the site and surrounds. No nests recorded within site.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Petroica phoenicea	Flame Robin	V	-	Was not recorded during the surveys. May forage within the site and surrounds. No nests recorded within site.	Minimal potential for impact due to the large amount of more suitable	No

Table 3.2 Assessment of threatened species previously recorded within the locality or considered to have the potential to occur

Scientific Name	Common Name	Legal Status*		Likelihood of occurrence	Potential for Impact	Further assessment required?
		TSC Act	EPBC Act			
					habitat in the locality.	
Rostratula australis	Australian Painted Snipe	V	V	Small drainage structures and dams nearby provide potential low quality habitat for this species in the wider study area.	No potential for impact as the works occur away from potential habitat.	No
Stagonopleura guttata	Diamond Firetail	V	-	Was not recorded during the surveys. May forage within the site and surrounds. No nests recorded within site.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Mammals						
Chalinolobus dwyeri	Large-eared Pied Bat	-	V	May forage within the site and surrounds. No roosting or breeding habitat is present.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Dasyurus maculatus	Spotted-tail Quoll	-	E	Habitat onsite unsuitable for this species.	No potential for impact.	No
Phascolarctos cinereus	Koala	V	V	No faecal pellets recorded on site. No SEPP44 feed trees recorded onsite. Yellow Box and Apple Box are known secondary feed trees for this species so potential habitat occurs in the study area.	Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Petaurus australis	Yellow-bellied Glider	V	-	No scars on trees recorded and habitat present is considered to be sub-optimal.	The proposal will not remove any potential roosting or nesting habitat for this species. Minimal potential for impact due to the large amount of more suitable habitat in the locality.	No
Petaurus norfolcensis	Squirrel Glider	V	-	No scats or scars on trees recorded on site. No potential shelter sites to be impacted. Unlikely to occur in area to be impacted.	The proposal will not remove any potential roosting or nesting habitat for this species. Minimal potential for impact due to the large amount of more suitable habitat in the	No

Table 3.2 Assessment of threatened species previously recorded within the locality or considered to have the potential to occur

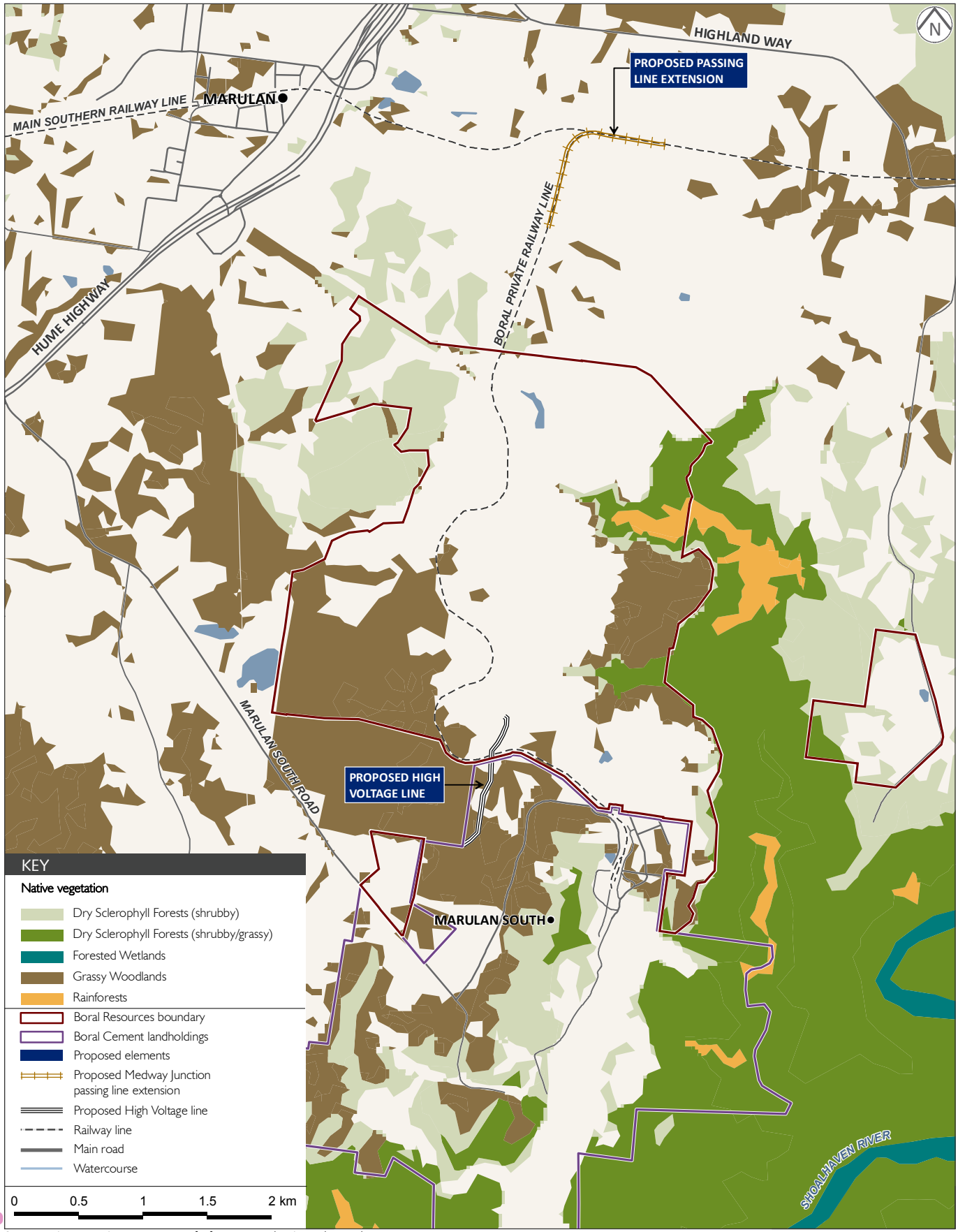
Scientific Name	Common Name	Legal Status*		Likelihood of occurrence	Potential for Impact	Further assessment required?
		TSC Act	EPBC Act			
					locality.	
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	No habitat available for the species in nearby areas or within the site.	No potential for impact.	No
Potorous tridactylus tridactylus	Long-nose Potoroo	-	V	No habitat available for the species in nearby areas or within the site	No potential for impact.	No
Mormopterus norfolkensis	Eastern Freetail-bat	V	-	May forage within the site and surrounds. Potential roosting habitat in hollow-bearing trees within the wider study area.	Minimal potential for impact. No hollow-bearing trees are to be removed. Large amounts of more suitable habitat occur in the locality.	No
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	May forage within the site and surrounds. Potential roosting habitat in hollow-bearing trees within the wider study area.	Minimal potential for impact. No hollow-bearing trees are to be removed. Large amounts of more suitable habitat occur in the locality	No
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-	May forage within the site and surrounds. No suitable roost sites occur within the study area.	Minimal potential for impact due to the large amount of more suitable foraging habitat in the locality..	No
Pseudomys novaehollandiae	New Holland Mouse	-	V	Suitable habitat for this species includes open heathland, open woodland with a heathy understorey and vegetated sand dunes. No suitable habitat occurs on site.	No potential for impact.	No
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	May forage within the site and surrounds. No camps were identified within the study area.	Minimal potential for impact due to the large amount of more suitable foraging habitat in the locality..	No
Reptiles						
Delma impar	Striped Legless Lizard	-	V	Requires relatively undisturbed native grasslands. No suitable habitat occurs for this species on site.	No potential for impact.	No
Hoplocephalus bungaroides	Broad-headed Snake	-	V	Requires rocky outcrops with adjacent sclerophyll forest and	No potential for impact.	No

Table 3.2 Assessment of threatened species previously recorded within the locality or considered to have the potential to occur

Scientific Name	Common Name	Legal Status*		Likelihood of occurrence	Potential for Impact	Further assessment required?
		TSC Act	EPBC Act			
				woodland. No rocky outcrops occur within the study area and this species is considered unlikely to occur.		
Amphibians						
Heleioporus australiacus	Giant Burrowing Frog	-	V	Associated with Devonian igneous and sedimentary rock and Ordovician metamorphic rock formations that support forest vegetation. No suitable habitat occurs for this species on site.	No potential for impact.	No
Litoria littlejohni	Littlejohn's Tree Frog	-	V	Requires rocky streams for breeding habitat. No suitable habitat occurs for this species on site.	No potential for impact.	No

Source: OEH 2012, DSEWPAC 2012

**TSC Act = Threatened Species Conservation Act 1995, EPBC Act = Environment Protection and Biodiversity Conservation Act 1999, V = Vulnerable, E = Endangered*



Source: Native Vegetation - Department of Infrastructure, Planning and Natural Resources.

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Vegetation map of the locality

Peppertree Quarry - Modification 3 - Ecology Assessment

Figure 3.1

4 Impact Assessment

4.1 HV Line

4.1.1 Construction impacts

No flora or flora species of conservation significance were recorded within the proposed HV line route, and it is considered that habitat for such species will not be impacted as a result of the proposal.

The HV line corridor will be 25 m in width and approximately 1 km in length. The installation of the line will result in impacts to less than 1 ha of woodland vegetation and adjacent disturbed and weedy pasture areas (see Figure 2.1). Approximately 0.475 ha of Box Gum Woodland would be disturbed as a result of the project. However, as the HV line will only require ground disturbance in and surrounding the proposed power pole locations to the extent shown in Figure 4.1, this impact could be reduced through appropriate construction management.

The potential for impacts to this community have been assessed under Part 5a of the EP&A Act (seven part test) and under the EPBC Act (assessment of significance) (see Appendix A). The potential impacts of the proposed HV line was not considered to be significant in accordance with the assessments, provided the mitigation measures outlined in this document were implemented to improve the condition of remnant Box Gum Woodland within the study area.

The HV line route was selected to avoid trees, however, a small number will require removal. It is anticipated that a total of fifteen trees will be removed for the project (see Figure 4.1 for locations and Table 4.1 for details). In addition, some areas containing juvenile and regenerating eucalypts will be impacted. In general trees to be removed are less than 20 m in height.

All the trees to be impacted are considered to be immature to mature, with no over-mature trees containing hollows to be cleared. None of these trees contain bird nests and they were selected for preferential removal due to their smaller size. Some additional tree branches may require trimming or lopping where the HV line passes near larger trees. None of the branches to be removed contain hollows or bird nests.

Table 4.1 Trees to be removed

Tree species	Height (m)	To be removed?	Easting	Northing
Apple Box (*E. bridgesiana*)	20	Yes	227278.3	6149312
Apple Box (*E. bridgesiana*)	20	Yes	227408.1	6149721
Apple Box (*E. bridgesiana*)	20	No	227415.9	6149734
Apple Box (*E. bridgesiana*)	20	No	227423.3	6149740
Apple Box (*E. bridgesiana*)	21	Yes	227262.8	6149298
Apple Box (*E. bridgesiana*) (3 trees)	21	No	227278.8	6149290
Apple Box (*E. bridgesiana*) (juvenile trees)	16	Yes	227303.1	6149338
Apple Box (*Eucalyptus bridgesiana*)	16	Yes	227208.2	6149257
Argyle Apple (*E. cinerea*)	15	No	227380	6149663
Blakely's Red Gum (*E. blakelyi*)	13	No	227361.5	6149685
Blakely's Red Gum (*E. blakelyi*)	14	Yes	227329.1	6149443

Table 4.1 Trees to be removed

Tree species	Height (m)	To be removed?	Easting	Northing
Blakely's Red Gum (*E. blakelyi*)	14	Yes	227390.3	6149730
Blakely's Red Gum (*E. blakelyi*)	14	No	227388.2	6149744
Blakely's Red Gum (*E. blakelyi*)	16	Yes	227202.6	6149235
Blakely's Red Gum (*E. blakelyi*)	17	Yes	227380	6149663
Blakely's Red Gum (*E. blakelyi*)	17	No	227309.8	6149459
Blakely's Red Gum (*E. blakelyi*)	28	No	227310.4	6149326
Blakely's Red Gum (*E. blakelyi*) (juvenile trees)	Up to 8	Yes	227408.8	6149790
Blakely's Red Gum (*E. blakelyi*) (juvenile trees)	Up to 8	No	227205.8	6149227
Narrow-leaved Stringybark (*E. eugenioides*)	16	No	227227.4	6149249
Narrow-leaved Stringybark (*E. eugenioides*)	17	No	227234.8	6149253
Narrow-leaved Stringybark (*E. eugenioides*)	22	Yes	227316.3	6149365
Narrow-leaved Stringybark (*E. eugenioides*)	28	No	227288.1	6149336
Narrow-leaved Stringybark (*E. eugenioides*)	30	Yes	227394.4	6149758
Narrow-leaved Stringybark (*E. eugenioides*)	30	No	227377.1	6149777
Narrow-leaved Stringybark (*E. eugenioides*) (juvenile trees)	Up to 8	Yes	227247	6149295
Yellow Box (*E. melliodora*)	15	Yes	227284.4	6149328
Yellow Box (*E. melliodora*)	15	Yes	227267.6	6149302
Yellow Box (*E. melliodora*)	17	Yes	227256	6149295
Yellow Box (*E. melliodora*)	20	Yes	227315.4	6149372
Yellow Box (*E. melliodora*) (juvenile trees)	Up to 16	Yes	227226.5	6149278

The HV line will not create a barrier to fauna movement or separate flora populations. Existing boundary and internal fencing already create a barrier to ground-dwelling fauna within the local area. There will be no additional barriers installed as a result of the construction of the HV line. Further, given the small easement size, it is unlikely that the HV line will create a barrier for the movement of genetic material and pollinators for native plants in the locality.

The vegetation within the proposed line area provides a buffer to a much larger intact remnant of vegetation. Given the large amount of existing grassy vegetation within the site, the removal of some trees for the installation of the line is not likely to exacerbate the un-vegetated areas that fauna species need to move through and thereby increase the potential risk of predation from feral animals.

The installation of the HV line will only impact on ground layer vegetation where poles are to be installed. The majority of the poles (PP14634 to PP 14647) will require disturbance of circular trench up to 2 m in diameter for an earthing wire. The remaining two poles (PP14648 and PP14649) located near the Quarry's processing plant require disturbance of 10 m diameter trenches around the poles. These two poles will be installed in pasture and there will be no impact to native flora or fauna as a result of the works.

The southern section of the HV line route is located adjacent to an agricultural lime plant. During the field investigation the woodland in this area was subject to industrial noise sources and nearby vegetation appeared to contain a cover of limestone dust. This area is consequently considered unlikely to provide preferred habitat for native fauna species given these existing ongoing disturbances.

Activities associated with the construction of the proposed HV line will increase the potential for weeds to spread and take advantage of disturbed areas; however such impacts will be mitigated through controls recommended in this document (See Section 5.3).

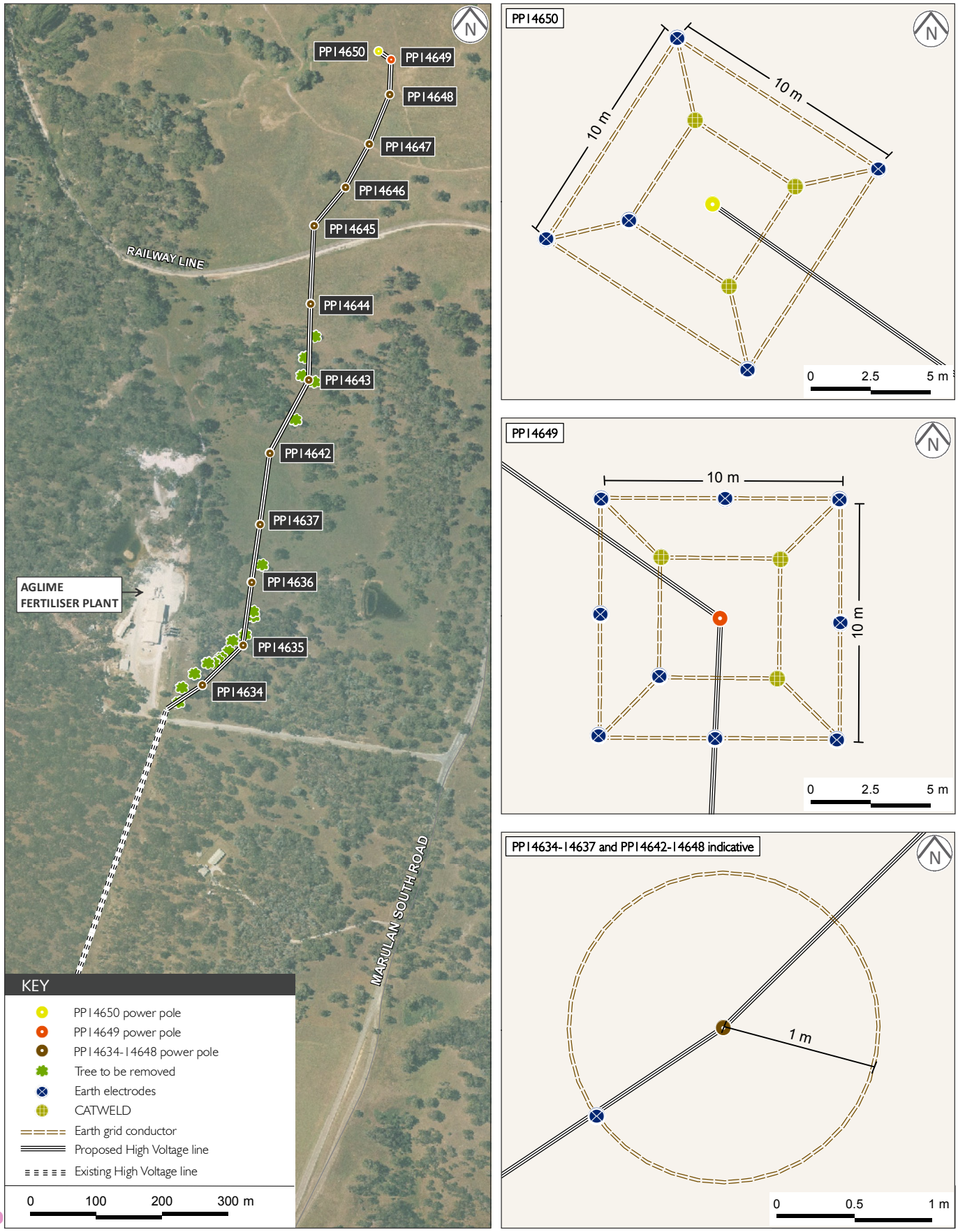
4.1.2 Operational impacts

Potential operational impacts from the HV line relate to the maintenance of the cleared easement, which will impact canopy species and will create some ground layer disturbance from vehicles and pedestrian traffic. The maintenance of a cleared 25 m easement is considered unlikely to impact arboreal fauna such as gliders, which can navigate such distances. Other fauna expected to utilise the area include highly mobile species such as bats and birds, which would be unaffected by the maintenance of the easement.

4.2 Passing line extension

The proposed extension to the passing will disturb an area of pasture and is not expected to impact on native flora and fauna species.

No operational impacts are expected as a result of the passing line extension.



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HV line construction works

Peppertree Quarry - Modification 3 - Ecology Assessment

Figure 4.1

5 Avoidance, mitigation and management

5.1 Avoidance

The proposal was designed to avoid ecological values within the site. This was achieved by line route selection being undertaken in conjunction with Boral personnel, and a preferred route being selected. This achieved the following outcomes:

- all large over-mature trees have been avoided and will not require removal;
- all hollow-bearing trees have been avoided;
- fauna habitat such as woody debris and drainage lines have been avoided;
- cleared areas have been preferentially selected;
- the area to be affected is considered depleted with respect to native species; and
- the design results in the smallest area of woodland possible being affected by the proposal (when considering engineering requirements).

5.2 Mitigation and management

The following management measures will be implemented during works to minimise the potential for ecological impacts:

- all disturbance areas and access routes will be clearly delineated and flagged in the field so that no areas outside of those assessed will be affected by machinery or personnel;
- no hollow bearing limbs or trees are to be impacted;
- if bird nests are identified these will be avoided by personnel and machinery;
- machinery will not drive over any woody ground debris and where debris is encountered, it will be moved into adjacent native vegetation by hand;
- all machinery will be inspected for weed seeds and clods of soil prior to entering vegetated areas;
- ground disturbance will be minimised wherever possible;
- all waste and materials used on site will be removed at the conclusion of the works;
- all holes and trenches will be filled or capped overnight to prevent fauna from injuring themselves or becoming trapped/drowned;
- sites will be monitored and managed for noxious weeds in the 12 months following works and until native species have regenerated the site; and
- a clearing maintenance protocol will be established for the ongoing maintenance of the easement. This should include the management of weeds such as Serrated Tussock.

Further, the Quarry's Landscape and Rehabilitation Management Plan will be updated, if required.

5.3 Improvement

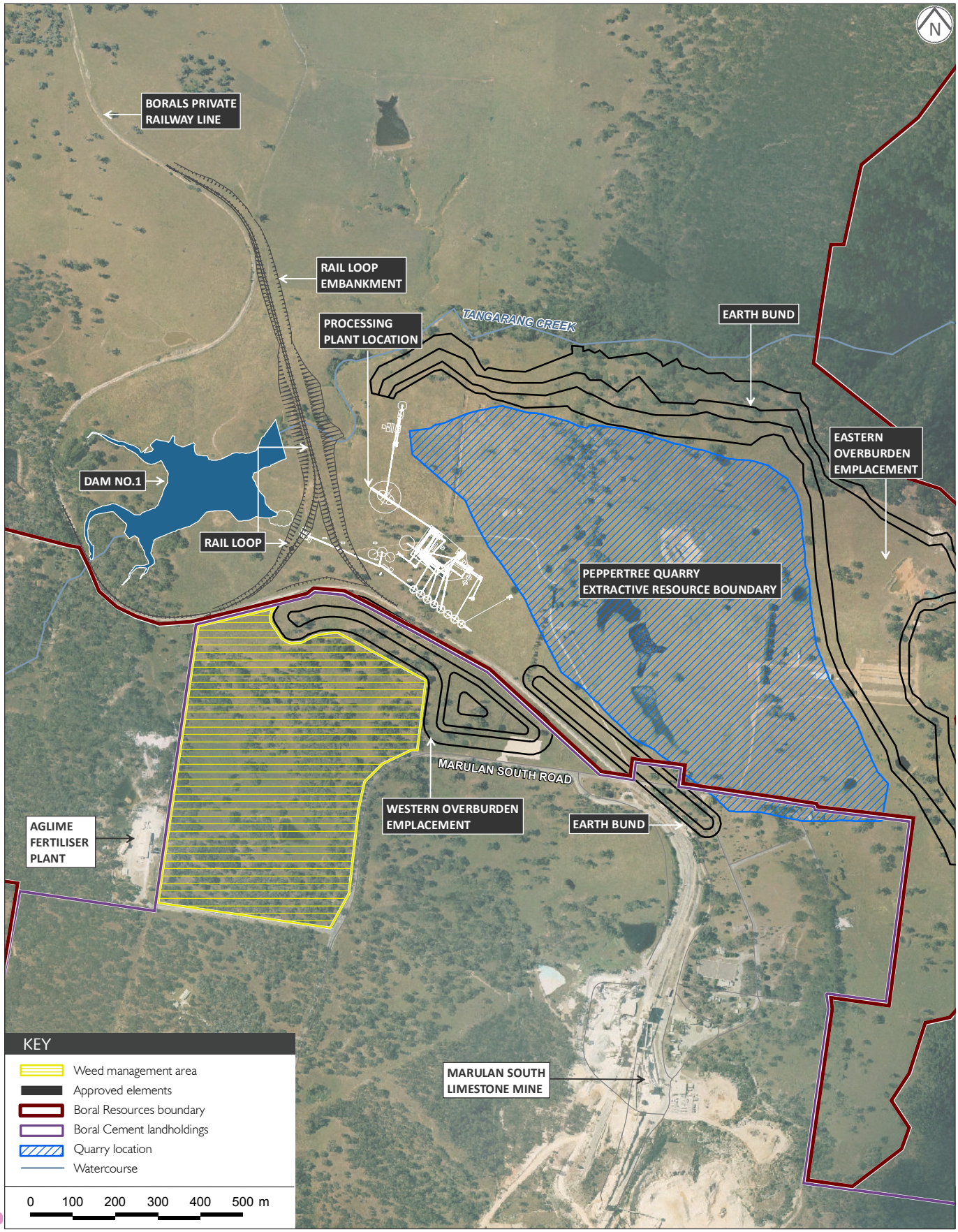
The greatest threat to the ecological integrity of the woodland of the site and immediate surrounds is the invasion by the noxious weeds Serrated Tussock (*Nassella trichotoma*) and St John's Wort (*Hypericum perforatum*). Serrated Tussock is listed as a Class 4 weed under the Noxious Weeds Act 1993 for the Goulburn Mulwaree Council area. This class requires that the growth of the plant must be managed in a manner that reduces its numbers, spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed. St John's Wort is listed as a Class 3 noxious weed in the area, with requirements for the plant to be fully and continuously suppressed and destroyed.

The clearance of vegetation to occur as part of the proposed HV line route is considered to be minor in comparison to the potential effects of these weeds on the Box Gum Woodland within the locality and the greater region. It is therefore considered that the removal and control of these weeds, would more than offset the impacts of the project on the woodland within the local area and the region. In addition, other measures to improve the ecological function of the site can also be contributed by the proposal.

The following measures have been identified to ensure an improved ecological outcome as a result of the proposal:

- Serrated Tussock and St John's Wort will be removed and continuously controlled from the area shown in Figure 4.1, allowing for continued natural regeneration of the woodland; and
- all woody material removed from the proposed HV Line route will be placed in surrounding woodland areas to be utilised as fauna habitat.

Natural regeneration of the woodland canopy species was recorded adjacent to the proposed route and therefore planting in cleared areas is not considered to be required, if weeds are adequately controlled in the area. It is likely that if appropriately managed into the future, adjacent pasture areas would naturally regenerate into a functioning component of the Box Gum Woodland community.



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Weed management area

Peppertree Quarry - Modification 3 - Ecology Assessment

Figure 5.1

6 Conclusion

The proposed modifications are considered unlikely to have a significant impact on native flora and fauna of the local area or the region because:

- the proposed route was selected to have minimal impacts on native species;
- the proposal will result in the removal of a very small area of vegetation;
- no large mature and over-mature trees will be removed;
- no trees bearing hollows or other significant attributes will be removed;
- the area to be affected is subject to ongoing disturbances making it marginal foraging habitat at best for significant fauna species;
- assessments of significance undertaken for the Box Gum Woodland community concluded that the proposal will not have significant impacts on the community; and
- measures have been proposed that will result in an improvement in the ecological values of the area.

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Appendix A

Assessments of Significance

A.1 Box Gum Grassy Woodland - assessment of significance under the EPBC Act

White Box Yellow Box Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands (Box-Gum Grassy Woodlands) is listed as a critically endangered ecological community (CEEC) under the EPBC Act. The community occurs in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria (Beadle 1981). It occurs in the Brigalow Belt South, Nandewar, New England Tableland, South Eastern Queensland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes, Victorian Midlands and Riverina Bioregions (Environment Australia 2000).

Box-Gum Grassy Woodlands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees (TSSC 2006a). The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated.

The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*) Poa Tussock (*Poa sieberiana*), Wallaby Grasses (*Austrodanthonia* spp.), Spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scrambled Eggs (*Goodenia pinnatifida*), Small St John's Wort (*Hypericum gramineum*), Narrow-leafed New Holland Daisy (*Vittadinia muelleri*) and Blue-bells (*Wahlenbergia* spp.). Shrubs are generally sparse or absent, though they may be locally common (NSW NPWS 2002).

The proposal will result in impacts to less than 0.5 ha of the community for the construction of a HV line. The vegetation in this area is considered to be low quality compared to the community described under the EPBC Act, due to the low diversity of the patch and the ongoing disturbances present there.

A.1.1 Significant impact criteria

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- *reduce the extent of an ecological community;*

The proposal will impact less than 0.5 ha of Box-Gum Grassy Woodland. This small area of low diversity woodland is unlikely to reduce the extent of the ecological community in the locality such that its long-term survival is compromised.

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;*

The small area to be affected by the proposal is isolated from other areas by a road and by an agricultural lime plant. At a wider scale the patch is located on the edge of a larger remnant that occurs to the south and the east. The small area to be affected by the proposal will therefore not fragment the community within the locality.

- *adversely affect habitat critical to the survival of an ecological community;*

Critical habitat has not been declared for this ecological community. However, the small area to be affected is unlikely to constitute important habitat for this community given the distribution of habitat in the wider locality (see Figure 5.1), the depleted nature of the community within the site and the ongoing disturbances present at the site.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;*

The proposal will not modify or destroy any abiotic factors that could affect the ecological community within the locality or the region.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;*

The proposal could result in an increased spread of weeds in disturbed areas, which could impact adjacent areas of woodland. To reduce the risk of this impact, the easement will be monitored and managed for weeds at the conclusion of works.

- *cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:*

    - *assisting invasive species, that are harmful to the listed ecological community, to become established; or*

    - *causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community;*

The proposal could result in an increased spread of weeds in disturbed areas, which could impact adjacent areas of woodland. To reduce the risk of this impact, the easement will be monitored and managed for weeds at the conclusion of works.

- *interfere with the recovery of an ecological community.*

The draft National Recovery Plan (DECCW 2010) for the community lists the following recovery objectives:

- achieving no net loss in extent and condition of the ecological community throughout its geographic distribution;

- increasing protection of sites in good condition;

- increasing landscape functionality of the ecological community through management and restoration of degraded sites;

- increasing transitional areas around remnants and linkages between remnants; and

- bringing about enduring changes in participating land manager attitudes and behaviours towards environmental protection and sustainable land management practices to increase extent, integrity and function of Box-Gum Grassy Woodland.

Given the small area to be impacted by the proposal, it is unlikely to interfere with the above objectives.

A.1.2 Conclusion

The proposal will not significantly impact the Box Gum Grassy Woodlands CEEC as it:

- will impact less than 0.5 ha of vegetation consistent with the listed community;
- will not fragment the community in the locality; and
- is not inconsistent with the recovery of the community.

A referral under the EPBC Act is not required for the proposed HV line.

A.2 Box-Gum Grassy Woodlands - assessment of significance under Part 5a of the EP& A Act – seven part test

Box Gum Grassy Woodlands is listed as an endangered community under the TSC Act. The community occurs in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW to central Victoria. It occurs in the Brigalow Belt South, Nandewar, New England Tableland, South Eastern Queensland, Sydney Basin, NSW North Coast, South Eastern Highlands, South East Corner, NSW South Western Slopes, Victorian Midlands and Riverina Bioregions.

Box Gum Woodlands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees (TSSC 2006a). The tree-cover is generally discontinuous and consists of widely-spaced trees of medium height in which the canopies are clearly separated.

The understorey in intact sites is characterised by native grasses and a high diversity of herbs; the most commonly encountered include Kangaroo Grass (*Themeda australis*) Poa Tussock (*Poa sieberiana*), Wallaby Grasses (*Austrodanthonia* spp.), Spear-grasses (*Austrostipa* spp.), Common Everlasting (*Chrysocephalum apiculatum*), Scrambled Eggs (*Goodenia pinnatifida*), Small St John's Wort (*Hypericum gramineum*), Narrow-leafed New Holland Daisy (*Vittadinia muelleri*) and Blue-bells (*Wahlenbergia* spp.). Shrubs are generally sparse or absent, though they may be locally common (NSW NPWS 2002).

The proposal will result in impacts to less than 0.5 ha of the community for the purposes of a HV line route.

a) *"in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,"*

This is not applicable to an ecological community.

b) *"in the case of an endangered population, whether the action proposed is likely to have an adverse affect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,"*

This is not applicable to an ecological community

c) *"in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:*

(i) *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*

(ii) *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,"*

Tozer *et al*. (2006) mapped more than 18,000 ha of this community in south-eastern NSW. The proposal will impact less than 0.5 ha of Box Gum Grassy Woodland and is therefore not likely to affect the endangered ecological community such that its local occurrence is likely to be placed at risk of extinction.

d) "in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

(ii) whether an area of habitats is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality."

Less than 0.5 ha of Box Gum Grassy Woodland will be impacted as a result of the proposal.

The proposal will not increase fragmentation given the small number of trees to be removed and the location of the easement within the landscape. The proposed HV line route is located within a fenced area which has been disturbed from agricultural activities and is adjacent to an agricultural lime plant and roadway. At a wider scale it is located on the edge of a larger woodland remnant that occurs to the south and the east, and the proposal will not result in further fragmentation of this area. The area of vegetation to be affected by the proposal has depleted native ground cover and is subject to ongoing disturbances including dust from a neighbouring agricultural lime plant and weed invasion. The area is therefore not considered important to the long-term survival of this ecological community in the locality.

e) "whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)"

To date, no critical habitat has been declared under the TSC Act for this endangered ecological community.

f) "whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan"

The draft National Recovery Plan (DECCW 2010) for the community lists the following recovery objectives:

- achieving no net loss in extent and condition of the ecological community throughout its geographic distribution;
- increasing protection of sites in good condition;
- increasing landscape functionality of the ecological community through management and restoration of degraded sites;
- increasing transitional areas around remnants and linkages between remnants; and
- bringing about enduring changes in participating land manager attitudes and behaviours towards environmental protection and sustainable land management practices to increase extent, integrity and function of Box Gum Grassy Woodland.

Given the small area to be impacted by the proposal, it is unlikely to interfere with the above objectives.

g) *"whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process"*

The proposed action is considered to constitute *Clearing of Native Vegetation*, a key threatening process under the TSC Act. Up to five trees may be removed as part of the proposed works, with impacts also anticipated for native ground cover in this area.

Actions will be taken to minimise the amount of native vegetation required to be cleared during the works to minimise this key threatening process. Given the small scale of the impact, it is considered that the proposed HV line will not result in significant impacts from this key threatening process to the community such that the integrity of the community in the locality is placed at risk of extinction.

A.2.1 Conclusion

The proposed HV line is unlikely to have a significant impact on the Box Gum Grassy Woodlands or its habitat in the locality. A Species Impact Statement is not required for the proposed HV line.

Appendix B

Flora species list

Table B.1 Flora Species List Modification 75W Peppertree Quarry

Scientific Name	Common Name
Acacia mearnsii	Black Wattle
Aristida sp.	Three Awn Grass
Austrodanthonia sp.	Wallaby Grass
Austrostipa sp.	Speargrass
Bothriochloa macra	Redlef Grass
Cassinia arcuata	Sifton Bush
Clematis glycinoides	Headache Vine
Eragrostis brownii	Brown's Lovegrass
Eucalyptus blakelyi	Blakely's Red Gum
Eucalyptus bridgesiana	Apple topped Box
Eucalyptus eugenioides	Thin-leaved Stringybark
Eucalyptus melliodora	Yellow Box
Geranium solanderi	Native Geranium
Hibbertia sp.	Guinea Flower
Hydrocotyle laxiflora	Stinking Pennywort
Lomandra multiflora	Multi-flowered Lomandra
Microalena stipoides	Weeping Meadow Grass
Panicum effusum	Panic Grass
Rumex brownii	Swamp Dock
Themeda australis	Kangaroo Grass
Tricoryne elatior	Yellow Autumn Lily
Vernonia cinerea	
Wahlenbergia communis	Native Bluebell
Exotic Species	
Conyza bonariensis	Fleabane
Dactylis glomerata	Cocksfoot
Hypericum japonicum	St John's Wort
Hypochaeris radicata	Catsear
Nassella trichotoma	Serrated Tussock
Plantago lanceolata	Plantain
Sporobolus indicus	Parramatta Grass
Trifolium repens	Clover

**Species in bold are listed as noxious weeds in the LGA*

Peppertree Quarry Modification 3

Appendix C: Aboriginal and Historic Heritage Impact Assessment

Planning + Environment + Acoustics

Peppertree Quarry Modification 3

Aboriginal and Historic Heritage Impact Assessment

Prepared for Boral Resources (NSW) Pty Limited | 30 July 2012

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Peppertree Quarry Modification 3

Aboriginal and Historic Heritage Impact Assessment

Final

Report J12053RP3 | Prepared for Boral Resources (NSW) Pty Limited | 30 July 2012

Prepared by	**Rebecca Moore**	Approved by	**Neville Baker**
Position	Archaeologist	Position	Associate Director
Signature		Signature	
Date	30/07/2012	Date	30/07/2012

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Document Control

Version	Date	Prepared by	Reviewed by
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Appendices

Tables

Figures

Photographs

1 Introduction

1.1 Project description

EMGA Mitchell McLennan Pty Limited (EMM) has been commissioned by Boral Resources (NSW) Pty Limited (Boral) to complete an Aboriginal and historic heritage impact assessment for proposed modifications to their project approval (PA06_0074) for Peppertree Quarry (the Quarry).

Two modifications are proposed:

- the construction of a 1 km long High Voltage (HV) line to the west of the Quarry; and
- the construction of a minor extension to the existing passing line on Boral's private rail line at its connection to the Main Southern Railway Line, approximately 8 km north of the Quarry.

The HV line will require clearance of a 25 m wide corridor (12.5 m either side of the centre line) along its length to achieve the necessary safety requirements. The construction will also involve some ground disturbance for the excavation of trenches around each pole which will be wired for earthing purposes.

Boral's existing private rail line connects the Quarry and Boral's Marulan Limestone Mine, located directly south of the Quarry, to the Main Southern Railway. There is a passing line at the junction with the Main Southern Railway which runs approximately 330 m. It is proposed to construction a 900 m extension to the passing line increasing its total length to 1.2 km. This will allow trains of a longer length to access the line for transportation of material from the Quarry.

An area of approximately 1,000 m^2 will be disturbed for the laying of new tracks and associated works. The passing line extension will also require minor alterations to the boundary between the existing rail corridor (Lot 1 DP 1124189) and the neighbouring eastern property "Glenrock" (Lot 204 DP 870194). Two areas of land, approximately 302 m^2 on the northern boundary and 658 m^2 on the southern boundary will be deducted from Lot 204 DP 870194 and added to Lot 1 DP 1124189.

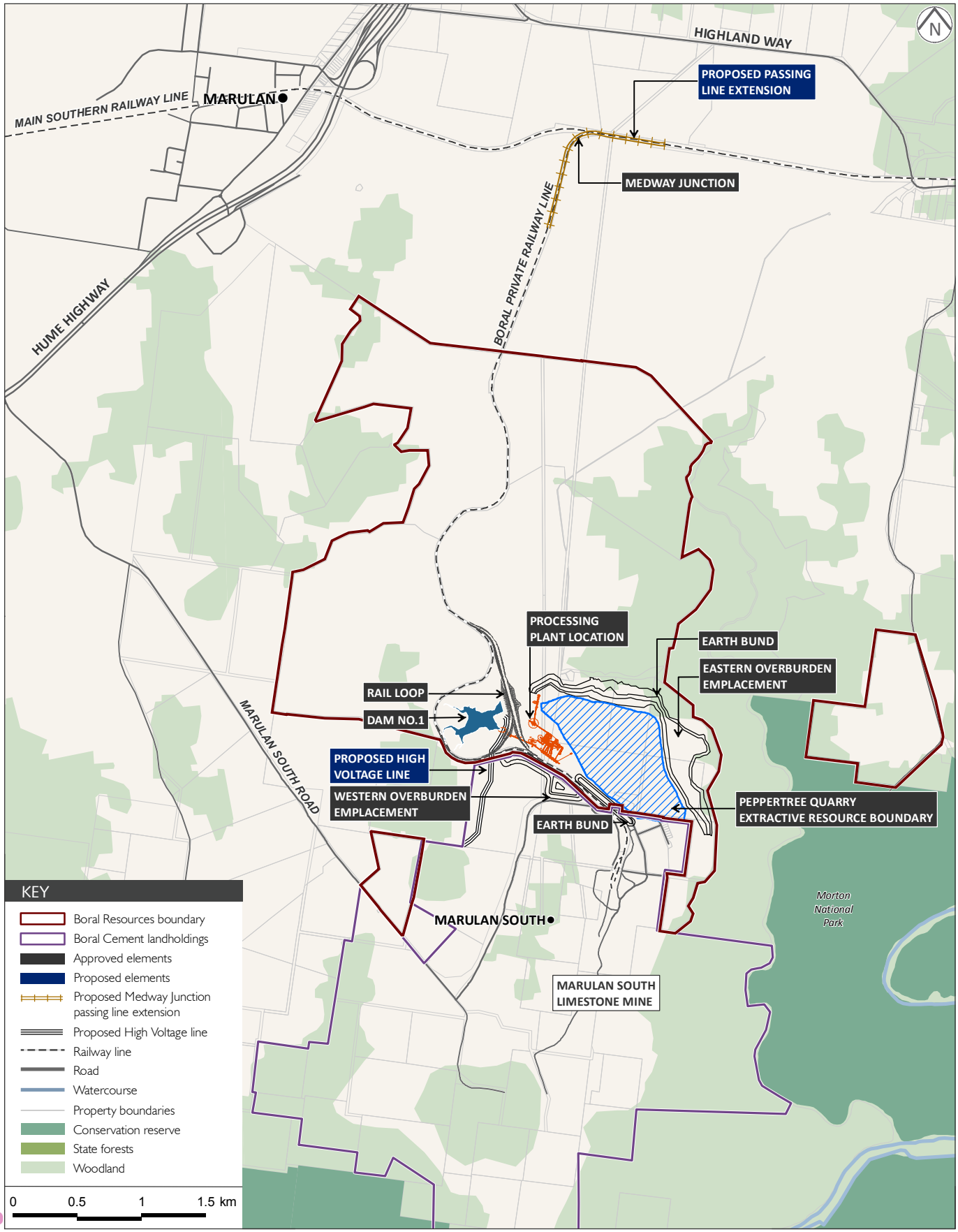
The extension will not result in an increase in the approved annual volumes of material transported from the Quarry nor the number of approved train movements.

1.2 Study area

The study area for this assessment is the disturbance footprint of each of the modifications. This includes the 25 m wide corridor (12.5 m either side of the centre line) required for clearance for the HV line and the 1,000 m^2 area to be disturbed for the extension to the passing line. The study area and proposed modifications are shown on Figure 1.1.

1.3 Planning context

The Project Approval for the Quarry was granted under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act). Boral wishes to modify the Project Approval under Section 75W of the EP&A Act. No Director-General's requirements have been issued for this modification.



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Proposed modification elements

Peppertree Quarry - Modification 3 -
Aboriginal and Historic Heritage Impact Assessment

Figure 1.1

1.4 Objectives of this assessment

The objectives of this assessment are:

- identify Aboriginal and historic heritage values relevant to the study area through desktop analysis;
- assess the significance of Aboriginal objects, sites and places identified in the course of field investigations and through Aboriginal community consultation;
- assess the significance of historic heritage items;
- assess the impact of the proposed modifications on the identified Aboriginal and historic heritage items; and
- identify appropriate management measures for potentially impacted Aboriginal and historic heritage.

1.5 Aboriginal consultation

In compliance with a condition of the Project Approval for the Quarry an Aboriginal Heritage Management Plan (AHMP) was prepared. The plan details management procedures for Aboriginal heritage within the development area and continuing consultation with the Aboriginal community. Members of the Peppertree Quarry Aboriginal Management Committee were invited to participate in the field survey and provide feedback on the measures in the draft report.

Two Aboriginal Management Committee members participated in the survey, Tyronne Bell of the Buru Ngunnawal Aboriginal Corporation (BNAC) and Dean Delponte of the Ngunnawal Heritage Aboriginal Corporation (NHAC). A member from the Pejar Local Aboriginal Land Council (Pejar LALC) was unable to attend on the day of the survey.

The draft report was provided to the BNAC, NHAC and Pejar LALC on 10 July 2012. All stakeholders responded with agreement to the management measures proposed in this report. Relevant correspondence is included in Appendix B documenting these responses.

1.6 Authorship and acknowledgments

This report was prepared by Rebecca Moore BA Hons Archaeology – Archaeologist, EMM. The report was reviewed by Neville Baker BA Hons Prehistory – Associate Director– Archaeologist, EMM.

The Boral project manager was Rod Wallace.

Aboriginal community fieldworkers included:

- Tyronne Bell (BNAC); and
- Dean Delponte (NHAC).

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2 Environmental background

2.1 Land systems

The terrain in the study area is predominantly flat along the HV line, with some gently undulating areas in the vicinity of the railway. The study area is located in the Southern Tablelands of NSW, a plateau surrounded by steep gorges and valleys. Prominent landforms in the vicinity are the Bungonia George to the east and south.

2.2 Geology and soils

The soils in the study area are acid-sodic soils with a thin topsoil A horizon and a clay B horizon. Deeper alluvial deposits have been formed along watercourses (Kelton 1997).

The study area lies within the Lachlan Ford Belt. Geology in the study area is Palaeozoic sequences. The regional geological pattern includes Middle Devonian Bindook Porphyry which includes quartz, tuff and feldspar.

2.3 Drainage

The major watercourse in the study area is Tangarang Creek, an ephemeral creek, which runs from west to east through the quarry near the northern end of the HV line. It is fed by ephemeral unnamed creeks to the north and south. Tangarang Creek flows into Barbers Creek which then flows into the Shoalhaven River.

Regionally the major nearby watercourses are Marulan Creek 2 km to the north and Bungonia Creek 4 km to the south. The water system of the region lies within the catchment of the Shoalhaven River which is located 5 km south east of the study area.

2.4 Land use and disturbance

Current land use in the study area is grazing and mining activities. An agricultural lime processing plant is located to the south-west of the study area and mining activities include Boral's Marulan Limestone Mine immediately to the south. Activities have also begun in the quarry area resulting in considerable disturbance to the northern area of the HV line. Previous archaeological salvage excavation has also occurred in this area prior to commencement of quarry activities. The Hume Highway is to the north-west of the study area.

Historically the area has been used for cattle and sheep grazing with some sowing of fodder crops. The grazing activities have resulted in disturbance to the study area through clearing of native vegetation and grazing of stock. The few roads and buildings that remain of the former town of Marulan South, lie to the south of the study area.

2.5 Implications for Aboriginal site location

Generally the study area has been disturbed by the processes of European occupation and clearing of the landscape for agricultural activities.

The northern end of the proposed HV line passes through an area of archaeological sensitivity due to its position within 200 m of Tangarang Creek. It is likely that this area has the potential for further Aboriginal artefacts to be uncovered.

2.6 Habitat Management Area

Schedule 3, Condition 33 of PA06_0074 requires that a Habitat Management Area (HMA) be established in the area to the west of the Quarry near Tangarang Creek (see Figure 2.1). The purpose of the HMA is to protect at least 12 ha of Box Gum Woodland and Aboriginal heritage items previously identified in the area by ERM (2006).

3 Aboriginal and historic heritage background

3.1 Ethno history

Information about the socio-cultural structure of Aboriginal society prior to European contact largely comes from ethno-historic accounts made by Europeans. These accounts and observations were made after massive social disruption due to disease and displacement. As a result, this information is often contentious, particularly in relation to language area boundaries.

Tindale (1974) identified four major language groups in the region; the Gandangara to the north-west, the Ngunawal to the south-west, the Wodi Wodi to the north-east and the Wandandian to the south-east. At European contact, these groups were increasing in similarity and linguistic anthropologists noted the almost identical word lists of the Gandangara and the Ngunawal groups around the 1890s (Koettig and Lance 1986). On the basis of Tindale's mapping, the development was most likely to have been within the boundary of the Gandangara group.

Certain other generalisations can be made from early colonial writing on the Aboriginal people of the Goulburn area. Aboriginal people from the area moved in small family groups and travelled throughout the area (Smith 1992). Historical records have noted large gatherings of people took place in Goulburn even in the early 1800s (Smith 1992). Families subsisted on eels, water birds and land dwelling fauna including kangaroos and possums, as well as plants such as bulrushes and sow thistles. Migrating Bogong moths were the basis of the food supply during the summer months and may have been the basis for large tribal gatherings during these months. Aboriginal groups had a wide range of tools and equipment made of wood and stone, including reed spears and axes. The bark of stringy bark trees were used for making shelters and rope.

3.2 Post settlement history

European explorers first visited the southern tablelands as early as 1798 when John Wilson was sent to the area by Governor Hunter (Chisholm 2006). It was officially found by James Meehan in 1818 (Firth 1983). In August 1820 Joseph Wild travelled south of the Cookbundoon Range and found what is now called Lake George (Watson 1931).

Stock and cattle stations were established in the 1820s throughout the Goulburn plains and the wool industry dominated the area during the 1800s and through the early twentieth century (Firth 1983). Sir Richard Bourke chose the area of the town of Goulburn in 1832. The railway was built to Goulburn in 1869. Major towns included Marulan, which was established first in 1834 and then moved approximately 2 km away in 1868 when the Great South Railway Line was constructed. Other towns established in the area included Tallong (1869), Wingello (1871) and Bungonia (1836).

The area remains agricultural used for cattle and sheep grazing. Tourism has increased as the improvements to the Hume highway connected the area to Sydney. The area was amalgamated into the Goulburn Mulwaree local government area (LGA) in 2005.

3.3 Historic heritage previously recorded sites

Desktop searches were conducted of the National, Commonwealth and State Heritage Registers and no historic heritage items of significance were identified in the study area. The Goulburn heritage study (Firth 1983) and the Mulwaree community heritage study (Heritage Archaeology 2004) also did not identify any historic sites within the study area. The NSW Heritage Inventory and the Goulburn Mulwaree Council

Local Environmental Plan 2009 did not identify any heritage items within the study area. A locally listed heritage item, the Glenrock homestead, stone outbuildings, grounds and trees was identified in the property adjoining the proposed rail corridor. The Glenrock homestead is a two storey house built in a Georgian style around the 1840s. It was originally owned by George Barber and Isabella Hume. Isabella Hume is the sister of explorer Hamilton Hume. It has been assessed as significant due to its fine stonework facade and its association with the Hume family, a prominent family in the local district.

Archaeological potential was investigated using aerial photographs and topographic maps of the study area. No areas of archaeological potential were identified.

Due to the factors detailed above the area is not considered sensitive for historic heritage. No heritage items will be affected by the proposed modifications.

3.4 Aboriginal heritage previously recorded sites

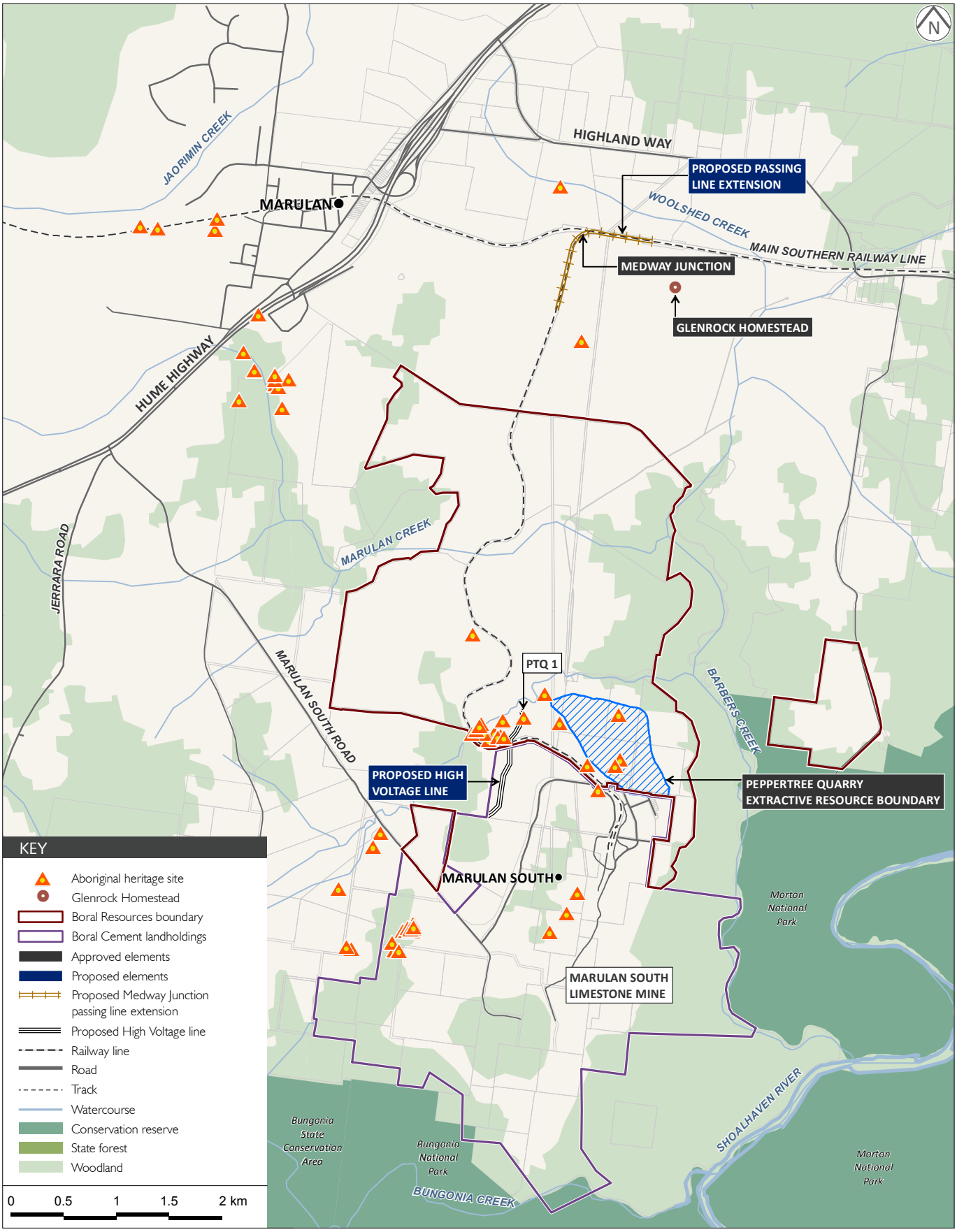
An AHIMS extensive search was conducted on 6 June 2012 for an area approximately 5 km by 3 km surrounding the study area. The search area was sufficient to define the pattern of previously recorded sites in the landscape.

The search revealed a total of 59 registered sites (see Table 3.1). The most common site type recorded was open camp site (artefact scatter) which amounted to 56% of the total sites registered. Isolated finds accounted for 41% of the total sites registered. One scarred tree and one burial were also identified.

Table 3.1 AHIMS registered sites within the search area

Site type	Number of sites
Open camp site (artefact scatter)	33
Isolated find	24
Scarred tree	1
Burial – stone arrangement	1
Total	59

The full results of the search are located in Appendix A. Figure 3.1 shows theses sites relation to the study area. All known sites are avoided by the proposed modification.



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Heritage database analysis

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Figure 3.1

3.5 Archaeological reports in the local area

Archaeological investigations have been conducted in the Southern Tablelands over a number of years. The following is a summary of the most relevant archaeological reports.

AMBS 2012, *Goulburn Mulwaree LGA Aboriginal Heritage Study,* prepared for Goulburn Mulwaree Council.

This report provided a comprehensive historical and ethnographic study of the region. It identified areas of Aboriginal sensitivity within the Goulburn Mulwaree LGA for consideration during developments in the LGA. This study identified the area around South Marulan as an area of Aboriginal heritage significance.

ERM 2006, *Marulan South Quarry Aboriginal Heritage Assessment*, prepared for Boral Resources (NSW) Pty Limited.

This report details the Aboriginal heritage assessment conducted for the Environmental Assessment of the Peppertree Quarry. The assessment identified 11 sites within the quarry footprint and a proposed water storage dam along Tangarang Creek. The majority of artefacts identified were silcrete and quartz flakes and cores. A recommendation was made for salvage excavation in areas along Tangarang Creek. This salvage has been completed however the report has not been finalised at this stage.

Umwelt 2006, *Aboriginal Archaeological Assessment of Transmission Line Easements and a proposed Substation Location near Marulan,* NSW, a report prepared for Country Energy.

This report documented investigations of proposed transmission lines at the Lynwood Quarry area approximately 1 km south of the study area. The survey identified 15 sites, eight of which were within the boundary of the project area.

Umwelt 2005, *Environmental Impact Statement Proposed Lynwood Quarry Marulan*, report for Readymix Holdings Pty Limited.

This report detailed the results of the survey for the Lynwood Quarry. The survey area for this report was approximately 5 km north of the study area. The survey located 52 Aboriginal sites including 30 artefact scatters, 13 isolated finds and seven scarred trees and two stone arrangements. Several artefact scatters with more than 150 stone artefacts were recorded. Artefact material included silcrete, quartz and chert.

Lance and Koettig 1986, *An Aboriginal Resource Planning Study for the City of Goulburn*, report by ANUTECH to Goulburn City Council.

This report detailed a large scale investigation into Aboriginal land use patterns in the Marulan region. The report predicted that stone artefact sites would be located with 100 m of water and the greatest density of artefacts would be found at the junctions of creeks and rivers. Smaller density camp sites were predicted on well drained lower slopes, ridge tops and creek flats.

Haglund 1986, *Archaeological Survey of Areas within Bungonia State Recreation Area likely to be Affected by Present and Future Recreational Activities and Associated Development,* report to Bungonia State Recreation Area Trust.

This report details an investigation of areas of potential archaeological sensitivity within the Bungonia State Conservation Area approximately 10 km south of the study area. In total 15 sites were identified with artefacts consisting of flakes, cores and blades made of silcrete, quartz and indurated mudstone.

3.6 Implications for archaeology in the study area

Previous studies in the region have shown that the study area has the potential to contain artefact scatters as these are the most common Aboriginal site identified. This research has also identified isolated finds, scarred trees and on rare occasions, burials. The study area has the potential to contain these site types as well.

The results of the AHIMS search show that the presence of modified trees is not common, only one was identified. There is a low potential for carved or scarred trees in the study area as it has been severely affected by land clearing activities. As such it is unlikely that mature aged trees of a suitable age have been retained in the disturbed landscape.

None of the studies in the local area have identified any Pleistocene aged material. The research previously conducted has indicated that artefacts found are probably Holocene in age. Thus it is likely that the study area would have the potential to retain similarly aged Aboriginal stone tools or cultural material. The prevailing archaeological evidence identified in these surveys is open stone artefact sites. The majority of stone tools found in the area are cores and flakes, comprising very small numbers of flaked stone artefacts. Tools are predominately made out of silcrete, with lesser proportions of indurated mudstone/tuff, quartz and other raw materials.

3.7 Predictive model of site location

A predictive model of site location is based on:

- the distribution of Aboriginal archaeological sites described in previous reports;
- any archaeological sites listed in the AHIMS register; and
- landscape features of the study area.

Based on the items described above the following predictions can be made of the study area:

- there is limited potential for rock shelter sites;
- if sites occur, they are likely to consist of flaked stone artefact scatters and isolated finds;
- silcrete from local and regional sources would be the most commonly used raw material;
- scarred trees are rare, but may be present where mature native trees remain in the study area.

The landscape has been disturbed by agricultural practices and clearing of natural vegetation. Thus artefacts discovered are likely to be in disturbed contexts.

Generally the study area does not include landforms identified as having a strong potential for Aboriginal artefacts (such as ridge tops). The majority of the study area is paddocks. As such it is unlikely that Aboriginal sites will be encountered. If Aboriginal artefacts are encountered it is likely they will be isolated finds which do not indicate the presence of archaeological deposit. Scarred trees, while rare, have been previously identified and may remain if trees of a suitable age have been retained in the landscape.

The northern part of the HV line crosses an area previously identified as sensitive due to the location of Tangarang Creek. These sites have been salvaged as part of an archaeological excavation to satisfy the conditions of project approval. As such there has been considerable subsequent disturbance of the area

including for a roadway. There is potential for further Aboriginal objects to be uncovered if development is proposed in these areas.

4 Field survey

4.1 Survey strategy

An archaeological inspection of the study area was undertaken by Rebecca Moore (EMM archaeologist), Rod Wallace (Boral Resources), Tyronne Bell (BNAC), and Dean Delponte (NHAC) on 25 June 2012. The visit was undertaken to provide a visual inspection of the areas to be disturbed. The results of the inspection are reported below.

The archaeological pedestrian survey was undertaken in sunny and windy conditions. The inspection was conducted along the proposed route of the HV line and the Medway Junction passing line extension. The inspection involved searching for soil exposures on the ground to determine whether stone artefacts were eroding from the topsoil. Mature trees were also inspected for the presence of Aboriginal scarring which might derive from the removal of bark or cambium wood for the manufacture of traditional implements.

4.2 Survey units

The survey was divided into three survey units as follows:

- The southern section of the HV line up to the rail line which consisted of flat ground with long grass cover and open woodland. This survey unit covered a distance of 724 m.
- The northern section of the HV line from the rail line to the final poles which was highly disturbed ground adjacent to the HMA. This survey unit was 317 m.
- The passing line extension which consisted of disturbed paddock land covered by paddock grasses. This survey unit was 164 m.

4.3 Survey results

No Aboriginal sites were identified during the survey of the southern section of the HV line. Grass cover in the area was approximately 95%. A number of ant nests were inspected for the presence of Aboriginal objects but none were found. There was little evidence of disturbance in this area (see Photograph 4.1).

No Aboriginal sites were identified during the survey of the passing line extension. One area of disturbance to the topsoil was inspected and no artefacts were identified. Grass cover in the area was 99% (see Photograph 4.2).

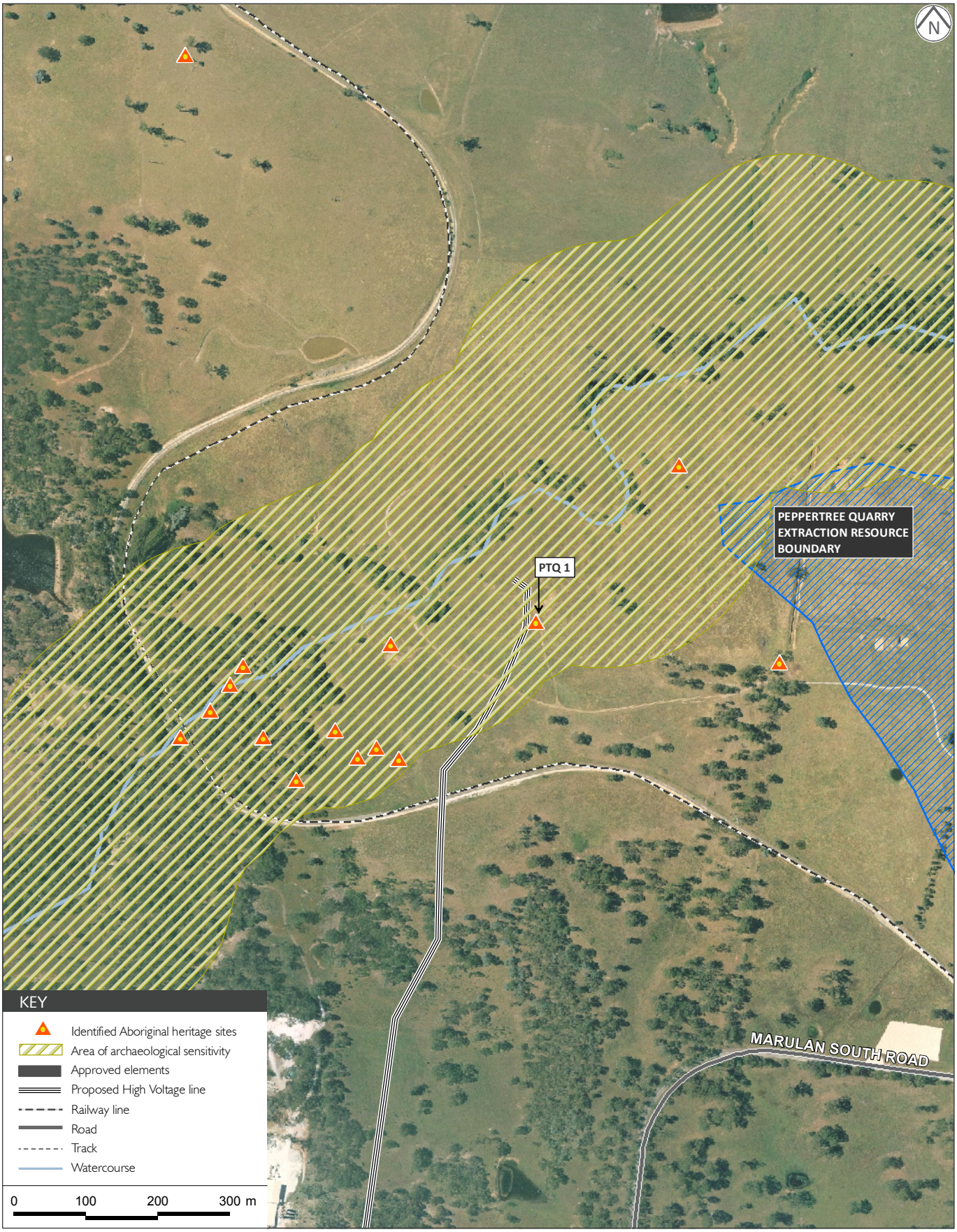
One Aboriginal site, designated PTQ 1 was located in the northern section of the HV line approximately 2 m from the location of power pole PP 14648. The rail line is located approximately 300 m to the north and south of the site. A dam is located to the west of the site and the high water mark of the dam is approximately 8 m from the site. PTQ 1 is located on flat ground. It is 10 m by 5 m. PTQ 1 contained six artefacts, two quartz flakes and three silcrete flakes (shown in Photograph 4.3). Soil associated with the site is brown silt. This site is located in an area disturbed through quarrying activities and a route used by trucks and it is likely that this disturbance has revealed the artefacts. There is moderate potential for archaeological deposit in this area, however subsurface deposit is unlikely to be intact due to the disturbance from quarrying activities. The area in which this site is located has been previously surveyed during the original Peppertree Quarry Environmental Assessment and was not identified. The area to the west of the site was identified as of high archaeological sensitivity and excavated as required, in the

conditions of approval. At the conclusion of the excavation program quarrying activities commenced resulting in the disturbance to this area. Site PTQ 1 is shown on Figure 4.1.

Photograph 4.1 Southern section of the HV line

Photograph 4.2 Passing line extension area

Photograph 4.3 The approximate location of site PTQ 1 is shown by the black arrow



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Archaeologically sensitive area

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Figure 4.1

5 Significance assessment

5.1 Defining heritage significance

Heritage sites, objects and places hold value for communities in many different ways. The nature of those heritage values is an important consideration when deciding how to manage a heritage site, object or place and balance competing land-use options.

The many heritage values are summed up in an assessment of 'Cultural Significance'.

The primary guide to management of heritage places is the Australia ICOMOS Burra Charter 1999. The Burra Charter defines cultural significance as follows:

> *"Cultural significance means aesthetic, historic, scientific, social or spiritual value for past, present or future generations. Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Places may have a range of values for different individuals or groups."*

This assessment has sought to identify Aboriginal objects and historic relics within the study area and obtain enough information to allow the values of those objects and sites to be determined. Given the lack of historic heritage evidence, this assessment pertains to Aboriginal heritage.

5.2 Socio-cultural value: significance to the Aboriginal community

Research and consultation with the Aboriginal community was conducted to determine whether any socio-cultural heritage value relates specifically to the study area regardless of archaeological evidence. While it is accepted that the broader landscape is of significance to Aboriginal people, this study sought to identify whether the study areas held specific values either in themselves, or as part of a specific local area of particular significance. To date, no information has been received that identifies specific heritage value unrelated to the Aboriginal sites.

Aboriginal heritage sites with archaeological evidence are all of value to the Aboriginal community through the tangible connection that they represent with pre-European Aboriginal land use. This is appropriately summed up in a statement by a Wonnarua Aboriginal consultant in a survey report from the Hunter Valley region,

> *"The Cultural Sites that we find today in the landscape remind us of our original connection to this Country that reinforces our ties to the land.* (Perry 1999: 2).

5.3 Scientific value

Scientific value is assessed according to the research potential of a site. Rarity and representativeness are also related concepts taken into account. Research potential or demonstrated research importance is considered according to the contribution that a heritage site can make to present understanding of human society and the human past. Those heritage sites, objects or places of high scientific significance are those which provide an uncommon opportunity to inform us about the specific age of people in an area, or provide a rare glimpse of artistic endeavour or provide a rare chronological record of changing life through deep archaeological stratigraphy.

Site PTQ 1 has low scientific value. The artefacts identified do not have high research potential due to their disturbed context.

5.4 Levels of significance

5.4.1 Rarity and representativeness

The comparative rarity of a site is a consideration in assessing scientific significance. A certain site type may be 'one of a kind' in one region, but very common in another. Artefacts of a particular type may be common in one region, but outside the known distribution in another. PTQ 1 is not considered rare as it is commonly found within the broader area and, therefore, has low scientific significance from a rarity perspective.

5.4.2 Integrity

The integrity of a site is also a consideration in determining scientific significance. While disturbance of a topsoil deposit with artefacts does not entirely diminish research value, it may limit the types of questions that may be addressed. A heavily cultivated paddock may be unsuited to addressing research questions of small-scale site structure, but it may still be suitable for answering more general questions of stone tool distribution in a region and raw material logistics.

In the southern area of the HV line no significance soil disturbance was identified and soil appeared to be intact. Some soil disturbance was identified along the rail line. Significance soil disturbance was identified along the northern section of the HV line and at site PTQ 1.

5.4.3 Research themes

The capacity of a site to address research questions is predicated on a definition of what the key research issues are for a region. In the local region, the key research issues revolve around the chronology of Aboriginal occupation and variability in stone artefact manufacturing technology. Sites with certain backed implements from the Holocene are very common, but sites with definite Pleistocene evidence are extremely rare, and hence of extremely high significance if found.

Site PTQ 1 offers no contribution to the understanding of chronology or stone technology.

5.5 Educational value

Educational value relates to the capacity of a site to portray more easily recognisable archaeological features. While the educational potential of Aboriginal sites can only be effectively realised through interpretation, those sites with more obtrusive elements and suitable settings offer greater potential to illustrate the salient features of Aboriginal activity.

Site PTQ 1 does not have educational value due to its high degree of disturbance.

5.6 Statement of cultural significance

PTQ 1 does not have significant research potential as it has been disturbed. The artefacts identified do not have evidence of rare features and are consistent with the artefacts identified and salvaged as part of the quarry excavation program. As such the scientific value of PTQ 1 is low.

6 Impact assessment

6.1 Historic heritage impact

The section of land required for the passing line will be bought from the Glenrock property holdings however the purchase will not impact on the significance of the homestead, stone outbuildings, grounds or trees. The passing line will not affect the pastoral setting of Glenrock or impact on its ability to contribute to our understanding of pastoral life in the area or the property's association with the Hume family. No trees which are part of the Glenrock property will be removed. Train movements will not increase and there are no predicted increases in vibration which may impact the homestead. Therefore, no heritage impact is predicted on the Glenrock homestead outbuildings, grounds and trees from the passing line extension. No further heritage items were identified in the passing line study area.

There are no predicted impacts on historic heritage along the HV line as no evidence of historic heritage items was found in the study area.

6.2 Aboriginal heritage impact

The passing line extension will not have a substantial impact on Aboriginal heritage as it is not predicted that Aboriginal objects will occur in this context. The survey did not reveal any evidence of Aboriginal objects and the passing line extension is being constructed in paddock areas. These areas do not contain landscape features which may predict the location of Aboriginal objects or sites.

The HV line will pass through areas where Aboriginal objects are predicted to occur, predominantly within close proximity to Tangarang Creek and the HMA. Aboriginal objects will be displaced within that area. As a result of the identification of site PTQ 1 the location of power poles PP14649, PP14650, PP14648, PP14647 have been moved closer to previously disturbed areas. Furthermore previous excavation of this area under the AHMP has recovered a large portion of artefacts in controlled conditions providing a rich research sample of the Tangarang Creek and its surrounds. Also the construction corridor for the HV line affects a minor proportion of the inferred artefact distribution. The total area of sensitivity estimated for the Tangarang Creek land is 6 km^2 (600 ha). The estimated area of the HV line corridor, allowing for a 25 m wide corridor is 2.7 ha (25 m x 1,080 m) which is 0.45% of the sensitive area. Therefore, impacts to Aboriginal heritage are low.

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7 Conclusions and management recommendations

7.1 Conclusions

This report has considered the available environmental and archaeological information for the study area including previous reports as well as the nature of the proposed activities.

The desktop and field survey did not identify any historic heritage items within the study area. One item, the Glenrock homestead, stone outbuildings, grounds and trees was identified adjacent to the proposed rail passing line. No impact to this item is predicted and as such no management measures are proposed.

A review of previous Aboriginal cultural heritage assessments and reports in the vicinity of the study area indicated that artefacts have been found in the region, usually on ridge tops or near watercourses. Aboriginal sites are usually open artefact scatters, isolated finds or scarred trees. Most stone tools are made of silcrete or quartz.

The record of land use in the study area and the extent of disturbance and modification to landscape indicated that artefacts were unlikely to occur. The landforms in the study area were generally cleared paddocks considered to be areas where artefacts or subsurface deposits were unlikely. One area of sensitivity was identified around Tangarang Creek, an ephemeral water source within the study area.

The survey identified evidence of Aboriginal artefacts in a disturbed area adjacent to the previous Tangarang Creek area and designated HMA. Responses to the survey from Aboriginal stakeholder groups are contained in Appendix B.

7.2 Management recommendations

As a result of the desktop study, survey and subsequent response from survey participants the following recommendations are made for the Peppertree Quarry Modification 3.

No management recommendations are made for historic heritage as historic heritage has not been identified in the study area.

No management recommendations are made for the passing line extension as this area is of low archaeological potential and construction is unlikely to affect Aboriginal objects.

7.2.1 Recommendation 1

That the area of archaeological sensitivity in the southern section of the HV line (as identified in Figure 4.1) is subject to monitoring during the construction of power poles number PP14634 to PP 14637 and PP 14642 to PP14644 (7 poles). This is due to the intact nature of this area. Monitoring of the area will be completed by members of the Aboriginal Management Committee and in accordance with the AHMP. Any artefacts identified during monitoring will be collected, bagged, tagged and stored with the artefacts already excavated from the quarry area.

7.2.2 Recommendation 2

That the area of archaeological sensitivity in the northern section of the HV line (as identified in Figure 4.1) is subject to monitoring during the construction of power poles number PP14646 to PP1450 (5 poles). While this area is disturbed and any potential artefacts are likely to be of low scientific significance,

monitoring is recommended due to their proximity to the HMA and the identified presence of Aboriginal objects. This management measure is in line with the significance of these objects and their presence in a disturbed area. Monitoring will ensure that further disturbance to an identified area of heritage significance is appropriately managed in accordance with site significance and the wishes of the Aboriginal community. Monitoring of the area will be completed by members of the Aboriginal Management Committee and in accordance with the AHMP. Any artefacts identified during monitoring will be collected, bagged, tagged and stored with the artefacts already excavated from the quarry area.

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Appendix A

Aboriginal Heritage Information Management System results

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : J12053 - Peppertree

Client Service ID : 71979

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
51-6-0102	Isolated Find 3	AGD	55	777420	6153370	Open site	Valid	Artefact : -	Isolated Find	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0101	Isolated Find 2	AGD	55	774550	6152900	Open site	Valid	Artefact : -	Isolated Find	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0091	Marulan 6	AGD	55	774310	6153270	Open site	Valid	Artefact : -	Open Camp Site	3605,99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0086	Marulan 1	AGD	55	774500	6153130	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0087	Marulan 2	AGD	55	774530	6153100	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0088	Marulan 3	AGD	55	774630	6153170	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0089	Marulan 4	AGD	55	774510	6153000	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0090	Marulan 5	AGD	55	774380	6153800	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0092	Marulan 7	AGD	55	774220	6153450	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0103	Isolated Find 1	AGD	55	774500	6153170	Open site	Valid	Artefact : -	Isolated Find	99404
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0104	Isolated Find 4	AGD	55	774550	6152900	Open site	Valid	Artefact : -	Isolated Find	
	Contact	**Recorders**	Mrs.Caryll Sefton					**Permits**		
51-6-0105	Marulan ER Site 1	AGD	55	774500	6153220	Open site	Valid	Artefact : -	Open Camp Site	99404
	Contact	**Recorders**	Miss.Jackie Taylor					**Permits**		
51-6-0287	MRN46	AGD	55	773309	6154841	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Mr.Graham Houghton					**Permits**		
48-4-0086	DP1056566 Lot 11/1	AGD	56	225675	6148350	Open site	Valid	Artefact : 12		99346,99362
	Contact T Russell	**Recorders**	Doug Williams					**Permits**	2536,2675,2676	
48-4-0087	DP1056566 Lot 11/2	AGD	56	226075	6148875	Open site	Valid	Artefact : 37		99346,99362
	Contact T Russell	**Recorders**	Doug Williams					**Permits**	2536,2675,2676	
48-4-0088	DP1056566 Lot 11/3	AGD	56	226000	6148750	Open site	Valid	Artefact : 3		99346,99362
	Contact T Russell	**Recorders**	Doug Williams					**Permits**	2536,2675,2676	

Report generated by AHIMS Web Service on 06/06/2012 for Rebecca Moore for the following area at Lat, Long From : 149.99599, -34.76397 - Lat, Long To : -34.71286, 150.04182 with a Buffer of 1000 meters.Additional Info : due diligence. Number of Aboriginal sites and Aboriginal objects found is 59

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : J12053 - Peppertree

Client Service ID : 71979

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
48-4-0092	DP1056566 Lot 12/IF1	AGD	56	225800	6147780	Open site	Valid	Artefact : 1		99346,99362
	Contact T Russell	**Recorders**	Doug Williams					**Permits**		
48-4-0093	DP1056566 Lot 12/IF2	AGD	56	225750	6147800	Open site	Valid	Artefact : 1		99346,99362
	Contact T Russell	**Recorders**	Doug Williams					**Permits**		
52-4-0143	MSQ 1	GDA	56	228240	6149470	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	Mr.Chris Lange					**Permits**		
52-4-0144	MSQ2	GDA	56	228140	6149710	Open site	Valid	Artefact : 3		
	Contact Searle	**Recorders**	Mr.Chris Lange					**Permits**		
52-4-0145	MSQ3	GDA	56	228450	6149755	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Chris Lange					**Permits**		
52-4-0146	MSQ4	GDA	56	228449	6149760	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Chris Lange					**Permits**		
52-4-0147	MSQ5	GDA	56	228400	6149700	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Chris Lange					**Permits**		
52-4-0148	MSQ6	GDA	56	227050	6150950	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Mr.Chris Lange					**Permits**		
52-4-0149	MSQ7	GDA	56	227735	6150380	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Mr.Chris Lange					**Permits**		
52-4-0150	MSQ8	GDA	56	227258	6150013	Open site	Valid	Artefact : 9		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		
52-4-0151	MSQ9	GDA	56	227204	6149944	Open site	Valid	Artefact : 4		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		
52-4-0152	MSQ10	GDA	56	227158	6150003	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		
52-4-0153	MSQ11	GDA	56	227043	6150003	Open site	Valid	Artefact : 8		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		
52-4-0154	MSQ12	GDA	56	227130	6150102	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		
52-4-0155	MSQ13	GDA	56	227085	6150040	Open site	Valid	Artefact : 4		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		
52-4-0156	MSQ14	GDA	56	227315	6149989	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : J12053 - Peppertree

Client Service ID : 71979

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-4-0157	MSQ15	GDA	56	227289	6149975	Open site	Valid	Artefact : 1		
	Contact Searle	**Recorders**	Mr.Neville Baker					**Permits**		
52-4-0158	MSQ16	GDA	56	227346	6149973	Open site	Valid	Artefact : 2		
	Contact Searle	**Recorders**	ERM Australia Pty Ltd-Pyrmont					**Permits**		
52-4-0159	MSQ17	GDA	56	227112	6150076	Open site	Valid	Artefact : 3		
	Contact Searle	**Recorders**	ERM Australia Pty Ltd-Pyrmont					**Permits**		
52-4-0160	MSQ18	GDA	56	228435	6150185	Open site	Valid	Artefact : -		
	Contact Searle	**Recorders**	ERM Australia Pty Ltd-Pyrmont					**Permits**		
52-4-0161	BCSC1	GDA	56	227944	6148309	Open site	Destroyed	Artefact : -		100467
	Contact Searle	**Recorders**	Environmental Resources Management Australia					**Permits**	2687,2976	
51-6-0412	MW1	AGD	55	774019	6154627	Open site	Valid	Artefact : 1		102089
	Contact T Russell	**Recorders**	Doctor.Tim Owen					**Permits**		
51-6-0464	Marulan T1 S9	AGD	55	773312	6154703	Open site	Valid	Artefact : 1		100614
	Contact Searle	**Recorders**	Umwelt (Australia) Pty Limited					**Permits**		
52-4-0195	M1 (BCSC1)	AGD	56	227940	6148310	Open site	Destroyed	Artefact : -		100467,101390
	Contact	**Recorders**	ERM Australia Pty Ltd-Pyrmont					**Permits**	2687,2976	
52-4-0246	M2	GDA	56	227783	6148128	Open site	Valid	Artefact : 3		
	Contact	**Recorders**	ERM Australia Pty Ltd-Pyrmont					**Permits**		
52-4-0264	Peppertree Burial 01	GDA	56	227335	6150132	Open site	Valid	Burial : -, Stone Arrangement : 2		
	Contact	**Recorders**	Godden Mackay Logan Heritage Consultants,Doctor.Tim Owen					**Permits**		
52-4-0265	Peppertree Scarred Tree 02	GDA	56	227874	6150107	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Godden Mackay Logan Heritage Consultants,Doctor.Tim Owen					**Permits**		
52-4-0266	BCSC AS1	AGD	56	226352	6147944	Open site	Valid	Artefact : 8		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0267	BCSC AS2	AGD	56	226371	6147950	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0268	BCSC AS3	AGD	56	226381	6147968	Open site	Valid	Artefact : 2		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0269	BCSC AS4	AGD	56	226380	6148020	Open site	Valid	Artefact : 22		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref Number : J12053 - Peppertree

Client Service ID : 71979

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
52-4-0270	BCSC IF2	AGD	56	226284	6147952	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0271	BCSC IF3	AGD	56	226206	6147767	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0272	BCSC IF4	AGD	56	226182	6147840	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0273	BCSC IF7	AGD	56	226313	6147951	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0274	BCSC IF8	AGD	56	226313	6147951	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0275	BCSC IF9	AGD	56	226333	6147978	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0276	BCSC IF11	GDA	56	226354	6147952	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0277	BCSC IF12	AGD	56	226357	6147961	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0278	BCSC IF13	AGD	56	226359	6147974	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
52-4-0279	BCSC IF14	AGD	56	226386	6147978	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	RPS Australia East Pty Ltd -Hamilton					**Permits**		
51-6-0697	Telstra Marulan 3/A	AGD	55	774043	6154729	Open site	Valid	Artefact : 11		
	Contact	**Recorders**	Mr.Peter Kuskie,South East Archaeology					**Permits**		
51-6-0698	Telstra Marulan 7/A	AGD	55	773447	6154672	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Peter Kuskie,South East Archaeology					**Permits**		

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Appendix B

Responses to survey

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Ngunawal Heritage
Aboriginal Corporation

245 Ash Road
PRESTONS NSW 2170
Ph: 0412 176 081
Fx: 02 8783 9820
ngunawalhac@gmail.com
ICN 4755
ABN 31494344309

12 July 2012

Rebecca Moore
Archaeologist
20 Chandos Street
St Leonards NSW 2065

Re: Peppertree Quarry Modification 3

Aboriginal and Historic Heritage Impact Assessment

Dear Rebecca,

Thank you for forwarding a copy of the heritage assessment report.

The Ngunawal people had a specific connection to this area (country and water ways) and it was actively used as meeting grounds and all aspects of cultural beliefs and practices were performed.

The field survey that was conducted is an important process in determining the existence of Aboriginal heritage sites and as the southern section of the HV line study area contained approximately 95% of grass cover the potential to locate surface artefacts was always going to be extremely low.

Although the southern section study area does not include landforms such as ridge tops and therefore regarded as not having a strong potential for containing Aboriginal artefacts the possibility of them occurring still exists.

The assessment of any study area (with consideration to disturbance) is an important process in determining the existence of Aboriginal heritage sites but must also take into account the environmental context of the wider area in which a particular site is found.

Permanent water, moderate climate and the diverse vegetation would have supported animals that could be hunted for food as well as provided roots and tubers, fruits and seeds to gather. Flowers, scrub and low forest would have provided a feeding ground for a range of animals and the waterways supplied fish, turtles, eels and water birds. Wood and stone (silcrete) provided raw materials for tools and other implements.

The conclusions and management recommendations outlined for this project is consistent with our views when assessing the potential for identifying Aboriginal sites in the study area.

We look forward to working with you on this project and if you require any further information please do not hesitate to contact me.

Kind Regards

Dean Delponte
Director

BURU NGUNAWAL ABORIGINAL CORPORATION

ABN : 24 059 704 833

11 July 2012

Planning and Environmental (EMGA)
Ground Floor, Suite 01, 20 Chandos Street
ST LEONARDS NSW 2065

Attention: Ms Rebecca Moore

Dear Rebecca

Draft Peppertree Quarry Modification 3
Aboriginal and Historic Heritage Impact Assessment Report

Thank you for your email dated 10 July 2012 advising of the above Draft Peppertree Quarry Modification 3 Aboriginal and Historic Heritage Impact Assessment Report and requesting input from Buru Ngunawal Aboriginal Corporation (BNAC).

BNAC members are the Traditional Owners of this area in NSW including the ACT. In particular, we would like to point out that Peppertree Quarry does hold a very significant spiritual and cultural importance to us, as the area was used prior to European settlement by our direct ancestors.

Aboriginal cultural heritage is not just about 'stones and bones', Aboriginal culture is a living, ongoing entity. It's deeply linked to the entire environment - plants, animals and landscapes. The land and waterways are associated with dreaming stories and cultural learning that is still passed on today. Sites show the remains of Aboriginal occupation, and are significant to Aboriginal communities today. These places are important for social, spiritual, historical, and commemorative reasons. They reflect the ways in which Aboriginal people view our cultural heritage. These places carry a relationship between one person and another, and between people and their environment. They can include ceremonial areas and natural sacred sites, occupation sites, scarred trees, rock art, burial sites, story sites, massacre sites and missions. This knowledge is held by Aboriginal people as part of our oral history and it must be respected.

As the Traditional Owners, we agree with EMGA's proposed management recommendations at Subsection 7.2 of the draft for this project, but we are of the belief that decision-making is a collaborative process involving all concerned parties. Being inclusive develops a strong working relationship with respect for opinions and an understanding of values and may increase the understanding of our need to protect our cultural heritage.

If you have any queries, please do not hesitate to contact Walter on the number below, or by email, or myself on 0407 517844.

Thank you for the opportunity to provide comment. We look forward to working with you collaboratively on this project.

Yours faithfully

T Bell

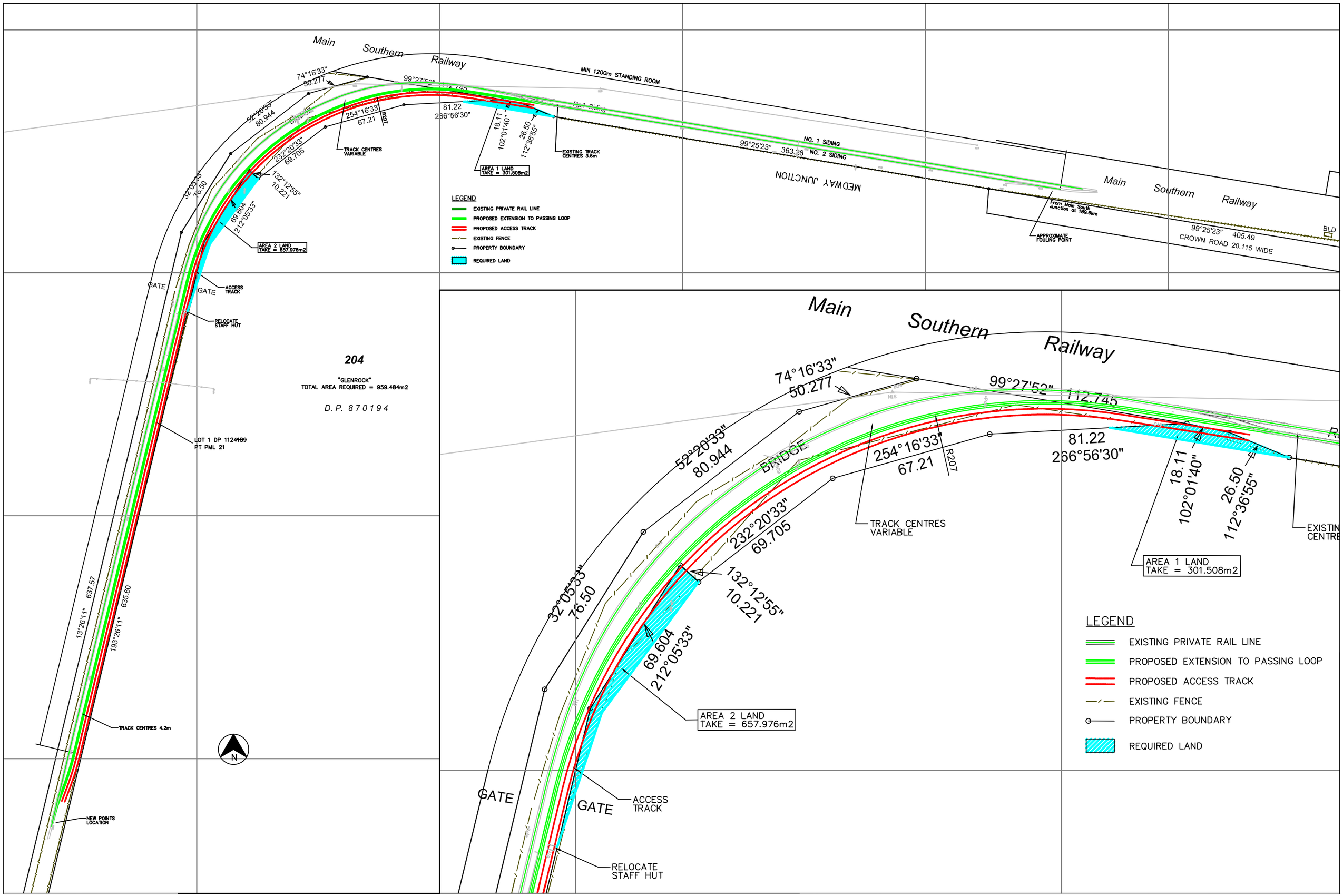
Tyronne Bell
Director/Senior Sites Officer

PO Box 6900, CHARNWOOD ACT 2615 Ph: 02 62591672 Fax: 02 6258 1264 Email: walbell@bigpond.net.au

Peppertree Quarry Modification 3

Appendix D: Passing Line Extension Plan

Planning + Environment + Acoustics


Main Southern Railway
74°16'33"
50.277
99°27'52"
112.745
MIN 1200m STANDING ROOM
52°20'33"
80.944
BRIDGE
254°16'33"
67.21
R207
81.22
266°56'30"
18.11
102°01'40"
26.50
112°36'55"
TRACK CENTRES VARIABLE
EXISTING TRACK CENTRES 3.6m
AREA 1 LAND
TAKE = 301.508m2
232°20'33"
69.705
132°12'55"
10.221
32°05'33"
76.50
69.604
212°05'33"
AREA 2 LAND
TAKE = 657.976m2
NO. 1 SIDING
99°25'23"
363.28
NO. 2 SIDING
MEDWAY JUNCTION
Main Southern Railway
From Main South Junction at 189.6km
APPROXIMATE FOULING POINT
99°25'23"
405.49
CROWN ROAD 20.115 WIDE
BLD
LEGEND
EXISTING PRIVATE RAIL LINE
PROPOSED EXTENSION TO PASSING LOOP
PROPOSED ACCESS TRACK
EXISTING FENCE
PROPERTY BOUNDARY
REQUIRED LAND
GATE
GATE
ACCESS TRACK
RELOCATE STAFF HUT
204
"GLENROCK"
TOTAL AREA REQUIRED = 959.484m2
D.P. 870194
LOT 1 DP 1124189
PT PML 21
13°26'11"
637.57
193°26'11"
635.60
TRACK CENTRES 4.2m
NEW POINTS LOCATION
N

EMM
EMGA Mitchell McLennan

SYDNEY
Ground floor, Suite 1, 20 Chandos Street
St Leonards, New South Wales, 2065
T 02 9493 9500 F 02 9493 9599

NEWCASTLE
Level 1, 6 Bolton Street
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BRISBANE
Suite 1, Level 4, 87 Wickham Terrace
Spring Hill, Queensland, 4000
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