

Marulan South Limestone Mine Continued Operations State Significant Development Application

RESPONSE TO SUBMISSIONS

Prepared for Boral Cement Limited | September 2019





Marulan South Limestone Mine

STATE SIGNIFICANT DEVELOPMENT | RESPONSE TO SUBMISSIONS REPORT

Prepared for Boral Cement Limited
27 September 2019

PR17

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CHAPTER 1

INTRODUCTION

1 INTRODUCTION

This report provides a response to submissions (RTS) on the environmental impact statement (EIS) for Boral Cement Limited's (Boral) proposal to continue and expand operations at the Marulan South Limestone Mine (the project). The project is subject to a State significant development (SSD) application (SSD 7009).

1.1 Overview

The project involves continuation and expansion of Boral's open cut limestone mine in the Southern Highlands of New South Wales (NSW) (refer to Chapter 2 for description).

Two approvals are required for the project:

- development consent for the project (SSD 7009) under Part 4, Division 4.7 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act); and
- controlled action approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for impacts on listed threatened species and communities (sections 18 and 18A of the Act).

Element Environment prepared an EIS report on behalf of Boral to assess the potential impacts from the project.

The Department of Planning, Infrastructure and Environment (DPIE) placed the EIS report on public exhibition for a period of 28 days from Thursday 4 April to Wednesday 1 May 2019. In a letter dated 3 May 2019, DPIE requested a RTS in accordance with clause 85A(2) of the NSW Environment Planning and Assessment Regulation 2000 (EP&A Regulations).

Eighty-one submissions were received from various government agencies, community organisations and the public.

1.2 Purpose of this report

This RTS has been prepared in accordance with the DPIE's (2017) *Draft Environmental Impact Assessment Guidance Series: Responding to Submissions*. The purpose of the document is to consider and respond to agency and public submissions and provide clarification of project components where relevant.

CHAPTER 2

OVERVIEW OF THE EXHIBITED
PROJECT

2 OVERVIEW OF THE EXHIBITED PROJECT

2.1 Key project components and summary of environmental impacts

The SSD application seeks consent for the continued and expanded operations of the existing and approved Marulan South Limestone Mine. The application is based on a 30-year mine plan that seeks to access approximately 120 Million tonnes (Mt) of limestone to a depth of 335 metres (m). The North Pit will be expanded westwards to the Middle Limestone and to mine deeper into the Eastern Limestone.

As the Middle Limestone lies 70-150 m west of the Eastern Limestone, the 30-year mine plan avoids mining (where practical) the interburden between these two limestone units thereby creating a smaller second, north-south oriented West Pit with a ridge remaining between. The North Pit will also be expanded southwards, encompassing part of the existing South Pit, leaving the far south of the South Pit for overburden emplacement and a visual barrier.

Limestone will be extracted at up to 4 Mt per annum (Mtpa) for 30 years. Clay shale will also continue to be extracted at up to 200,000 tonnes per annum (tpa). The limestone will be processed to create limestone aggregates, sand, and lime products including hydrated lime and quick lime.

To support the continued and expanded operations the following associated works are also proposed:

- relocation of a section of high voltage power line to accommodate the proposed northern overburden emplacement (shared with Peppertree Quarry);
- realignment of a section of Marulan South Road, to accommodate the proposed western overburden emplacement;
- relocation of the processing infrastructure and the stockpile and reclaim area at the northern end of the North Pit to allow the northward expansion of the pit; and
- establishment of a shared Road Sales Stockpile Area including a weighbridge and wheel wash to service both the mine and Peppertree Quarry.

The project, as described in detail in the EIS, is summarised in Table 2.1 and shown on Figure 2.1 The project and Figure 2.2 The project (Marulan Creek dam).

The EIS was prepared to inform the public, government authorities and other stakeholders about the project and the measures that will be implemented to mitigate, manage and/or monitor potential impacts, together with a description of the remaining social, economic and environmental impacts.

The environmental issues, management measures and residual risks after application of the management measures determined during the assessment are summarised in Table 2.2.

Table 2.1 Project summary

Project component	Summary of the project
Mining method	Overburden including clay shale is removed using excavators and front-end loaders. Limestone is extracted using open-cut drill and blast techniques. Limestone is loaded using excavators and front-end loaders and hauled either to stockpiles or the primary processing plant using haul trucks. Oversized material is stockpiled and reduced in size using a hydraulic hammer attached to an excavator, before being introduced to the processing plant.
Resource	The proposed 30-year mine plan accesses approximately 120 Mt of limestone down to a depth of 335 m Australian Height Datum (AHD). The mine footprint focuses on an expansion of the North Pit westwards to mine the Middle Limestone and to mine deeper into the Eastern Limestone. As the Middle Limestone lies approximately 70 m to 150 m west of the Eastern Limestone, the 30-year mine plan avoids mining where practical the interburden between these two limestone units thereby creating a smaller second, north-south oriented West Pit with a ridge remaining between. The North Pit will also be expanded southwards, encompassing part of the South Pit, leaving the remainder of the South Pit for overburden emplacement and a visual barrier.
Project site and disturbance area	The project site covers an area of approximately 846.4 hectares (ha). Existing operations have disturbed approximately 341.5 ha of the project site. The project will disturb an additional 256.5 ha.
Annual production	Limestone will be extracted at a rate of up to 4 Mtpa for a period of 30 years. Clay shale will also continue to be extracted at a rate of up to 200,000 tpa.
Mine life	Project life 30 years.
Total Resource recovered	Up to 120 Mt of limestone and up to 5 Mt of shale resource extracted over 30 years.
Beneficiation	Processing of 4 Mtpa of limestone to create various limestone and lime products including limestone aggregates and sand, hydrated lime and quick lime.
Management of mining waste (overburden)	The proposed 30-year mine plan will generate approximately 108 Mt of overburden. Overburden will be emplaced in 'in-pit' and 'out-of-pit' overburden emplacements.
General infrastructure	<p>The existing mine includes access and haul roads, limestone handling and processing equipment, limestone product stockpiling and reclaim areas, conveyor network, lime production and processing plant, limestone sand plant, rail loading and despatch infrastructure, administration offices and visitor/employee car parking facilities, electricity supply and distribution, utility infrastructure, workshop, stores and ablution buildings, underground diesel storage, heavy vehicle servicing, parking and washdown facilities.</p> <p>The project will require the following key infrastructure changes:</p> <ul style="list-style-type: none"> ▪ relocation of a section of high voltage power line to accommodate a proposed northern overburden emplacement (shared with Peppertree Quarry); ▪ realignment of a section of Marulan South Road, to accommodate the proposed western overburden emplacement; ▪ relocation of the processing infrastructure and the stockpile and reclaim area at the northern end of the North Pit to allow the northward expansion of the pit; and ▪ establishment of a shared Road Sales Stockpile Area including a weighbridge and wheel wash to service both the mine and Peppertree Quarry.

Project component	Summary of the project
Product transport	<p>Most limestone products will continue to be transported to customers by rail for cement, steel, commercial and agricultural uses. Boral seeks to maintain the approved rail transportation limit of six trains departing the mine per day.</p> <p>Manufactured sand will continue to be transported by truck along a dedicated internal road, across Marulan South Road and into Peppertree Quarry for blending and dispatch by rail. The mine currently produces approximately 500,000 tpa for Peppertree Quarry and proposes to increase production of manufactured sand to approximately 1 Mtpa.</p> <p>Agricultural lime, quick lime and fine limestone products will continue to be transported by powder tanker, bulk bags on trucks or covered tipper trucks along Marulan South Road.</p> <p>Shale, limestone aggregates, sand and tertiary crushed products will be transported by predominantly truck and dog along Marulan South Road.</p> <p>The adjoining Peppertree Quarry is currently approved to transport all products by rail. Boral will seek to transport approximately 150,000 tpa of Peppertree Quarry's products from the mine to customers via Marulan South Road. This could be achieved by back loading to the new shared road sales product stockpile area by the trucks carrying the limestone sand to Peppertree Quarry.</p> <p>In total, Boral is seeking to transport up to 600,000 tpa of limestone and hard rock products along Marulan South Road to the Hume Highway, as well as 120,000 tpa of limestone products to the agricultural lime manufacturing facility, which is approximately 1 km west along Marulan South Road.</p>
Water management	<p>Water supply for the project, including dust suppression, processing activities and some non-potable amenities will be from existing and new on-site dams and a proposed new 118 megalitre (ML) water storage dam on Marulan Creek. This dam will be on Boral owned land north of Peppertree Quarry. Water from the dam will be pumped into a water pipeline, which will transfer water from the dam to the mine. This dam will require the purchase of water entitlements.</p> <p>Mine water demand in the earlier stages of the 30-year mine operations (before the construction of the dam on Marulan Creek) will continue to be met from sources currently used by the mine including on-site water storage dams, Tallong dam via the Tallong water pipeline and the groundwater production wells (WP16 and 17) north of the pit.</p> <p>Surface water runoff from active mining areas will drain to a network of sediment basins. Water captured in sediment basins will be pumped to the water storage dams to service the mine's water demand and to restore capacity in the sediment basins.</p>
Operational workforce	<p>Approximately 191 full time personnel are currently employed by Boral in connection with the mine, including lime manufacturing, administration and logistics. This includes 118 personnel on-site (excluding contractor personnel) and another 73 that are employed at other locations e.g. Berrima and Maldon Cement Works and North Ryde that would otherwise not be employed if it weren't for the mine.</p> <p>The project will provide continued direct employment for 118 people on the mine site and 73 offsite.</p>
Hours of operation	24-hours per day, 7 days per week. Blasting will continue during daylight hours on weekdays, excluding public holidays.
Blasting frequency	Blasting will continue at a frequency of up to one blast per day on weekdays, excluding public holidays, totalling up to five blasts per week.
Key environmental impacts and mitigation measures	<p>The following key environmental impacts have been assessed through specialist technical assessments:</p> <ul style="list-style-type: none"> ▪ surface water and hydrology;

Project component	Summary of the project
	<ul style="list-style-type: none"> ▪ groundwater; ▪ air quality; ▪ noise and blasting; ▪ soils and rehabilitation; ▪ aboriginal heritage; ▪ historic heritage ▪ biodiversity; ▪ traffic; ▪ visual amenity; ▪ economics; ▪ social; and ▪ contamination. <p>These technical specialist assessments have identified environmental management and mitigation measures which are to be implemented during construction and operational phases of the project, to minimise environmental, social and economic impacts associated with the project.</p>
Capital investment value	\$111 million.

Figure 2.1
The Project

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS - SSD APPLICATION
RESPONSE TO SUBMISSIONS

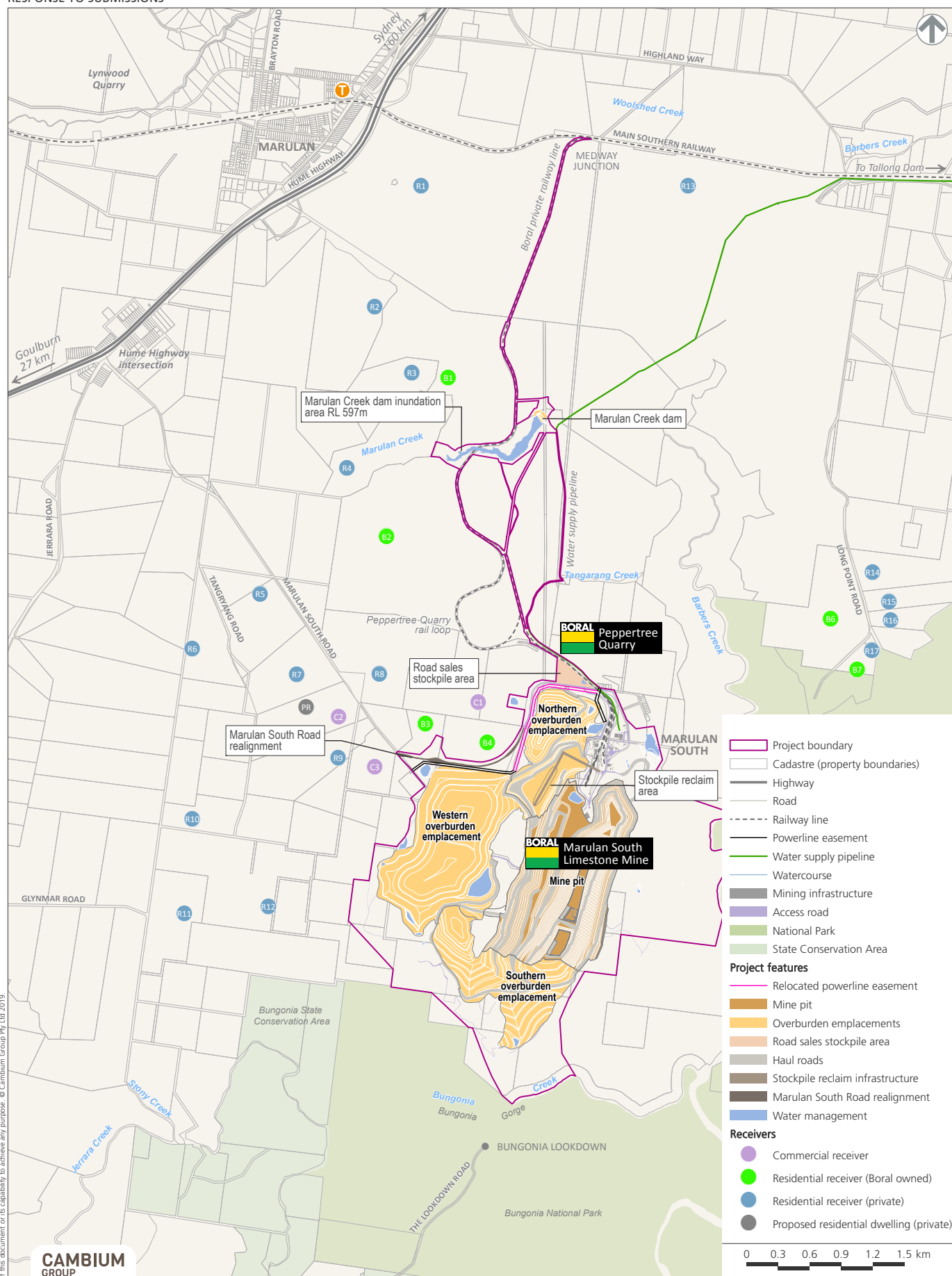


Figure 2.2
The Project (Marulan Creek Dam)

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS - SSD APPLICATION
RESPONSE TO SUBMISSIONS

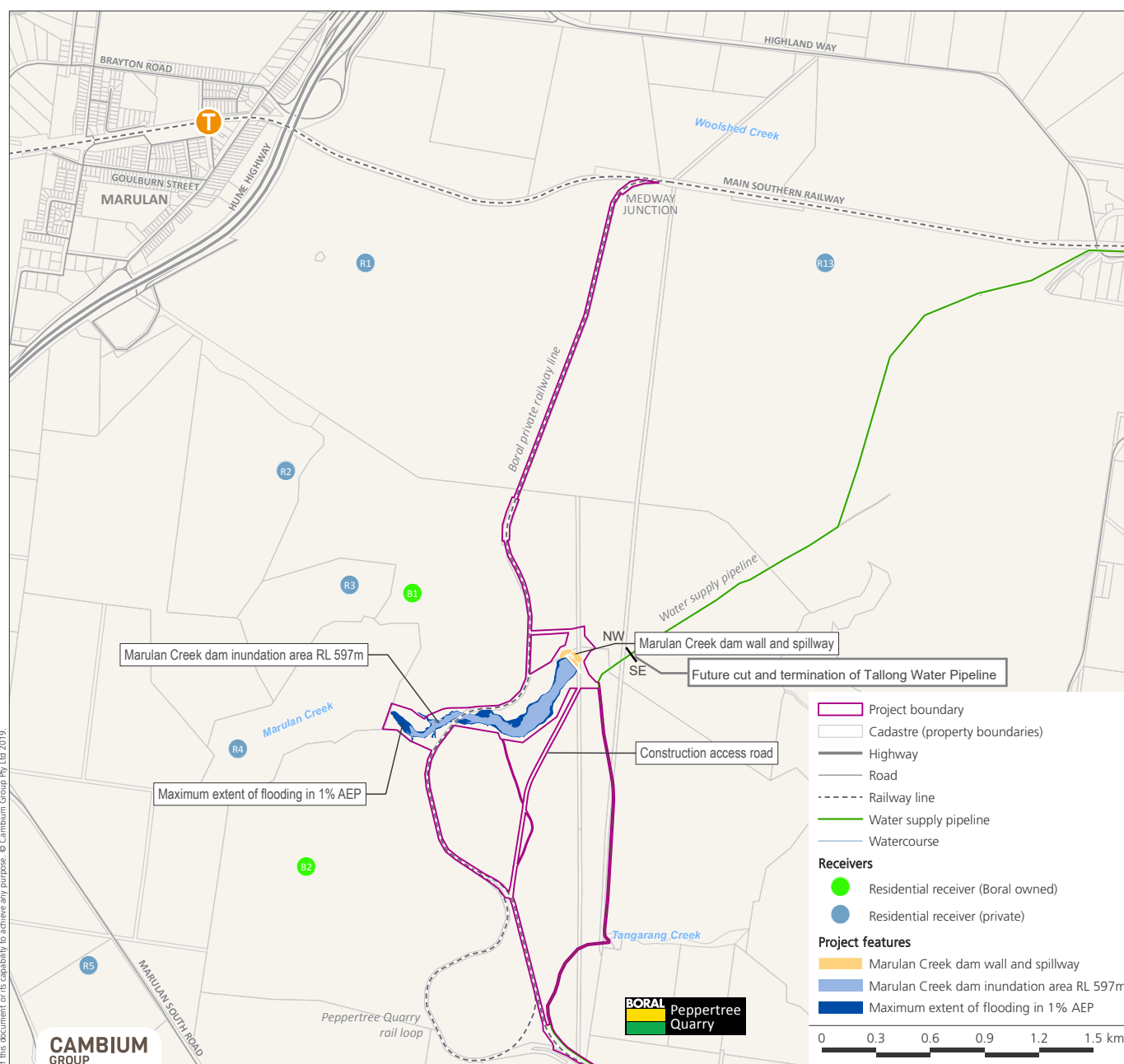
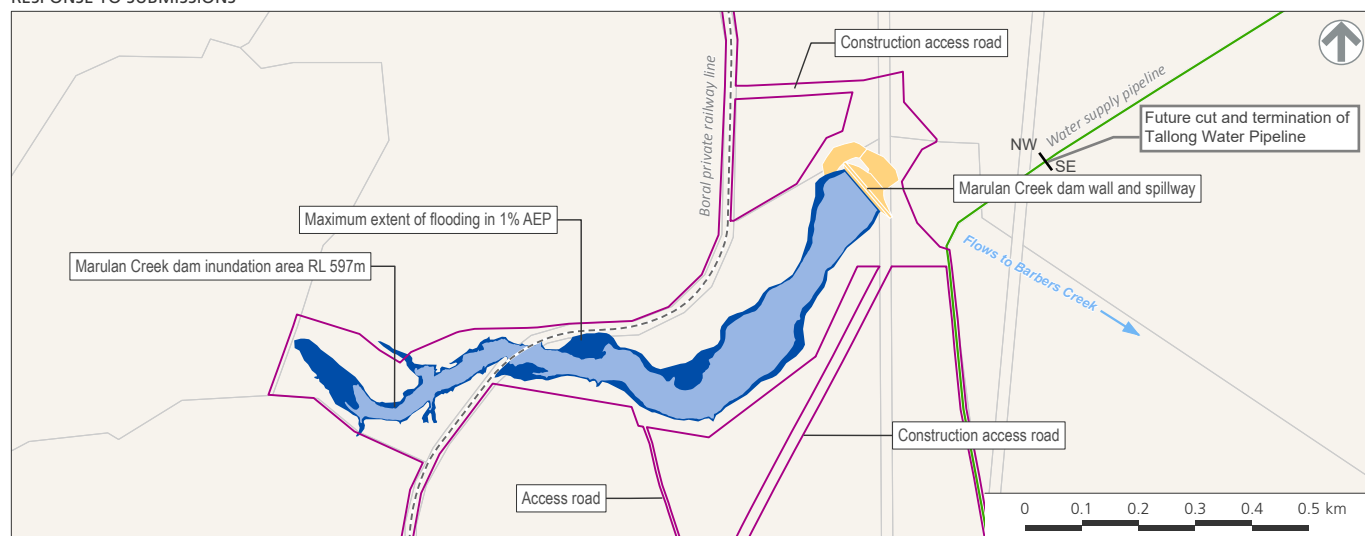


Table 2.2 Summary of environmental issues

Environmental issue	Comments	Residual impacts
Surface water and hydrology	<p>The water management system will be designed to retain almost all runoff on-site with only occasional overflows from sediment basins into natural receiving waters.</p> <p>There will be a reduction in flows in Marulan Creek downstream from the Marulan Creek dam. However, the dam will be designed to allow water seepage into the creek and maintain a riparian flow.</p>	<p>Implementation of the water management system will restrict overflows from the sediment basins to twice a year, which is within the neutral or beneficial effect (NorBE) criteria.</p> <p>Marulan Creek dam will be designed to maintain daily riparian flow along Marulan Creek.</p>
Groundwater	<p>At equilibrium, there will be an approximately 1 m drawdown of the water table, which will not impact any water users.</p> <p>The project will result in an increase in outflows from the pit to underlying geology, which will increase flows into springs.</p>	<p>An approximately 1 m drawdown of the water table to approximately 1.2 km north-east of the northern extent of the mine, and approximately 600 m east and west of the final void at equilibrium. This will not impact water users and 'make good' arrangements will not be required.</p>
Air quality	<p>Cumulative total suspended particulate (TSP), particulate matter with aerodynamic diameter of less than 10 microns (PM₁₀), particulate matter with aerodynamic diameter of less than 2.5 microns (PM_{2.5}) and dust deposition results will not exceed criteria at privately-owned residential or commercial receivers. Annual average PM₁₀ criteria will be exceeded at B4 (Boral owned) in Stage 1.</p> <p>Stack emissions will be below criteria at Boral owned, private residential and commercial receivers.</p> <p>The project will not have dust impacts on more than 25% of any privately-owned properties.</p>	<p>Annual average PM₁₀ criteria will be exceeded at Boral owned receiver B4 in Stage 1.</p>
Noise and blasting	<p>Noise will not exceed project operational noise trigger levels or sleep disturbance screening levels at any residences during any mining stage or time period.</p> <p>Noise generated by construction of Marulan Creek dam will comply with criteria at all receivers. Traffic noise will comply with the criterion at all receivers. Noise from project related trains will be below the <i>Rail Infrastructure Noise Guidelines</i> criterion at all receivers.</p> <p>Highest predicted blast vibration and overpressure will be below the human comfort and structural damage criteria.</p>	<p>No residual or noise impacts were predicted.</p>
Soils and rehabilitation	<p>Topsoil stripping will generate topsoil resources for use during rehabilitation. However, it will not generate a sufficient quantity and will need to be supplemented with alternative growth media.</p>	<p>After implementation of the rehabilitation method there are risks that rehabilitation will only be partially successful. A trigger action response plan will be prepared and implemented to</p>

Environmental issue	Comments	Residual impacts
	<p>The project will have an overall minimal impact on agricultural land.</p> <p>Disturbed areas will be rehabilitated to be stable, returned to the pre-mining land capability, be visually compatible with surrounding areas and not increase surface water impacts.</p>	address issues with rehabilitation should any arise.
Aboriginal heritage	<p>Ten Aboriginal sites will be totally disturbed by the project and 39 will be totally lost without management measures. One of the sites to be totally disturbed is of medium significance, five of the sites to be totally lost are of medium significance and one is of high significance.</p> <p>Thirty-two sites will be collected prior to disturbance and there will be salvage excavations in the areas of moderate and high archaeological sensitivity.</p> <p>Impact to a cultural site on Marulan Creek will be avoided through the redesign of the Marulan Creek dam.</p>	Eight sites in the main project site and two along the Marulan Creek dam access road will have unmitigated impacts. These sites are of low scientific value.
Biodiversity	<p>The project will result in the clearing of a threatened ecological community (TEC) and habitat for the Koala and Large-eared Pied Bat, and the loss of one individual plant of a threatened flora species.</p> <p>A biodiversity offset strategy will be prepared and implemented to offset the impacts to the TEC and threatened species habitat.</p> <p>Stygofauna has not been identified in the project site and is unlikely to be impacted by the project.</p>	Even though there will be loss of a portion of a TEC and threatened species habitat in the project site, the offset strategy will ensure compensatory land is protected into perpetuity.
Visual	<p>The project has low overall visual exposure to its visual catchment. Of the 24 assessed viewpoints, only two will have medium impacts and the remainder will have low impacts. The viewpoints with medium impacts are Bungonia Lookdown Lookout and near Long Point Lookout.</p>	Views from the affected viewpoints will improve over time as overburden emplacements are rehabilitated. Bungonia Lookdown Lookout has the most significant views to the mine, which will substantially reduce by Year 30 when the southern overburden emplacement (SOE) is complete and is being rehabilitated.
Traffic and transport	<p>The project will result in two to four additional one-way trips in an average hour on an average day, which will have a minor impact on level of service (LoS) and average vehicle delay (AVD) along Marulan South Road. The extra traffic will not change the LoS at the Hume Highway interchange from A (good operation).</p> <p>The proposed intersection on Marulan South Road will have LoS A and the project is unlikely to impact safety along Marulan South Road, for example on school buses.</p>	<p>The small increase in vehicle movements associated with the project will have minor residual impacts on intersections and road service levels and safety.</p> <p>The proposed upgrade of Marulan South Road will improve safety.</p>
Contamination	<p>Total petroleum hydrocarbon was found in a sampling bore, however it represents a negligible risk to human health. Elevated levels of methylene blue active substances in two sample bores have negligible migration pathways or human health risks.</p>	After identification and removal of asbestos in Marulan South township there will not be any residual contamination risks.

Environmental issue	Comments	Residual impacts
	There is a potential human health exposure pathway for asbestos at the former Marulan South township.	
Historic heritage	Thirteen items of historic heritage significance were discovered during surveys in the project site. Seven of these will be removed as it is not possible to significantly alter the disturbance footprint given the alignment of the limestone. None of these items have been previously listed on statutory heritage registers.	The project will have moderate residual impacts on items of on-site historic heritage as there is little opportunity to alter the mine plan due to the alignment of the limestone.
Economics	The cost benefit analysis determined the project will have net social benefits to Australia of \$643 million (M) and to NSW of \$321 M. Any unquantified residual impacts of the project after mitigation, offset and compensation would need to be valued at greater than these amounts for the project to be questionable from a national and NSW economic efficiency perspective.	There are no residual economic risks associated with the project.
Greenhouse gases	Greenhouse gases (GHG) generated by the project will equate to 0.83% of the national 'Metal ore and non-metallic mineral mining and quarrying' sector's annual GHG emissions.	The project will continue to generate minor quantities of GHGs after implementation of management measures.
Waste management and minimisation	The project will not generate significant quantities of general solid, hazardous or liquid waste. The project will generate large quantities of overburden, which will all be managed on-site.	The project will generate minor quantities of waste requiring offsite disposal.

CHAPTER 3

ANALYSIS OF SUBMISSIONS

3 ANALYSIS OF SUBMISSIONS

Public exhibition of the EIS commenced on 4 April 2019 and ended on 1 May 2019. A total of 81 submissions were lodged with the DPIE during the exhibition period, including agency responses and the request for a RTS from the DPIE.

There were four late submissions, comprising:

- Department of Industry received on 6 June 2019;
- Aglime Fertilisers received on 17 June 2019;
- NSW Rural Fire Service (RFS) on 27 June 2019; and
- DPIE Water/Natural Resources Access Regulator (NRAR) on 4 July 2019.

3.1 Submission matrix

A detailed matrix of the types of submissions received and submission themes is in Appendix A. The matrix notes which submissions are comments, which are in support and which are objections.

An overview of the submissions received is provided in Table 3.1.

Table 3.1 Overview of submissions

Position	Community	Organisation	Public authority	Total
Comment	0	0	12	12
Objection	66	2	0	68
Support	0	1	0	01
Total	66	3	12	81

Sixty-eight public objections were received of which sixty-four were on a standard template with the primary concern relating to local water supply. Also included in the template were concerns regarding air quality, noise and consultation.

One submission of support was received from Aglime Fertilisers.

3.2 Submission themes

The submissions matrix (Appendix A) provides a detailed list of the matters raised in the submissions. The key themes raised in submissions are summarised in Table 3.2, with many submissions commenting on multiple themes. The themes are grouped as follows in descending order of quantity of comments (the amount of submissions on each theme are shown graphically in Figure 3.1 Key submission themes):

1. Water – the majority of the water matters related to use of water from Tallong dam and impacts of the proposed Marulan Creek dam on the downstream environment.
2. Noise – matters related to noise levels, sources, assessment and other noise related matters.
3. Air quality – matters related to dust levels, monitoring, assessment, management and other air quality related matters.
4. Consultation – matters related to public consultation for the project.
5. Traffic – matters related to traffic generation, modelling, management and other traffic related matters.
6. Biodiversity – matters related to threatened species, offsets and other biodiversity related matters.
7. Visual amenity – matters related to visual impacts.

8. Heritage – matters related to historic heritage and one comment on Aboriginal heritage.
9. Other – the remaining matters related to a range of matters such as mining titles, the economics of the project etc. Most of these matters only received a few comments and many only received one comment.

Each individual government agency submission is addressed in Chapter 6. The public submissions have been grouped into themes and addressed in Chapter 7.

Table 3.2 Key submission themes

Key Themes	Public authority	Community/ organisations	Total
Water	8	65	73
Noise	3	58	61
Air Quality	3	59	62
Traffic	3	2	5
Biodiversity	3	4	7
Visual	2	3	5
Heritage	3	2	5
Consultation	1	61	62
The homestead property (Receiver 13)	1	0	1
Bushfire	1	0	1
Access to information	0	1	1
Notification of exhibition	0	1	1
Social impact	1	0	1
Resource sterilisation	1	0	1
Mining lease	1	0	1
Economics	1	0	1
Cumulative impacts	0	1	1
Merit	0	2	2
Zone objectives	0	3	3
Site analysis	0	1	1
Management measures	0	1	1
Environmental audit	0	1	1
Support of project	0	1	1
Titles	1	0	1
Amenity (general)	2	1	3

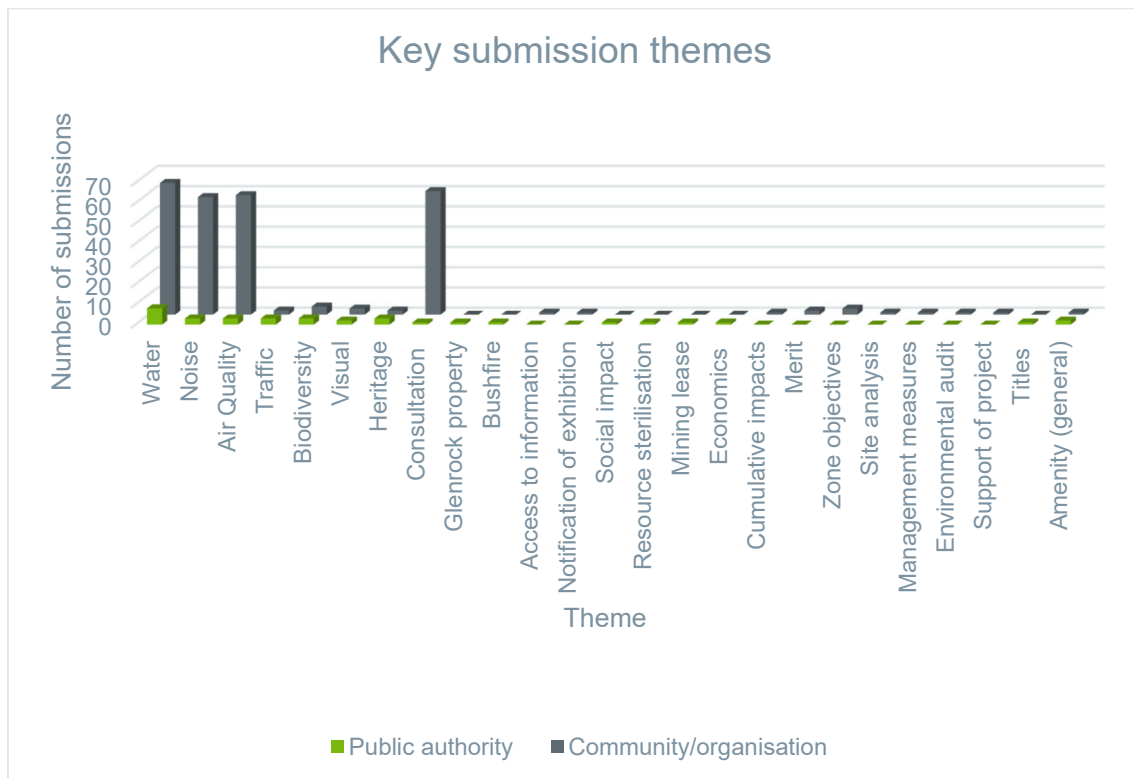


Figure 3.1 Key submission themes

CHAPTER 4

POST-EIS ACTIVITIES

4 POST-EIS ACTIVITIES

This section summarises community engagement activities Boral undertook after submission of the EIS to clarify the proposed approach to meeting the mine's water demand. This section also outlines additional consultation undertaken with government agencies.

4.1 Community engagement

4.1.1 Tallong community meeting

On 25 April 2019 Boral became aware of an increasing community concern regarding the SSD application. In response a community meeting was arranged, with the assistance of the Tallong Focus Group. The meeting was held on 1 May 2019 at the Tallong Memorial Hall.

The principal concern raised by members of the Tallong community through this meeting was the perception that Boral was intending to use the Tallong dam to fill the proposed Marulan Creek dam. Boral confirmed that there was no intent to use water from Tallong dam for the purpose of filling the proposed Marulan Creek dam.

A record of the questions from the evening and responses is provided in Attachment B of Appendix B. Feedback during the meeting indicated attendees accepted Boral's project clarifications and further information. Boral circulated the record of the questions from the evening and responses to community members in a summary email issued on 14 May 2019 (refer Attachment B of Appendix B). No further community response was received after the meeting.

4.1.2 Social media, email, website and letter

Following the Tallong community meeting this statement was posted to Boral's Marulan Operations webpage and emailed to Boral's stakeholder contacts list:

We've become aware there is concern about the potential effects upon local water supplies if our State Significant Development (SSD) planning application for Marulan South Limestone is approved.

To clarify, at present the Limestone operations are supplied with water via a pipeline connected to the Tallong 'Dam' reservoir. This has been the case for almost 40 years.

The SSD seeks to allow us to build our own water storage so we can reduce our reliance on the Tallong reservoir, and eventually stop using it altogether. We certainly are NOT looking to connect the new yet-to-be-approved storage to the Tallong Dam.

You can find out more about the SSD application by visiting our Boral Marulan website - www.boral.com.au/marulan.

In June 2019 Boral also issued direct correspondence to those members of the Tallong Community who had made a formal submission to DPIE (refer to Attachment C of Appendix B). This correspondence further confirmed that Boral did not intend to pump water from Tallong dam to the proposed Marulan Creek dam and sought further comments on the project. Only one response was received thanking Boral for the clarification (refer to Attachment C of Appendix B).

4.1.3 Newsletters

Boral is a regular contributor to a locally circulating e-newsletter, *Discover Marulan*. The statement in Section 4.1.2 was run in this newsletter following the meeting of 1 May 2019. This statement appeared in the June and July 2019 editions. Refer to Appendix C.

Since the meeting of 1 May 2019, Boral has been making regular contributions to the *Tallong Community Newsletter*.

4.1.4 Community Consultative Committee

The project application has been discussed with the Community Consultative Committee since 2016 when preparation of the application began. The project was most recently discussed at the CCC meeting of 12 June 2019. SSD 7009.

Boral confirmed the information provided to the community at the meeting of 1 May 2019, that it will not pump water from Tallong dam to fill the proposed Marulan Creek dam.

4.2 Government agency engagement

To support agencies in their review of the EIS documentation and provision of advice to the DPIE, Boral hosted several site tours and has engaged in ongoing liaison with agencies, where relevant, to support the preparation of the response to submissions.

4.2.1 Site tours

Some agencies toured the mine following lodgement of the final EIS and during exhibition of the EIS. The agencies and dates of tours are in Table 4.1 **Error! Reference source not found..**

Table 4.1 Agency site tours

Agency name	Date
DPIE, Division of Resources and Geoscience	4 April 2019
Environmental Protection Authority	30 April 2019
WaterNSW	1 May 2019
Crown Lands	Ongoing

Where relevant, matters arising from these meetings are discussed in response to specific comments received from agencies in Chapter 6.

4.2.2 Direct engagement

Roads and Maritime Service

The Roads and Maritime Services (RMS) submission provided in Section 6.11 noted the EIS modelled traffic impacts to 2025 and requested modelling to reflect the 10-year post development traffic impact scenario (to 2029). Transport and Urban Planning modelled the 10-year scenario and results are provided in Appendix E and summarised in Section 6.11.2.

Tables 2 and 3 in Appendix E demonstrate that the intersections in the Marulan South Interchange will continue to operate at a LoS A with very low vehicle delays in the AM and PM peak hours in 2029.

RMS responded via email on 19 August 2019 that no further modelling is required to address their submission.

Department of Planning, Industry and Environment – Water and Natural Resources Regulator

DPIE Water including the NRAR made a submission to the planning division of DPIE on 4 July 2019. The principal feedback in the submission was a request for Boral to consider an alternative to the proposed Marulan Creek Dam as DPIE Water did not believe the proposed location to be compliant with the water sharing plan nor the guidelines for controlled activities on waterfront land riparian corridors.

Boral requested a teleconference with DPIE Water to discuss the feedback as Boral had already considered alternatives to the dam during the project feasibility process, and the dam was determined to be the only feasible water storage option. The teleconference was held on 29 July 2019, and DPIE Water agreed to provide a revised submission reflecting Boral's previous feasibility work and that the project is SSD and the guidelines for controlled activities do not apply to such projects.

DPIE Water provided a revised submission on 15 August 2019. DPIE Water's revised submission is addressed in Section 6.3.

WaterNSW

WaterNSW inspected the site on 1 May 2019 and made a submission to the planning division of DPIE on 7 May 2019. WaterNSW requested additional information on potential reduction in stream flows downstream of the proposed dam, long term stability of overburden emplacements and risks to water quality.

Boral held a teleconference with WaterNSW on 24 June 2019 to discuss its approach to addressing WaterNSW's request. WaterNSW's submission is addressed in Section 6.6.

Goulburn Mulwaree Council

Goulburn Mulwaree Council (GMC) staff reported the application to council at its meeting of 7 May 2019. Council staff referred the following reports to the council:

- Item 12.2: Submission on the Proposed Marulan Quarry (SSD-9750); and
- Item 12.11 Marulan South Limestone Mine – Community Submissions.

Report Item 12.2 set out council officer's assessment and recommendation to the council for the purpose of responding to the DPIE referral and exhibition. The second report, Item 12.11, reported the Tallong community response to the exhibition.

A Boral representative attended the meeting and made deputation to the council. The deputation sought to provide an overview of the proposal, an opportunity for councillors to ask questions and for Boral to respond to the concerns of the Tallong community in relation to the use of water from the Tallong dam.

In relation to the latter, Boral again confirmed the proposal does not include pumping water from Tallong dam to the proposed Marulan Creek dam. A copy of the PowerPoint presentation is in Appendix D.

Marulan South Road

As described in Section 2.1, Boral is seeking to close and realign a portion of Marulan South Road. Since the lodgement of the EIS, Boral has had several discussions with GMC, which are generally summarised below.

- 13th May 2019: Met with GMC to discuss road upgrades, closures etc as detailed in the EIS.
- 21st May 2019, further meeting to discuss timing of the upgrades, safety matters etc.
- 6th June 2019, met with GMC to discuss upgrades, re-alignment and agreement.

The proposed closure has been and continues to be the subject of ongoing discussion with GMC officers.

Boral is in the process of engaging engineers to survey the condition of the portion of Marulan South Road to be closed and upgraded. This survey will inform the scope of works that will be progressed through an activity approval under Part 5 of the EP&A Act.

CHAPTER 5

PROJECT CLARIFICATIONS

5 PROJECT CLARIFICATIONS

The following section clarifies matters raised during the exhibition period, principally the use of water taken from Tallong dam and potential traffic impacts.

5.1 Water extraction from Tallong dam

As summarised in Section 3.2, most submissions concerned the use of water from Tallong dam. This section clarifies the interaction of the project with Tallong dam.

5.1.1 Existing use of Tallong dam

Tallong dam is north of Tallong village and is owned by Sydney Trains. Boral leases the dam from Sydney Trains, and transfers water within its entitlement (76 million litres per year (ML/yr) under Water Access License (WAL) 25207) to a reservoir in Tallong village, then to the mine via the water supply pipeline. Water from Tallong dam is received and stored at the 27 ML Main Plant Dam 1 and used for lime hydration, kiln cooling and non-potable uses.

5.1.2 Proposed Marulan Creek dam

As described in Section 4.4.2 of the EIS, Boral proposes to construct a 118 ML dam on Marulan Creek as the existing and new on-site mine water dams will not always meet predicted water demand.

As shown in Figure 5.1, Marulan Creek dam is anticipated to have sufficient water volume to start supplying the mine around three years after the dam is built. The dam will be required to meet mine water demands when the sediment basins and on-site mine water storage dams do not contain sufficient water to meet demand.

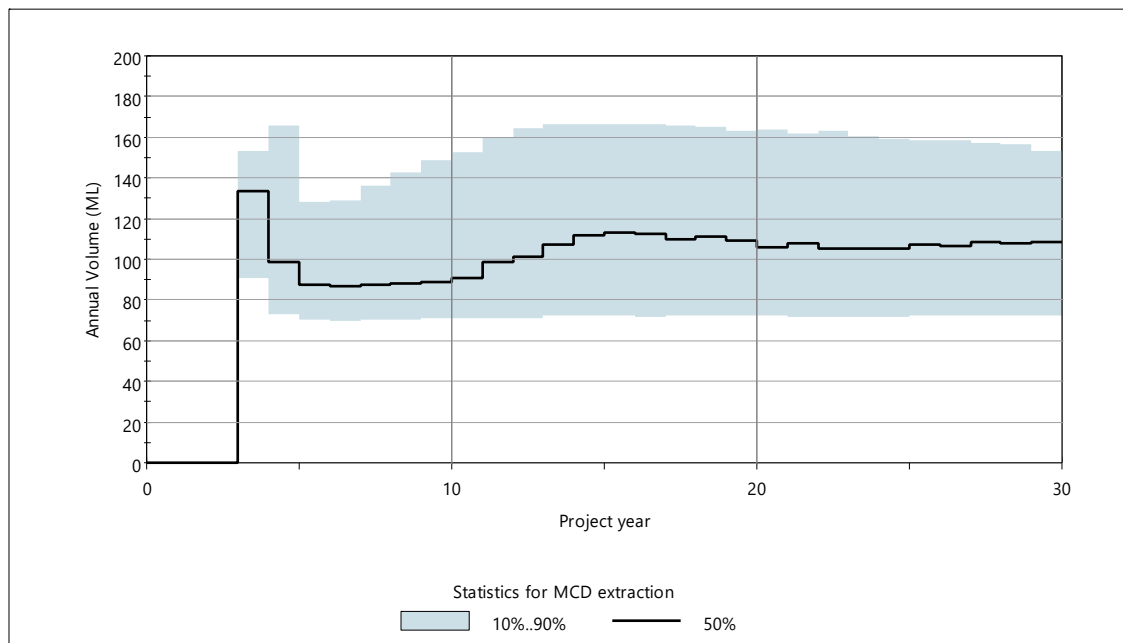


Figure 5.1 Annual extraction probability ranges for Marulan Creek dam (Figure 7.2 Advisian 2018)

In addition to water from the proposed sediment basins and on-site mine water storage dams, water from Tallong dam and the groundwater bore will continue to be used to meet mine water demands, as per current arrangements, until Marulan Creek dam is sufficiently full. The exact

timing and date of when Boral will cease to use water from Tallong dam is not yet known but will likely be within the first seven years of the mine plan, as shown in Figure 5.2 and Figure 5.3.

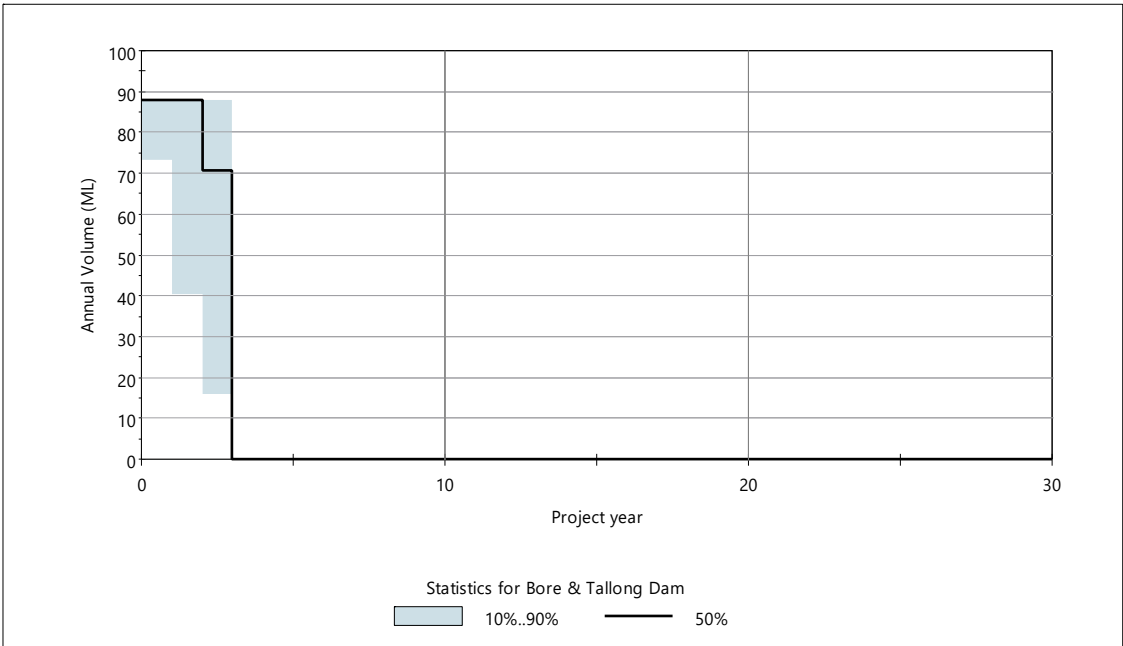


Figure 5.2 Annual extraction probability ranges for the groundwater bore and Tallong dam (Figure 7.3 Advisian 2018)

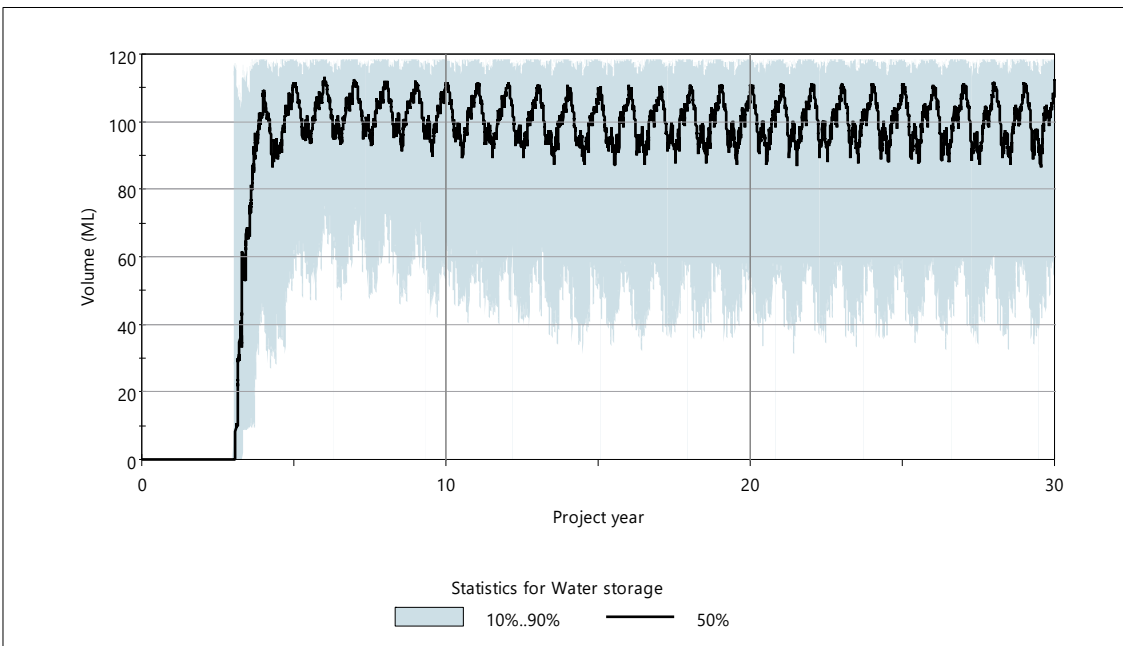


Figure 5.3 Marulan Creek dam statistics for water storage (Figure 7.12 Advisian 2018)

As described in Section 4.4.2 of the EIS, Marulan Creek dam will be a new in-stream dam which will fill naturally from flows in Marulan Creek.

5.1.3 Use of water from Tallong dam

As described in Section 3.2 and Appendix A, agency and public submissions raised concern regarding the intended use of water from Tallong dam. Specifically, that Tallong dam would be drained to fill the proposed Marulan Creek dam.

The source of confusion was identified as a description on the location of the proposed Marulan Creek dam and the EIS summary document. This document was intended as a positive communication tool allowing for an accessible, short form and plain English explanation of the more detailed technical assessment (i.e. the full EIS and all supporting reports) and does not form part of the technical information submitted for assessment.

In particular we note that one submission has highlighted the following specific statement:

*Water supply for the project, including dust suppression, processing activities and some non-potable amenities will be from existing and new on site dams and the proposed 118ML water storage dam on Marulan Creek. **This dam will be on Boral's adjoining Tallong water pipeline to transfer water to the mine.** This dam will require purchase of water entitlements*

Boral notes the above statement does not appear in the EIS or summary document, with the closest published statement below, which is from Table 1.1 of the EIS and Table 1 of the summary document.

Water supply for the Project, including dust suppression, processing activities and some non-potable amenities will be from existing and new on-site dams and a proposed new 118 megalitre (ML) water storage dam on Marulan Creek. This dam will be on Boral owned land north of Peppertree Quarry and will use Boral's adjoining Tallong water pipeline to transfer water to the mine. This dam will require the purchase of water entitlements.

Boral has acknowledged with regret that this statement may have contributed to a misunderstanding of both intent and the scope of the proposed development. As set out in Section 4.1, after becoming aware of the misunderstanding Boral took action to provide a clear and unambiguous statement that they do not propose to use water taken from Tallong dam to fill Marulan Creek dam.

The Marulan Creek dam will be filled by natural inflows from Marulan Creek and overland flow from the catchment.

As the action does not form part of the application and is not “development” for the purposes of the EP&A Act there is no requirement to amend the application.

5.2 Speed zone

The RMS noted a possible extension of the 60 km/h speed zone to include the proposed new intersection and advised RMS is the sole authority responsible for speed zones in New South Wales.

Boral notes that it proposes to deregister the section of Marulan South Road subject to the potential speed limit change. The change in the speed limit zone would only occur following deregistration.

CHAPTER 6

RESPONSE TO PUBLIC
AUTHORITIES

6 RESPONSE TO PUBLIC AUTHORITIES

6.1 Introduction

The public authority submissions are addressed in this chapter. **Bold** text is an exact reproduction of the submissions received, while normal text is Boral's response to submissions.

6.2 NSW Department of Planning, Industry and Environment

The DPIE provided comment on 3 May 2019 requesting that the RTS provide specific focus on the following aspects:

6.2.1 Water resources

Potential direct impacts on the continued availability of local water resources, particularly the Tallong Dam, are of significant concern to the community. Community submissions have also raised concerns regarding associated indirect impacts on biodiversity, local amenity and recreation, and availability of water supplies for firefighting. The Department requests a detailed response to each of these concerns. This response should include a clear comparison between Boral's existing water usage from Tallong Dam and proposed water usage under SSD-7009, throughout the various stages of proposed mining.

Refer to Section 5.1 of this report for a clarification on proposed use of water from Tallong dam. Refer to Section 7.2 of this report for responses to community submissions regarding proposed use of water from Tallong dam.

Boral's existing and proposed use of water from Tallong dam is described in Section 5.1 of this report. In summary, Boral currently extracts² water from Tallong dam within its 76 ML/year entitlement, with use varying between years depending on climatic conditions. Boral will continue to extract water from Tallong dam within its entitlement for the first three years of the mine plan. This use will fall after water starts being extracted from Marulan Creek dam.

Once the Marulan Creek dam is full (from natural flows down Marulan Creek) and operational, Boral will as soon as practicable cease using water from Tallong dam. It is envisaged this will be during the first stage of the proposed 30-year mine plan. Tenure over the Tallong dam is uncertain given the lease arrangement with Sydney Trains.

WaterNSW has provided initial advice in relation to the project. This advice:

- a. raises concerns regarding the predicted reduction in flows in Marulan Creek;**
- b. raises concerns regarding the long-term geomorphological stability of proposed overburden emplacement areas; and**
- c. requests further information regarding existing wastewater management systems, noting that these systems may not meet contemporary standards.**

Refer to Section 6.6 for responses to WaterNSW's submissions.

Section 9.3 of the Surface Water Assessment states that as 'there are no downstream users, licensed extraction of water from Marulan Creek Dam would not have any impact on other users. Please provide further explanation for this conclusion, given that the proposed dam would be located within the wider Barbers Creek Management Zone, which ultimately forms part of the Sydney Drinking Water Catchment.

As shown in Table 6.4 of the EIS and described in Section 9.3.1 of the surface water report, there is a total entitlement of 1,176 ML/year in the Barbers Creek Management Zone with 11 existing

users licensed to take from this entitlement. As shown in Table 3.4 of the EIS, Boral holds 87 ML of entitlement within the management zone and as described in Section 6.3.10 of the EIS Boral will require a total entitlement of 183 ML/year including for the Marulan Creek dam.

As summarised in Table 6.4 of the EIS, water trading is permitted within this management zone subject to assessment. Boral will negotiate with existing water shareholders within the Barber's Creek management zone to ensure that the necessary entitlements are obtained. It is envisaged that Boral would apply to transfer the existing entitlements to extract water from Tallong dam (WAL 25207 and 25373) to the Marulan Creek dam when the dam has reached sufficient capacity to ensure water availability for use by the mine.

This would occur during the first stage of the project after Marulan Creek dam has been constructed, is full (from natural flows down Marulan Creek) and is fully operational. As described in Section 9.3.1 of the surface water assessment, it is anticipated that Boral will be able to obtain these entitlements from the market. If this trading is with existing license holders, there will be no net reduction in flows to the Sydney drinking water catchment from the management zone. If new entitlements are purchased, there will be net reduction to the catchment equivalent to the difference between the mine's water requirement and transfer of Boral's existing entitlement described above. This reduction in flows will be within the total entitlement in the management zone, which has legal force under the *Greater Metropolitan Region Unregulated Area Water Sharing Plan*.

Section 6.2.3 of the Surface Water Assessment indicates that Stage 1 of the project includes the upgrading of the Tallong Dam pipeline to facilitate the connection of the proposed Marulan Creek Dam to Boral's existing on-site reservoir. The Department requests clarification as to whether this upgrade would be wholly contained within the proposed disturbance footprint, as shown in Figure 4.1 of the EIS.

Boral confirms the pipeline upgrade will be entirely within the project area and disturbance footprint shown on Figure 4.1 of the EIS. Specifically, the works will comprise construction of a pump station adjacent to the Marulan Creek dam wall and a short pipeline connecting the pump station to the existing pipeline. This work will occur in the section of project boundary surrounding the Marulan Creek dam and adjacent section of water supply pipeline shown on Figure 4.1.

The Environment Protection Authority (EPA) has advised that future recommended conditions of consent are likely to require that:

- a. a new water pollutant monitoring point be established to replace WP16;**
- b. additional groundwater monitoring bores be established to offset the loss of MW1 and MW2, preferably prior to removal of the existing bores;**
- c. further assessment be undertaken with respect to bicarbonate alkalinity, total suspended solids and settling agents in order to determine appropriate discharge limits; and**
- d. any future surface water monitoring program include analysis of metals, including aluminium and chromium, bicarbonate alkalinity and settling agents. Please provide a response to the EPA's proposals in the RTS.**

Refer to Section 6.5 for responses to EPA submissions.

6.2.2 Noise

The EPA has raised a number of concerns regarding the Noise and Blasting Assessment (NBA), particularly with respect to background noise levels, inconsistencies between the noise modelling and source location maps, and the omission of rail-loading related noise sources from the assessment.

The EPA has also requested:

- a. clarification regarding the assessment of meteorological conditions;
- b. further explanation regarding predicted noise levels, and whether these predictions represent worst-case noise impacts for Receivers R9 and R12;
- c. that the relocation of the stockpile reclaim area and construction of the road sales stockpile area be included in the operational noise assessment, rather than the construction noise assessment; and
- d. demonstrated validation of the noise model.

The Department requests that the RTS include a revised NBA which addresses all EPA concerns.

The NBA was not revised as the EPA's comments could be addressed in an addendum report (Appendix F) and attached to the RTS rather than revising the existing large report for resubmission. Refer to Section 6.5 for responses to EPA submissions.

6.2.3 Traffic and Transport

Roads and Maritime Services (RMS) has requested that the intersection modelling provided in the Traffic Assessment be updated to include a 10-year post-development scenario, with supporting justification for the anticipated traffic volumes. RMS has also requested that the updated modelling data be provided directly to RMS for review.

Refer to Section 6.6.11 for responses to RMS submissions.

The project description includes the upgrading of Marulan South Road between the project site and the Hume Highway intersection. As the Department has previously noted, the impacts of proposed road widening, particularly with respect to biodiversity and Aboriginal heritage values, have not been assessed in the EIS. The Department understands that Boral is negotiating an agreement with Council which may allow a separate assessment of the proposed road works under Part 5 of the Environmental Planning and Assessment Act 1979. However, this is not reflected in the EIS, and the status of Boral's negotiations with Council remains unclear. The Department requests clarification in this regard.

Boral is negotiating with GMC in relation to a deed of agreement for the delivery of upgrades to Marulan South Road. GMC has indicated general support of using Part 5 of the EP&A Act to deliver this upgrade, as described further in Section 6.4.1.

The community submissions raised concerns regarding additional truck movements and associated impacts on rural amenity. The RTS should give detailed consideration to:

- a. the feasibility of additional rail transport, as an alternative to road haulage; and
- b. potential mitigation measures, including restrictions on heavy vehicle movements during the night and morning shoulder periods.

Boral has previously investigated alternative transport routes and additional rail transport and determined these unviable. The project maintains rail as the primary means of transporting material from the site to customers and Boral seeks no limitation on the volume of products transported by rail as they will prioritise rail over road transport (refer to Section 4.6 of the EIS for further detail).

The proposal to allow transportation of material by road is sought on the basis of providing operational flexibility, as Boral can only deliver products by rail to customers with rail receipt facilities. Currently mine product delivered is limited to customers able to receive these products by this method. Boral seeks allowance for a relatively small quantity of material to be moved by road to support delivery materials to customers without access to rail facilities.

Mitigation measures, such as restricting vehicle movements, are typically required where there is demonstrable impact on service operating levels or local amenity. In this regard the following is noted:

- The proposed increase in road transport is minor in nature contributing in an additional 2-3 truckloads (one-way trips) per average hour and 5 truckloads (one-way trips) per worst case hour.
- Modelled traffic scenarios up to 2029, indicate that even after including other sources of traffic, such as the approved Lynwood, Ardmore and Gunlake quarries, indicate that the key intersection of the Marulan South Road/Hume Highway interchange will continue to operate at a Level of Service “A” (good operation) during peak hours. Therefore, the additional project traffic will not impact on road capacity or functionality.
- The additional traffic will result in nominal 2 dB increase in noise levels at receivers along Marulan South Road during the day, and 1 dB at night. These increases are within the traffic noise criterion at all receivers.
- Air quality impacts from truck movements will not be significant as aggregate product trucks will have covered loads and fine products will be transported in tankers or closed bags.

Given truck movements, particularly those during sensitive hours, associated with the project will not result in significant traffic or amenity impacts, Boral believes it is not necessary to restrict heavy vehicle movements during the night and morning shoulder due to the nominal increase proposed and the absence of likely amenity impacts.

Sections 21.3 and 29.2 of the EIS describes the proposed road transport management measures.

6.2.4 Biodiversity

The Office of Environment and Heritage (OEH) has raised concerns regarding potential biodiversity impacts associated with the drawing of water from Tallong Dam. The Department notes that the Biodiversity Development Assessment Report (BDAR) may require revision, after item (1) above has been clarified.

Refer to Section 6.7.1 for responses to OEH’s comments regarding Tallong dam.

OEH has requested further clarification regarding Boral’s proposed approach to the separation of offset requirements for SSD-7009 and Peppertree Quarry Modification 5 (MOD 5). Given that MOD 5 is nearing determination, the Department’s preference would be for Boral to provide a revised BDAR in the RTS which includes updated credit calculations, excluding the disturbance area proposed under MOD 5.

Refer to Section 6.7.2 for responses to OEH’s comments regarding the separation of Peppertree Quarry and Marulan South Limestone Mine credit requirements. Boral has taken the approach of replicating the credit requirements for each project and subtracting those for Peppertree Quarry from those for the mine to demonstrate the mine’s standalone credit requirements.

6.2.5 Visual impacts

The community submissions raised concerns regarding the visual impacts of the project, including impacts from public vantage points (i.e. the Lookdown). The submissions also question whether the proposed rehabilitation strategy could be amended in order to reduce the duration of those impacts. The RTS should provide a detailed response in this regard.

Refer to Section 7.7 of this report for responses to the community’s visual impact related submissions.

The RTS should provide further information regarding the finished height of overburden emplacement areas. This should include cross sections and allow a simple comparison between proposed finished height and existing ground levels.

Cross sections are provided in the following EIS figures:

- Figure 4.24 – view from approximately east to west showing existing and final elevations for south pit, north pit; and final elevations for southern overburden emplacement, western overburden emplacement and northern overburden emplacement.
- Figure 4.25 – view from approximately south to north showing existing and final elevations for north pit and west pit; and final elevations for western overburden emplacement and northern overburden emplacement.
- Figure 4.26 – view from approximately north to south showing existing and final elevations for north pit and west pit; and final elevations for western overburden emplacement.

The figures include the surface elevation as at April 2018 and final surface elevations at the end of the 30-year mine plan, expressed as metres above sea level on the vertical axis. The final maximum overburden emplacement heights (highest point across all proposed overburden emplacements) are in Table 6.1.

Table 6.1 Final maximum overburden emplacement heights

Emplacement	Height (mAHD)
Southern	475
Western	650
Northern	650

Section 4.5 of the EIS also provides a detailed description of all stages of the 30-year mine plan development from Stage 0 (pre-SSD and current mine operations) to the end of Stage 4 (end of mining). Section 4.5 describes the height of each overburden emplacement at the end of each stage and refers to figures 3.3 and 4.12 to 4.21 which show the height of all overburden emplacements at the start of mining, at the end of each of the four stages and at completion of mining, as the final landform.

6.2.6 Heritage

The Heritage Council of NSW has recommended conditions with respect to future archaeological investigations. The Department may accept a commitment from Boral in its RTS to implement these recommendations, in lieu of specific conditions in this regard.

Boral acknowledges the NSW Heritage Council's submission and agrees to incorporate the recommendations into the relevant management plan.

6.2.7 Impacts on the homestead property

A detailed submission has been made on behalf of the owner of the 'Glenrock' property. The RTS should include a careful response to all matters raised in this submission, including noise, air quality and visual impacts and security of water supply (both surface and ground water) in respect of the Glenrock property and its associated cattle operations.

The Department also requests that Boral consult further with Gormen Pty Ltd directly to resolve any issues which are subject to private agreements between the two parties, including previous agreements regarding water supply and the planting of screen trees.

Boral acknowledges the submission made on behalf of the owners of the “the homestead” property and has responded in sections 7.2, 7.3, 7.4, 7.5, 7.6, 7.9, 7.12, 7.13, 7.14 and 7.15 of this report. This submission and property is referred to hereafter as “the homestead” or “Receiver 13 (R13)” as reflected in the assessment documentation of the EIS.

Boral actively sought to engage Tomasy and the owner of the homestead in relation to the submission. A chronology of communications with Tomasy is provided in

Table 6.2.

A meeting was held on Monday, 16 September 2019. Through the course of this meeting and subsequent correspondence, it was confirmed that the primary issues of concern were:

- Boral’s intended use of water from the Tallong dam;
- Potential visual amenity impacts associated with the northern overburden emplacement; and
- Amenity impact associated with potential dust generation.

In discussions directly with both the owners of Glenrock and MRAG, Boral Cement Limited (Boral) has agreed and committed to the following six (6) matters and actions. On the basis of the following, each of the owners of Glenrock and MRAG have indicated they consider their objections adequately addressed:

1. Boral undertakes that neither the Tallong Dam nor the existing water pipeline (Tallong Water Pipeline) will be used to feed or fill the 118ML Boral will water storage dam (WSD) which is proposed to be constructed and which forms the main emphasis of both the Glenrock and MRAG submissions to the DPIE. The WSD will be filled only from Marulan Creek, not the Tallong Water Pipeline.
2. Boral will ensure the WSD commences water supply to Boral’s South Marulan limestone mine (Mine) when the water level in it reaches the point of filling deemed to be adequate to commence supply (a point estimated to be not greater than 75% of the WSD water holding capacity, to be determined and stipulated in the design of the WSD) (Trigger Point). Boral will notify the community when the WSD commences water supply to the Mine.
3. When the Trigger Point occurs Boral will cut and terminate the Tallong Water Pipeline currently supplying the Mine, at which time access to and use of the Tallong Water Pipeline will abruptly cease. The cut and termination is to occur at a location just above the proposed WSD site. A depiction of the location of the point of termination is contained in Figure 2.2, being a short black diagonal line drawn NW to SE across the approximate location of the Tallong Water Pipeline cut and termination. The precise termination location will depend on practical access and proximity of joints in the immediate vicinity of the indicated position.
4. Accordingly, Boral hereby requests the DPIE to include the following as conditions of consent to SSD7009 (using the above defined terms):

“Conditions of consent regarding Tallong Dam and water usage:

A. The WSD may not be filled, supplemented or maintained by the Tallong Water Pipeline: the WSD is to be filled and maintained only from Marulan Creek and the natural watercourse.

B. Boral must ensure the WSD commences the supply of water to the Mine when the water level in the WSD reaches a point of filling deemed to be adequate to commence supply to the Mine (a point estimated to be not greater than 75% of the WSD water holding capacity, to be determined and stipulated in the design of the WSD) (Trigger Point). Boral must notify the community when the WSD commences water supply to the Mine.

C. When the Trigger Point occurs Boral must cut and terminate the Tallong Water Pipeline currently supplying the Mine, at which time access to and use of the Tallong Water Pipeline will abruptly cease. The cut and termination is to occur at a location just above the proposed WSD site, as approximately depicted in Figure 2.2 (the precise termination location will depend

on practical access and proximity of joints in the immediate vicinity of that indicated position). Boral must notify the Department of Planning, Industry and Environment (Department) when this occurs.”

5. If for any reason the Department declines to condition any or all of the above matters as conditions of consent to SSD7009, Boral will honour them regardless and as a public commitment to the community.
6. Boral will at its cost plant and irrigate a sufficient number of trees of an agreed and suitable species (most likely Eucalyptus and Angophoras) to maximise visual mass (over time) and act as a light and dust break to the Mine’s Northern overburden area so it is not visible from the Glenrock property. These will include mature trees at a minimum height of 5 metres on installation and will be planted in a format of several rows to ensure they are capable of becoming self-sustaining once properly established. The location of the planting area(s) is to be agreed between Boral and Gormen on a site visit; logically the location will be the highest ridge as close to the overburden area as practicable (by reference to the projected mature overburden footprint) in order to enable Glenrock to continue to maximise use of its grazing land for its cattle herd. The site visit will be confirmed between Boral and Gormen directly.”

Table 6.2 Communication with Tomasy Planning and the owner of the homestead

Date	Event
29 April 2019	Email correspondence from Boral to Tomasy acknowledging receipt of correspondence and confirming Boral’s willingness to discuss their submission and concerns. Boral advised they would be available on 1 May 2019.
29 April 2019	Boral advised by return email the earliest a meeting could be held was the week beginning 20 May 2019 due to prior commitments.
3 May 2019	Email from Boral to Tomasy regarding potential meeting dates starting Monday 20 May 2019.
3 May 2019	Email response to Boral advising that availability had changed. Meeting could not be arranged until after 25 May 2019.
27 May 2019	Email from Boral to Tomasy seeking to arrange a meeting to discuss the submission offering a range of meeting dates from Monday 3 June to Friday 7 June.
7 June 2019	Boral advised that representatives were unavailable the week of 7 June 2019.
11 June 2019	Email from Tomasy to Boral requesting a binding agreement in relation to the submission made by the community organisation and concern raised regarding water use.
13 June 2019	Boral response to Tomasy with Boral’s public statement in respect to water use.
16 June 2019	Tomasy further email to Boral further requesting a “clear and binding agreement” prior to meeting to discuss the submission.
24 June 2019	Tomasy followed up on email of 16 June 2019.
25 June 2019	Boral response to Tomasy seeking to discuss the contents of the email of 16 and 24 June in a meeting.
25 June 2019	Boral received a further request for a “clear and binding agreement” prior to meeting to discuss the submission.
16 September 2019	Boral met with Tomasy and the owner of the homestead and agreed on their key matters of concern.
16 – 26 September 2019	Boral and the owner of the homestead corresponded on and agreed to the commitments Boral would make to address their key matters of concern.

6.2.8 Compatibility with zone objectives

The submission on behalf of the owner of 'Glenrock' also raised concerns that the proposal is inconsistent with zoning objectives under the Goulburn Mulwaree Local Environmental Plan 2009. The RTS should provide a considered response in this regard.

The project is considered against the objectives of the RU1 Primary Production zone under the Goulburn Mulwaree Local Environmental Plan 2009 in Section 7.10 of this report.

6.2.9 Community consultation

Many community submissions express concerns regarding the lack of community consultation regarding the project more broadly. Therefore, the Department strongly recommends that Boral undertake additional community consultation in the Tallong area, including consultation with the Marulan Residents Action Group (MRAG). This consultation process should be documented in the RTS.

The community's concerns about notification of public exhibition of the EIS, the length of the exhibition period and the accessibility of the EIS are addressed in Section 7.4 of this report.

As described in Section 4.1.1, Boral met with the Tallong community on 1 May 2019 to discuss their concerns with the project which were principally around the misunderstanding that Boral was proposing to pump water from Tallong dam to fill the proposed Marulan Creek dam. As described in Section 4.1.2, after the meeting a statement was sent to all Tallong community who attended the meeting and provided contact details, confirming in writing that Boral was not going to pump water from Tallong dam to fill the proposed Marulan Creek dam and inviting the community to contact Boral if they had any further concerns or comments.

In June 2019 Boral issued direct correspondence to those members of the Tallong Community who had made a formal submission to DPIE (refer to Attachment C of Appendix B). This correspondence further confirmed that Boral did not intend to pump water from Tallong dam to the proposed Marulan Creek dam and sought further comments on the project. Only one response was received thanking Boral for the clarification (refer to Attachment C of Appendix B).

A meeting was held with the Chairperson of community organisation on Monday, 16 September 2019. The matters discussed and the outcome of this meeting are set out in section 6.2.7 above.

6.3 NSW Department of Planning, Industry and Environment – Water/Natural Resources Regulator

Two submissions were made by the NSW Department of Planning, Industry and Environment – Lands, Water and Primary Industries on 6 June 2019 as amended on 15 August 2019. The latter submission followed ongoing discussions between DPIE water and Boral with the aim of resolving concerns regarding the Marulan Creek online dam.

In accordance with the amending advice of DPIE – Water the submission of 15 August 2019 replaces that of 6 June 2019.

6.3.1 Pre-approval comments

Water Sharing Plan

Key objectives under clause 10 of the Water Sharing Plan for the Greater Metropolitan Unregulated River Water Sources 2011 include:

(a) provide for the water supply for the people of Sydney, the Illawarra, the Shoalhaven, the Southern Highlands and the Blue Mountains, which comprise approximately 70% of the NSW population,

(b) contribute to the sustainable and integrated management of the water cycle across these water sources,

(c) protect, preserve, maintain and enhance the important river flow dependent and high priority groundwater dependent ecosystems of these water sources, Clause 12 describes the performance indicators that are used to measure the success of the strategies of the WSP in reaching the objectives of the Plan, some key ones related to the Marulan Creek dam proposal are:

(a) change in low flow regime,

(b) change in moderate to high flow regime,

(c) change in surface water extraction relative to the long-term average annual extraction limits,

(d) change in water quality in these water sources,

(e) change in the ecological condition of these water sources and their dependent ecosystems,

Impacts of the Proposed Marulan Creek Dam

The proposed dam will impact total flows downstream in Marulan Creek and into the Barbers Creek gorge and flow variability and ecological resilience within the channel and fringing zone. The EIS does not assess the likely cumulative impacts on flow dependent species, nor does it present an analysis of reducing flow variability on sediment transport or interruption of geomorphic processes in Barbers Creek. It is important that the proponent address the above objectives and performance indicators in the water sharing plan when preparing additional information to support consideration of a new dam.

In reference to clause subsections a) and b) above:

- The mine is in Sydney's drinking water catchment. Under clause 10 of the SEPP, a consent authority must not grant consent to the carrying out of development on land in the Sydney drinking water catchment unless it is satisfied that the carrying out of the proposed development would have a neutral or beneficial effect (NorBE) on water quality.

As described in Section 8.4 of the EIS, the overflows from the sediment basins will be within the range specified in Department of Environment and Climate Change, (2008), *Managing Stormwater: Soils and Construction, Volume 2E – Mines and Quarries* and will be consistent with NorBE. Therefore, the overflows will not have a significant impact on the receiving waters.

- As described in Section 5.1, the proposed dam will replace supply currently sourced from Tallong dam. As described in Section 6.6.1, Boral proposes to purchase up to 183 ML from existing Water Access Licence holders within the Water Management Zone. No changes are proposed to total water entitlements within the water source, only trading between existing Water Access Licence holders within the Water Management Zone. Therefore, the overall impact of the proposed dam on the water cycle in the WSP area will be minimal.

The following sections regarding changes in flow regimes and geomorphology respond to the matters listed under subclause c). Additional detail regarding water quality and aquatic biodiversity are provided in sections 6.5.3 and 6.6.1, respectively.

In summary, the proposed dam is unlikely to impact the frequency, duration and volume of low and high range flows. It is unlikely to impact the frequency and duration of mid-range flows, but is

likely to impact the volume of these flows. This change in mid-range flow volumes is unlikely to impact the geomorphology of Marulan or Barbers creeks as the geomorphology of these streams is influenced more by high flows, and aquatic biodiversity in the streams are adapted to a variable flow regime including long periods of low flows.

According to clause 41(5)(a), the long-term average annual extraction limit for the Shoalhaven River Extraction Management Unit is equal to 36,000 ML/year. Boral will require a total entitlement of 183 ML/year including for the Marulan Creek dam. This represents 0.5% of the long-term average annual extraction limit.

Recommendations

DPIE (Water) recommends that the proponent provides further detail in their Response to Submissions regarding:

Marulan Creek Dam impacts and mitigation:

- **Description of the current geomorphology, aquatic environment and ecological communities downstream of the proposed dam in Marulan Creek and Barbers Creek**

The aquatic environment and ecological communities in Marulan and Barbers creeks downstream of the proposed dam are described in detail in Appendix L and summarised in Section 3.2 of the EIS.

Barbers Creek

Barbers Creek downstream of the confluence of Marulan Creek is steep sided gorge. The gorge section of Barbers Creek extends from 1.5 km upstream of the confluence with Marulan Creek to the Shoalhaven River, 8 km in total. This section of Barbers Creek is characterised by a rocky, boulder-strewn channel with rock pools. The channel gradient ranges from approximately 5% to 6%.

Barbers Creek downstream of the proposed dam comprised pools with little macrophyte growth. It had a strong base flow component to the overall flow, and in lower flow periods often had no visible surface flow. It had strong subsurface connectivity, particularly in downstream sections. The riparian vegetation was in good condition, showed little disturbance and provided moderate-high shading of the river. Dominant canopy species included River Oak and Pittosporum, with Sandpaper Fig and Grey Myrtle.

Marulan Creek

Downstream of the proposed dam, Marulan Creek enters a steep sided gorge. The creek gradient increases to as much as 10% through the gorge, where it joins Barbers Creek and continues to the Shoalhaven River. This section of Marulan Creek is characterised by a rocky, boulder-strewn channel with rock pools.

Throughout the gorge, natural vegetation extends from the stream banks to the top of the gorge. Geomorphology is consistent with spatial mapping of the catchment (NSW Office of Water (2012), which characterises this section of Marulan Creek as Confined Valley Gorge (CVG), based on The River Styles Framework (Brierly, 2006).

The water clarity was good. Macrophytes consisted of Bullrush and Common Reed, which covered a significant portion of the stream. Filamentous algae covered most of the substrate. The riparian vegetation provided moderate shading of the river and showed moderate disturbance due to the presence of exotic flora. The canopy was dominated by River Oak. Other species included Blackberry (*Rubus* sp.), Lantana (*Lantana camara*) and *Acacia* sp.

Aquatic fauna

The introduced Mosquitofish (*Gambusia affinis*) was the only fish species observed in Marulan Creek. Barbers Creek showed longitudinal distribution of fish species, with Mountain Galaxias (*Galaxias olidus*) only observed upstream of the proposed dam. Cox's Gudgeon (*Gobiomorphus coxii*) were commonly observed in Barbers Creek.

Flathead Gudgeon (*Philypnodon grandiceps*) and Australian Smelt (*Retropinna semoni*) occurred sporadically throughout streams in the area, while Carp (*Cyprinus carpio*) and Eel-tailed Catfish (*Tandanus tandanus*) were recorded only downstream of the project area.

- **Management of the impacts to the above including the impact of the proposed dam on the flow regime, and geomorphic and ecological processes in Marulan Creek and Barbers Creek**

Dam riparian release

As described in Appendix G and summarised in Section 8.2.2 of the EIS, the proposed Marulan Creek Dam will include a riparian release regime like that of the nearby Tangarang Creek Dam. The riparian release regime will minimise the impact to the flow regime, by ensuring that frequency and duration of mid-range flows downstream of the dam are like the inflows. The assumed riparian release conditions will be when the inflow to the dam is:

- greater than 10 megalitres per day, downstream releases will be equal to 10 percent of the inflow;
- less than 10 megalitres per day and greater than or equal to 1.0 megalitres per day, downstream releases will be no less than 1.0 megalitres per day; and
- less 1.0 megalitres per day, downstream releases will be equivalent to the inflow at the time.

The riparian release regime and spillway will ensure that:

- Water is released from the dam to maintain the low flow regime.
- Water is released from the dam to mimic mid-range flows, such that frequency and duration of flows between 1 and 10 ML/day are similar to the current situation.
- Flood flows would pass through the dam spillway, maintaining the frequency and magnitude of flooding events.

Flow regime

The flow regime in Marulan Creek was assessed in Annexure D of Appendix G of the EIS. There are no stream gauges on Marulan Creek which would allow direct analysis of the existing flow regime and to assess the impact of the dam on the existing flow regime. Therefore, hydrology has been modelled to characterise the flow regime for Marulan Creek near the proposed dam. The modelling was based on flow data for nearby creeks with comparable geology, land-use and climate to the Marulan Creek catchment. The Australian Water Balance Model (AWBM) was used as it is a well-recognized model.

Modelling indicated that flow in Marulan Creek is highly variable, with short duration flow events following rainfall (Figure 6.1), with longer periods of low/no flow between events. On average there are likely 10 flow events per year of greater than 1 ML/day (mid and high flow events), but there will be a variation year to year (10th percentile: seven events per year and 90th percentile 16 events per year) as shown in Figure 6.2.

The events are consistent through the year, with generally three per quarter (range 0-5 events per quarter) as shown in Figure 6.3. Duration of events is about 3 days per year (with a range of 1-5 days) as shown in Figure 6.4.

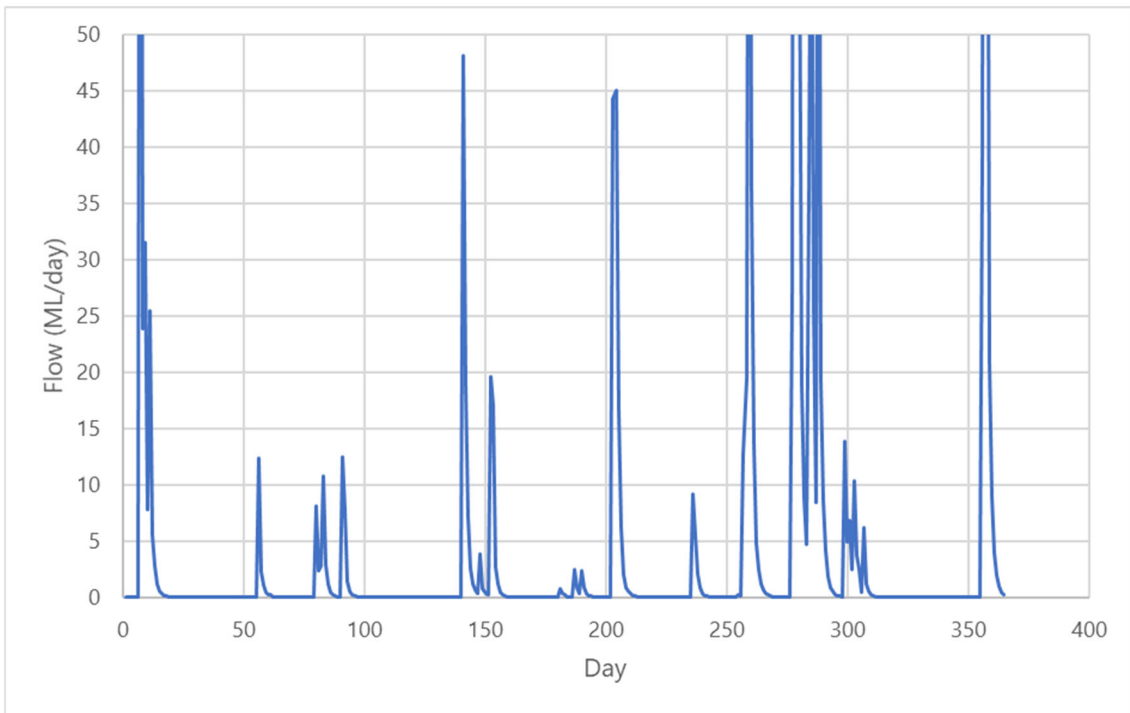


Figure 6.1 Marulan Creek daily flow

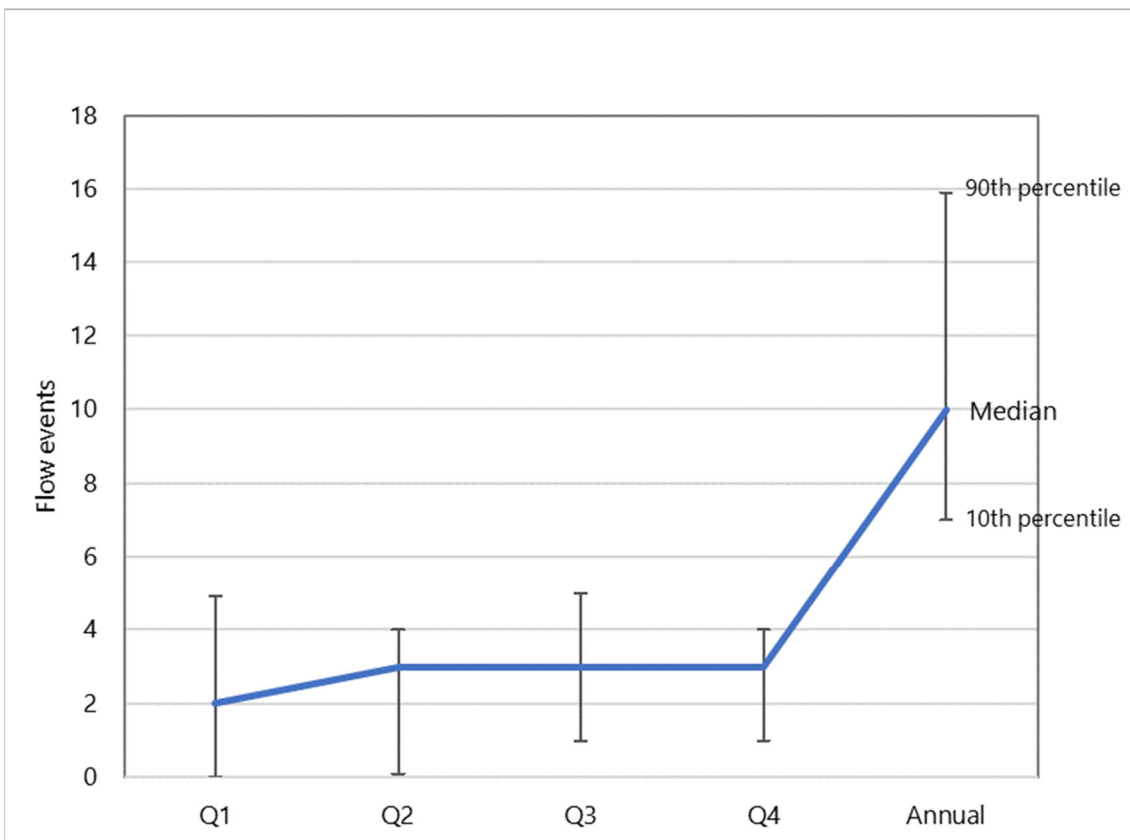


Figure 6.2 Marulan Creek flow events

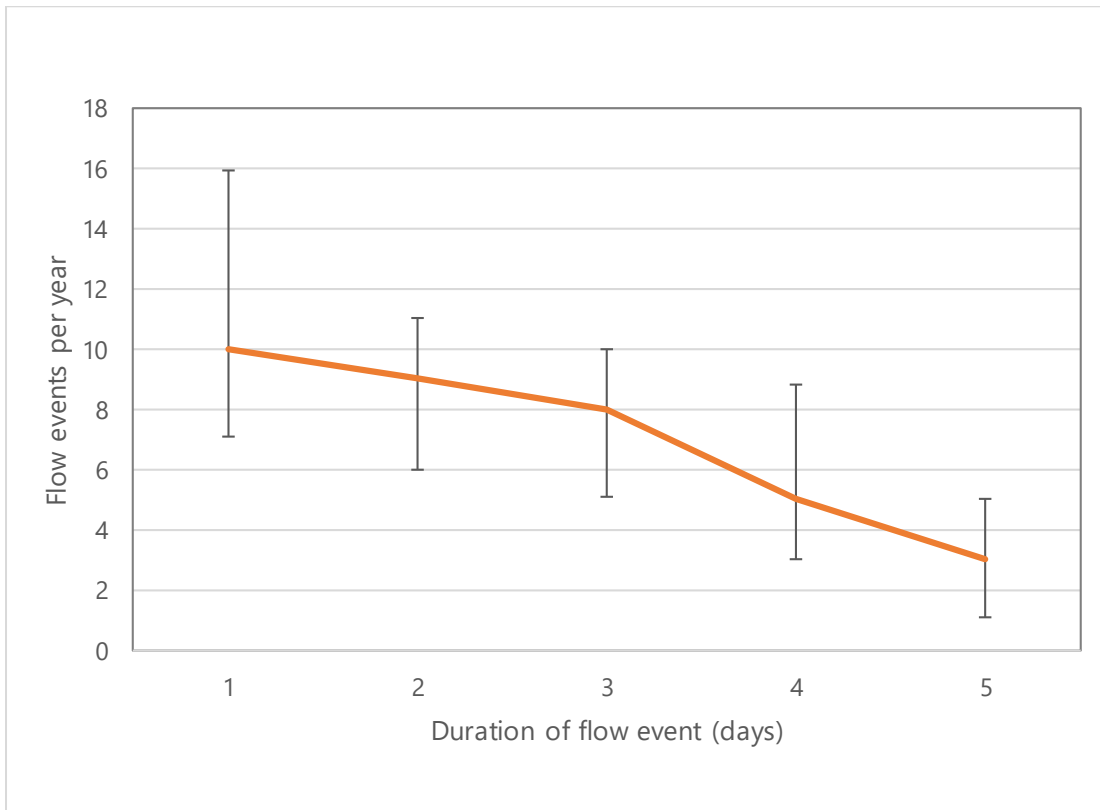


Figure 6.3 Mean duration of flow events

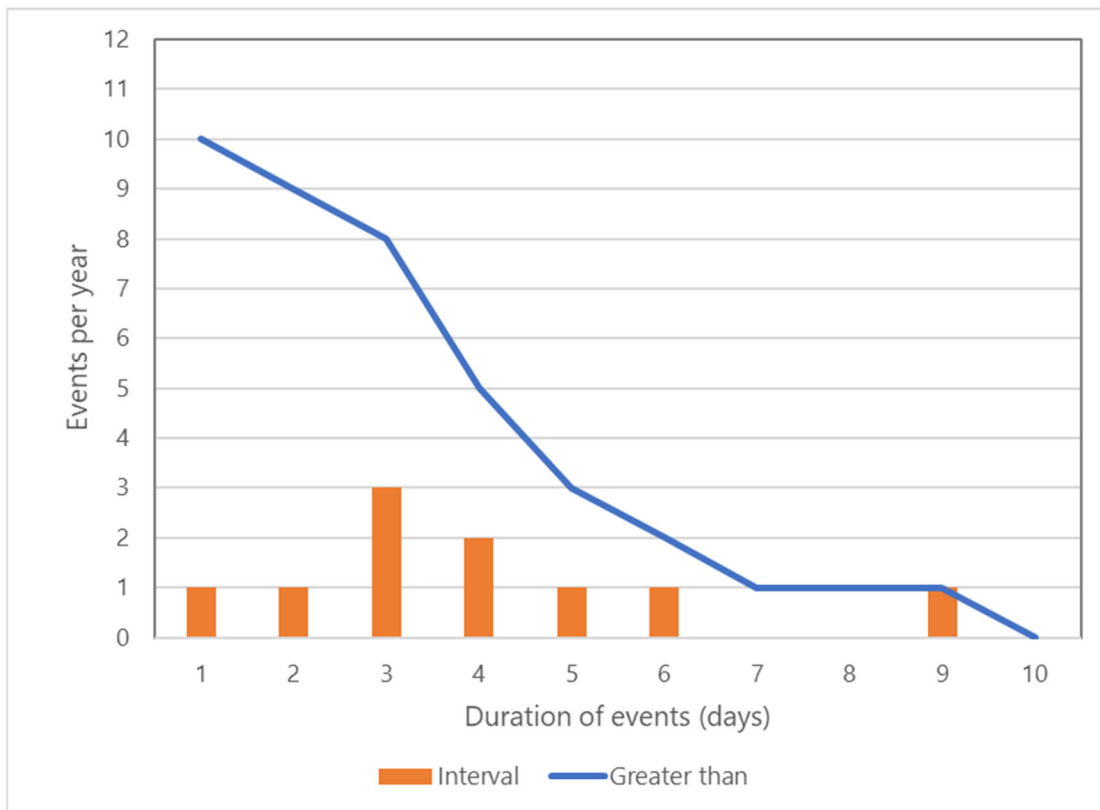


Figure 6.4 Duration of flow events

Potential impacts

The change in flow regime has been assessed through water balance modelling of the project. With the assumed licence conditions, the number and duration of mid and high flow events are maintained as shown in Table 6.3, with only a change in the volume as described in Section 6.6.1 (total reduction in annual average flow in Marulan Creek from 1,023 ML/year to 829 ML/year).

Table 6.3 Change in mid and high flow regime

Flow events	Marulan Creek upstream of dam			Marulan Creek downstream of dam		
	10 th %ile	Median	90 th %ile	10 th %ile	Median	90 th %ile
Flow events per year (>1 ML/day)	7	10	16	7	10	16
Duration of flow events (>1 ML/day)	1	3	6	1	3	6

The geomorphic structure of the Marulan Creek gorge, downstream of the dam reflects infrequent high magnitude flood events (Brierley, 2006). The relative size of reservoir to flood flows mean that flood flows will be similar in magnitude and frequency to the current situation, as shown in flow duration curve (Figure 6.4). As flood flows pass through the dam and spillway relatively unchanged, the geomorphology is unlikely to change, either in Marulan Creek downstream of the dam or further downstream in Barbers Creek to the confluence of the Shoalhaven River. Potential impacts to aquatic biodiversity are described in Section 6.6.1.

- **Consideration of managing impacts through retirement and removal of existing dams managed by Boral. This should include a discussion on the effectiveness of dam removal in mitigating the impacts of a new dam on catchment hydrology including Barbers Creek**

Boral leases adjoining land to the north and west of active extraction areas to local farmers and graziers. Many of the dams located on Boral land, not associated with quarrying and mining operations are used by leases for the purpose of stock watering. Any removal of these dams would adversely impact on the viability of these ongoing and established agricultural uses.

Boral is investigating the purchase of WALs additional to its requirements for the proposed dam. This additional entitlement would be released as riparian flow when appropriate and may offset the potential impacts of the proposed dam on Marulan and Barbers Creeks to some extent. The certainty and quantity of this purchase is not known at present as it is part of the WAL negotiations described below.

- **Detail of how and when monitoring, evaluation and reporting mechanisms will be designed to demonstrate the effective management of the river system and its catchment to minimise impacts on hydrology, geomorphic processes and downstream ecological health.**

Boral will update and augment the existing water management and monitoring program to include additional measures aimed at demonstrating effective management of the river system and its

catchment prior to construction of the proposed Marulan Creek dam. The following sections sets out the broad objectives, monitoring methods and evaluation and reporting frameworks.

A more detailed program would be developed as a post consent measure in consultation with DPIE – water.

Objectives of the water monitoring program

The objective of the water monitoring program will set clear goals for the effective management of the Marulan Creek Dam. The objectives will focus on the management of:

- (a) low flow regime;
- (b) moderate to high flow regime;
- (c) surface water extraction relative to the long-term average annual extraction limits;
- (d) water quality in the relevant waterbodies; and
- (e) ecological condition of these waterbodies and their dependent ecosystems.

Monitoring

Boral will modify the current monitoring program described in Section 2.2.1 of the EIS, by installing a stream gauging station:

- upstream of the proposed Marulan Creek Dam, just upstream of the full water storage level of the dam;
- downstream of the Marulan Creek Dam embankment, just downstream of the confluence of the existing channel and dam spillway; and
- in Barbers Creek downstream of the junction of Tangarang Creek and Barbers Creek.

The gauging stations will be equipped with automated monitoring equipment, such that water level and flow data are recorded continuously. These gauging stations will be regularly maintained and calibrated to account for any changes in the channel bed.

Evaluation and reporting

Data from flow monitoring stations will be evaluated regularly, comparing dam inflow and releases to ensure compliance with license conditions. Data will be evaluated in more detail annually to assess the performance of the riparian releases, evaluating:

- compliance with relevant conditions from the water license and project approval;
- change in low flow (<1ML/day) durations and total volume;
- baseflow index upstream and downstream of the dam;
- change in moderate flow (>1ML/day), events per year, duration and total volume; and
- total extraction from Marulan Creek Dam, compared with water access license entitlement.

This evaluation will be integrated with aquatic ecology, meteorological and surface water quality monitoring during the review period. Results from the evaluation will be included in the annual environmental management report.

Water Access License (WAL) purchase(s) and transfer:

- **A plan of when and how the proponent intends to acquire the necessary water entitlements to cover supply from the proposed Marulan Creek Dam should it be approved**

Boral is currently negotiating the purchase or lease of WALs with existing entitlement holders within the catchment. The timing for conclusion of these matters is unknown.

Boral is also considering purchasing/leasing WALs additional to its requirements for the proposed dam to compensate for predicted reduced flow volumes along Marulan Creek downstream of the dam.

Boral commits to not commencing construction of the proposed dam until sufficient WALs are secured.

- **Consideration of the transfer and/or retirement of WALs to address the medium to long term alteration in flow characteristics into Barbers Creek including consideration of offsets elsewhere in the Barbers Creek Management Zone**

As described above, Boral is discussing the purchase or lease of WALs with existing holders. These WALs will cover Boral's deficiency in entitlements for the proposed dam. Boral will not commence construction of the proposed dam until sufficient WALs are secured.

6.3.2 Post-approval recommendations

Should the project be approved, DPIE and NRAR provide the following recommendations:

- **Impose a condition requiring Boral to remediate and rehabilitate channel degradation along Marulan Creek and other watercourses within its ownership. Prioritisation and development of rehabilitation options should follow the procedure set out in *A Rehabilitation Manual for Australian Streams* (Cooperative Centre for Catchment Hydrology, Land and Water Resources Research and Development Corporation, 2000).**

Boral agrees to include remediation and rehabilitation of channel degradation along streams in the project area in the rehabilitation management plan committed to in Table 29.2 of the EIS.

- **Reviews the site water balance upon the commencement of operations and update every three years. This must include a review of all forms of take of water as set out in section 60I of the Water Management Act 2000.**

Boral commits to reviewing the water balance in Table 29.3 of the EIS. As described in Section 6.3.1, Boral is negotiating the purchase or lease of WALs with existing entitlement holders within the catchment to account for the take indicated by the water balance.

- **Develops alternate water quality trigger threshold values to ensure impacts from mining operations at each surrounding watercourse are detected at an early stage.**

Boral commits to preparing a water management plan including a trigger action response plan in Table 29.3 of the EIS for the waterways described in Table 2.2 of the EIS.

Refer to the response under EPA's submission on trigger values (Section 6.5.3) for proposed trigger values for Barbers and Bungonia creeks.

- **Consider release measures for Tallong weir and Tangarang Creek dam to increase flow variability downstream into Barbers Creek gorge. This should be designed around downstream ecosystem flow requirements, following review of likely and potential ecological niches within Barbers Creek to the Shoalhaven River junction.**

The Tangarang dam supports operations at Peppertree Quarry that was approved and operates under a separate consent granted to Boral Resources (NSW) Pty Ltd. This request is beyond the scope of the project.

Boral is not able to release water from Tallong dam as it is not the owner of the structure. Boral transfers water from the dam to the mine and does not use/control the dam release gate.

- **Prepares a groundwater monitoring and management plan in the first year that includes:**
 - **Continuation of data gathering from the existing monitoring network throughout the project lifetime.**

Boral commits to continuing gathering data from the existing monitoring network in Table 29.3 of the EIS.

- **Establishment of a groundwater level and quality monitoring network in and around Mt Frome Middle Limestone within one year from the granting of the approval. Formations hydraulic parameters are required to be characterised during that program.**

There are no bores in the Mt Frome Middle Limestone, so a monitoring bore into this sequence would be needed. Bore MW7 was drilled in the adjacent volcanics and does not intersect the Mt Frome Middle Limestone.

The location of a monitoring bore network in and around the Mt Frome Middle Limestone will be determined during preparation of the groundwater monitoring and management plan, as part of the overarching water management plan for the mine. Whilst a monitoring bore network downgradient of the Mt Frome Middle Limestone should be suitable for groundwater level measurements, this may not be the case for groundwater sampling. That is, the depth to groundwater may be deeper than the practical limit for collecting a representative sample for determining groundwater quality. If groundwater quality monitoring is not possible from the future bores in the Mt Frome Middle Limestone, then an alternative option will be to use the Main Gully Spring (B68 – ‘Blow Hole’ [refer sections 5.2.2 and 7.5, AGE, 2019]) for groundwater quality sampling downgradient from the pit.

- **Monitoring of seepage from the overburden emplacements and mine inflows.**

Seepage from the overburden emplacements and mine inflows will be determined during the ongoing confirmation/use of the water balance model to predict water supply shortfalls as committed to in Table 29.3 of the EIS.

The EPA referred to potentially alkaline seepage and surface runoff from overburden emplacements. As described in Section 6.5.3, Runoff and seepage from the waste rock is likely to be slightly alkaline and contain low concentrations of dissolved salts and unlikely to impact on the surface and groundwater resources at the site. All limestone including contact zones between the limestone and overburden is used in products, with none sent to overburden emplacements.

- **Model validation by verification and update of the groundwater model within three years of approval and every three years ongoing throughout the project lifetime. The model is to be informed by the data collected on formation characterisation and groundwater levels.**

Ongoing quarterly groundwater monitoring will continue in the existing and proposed groundwater well network for the parameters and at the existing locations identified in Section 8.3.2 of the EIS and at the replacement/additional groundwater wells identified in this section and Section 6.5.2, and will involve:

- downloading data from the pressure transducers, which electronically record water levels;
- sampling for acidity, salinity, major cations, major anions, metals and fluoride.

Boral commits to validating and verifying the groundwater model within three years of approval and every three years throughout the project life. The validation and verification will be based on data gathered by the above means.

- **Definition of a trigger threshold identifying if the capture of water and impact prediction remain within predictions specified in the environmental assessment. A response plan must be prepared to define the management and mitigation actions to be implemented if site observations or model update predictions are above that trigger.**

Boral commits to preparing a trigger action response plan (TARP) which will contain trigger thresholds identifying if the capture of water and impact prediction remain within EIS predictions. As described in Section 8.3.2 of the EIS, the TARP will incorporate the trigger values in Table 8.6 of the EIS.

The values will be triggered by results of monitoring upstream and downstream of the mine on Barbers and Bungonia creeks and used as follows:

- If, during quarterly ambient surface water quality monitoring the upper bounds for pH, EC, TSP or turbidity are exceeded downstream of the mine but not exceeded upstream of the mine, it will trigger further monitoring on a monthly basis for two more months at the sampling point where the exceedance was measured.
- If one or more of the same parameters are exceeded in the three consecutive months of monitoring downstream of the mine but not exceeded during this period upstream of the mine, it will trigger assessment of potential sources in the mine.
- If the assessment finds the change in water quality may be caused by the mine, the source will be identified and operations will be reviewed and revised to address the impact.
- Following the revision of operations, monthly monitoring will continue to be undertaken at the sampling point where the exceedance was measured, until none of the parameters trigger values are exceeded. Thereafter monitoring at that sampling point will revert to quarterly monitoring.

6.4 Goulburn Mulwaree Council

A review of the Environmental Impact Statement prepared by Boral Limited has been undertaken in relation to the above proposal and a report was considered at the 7 May 2019 Council Meeting. At this meeting, Council resolved:

A submission be made to the Department of Planning & Environment highlighting the following items for consideration in their assessment of the application:

- a. The need to upgrade Marulan South Road and seek ongoing developer contributions for the maintenance of the asset in accordance with Section 7.11 EP&A Act 1979.
- b. The identified social impacts be addressed.
- c. Consideration be given to environmental matters including noise and dust emissions, and visual amenity.
- a. The significant interest demonstrated by the Tallong and Marulan communities in relation to water security and access to water for a number of purposes including but not limited to firefighting, recreation and environmental purposes.

In addition to the above, the following information was contained within the staff report presented to Council and has been provided as supplementary information in order to provide the Department and the applicant further insight into Council's resolution.

Comments of GMC are noted. Matters raised by GMC are addressed in the following sections.

6.4.1 Marulan South Road

Council is currently in negotiations with Boral in relation to the scope of the required upgrade and ongoing maintenance of Marulan South Road. The road is currently considered inadequate in terms of its construction and safety, and as a result, consistently generates concerns from road users and local residents.

The age of the existing limestone quarry has meant that Council has had limited opportunity in the past to apply maintenance contributions. It is the view of Council that the continued operations and proposed expansion of the mine is significant enough to

warrant the imposition of a developer contribution in accordance with Section 7.11 (formerly s94) of the EP&A Act 1979.

Boral have indicated a desire to enter into a deed of agreement with Council as a mechanism to enable the road upgrade. Details are still being sought as to the appropriateness of a deed of agreement compared to either conditions of consent or a Voluntary Planning Agreement.

GMC has since confirmed that a deed of agreement is an acceptable and legal mechanism to support the delivery of the road upgrade works. The terms of the agreement are yet to be finalised.

The road upgrade works will be delivered under a separate Part 5 activity approval relying on clause 94 (1) of State Environmental Planning Policy (Infrastructure) 2007.

In light of the above, the following comments are made:

Road Construction

- Section 4.4.6 of the EIS states, “Boral has committed to upgrading Marulan South Road from the site to the Hume Highway”, and “The upgrade will be to Austroads and relevant Council Standards and Specifications”.
- Section 21.3.4 of the EIS states, “Boral will undertake (a pavement condition) survey and include any required pavement works with the upgrading of Marulan South Road”.
- Section 4.4.4 of the EIS states, “Boral proposes to realign a section of Marulan South Road to accommodate the northern portion of (their works)”. This realignment will be to Council standards and will improve the alignment of the road.
- Section 7.2.3 of the DCP requires the following minimum standards for a heavy haulage route:
 - 7m wide sealed carriageway
 - 1m wide shoulders each side, 500mm of which is sealed
 - 80km/h design standard
 - Minimum of 10 years remaining pavement life.

It should be noted however, that the exact details of the upgrade are being negotiated with Council’s Director Operations as some items of the upgrade, including line marking, are beyond the requirements of the DCP.

In this regard, Council are seeking that the road design plans are to include a line marking plan with Wide Centre Line Treatment (WCLT) of the road centreline. This outcome would be consistent with the haul route that has been approved and recently constructed as part of the Gunlake Quarry consent (Brayton and Ambrose Road).

An image depicting a WCLT treatment has been provided below:



Furthermore, the design should also demonstrate the provision of retroreflective pavement markers (as utilised upon Kings Highway, Newell Highway, Brayton & Ambrose Road), edge line marking with retroreflective pavement markers, and guide posts at a spacing as determined from an analysis of heavy fogs along South Marulan Road.

- Council requires that a survey of South Marulan Road is undertaken to identify corridor boundaries, sealed and unsealed pavement extents, line marking, signage, hazards, driveways, intersections, road shoulders, vegetation, drainage structures and power poles. The survey must include sufficient details to indicate horizontal and vertical alignment of the existing pavement, shoulders and clear zone.
- Design plans must comply with Austroads design guidelines. The typical cross section of the design must incorporate 2 x 3.5m sealed travel lanes, 1.5m shoulders (1m sealed), and a 3.0m clear zone. Where this cannot be achieved alternate measures are to be proposed and indicate how non-compliance does not adversely impact road safety. Council will review concept design plans before detail design plans are prepared. The design plans are to be certified by a qualified and experienced civil engineering consultancy and supported by a design report.
- Design plans must identify the extent of trees and native vegetation to be removed and indicate appropriate environmental management measures.
- A geotechnical report is to be carried out to identify the condition of the existing pavement and proposed pavement upgrade to achieve a minimum 10 year pavement life with increased truck volumes. The type and extent of testing is to adequately characterise the existing pavement. The geotechnical report is to include a pavement design that caters for the estimated design traffic and considers the subgrade conditions.
- An assessment of the existing drainage structures is to be carried out to determine the structural integrity and hydraulic capacity of these structures. The drainage system is to operate so there is no detrimental impact on the road pavement, adjoining properties and vegetation during and following wet weather events.

Boral acknowledges GMC's engineering design requirements for Marulan South Road, and notes it is in ongoing negotiations regarding road design and responsibilities for road construction and financing.

Boral is in the process of obtaining a survey to assess the current condition of Marulan South Road against the Austroads design guidelines in order to provide definition to the scope of the road upgrade.

Compliance with Goulburn Mulwaree S94 Development Contributions Plan 2009

- Section 11.3 of the s94 Plan requires the payment of a contribution based on the tonnages transported over a Council road. The current (2018/19) rate is \$0.0488/t/km.
- Section 21.3.4 of the EIS states, “Boral currently pays a contribution to Council for road maintenance and will continue to do so during continued operation of the mine”. However, the contributions paid by Boral only relate to their brown clay and white clay products. These products amount to approximately 150,000t/a, which is only about one third of their total material transported along Marulan South Road.
- Council will be seeking that the current rate be applied to all additional tonnages to be transported over Marulan South Road as well as those existing tonnages not subject to contributions.

Boral generally accepts GMC’s request in relation to the application of the current rate to the additional tonnages and existing tonnages not subject to contributions, noting that Boral and GMC are in ongoing negotiations on this subject.

Road Capacity, Efficiency and Safety

- The proposal is for an average of an additional 68 trips (34 laden, 34 unladen) along Marulan South Road per day.
- Section 6 of the Traffic Impact Assessment states, “... traffic impacts of the additional product truck movements ...has found the impacts would be relatively minor and there will be minimal changes to the Level of Service and vehicle delays on the road network.”
- Section 21.3.2 of the EIS states the road upgrade “will take into consideration the need for and location of school bus stopping and turning”, and “will consider improving certain significant dips in the vertical alignment of the road to improve visibility and road safety”.
- Section 21.3.3 of the EIS states with regard the truck driver behaviour, “Boral proposes to further develop and continue to implement driver safety awareness training...”.
- Marulan South Road is currently a B-double route, however has a time restriction. With the upgrade of the road, including bus stops, it is considered the route would be appropriate as an unrestricted B-double route.

Council will require that a Traffic Management Plan be developed by the applicant in consultation with RMS and GMC. The plan is to consider measures to avoid dispatching or receiving large convoys of laden trucks onto public roads, a drivers code of conduct (including means of compliance), and methods used to minimise the transmission of dust and tracking of soil onto public roads.

Boral acknowledges GMC’s comments and notes that a traffic safety management plan applies to current operations, which will be revised to include GMC’s requirements and request for consultation.

De-registration of Public Roads

- Section 4.4.5 of the EIS states, “Boral proposes the de-registration of all public roads in the former village of Marulan South as well as the section of Marulan South Road between Boral’s operations and the entrance to the agricultural lime manufacturing facility”.
- This proposed de-registration is supported since it is considered beneficial to Council to decrease the maintenance burden of these heavily used roads.

- Road Closure Applications for Hume Street, Barber Street, Cooper Crescent in the former village of Marulan South and also two sections of Marulan South Road are off public exhibition and no objections were received. However Essential Energy requested a Right of Carriageway to access their substation on Lot 1 in DP 1186554 (i.e. off one section of Marulan South Road that is subject to the Road Closure Application) and OEH requested a Right of Carriageway or Easement for Access to provide them with continued legal access to the Bungonia National Park. Boral has instructed their surveyor to make provision for these requirements in the Plan of Road Closure (yet to be finalised).
- The Plan of Road Closure will be made available to Council for review before being forwarding to NSW LRS for registration purposes in order for new titles to be created in Council's name and then transferred to Boral, subject to them paying Council compensation consistent with updated Market Valuations.
- At a meeting with Boral representatives on 3 April 2019, Council staff were informed that whilst Boral wish to acquire a section of Marulan South Road representing a combined area of 5.437 hectares, they now wish to defer the Road Closure Application relating to a second section of Marulan South Road, representing an area of 6.613 hectares. The deferral would be for 7 years and Boral have stated a desire to enter into a Deed of Agreement or legally binding instrument to reflect this arrangement.

In light of this request from Boral and the magnitude of the proposal, it may be preferable for Council to insist on both parties entering into a Voluntary Planning Agreement (VPA).

Boral is progressing matters related to the deregistration process of Marulan South Road, including appropriate measures to ensure access to Essential Energy and DPIE.

Late advice received from Crown Lands – Crown Roads is also being addressed through realignment of access arrangements to ensure continued access to Crown Reserve land to east of the mine.

Since the meeting of 3 April 2019 Boral and GMC have held further discussions. It has been generally agreed that the road closure and upgrades will be dealt with by deeds of agreement. The timing of the road closure and realignment works are the subject of ongoing negotiations.

Boral will continue to engage GMC on this matter.

6.4.2 Social Impact

The EIS indicates that a number of moderate social risk ratings have been predicted via the preparation of a Social Impact Assessment. These include:

- Dust fallout
- Noise from airbrakes
- Increased traffic volume
- Headlight spill from the realignment of Marulan South Rd
- Impact to the condition of the pavement on Marulan South Rd
- Existing concerns as to the overall safety of Marulan South Road including but not limited to narrow pavement and shoulder and road undulation.

Council believes that it is necessary for the issue of headlight spill to be addressed by a condition of consent that stipulates either design adjustments or the provision of a vegetated earth mound to minimise the risk of headlight spill. The proposed method should be nominated by the applicant and endorsed by the Department of Planning & Environment.

The EIS indicates that Boral intend to reduce the social risk rating associated with Marulan South Road by adopting the road upgrade as a mitigation measure. Reference is made to the above comments in relation to Marulan South Road in this regard.

It is noted that a supplementary report was provided to Council following receipt of 64 public submissions, copies of which have been attached.

The key issues being raised within these submissions appear to be outside of Council's jurisdiction, principally water storage and the relocation of the water license from the existing Tallong Railway Dam to a new dam proposed to be constructed closer to the quarry.

As a result the following comments are made:

1. The Tallong Railway Dam is owned by the railway – it is therefore not publicly accessible infrastructure.
2. The majority of water contained within the Tallong Railway Dam is licensed to Boral, and again is not a publicly accessible asset.
3. The dam supplies water to a small reservoir within the Tallong Village. The reservoir is also owned by the railway and leased to Boral as part of the previously mentioned dam lease. The water is untreated and therefore unsuitable for drinking purposes. It is believed that a number of premises throughout the village have informal connections to the reservoir for the purposes of irrigation.
4. Council do not own, operate or manage any of the abovementioned infrastructure.

Notwithstanding the above, due to the significant interest demonstrated by the community, Council wishes to ensure that the matters raised within the submissions, particularly water security and access to water, are appropriately considered by the Department.

Boral acknowledges GMC's comments regarding Tallong dam (referred to by GMC as Tallong Railway dam) and the public submissions on the EIS. Boral's intended use of Tallong dam is clarified in Section 5.1 and the public submissions are addressed in Chapter 7.

Boral acknowledges GMC's comment in relation to potential headlight spill from the realignment of Marulan South Road. As stated in Section 20.4.3 and 20.5 of the EIS, design adjustments to change the vertical alignment of the realigned section of road or the construction of vegetated earth bunds on the southern side of the road, will be investigated during detailed design in consultation with the potentially affected land owners. If additional management measures result from the consultation, Boral will engage with GMC if these measures are required in the road reserve and seek appropriate approvals if necessary.

6.4.3 Noise and Dust

Potential noise and dust impacts from construction and operation of the proposal on nearby sensitive residential, commercial and industrial receivers were addressed within the EIS. Council notes that it is not the appropriate regulatory authority for either matter.

Council understands that the proposal will be subject to adherence with the NSW Noise Policy for Industry and subject to an Environmental Protection Licence which will be overseen by the EPA.

Boral notes GMC's response regarding potential noise and dust impacts and management.

6.4.4 Visual Amenity

Council notes that the Rehabilitation Strategy provide within the EIS demonstrates a progressive approach to rehabilitation of the overburden emplacements to be undertaken

over a period of 30 years. In the context of the surrounding extractive industries developments, the visual impact is considered acceptable, noting that the final stage 4 landform will provide for an improved outlook from the Bungonia Lookdown.

Boral notes GMC's response regarding potential visual impacts and management.

6.5 NSW Environmental Protection Authority

The Environmental Protection Authority (EPA) provided comment on the EIS dated 1 May 2019, and reviewed the EIS, groundwater assessment, surface water assessment, air quality impact assessment and noise and blasting assessment to compile the submission.

6.5.1 Environment protection license

Should the proposal be approved, the applicant will need to apply to the EPA to vary the existing Environment Protection Licence (No. 944) for the Marulan South Limestone Mine. Licence conditions relating to groundwater monitoring, surface water discharges, air quality monitoring would likely require modification.

Boral accepts the need to update EPL 944 as described by the EPA.

6.5.2 Groundwater

Australian Groundwater and Environment Consultants provided advice on this submission, which is included below.

Revision of EPL water pollutant monitoring point

According to the proposal documentation, the in-pit production well, WP16, will be 'consumed' by the mine. This is assumed as having to be removed as a result of mining expansion. Currently, mine operations are reliant on the water sourced from two production bores within the existing mining pits, WP16 and WP17. Both are scheduled to be removed if the proposal is approved.

WP16 is currently licenced as point 13 on EPL944, monitoring for oil and grease, as well as for total suspended solids. It is the only monitoring point across the existing mine that monitors for pollutants to water. No other alternative bores or locations have been proposed by the proponent to allow for the monitoring of pollutants should WP16 be removed.

It is therefore suggested that the proponent identify potential locations where continued pollutant monitoring can be undertaken, or request the proponent establish a location where monitoring can continue in future, prior to the removal of WP16.

Other than the expansion of mining operations, the proponent is seeking the approval of an upstream dam to allow for the continued supply of water on-site, in lieu of the existing production wells. Should the dam not be approved, the proponent has a contingency plan to install a series of six new wells north of the pit expansion area to maintain the supply of water for mining operations. It may be a viable option to utilise one or more of these bores as an additional licenced monitoring point in future.

Recommendation

That the proponent establish a new water pollutant monitoring point to be incorporated into EPL 944 prior to the onsite removal of EPL monitoring point 13 (North Pit Bore I WP16), should the proposal be approved.

A new groundwater bore will be installed to replace bores WP16 and WP17 for the purpose of monitoring groundwater level and water quality. This bore will be in the area identified as Site 1 and shown in Figure 6.5. This area is near bores WP16 and WP17, is immediately downgradient of the main mine processing plant, and outside of the pit expansion footprint in this part of the mine development area.

The ground surface elevation for this area ranges from 570 m Australian height datum (AHD) at its southern extents to 600 m AHD along its northern extents. The groundwater level for bores WP16 and WP17 is around 545 m AHD. Generally similar groundwater levels would be expected in Site 1.

Based on the elevation data, the depth of the replacement bore can be expected to be between 25 m and 55 m below ground surface. This location is suitable for monitoring potential pollutants from the mine. The exact location will be confirmed in consultation with the EPA and will be determined during preparation of the groundwater monitoring and management plan, as part of the overarching water management plan for the mine.

Offset monitoring bores

The proposed modification of the pit boundary will remove four existing on site wells, including the only licenced water monitoring point on EPL944. Two production wells (WP16 and WP17), and two monitoring wells (MW1 and MW2) are proposed to be removed as expansion of the quarry pits progresses if the modification is approved. No additional monitoring wells commensurate with pit boundary expansions were proposed in the proposal.

Given the removal of the two monitoring bores, in particular the closest bore to mining operations (MW1) and the only monitoring bore nearest to the south pit (MW2), the creation of blind spots will occur in the existing monitoring network, possibly negating indications of impact to groundwater dependent environments south of the pit in Bungonia Gorge, and east of the pit towards Barbers Creek.

The establishment of two or more monitoring bores to counter the loss of the two existing monitoring bores is not proposed in the proposal.

If additional bores are to be constructed to offset the removal of MW1 and MW2, then the collection of adequate baseline data (2 years of groundwater information) from the newly constructed bores would assist in increasing the confidence of established groundwater characteristics, given the nature of the geology of the site. Preferably, any new bores would be drilled prior to the removal of the existing bores.

Recommendation

That the proponent establishes a series of new monitoring bores to offset the predicted removal of the existing bores that are within the proposed pit expansion boundary, should the proposal be approved.

Replacing monitoring bores MW1 and MW2 in a similar location (in the bottom of the pit) is not feasible as these areas are in the current and future mine pit extraction area, where blasting and extraction of limestone occurs daily and the bores would need to be replaced on a regular basis. Locating replacement bores in the mine pit batters is not practical as the final mine pit batters are only established later on in the mine life and maintaining an access road/track into the pit along benches will likely be impracticable and potentially unsafe.

Similar for bores WP16 and WP17, a new (single) groundwater bore will be installed downgradient of the pit void to replace bores MW1 and MW2. The best available options for siting a replacement monitoring bore is in the area identified as Site 2 and shown in Figure 6.5, which includes the following area:

- southern end of south pit just south of the proposed southern overburden emplacement toe at 440/450 m elevation;
- along the south-eastern rim of the south pit at 410/420 m elevation; and
- down Middle Gully near the sediment basin S2 at 395/400 m elevation.

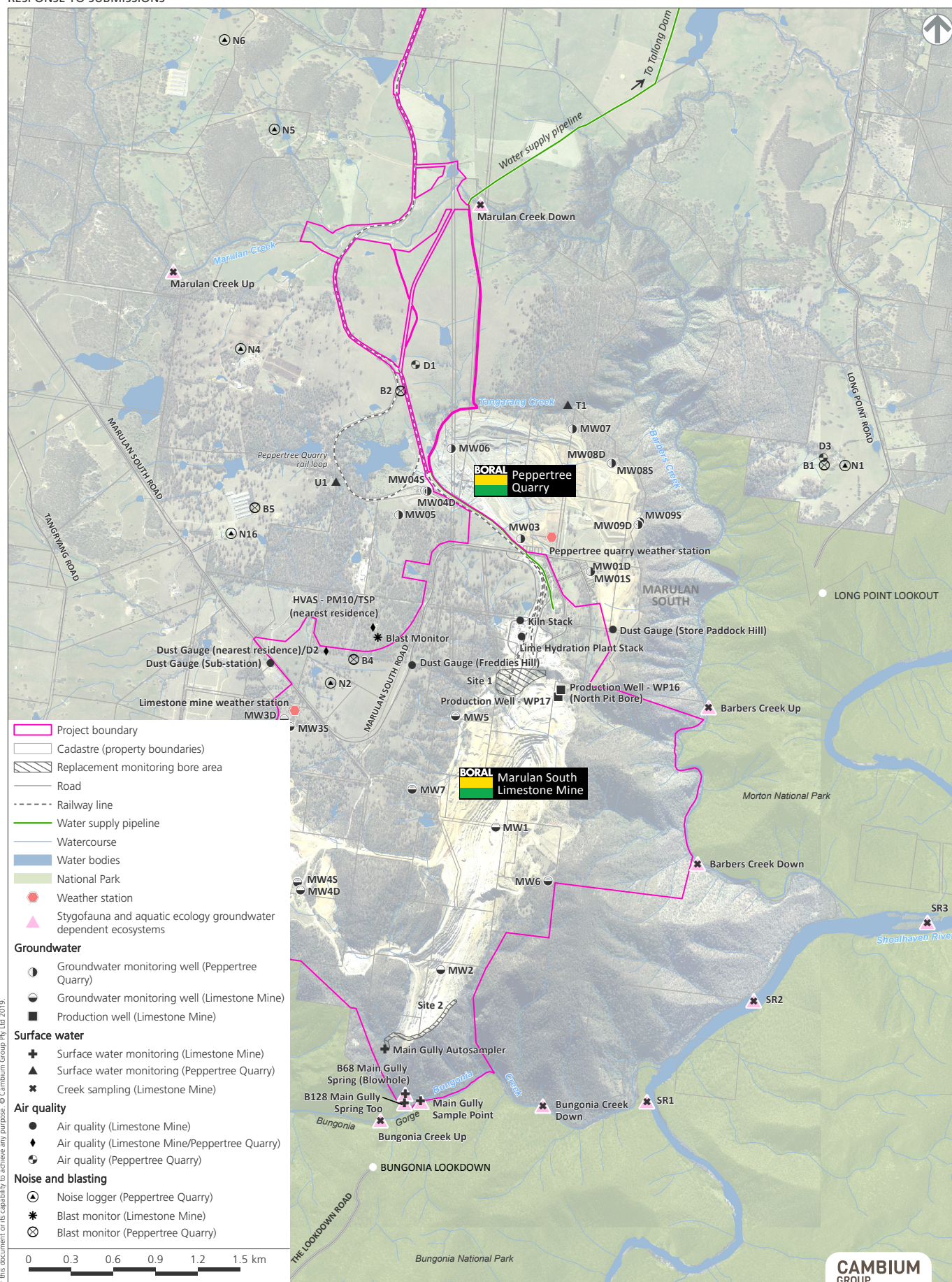
This area is downgradient of most of the 30-year mining operations and provides an option for locating a site to replace bores MW1 and MW2. This area can be accessed by vehicle during early stages of mining and remain undisturbed during the proposed 30-year mine operations. The eastern part of this site can be accessed by foot during later stages of the 30-year mine operations and post mining, while the western extent of this site near sediment basin S2 and the Main Gully stormwater discharge point can either be accessed on foot or from the existing vehicle track off the Mt. Frome track.

The inferred groundwater level along the Site 2 alignment is around 300 mAHD. Based on the ground elevation data along this alignment, the eastern and western extents provide the best opportunities for locating a site to replace bores MW1 and MW2. The estimated depth to groundwater at these locations would be between 85 m and 110 m below ground surface. Whilst a monitoring bore at this location should be suitable for groundwater level measurements, this may not be the case for groundwater sampling. That is, the depth to groundwater is likely to be deeper than the practical limit for collecting a representative sample for determining groundwater quality. If groundwater quality monitoring is not possible from this bore, then an alternative option will be to use the Main Gully Spring (B68 – ‘Blow Hole’ [refer sections 5.2.2 and 7.5, AGE, 2019]) for groundwater quality sampling downgradient from the pit.

The location for the MW1/MW2 replacement monitoring bore will be confirmed in consultation with the EPA and will be determined during preparation of the groundwater monitoring and management plan, as part of the overarching water management plan for the mine.

Figure 6.5
Replacement monitoring bore area

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS - SSD APPLICATION
RESPONSE TO SUBMISSIONS



6.5.3 Surface water

Advisian provided advice on this submission, which is included below.

Sediment basin discharges

The EIS proposes that:

- runoff collected in the sediment basins would either be pumped to one of the mine water dams for reuse in limestone processing or dust suppression or would drain to the mine pit. In the event that there is insufficient capacity in the mine water dams to retain water pumped from the sediment basins, water quality in the sediment basins would be tested and flocculant added if necessary to achieve total suspended solids of 50 mg/L for discharge.
- sediment basins will be sized in accordance with - Managing Urban Stormwater: Soils and Construction - Volume 2E Mines and Quarries.

This indicates that due to reuse a lower frequency and volume of controlled discharges will occur compared to a Volume 2E design without reuse, however controlled discharges from each discharge point are proposed and will require limits for all analytes that may have a non-trivial impact on receiving waters. This may include total suspended solids, pH, bicarbonate alkalinity and settling agents.

Samples of "waste rock" indicated slight alkalinity, indicating that these materials are likely to contribute alkalinity to initial surface runoff and seepage. The alkalinity ranges from 23 to 1,426 mg/L (median 50 mg/L) and is typically well in excess of the measured acidity leading to positive net alkalinity values.

The EPA believes that the potential risk of bicarbonate alkalinity has not been adequately assessed for controlled discharges and managed overflows from sediment basins, and a standard 50 mg/L total suspended solids may not take into account all practical measures that could be implemented considering downstream national park waterways.

It is the responsibility of licence holders to ensure their licence regulates the discharge of all pollutants that pose a risk of non-trivial harm.

It appears there are potential contingencies and mitigation measures that could be implemented to address any residual risk of alkalinity and total suspended solid at the site considering:

- the relatively low frequency of controlled discharges due to reuse within the operation
- potential mitigation of risks during managed overflows due to the volume of rainwater
- potential for gaining a better understanding natural background levels of alkalinity in receiving waters
- the proponent could commit to implementing all practical contingency measures based on a post-approval assessment to inform licence conditions.

Recommendation:

That a post-approval assessment to inform environment protection licence conditions is conducted on potential impacts of bicarbonate alkalinity, total suspended solids and settling agents to determine the final set of analytes requiring limit conditions on the licence and the limits that would apply.

That a basic suite of metals, including aluminium and chromium, bicarbonate alkalinity, settling agents and current licence analytes are included in a post- approval verification

monitoring program if there are any residual risks identified in the post-approval assessments.

Boral accepts the requirement for a post-approval assessment to determine appropriate limits for total suspended solids only. Bicarbonate alkalinity in the receiving environment is summarised in Annexure C – Attachment 1 of *Marulan South Limestone Mine Continued Operations – Surface Water Assessment*. Bicarbonate alkalinity ranges between 101 to 226 mg/L in Barbers Creek and 107 to 166 mg/L in Bungonia Creek. Suspended solids range between <5 to 6 mg/L in Barbers Creek and <5 mg/L in Bungonia Creek.

The *Waste Rock Geochemical Assessment (Marulan South Limestone Mine Continued Operations – Groundwater Technical Study Appendix C)* determined potential runoff and seepage water quality by extracting water samples from pulped samples of waste rock (overburden material) and limestone ore. Water extraction from most of the samples had low alkalinity (23 to 63 mg/L), with the limestone ore sample providing the upper bicarbonate alkalinity value of 1,426 mg/L. Runoff and seepage from the waste rock is likely to be slightly alkaline and contain low concentrations of dissolved salts and unlikely to impact on the surface and groundwater resources at the site. All limestone including contact zones between the limestone and overburden is used in products, with none sent to overburden emplacements.

The maximum catchment area of Sediment Basin S2 is 13 ha, compared to the total Bungonia Creek catchment area of 27,500 ha. Water will be released from sediment basin S2 to Main Gully to restore capacity following rainfall events. This will occur when there are elevated flows in Main Gully and Bungonia Creek, providing substantial dilution.

The maximum catchment area of Sediment Basins N2 and W1 is 16 and 25.5 ha respectively, compared to the Tangerang Creek dam catchment of 614 ha. Water will be released from N2 and/or W1 to restore capacity following rainfall events. This will occur when there are elevated flows in the tributaries of Tangerang Creek, providing substantial dilution.

Given the bicarbonate alkalinity in waste rock runoff is lower than the baseline conditions in Barbers and Bungonia Creek, the relatively small contributions to total runoff in the creek systems and low frequency of discharge, the risk to downstream water quality is low.

A range of factors will need to be considered prior to dosing of sediment basins with settling agents (flocculants/coagulants), including the water chemistry and potential for impacts on downstream water quality and ecology. Boral will only use settling agents where whole of effluent ecotoxicity testing has confirmed low risk levels as detailed on the product's safety data sheet. This will ensure the most effective settling agent can be selected to reduce risk to downstream ecology.

Boral intends to verify sediment basin discharge conditions as part of the annual review, rather than as a separate process. The ANZECC trigger levels presented in Table 6.4, provide triggers to investigate changes in water quality. The following additional monitoring will help meet the requirements of the verification program:

- Quarterly water quality sampling of sediment basins.
- Water quality sampling of sediment basins following rainfall events greater than 36 mm over five days (90th percentile five-day rainfall).
- Water quality sampling of upstream and downstream Bungonia Creek sites following rainfall greater than 36 mm over five days.
- Analysis of water quality parameters as detailed in Table 5.3 of the SWA.
- Comparison of water quality of sediment basins with baseline conditions.
- Reporting of results in the annual environmental management review and adjustment of the downstream water quality triggers and/or environmental protection licence conditions if required.

Proposed total suspended solids limit

The proposal proposes limits of 50mg/L TSS from three sediment basin discharge points.

Some activities will present a higher risk to waterways and therefore require a more detailed assessment. A more detailed assessment would be expected for a project occurring adjacent to a waterway that flows through a national park. Application of a 50 mg/L limit for total suspended solids may not be adequately protective of downstream waters or reflect the full range of potential impact mitigation measures that could be put in place such as the addition of grassed swales and vegetative strips below the discharge point from the sediment basins. These additional measures should also take into account mitigating any potential risks associated with bicarbonate alkalinity and residual settling agents.

Recommendation:

That a post-approval assessment considers an appropriate limit for total suspended solids based on:

- a. the full range of potential impact mitigation measures that could be put in place such as the additional of grassed swales and vegetative strips below the discharge point from the sediment basins;
- b. the sensitivity of downstream waters such as streams through national parks and above drinking water supplies.

Boral requests a discharge turbidity limit of 25 NTU (consistent with the default ANZECC trigger level for slightly disturbed ecosystems in south east Australia) for Sediment Basin S2 and the standard total suspended solids (TSS) of 50 mg/L for Sediment Basins N2 and W1, which will account for the different sensitivities of downstream environments.

Sediment basins for the project have been designed in accordance with Table 6.1 of *Managing Urban Stormwater: Soils & Construction – Volume 2E: Mines and Quarries* (DECC, 2008) using the criteria for 'fine' or 'dispersive' sediments. The basins have been sized to capture the runoff from a 95th percentile five-day storm (52.8 mm) according to the criteria for discharge to a 'sensitive' environment. In this context 'sensitive' is an environment of high conservation value or supports human uses of water that are particularly sensitive to degraded water quality.

There are two smaller sediment basins in Main Gully, downstream of Sediment Basin S2 and the Main Gully discharge point. One of the smaller sediment basins downstream of the Main Gully discharge point has a v-notched weir and autosampler.

Further downstream, there is limited disturbance. The natural stream bed is very steep, with natural vegetation and no vehicle access. Any further erosion and sediment control works would require disturbance in the stream bed as well as construction of additional access tracks.

The sediment basin is designed to the highest standard (95th percentile five-day storm), providing the most effective sediment control in this location. Additional erosion and sediment control works downstream are unlikely to provide any additional sediment control and increase erosion risk through disturbance of the existing landscape and stream channel.

The drainage channels downstream of proposed sediment basins W1 and N2 are vegetated with pasture, providing additional sediment control should the basins overflow. Sediment Basin W1 would discharge to a tributary of Tangarang Creek approximately 1.2 km upstream of Tangarang Creek dam. Sediment Basin N2 would discharge to a separate tributary of Tangarang Creek 800 m upstream of Tangarang Creek dam.

Both tributaries and the Tangarang Creek dam are on Boral owned land (crossing Aglime owned land in the vicinity of the rail loop). Overflows to Tangarang Creek dam flow into Barbers Creek

2 km downstream of the dam. Given these basins overflow to vegetated drainage lines, then Tangarang Creek dam, the standard TSS discharge limit of 50 mg/L is considered appropriate.

Road sale stockpile area

The EIS proposes a small sediment basin (P1) to treat runoff from the Road Sales Stockpile Area located adjacent to the access road on the northern side of the site. This site would contain stockpiles of crushed limestone and road base products (from Peppertree Quarry). The sediment basin would be designed in accordance with the criteria for 'coarse' sediments as set out in *Managing Urban Stormwater: Soils & Construction* (Landcom 2004). It is unclear why this basin is not designed in accordance with *Managing Urban Stormwater: Soils & Construction Volume 2E*.

Recommendation:

That the sizing of the road sales stockpile area sediment basin, and the potential risk of total suspended solids, alkalinity and settling agency are included in the recommended post-approval assessment to inform license conditions.

Sediment Basin P1 is proposed as part of the Peppertree Quarry (PA 06_0074) Modification 5 Application to capture runoff from the quarry's modified western overburden emplacement.

The modification application describes the design of this basin in accordance with Table 6.1 of *Managing Urban Stormwater: Soils and Construction – Volume 2E: Mines and Quarries* (DECC, 2008) using the criteria for 'fine' or 'dispersive' sediments, not 'coarse' sediments as described in *Marulan South Limestone Mine Continued Operations – Surface Water Assessment*.

This is an inconsistency in *Marulan South Limestone Mine Continued Operations – Surface Water Assessment*, with the Peppertree Quarry MOD 5 application containing the correct design description. The sediment basin P1 is designed to capture runoff from 4.1 ha of the road sales stockpile area. Indicative sizing of the sediment basin is 2.1 ML, with overflow from the sediment basin directed to the quarry's in-pit sump.

These matters are being conditioned under Modification 5 of Peppertree Quarry's consent.

Trigger values

While the EPA regulates impacts at the point of discharge, it should be noted that the proposed trigger value for salinity (1600 μSiem) used to assess potential mining induced impacts on water quality in creeks in the vicinity of the mine (Table 4.3) is unlikely to provide a useful trigger or action as those creeks show very different salinity characteristics and the high value from one system is used as the trigger for all creeks. The trigger values also should include bicarbonate alkalinity.

Recommendation:

That trigger values to be used in the operational environmental management plan take into account the difference between receiving waters adjacent to different parts of the site and also include appropriate trigger values for alkalinity.

Site specific water quality triggers were proposed in Section 11.2.3 of *Marulan South Limestone Mine Continued Operations – Surface Water Assessment*. Using the same method, proposed trigger levels for Barbers and Bungonia creeks are shown in Table 6.4.

The ANZECC guidelines (2000) do not provide default triggers for alkalinity (total or bicarbonate). Trigger values for bicarbonate alkalinity for both Barbers and Bungonia creeks have been added to Table 6.4 based on the 80th percentile values for baseline monitoring from the respective creek

system. ANZECC guidelines note that ranges for turbidity and suspended solids are similar and only turbidity values are provided.

Table 6.4 Proposed trigger levels for Barbers and Bungonia creeks

Parameter	ANZECC Default Trigger for Ecosystem Protection ¹	WaterNSW Benchmarks for Catchment Streams ²	Proposed 'Trigger Values' Barbers Creek	Proposed 'Trigger Values' Bungonia Creek
pH	6.5 – 8.0	6.5 – 8.0	6.5 – 8.1	6.5 – 8.2
EC (µS/cm)	350	NA	930	682
Total nitrogen (mg/L)	0.25	0.25	0.6	3.6
Total phosphorus (mg/L)	0.02	0.02	0.02	0.02
Turbidity (NTU)	25	25	25	25
Bicarbonate alkalinity (mg/L)			230	170

¹ Default trigger values for physical and chemical stressors for South-east Australia for slightly disturbed ecosystems in upland rivers.

² Table 4.4 in Annual Water Quality Monitoring Report - Sydney Catchment Area 2014-15 (WaterNSW).

6.5.4 Air quality

Todoroski Air Sciences (TAS) was engaged to respond to the EPA's air quality related comments, which is provided below.

Air quality impact assessment – review and comments

The AQIA has been conducted with reference to and in general accordance with the EPA's Approved Methods for the Modelling and Assessment of Air Pollutants in NSW.

Three operating scenarios were assessed to evaluate potential impacts from emissions associated with various indicative stages of the proposal.

- Stage 1 - summarised on page 35 of the AQIA;
- Stage 2 - summarised on pages 35 and 36 of the AQIA; and
- Stage 3 - summarised on page 36 of the AQIA

The AQIA Executive Summary concludes that "adverse air quality impacts are unlikely to arise due to the continued operations of Marulan South Limestone Mine if air emissions from the operations continue to be managed and mitigated effectively".

Boral acknowledges the EPA's comment.

The above AQIA conclusion is generally consistent with assessment results presented with the AQIA modelling results showing compliance with the EPA's impact assessment criteria. However, some assessment methods adopted in the AQIA are inconsistent with the requirements of the EPA's Approved Methods, potentially influencing on the modelling results presented. A sample of those issues is listed and briefly described below.

- Despite the long history of mine operation at the site, there was no continuous ambient particle monitoring data available to characterise the existing/background local air quality. On this basis, alternate methods and adjustments to available data were made to undertake the cumulative PM₁₀ and PM_{2.5} assessments.

For some aspects of the assessment in this case, there are no options per the EPA's *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (Approved

Methods) that can be applied, and approaches used in other similar jurisdictions (e.g. Victoria) were thus considered.

The available ambient air quality monitoring data for the mine was used as the basis for establishing the likely background air quality levels applied for the assessment. The air quality monitoring network for the mine consists of high-volume air samplers (HVAS) measuring PM₁₀ and TSP, and a number of dust deposition monitors.

The PM₁₀ HVAS monitor only provides a reading every sixth day and there is no ambient PM_{2.5} data available for the area. Due to this, there was a need to apply an alternate approach to assess the potential cumulative 24-hour average PM_{2.5} and PM₁₀ due to the project.

- **Two methods were used to account for PM_{2.5} background concentrations. Neither method is consistent with requirements of the Approved Method Modelling or demonstrated in the AQIA as conservative.**

As outlined above, the Approved Methods do not provide clear guidance for situations with limited availability of ambient air quality monitoring data such as for the project.

The two methods applied in the assessment are suitable alternative approaches in such a situation. The results produced using each of the two options show a large margin of compliance with the applicable criteria, indicating adverse air quality impacts from the project are unlikely to arise.

Further discussion on each method is provided below.

- **Method 1 assumed equivalency between the annual average PM_{2.5} and PM₁₀ criteria and subsequently applied the ratio of the two criteria ($8/25=0.32$) to monitored PM₁₀ values to generate a PM_{2.5} dataset. The method and subsequent ratio was not demonstrated as robust and conservative. Notwithstanding the questionable assumption of ratioing criteria to adjust monitoring data, given the adjustment was undertaken for the 24-hour prediction, the more defensible ratio would be based on the 24-hour values rather than the annual values. Applying the 24-hour criteria to the ratio method adopted in the AQIA yields a ratio of ($25/50$) 0.5, which is significantly greater than 0.32 and would result in an increase in modelling assessment results.**

The assumed PM_{2.5} levels are based on the ratio of the annual average PM_{2.5} and PM₁₀ criteria ($8/25 = 0.32$). The 0.32 ratio was applied based on TAS's understanding of the surrounding land uses likely to influence the ambient air quality levels for the area and known data in other regions.

In this location, the mine and Peppertree Quarry would be contributors to PM_{2.5} and PM₁₀ levels in the surrounding area, with a relatively larger PM₁₀ contribution than PM_{2.5} contribution.

Most dust particles generated from mining are from abrasion or crushing of rock and the general disturbance of dusty material. These emissions will generally be larger than 2.5 µm as these fine particulates are predominantly generated through combustion.

The inventory of dust generated by the mine shows that the PM_{2.5} dust emissions comprise approximately 15% of the PM₁₀ emissions from the mine. Most activities contribute PM_{2.5} particles, but these contributions are low.

The ambient air quality levels that may be affected by mining are therefore weighted towards PM₁₀ rather than PM_{2.5}. The assumed 0.32 ratio used in the assessment is more than double that which may be due to mining and is conservative (overestimating the mine contribution).

To further consider the applicability of the applied ratio for the project, ambient PM_{2.5} and PM₁₀ datasets recorded by the Upper Hunter Air Quality Monitoring Network were analysed. The land use in the Hunter Valley region is dominated by open cut coal mining and the ratio of PM_{2.5} and

PM₁₀ levels there are generally like, but somewhat higher than would arise in the ambient air near the project.

The available 24-hour average PM_{2.5} and PM₁₀ data recorded at the Muswellbrook, Singleton and Camberwell sites since commissioning in 2011 were analysed. All three sites follow a similar underlying seasonal trend. The same seasonal trend is also apparent in the PM₁₀ levels measured near the mine (refer to Figure 6-6 of *Air Quality Impact Assessment – Marulan South Limestone Mine Continued Operations*).

A review of the monitoring data from the three sites shows they are impacted by both local and regional PM_{2.5} and PM₁₀ influences and in order to apply the ratio of PM_{2.5} to PM₁₀ from any of these sites to another location, these local influences need to be identified and accounted for.

To identify these local influences the data were normalised and averaged on a running 31-day basis. These data are presented in Figure 6.2 to Figure 6.4. Where the normalised PM_{2.5} (orange) and PM₁₀ (blue) lines meet and follow the same pattern in the lower plots, the PM_{2.5} and PM₁₀ concentrations would be primarily influenced by the same underlying sources. Where the lines diverge, there is a significant impacting source impacting either PM_{2.5} or PM₁₀, but not both (or at least not to the same scale).

The PM_{2.5} and PM₁₀ ratios for each monitoring site are split into periods that are unaffected (underlying) and affected (impacted) by local influences such as wood heaters or dust storms. The underlying and impacted periods are presented respectively by the purple and green lines in the upper plots in Figure 6.2 to Figure 6.4. The figures show that whilst the three monitoring sites all have localised PM₁₀ or PM_{2.5} influences unique to their location, all three sites also record a similar underlying PM_{2.5} to PM₁₀ ratio.

The average underlying and impacted PM_{2.5} to PM₁₀ ratios for Muswellbrook, Singleton and Camberwell are summarised in Table 6.5.

The table and figures show that the underlying ratio of PM_{2.5} to PM₁₀ is consistent between all three sites (indicated by the purple line in Figure 6.6 to Figure 6.8). However, there is large variation between the impacted ratios at the three sites (the green line in Figure 6.6 to Figure 6.8). The higher impacted ratios at Muswellbrook and Singleton indicate that these sites are largely affected by sources of PM_{2.5}, which has been proven by CSIRO and ANSTO studies to be primarily due to smoke from residential wood heaters in winter.

Notably, Camberwell, which has a small population (and less wood heaters), displays a lower impacted ratio than the underlying ratio. This implies the site is primarily affected by sources of PM₁₀, as would be expected due to the local mining influences.

Table 6.5 Underlying and impacted PM_{2.5} to PM₁₀ ratios at Muswellbrook, Singleton and Camberwell

PM _{2.5} /PM ₁₀ ratio	Muswellbrook	Singleton	Camberwell	Average
Underlying	0.35	0.38	0.35	0.36
Impacted (by PM ₁₀ or PM _{2.5})	0.58	0.44	0.31	N/A
Impacted (by PM _{2.5})	0.68	0.53	0.42	N/A
Impacted (by PM ₁₀)	0.28	0.31	0.24	N/A

On this basis, the applied ratio for the Project of 0.32 is a reasonable assumption. As the area surrounding the mine may be affected by PM₁₀ from mining rather than PM_{2.5} from large numbers of domestic wood heaters, the ratio would tend to be lower not higher.

The ratio of the 24-hour criteria ($25/50 = 0.5$) that EPA raises was considered. The highest 24-hr PM_{10} and $PM_{2.5}$ levels are unlikely to occur at the same time, and thus the ratio is not 'valid'. Additionally, this ratio would be unrealistic for this project as it could only occur in situations where sources of $PM_{2.5}$ are a very dominant influence, as may occur in large rural towns in cooler climates. Examination of the available data indicates that the 24-hour average criteria ratio cannot reasonably be applied to represent the likely conditions surrounding the mine as there is no major such source of $PM_{2.5}$.

We also note that the modelling predictions have been tested with the application of the average underlying ratio in the Hunter Valley of 0.36 to the assessment instead of 0.32, and as a result does not change the outcomes of the assessment.

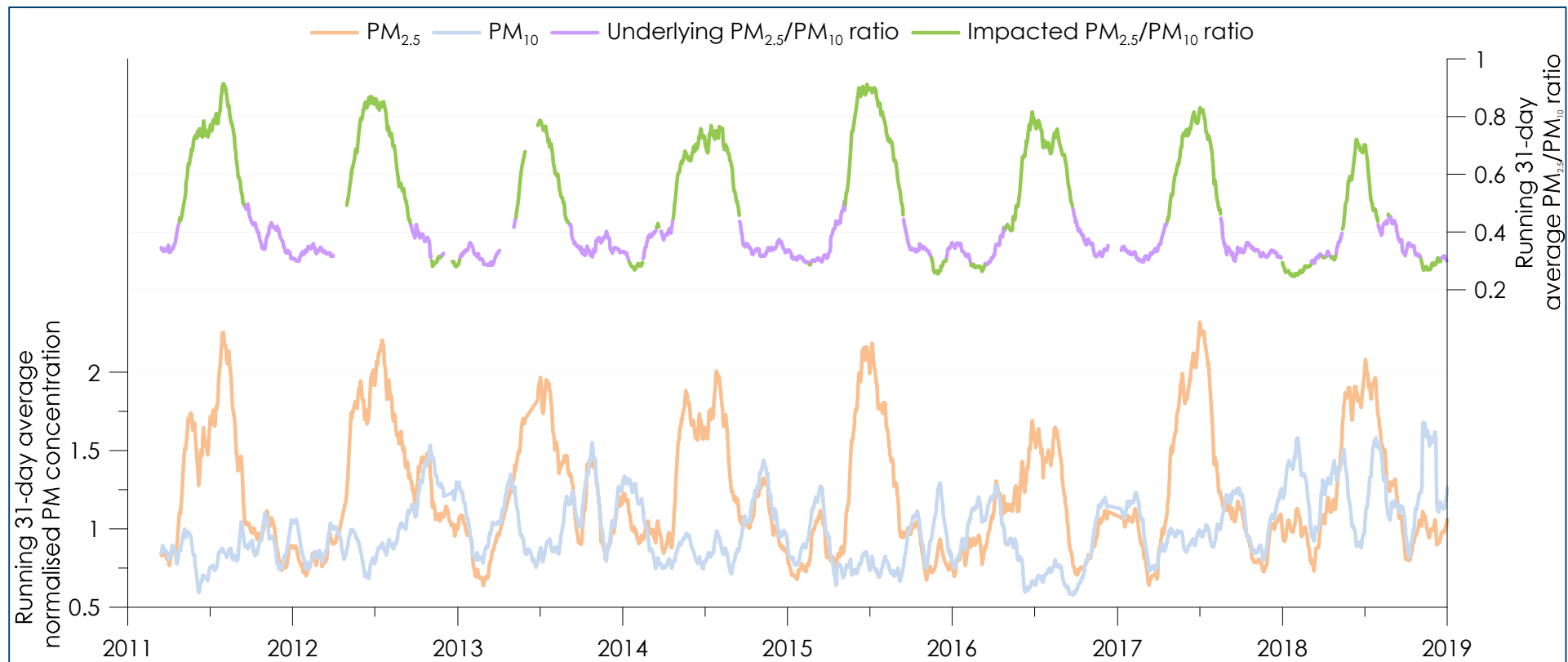


Figure 6.6 Running 31-day average normalised PM and $PM_{2.5}/PM_{10}$ ratios for Muswellbrook

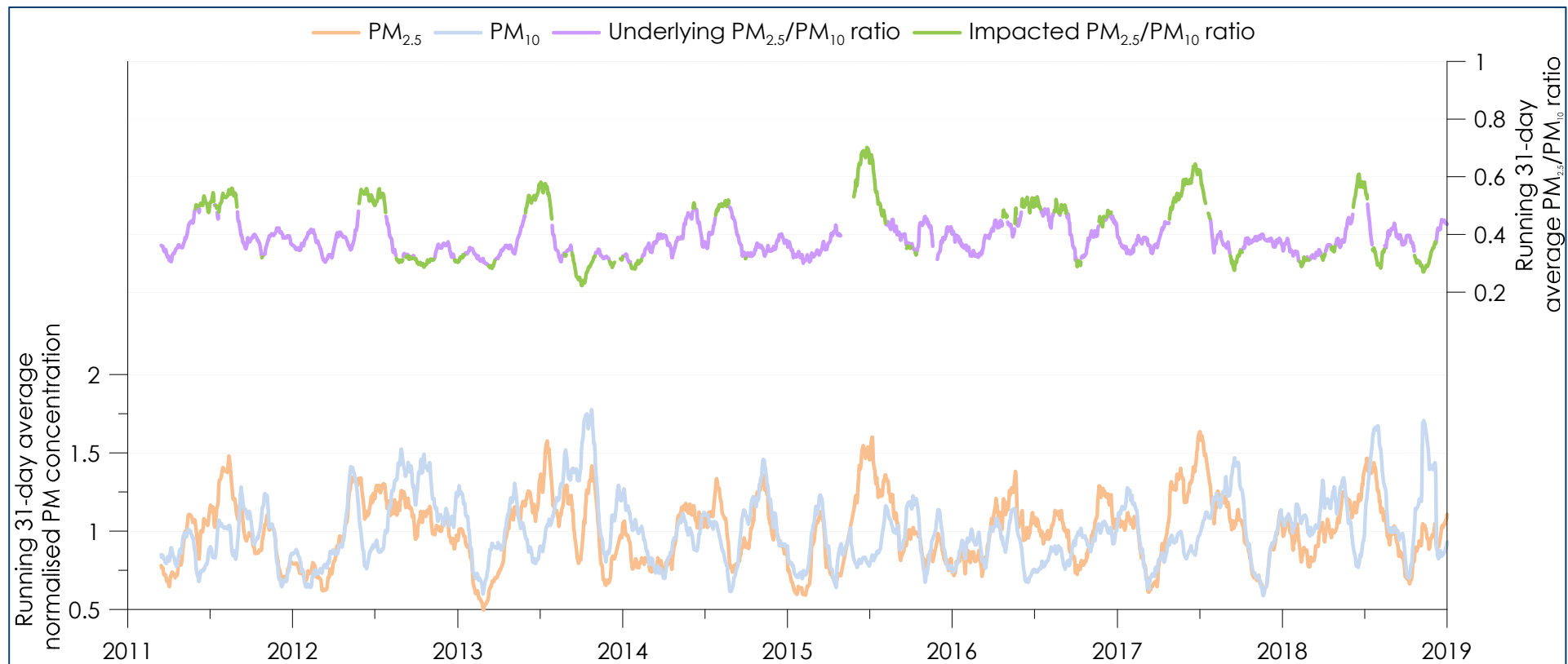


Figure 6.7 Running 31-day average normalised PM and $PM_{2.5}/PM_{10}$ ratios for Singleton

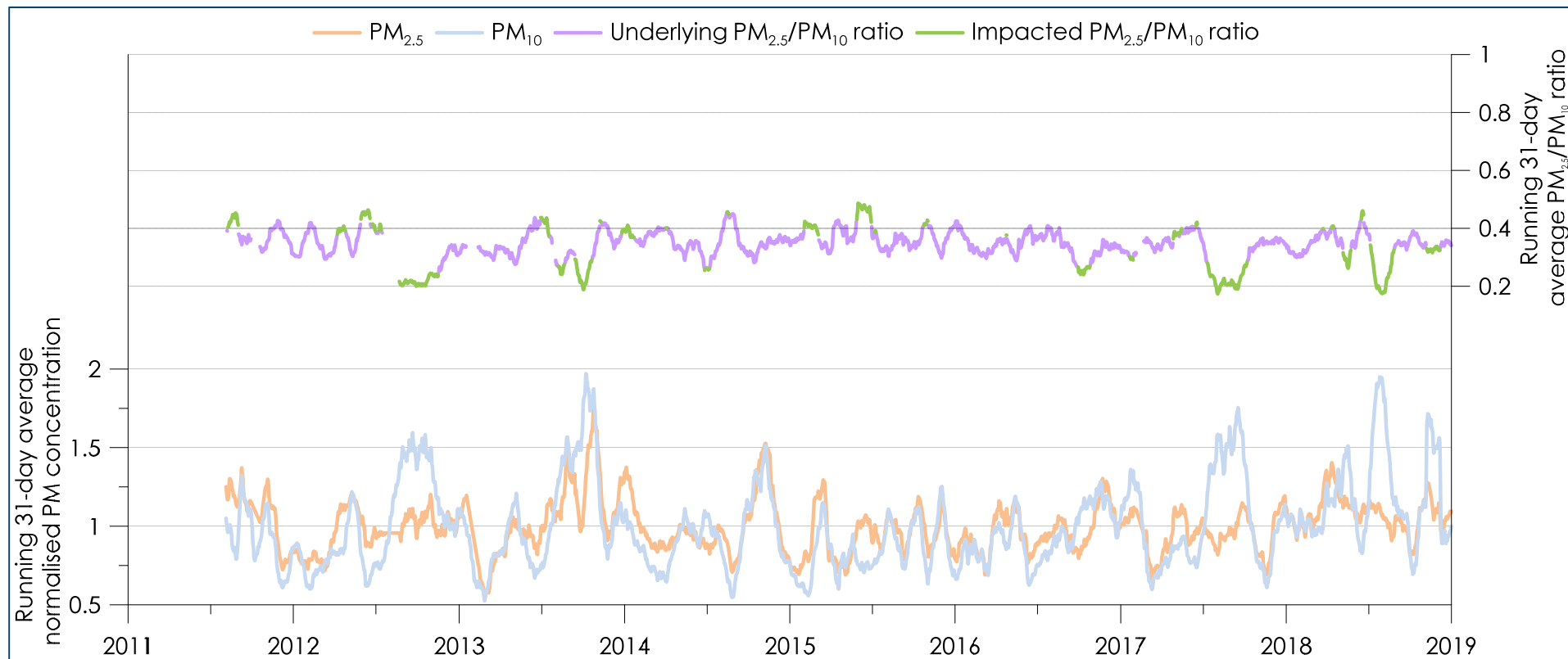


Figure 6.8 Running 31-day average normalised PM and PM_{2.5}/PM₁₀ ratios for Camberwell

- **Method 2 adopts a Victorian assessment methodology, using the 70th percentile of monitored results. This methodology was not demonstrated as conservative and is not consistent with NSW Approved Methods Modelling assessment requirements.**

The Victorian EPA approach is used to supplement the other approach and has been applied for projects in NSW in cases such as this where the Approved Methods approach cannot be explicitly followed. A similar approach has been applied in the approved:

- *Air Quality Impact Assessment Peppertree Quarry Modification 4* (Todoroski Air Sciences, 2016);
- *Air Quality and Greenhouse Gas Assessment Warkworth Continuation 2014* (Todoroski Air Sciences, 2014);
- *Mount Pleasant Operation Mine Optimisation Modification Air Quality and Greenhouse Gas Assessment* (Todoroski Air Sciences, 2017);
- North Galilee Basin Rail Project – Air Quality (GHD, 2013); and
- the recent *Air Quality Impact Assessment Peppertree Quarry Modification 5* (Todoroski Air Sciences, 2018).

A similar approach is also adopted by the Brisbane City Council *Air Quality Planning Scheme Policy* where for short term cumulative impact assessment, the 70th percentile of the hourly background data can be applied as a constant background value.

For the Victorian EPA approach, ambient monitoring data were obtained from the OEH's Wollongong monitor. As noted in the assessment, this monitor is representative of a more densely populated area with a greater influence of anthropogenic sources compared to the area surrounding the project. Therefore, the measured levels at the Wollongong monitor are likely to be higher than at the mine and hence this method is conservative.

Use of the 70% percentile of the Wollongong PM_{2.5} dataset, per a regulatory approved approach (in another jurisdiction) and for a recently approved nearby project, would provide a reasonable value for the background level for the assessment of potential cumulative impacts.

It is noted that applying the maximum measured level from the Wollongong monitor as per the Approved Methods Level 1 assessment approach would result in compliance and does not change the outcomes of the assessment, further supporting the findings of a large margin of compliance with criteria in this case.

- **For the cumulative 24-hour PM₁₀ assessment, where periodic hi-volume air sampler (HVAS) data was not available (the monitor works on a 1 day in 6 cycle) the 70th percentile of observed values was adopted as the background value without justification. It is noted that the 70th percentile value (~20ug/m³) was applied on many days with high model increments, resulting in some uncertainty in the final prediction.**

There is always some uncertainty in any modelling assessment. In this case, uncertainty arises as to the precise background levels on the days for which there is no available monitoring data. To deal with this uncertainty, two approaches were applied, and the more conservative (overestimating) approach was adopted.

It was considered reasonable that using the 70% percentile value per a regulatory approach (used in jurisdictions) and per approved or recent nearby assessments (*Air Quality Impact Assessment Peppertree Quarry Modification 4*, *Air Quality Impact Assessment Peppertree Quarry Modification 5* and the above examples) would provide a reasonable basis for the potential background level for the assessment of potential cumulative impacts for the area surrounding the project. This approach tends to overestimate background levels more often than not, given it uses the 70th percentile which is higher than the average.

A review of the adopted background levels in Figure 9-2 to Figure 9-7 of *Air Quality Impact Assessment – Marulan South Limestone Mine Continued Operations*, as indicated by the light and dark blue bars, shows that the adopted background level is reasonably conservative, given that the measured background readings only exceed this level on nine occasions over the year-long assessment period.

It is noted that *Air Quality Impact Assessment – Marulan South Limestone Mine Continued Operations* contains an additional analysis using the 2014 Bargo data, which is an alternative near monitor where daily average data are available. This analysis shows a larger margin of compliance compared to the adopted approach, and supports the reasonableness of the more conservative, adopted approach.

- **Cumulative 24-hour PM₁₀ results are presented for a subset of residential receptors. Assessment results for this metric were not presented for the commercial receptors. The incremental (project contribution) result at receptor C1 was more than 45ug/m³, representing 90% of the EPA's cumulative assessment criteria. It is therefore likely that the criteria would have been exceeded, had a cumulative analysis been undertaken and presented in the AQIA.**

It is acknowledged that some commercial receptors, such as a boarding school or hospital may have sensitive individuals present for periods of time over which EPA criteria apply, and such receptors may, (and generally would) be considered to be sensitive receptors. However, not all places where people work are automatically sensitive receptors at which the EPA criteria would apply.

All potentially sensitive receptors were considered in the AQIA. The existing and likely future commercial receptors were examined and are specifically identified as commercial receptors in the AQIA. The nature of the activities at these receptors, such as fireworks manufacturing, lime processing, or poultry farming was considered and we did not find receptors C1, C2 and C3 to be sensitive receptors for any further detailed assessment of cumulative 24-hour average PM₁₀ impacts. The assessment did however also find two commercial operations that are sensitive receptors (R8 and R9) due to additional residential use of the property.

The key factors considered were that only healthy adults would be present, and even then for much less than 24-hours over any day, whereas the EPA criteria are set at levels suitable to protect the most sensitive individuals in the community and such individuals would unlikely be present at the commercial facilities. Workplace air quality standards are many times higher than the EPA criteria, and are directly applicable to the places where people may work at the nearby commercial receptors. The workplace criteria are set at suitable levels to manage the health of adult workers present at the commercial receptors, and compliance with such criteria would not tangibly be affected by dust from the Project.

- **Cumulative 24-hour predictions were not presented for Boral owned receptors. It is noted that the incremental predictions for PM₁₀ exceed the EPA's (cumulative) assessment criteria at receptor B4.**

Noted. Per industry practice all such receptors would be informed of the potential for dust impacts and provided with the NSW Health *Mine Dust and You* fact sheet.

Interpretation of assessment results

To help interpret the AQIA modelling results in conjunction with the AQIA method uncertainty, it is noted that:

- The proposal is not a greenfield development. Rather the proposal is for continued operation incorporating a modest expansion in mine extraction and processing rate.
- Section 8.6 of the AQIA summarises current and proposed dust management practices for the proposal, which were included in the dust emission estimates for the proposal (where applicable).
- The EPA's experience is that the mine has a long history of operating without significant air quality issues or dust complaints.

Based on the AQIA results and considering the above factors, it is likely that continued mine operations could be managed and regulated adequately - provisional upon the application of all reasonable and feasible proactive and reactive best practice air quality management measures.

Noted. The EPA's interpretation is consistent with the findings of the air assessment.

Section 11 of *Air Quality Impact Assessment – Marulan South Limestone Mine Continued Operations* describes suitable dust mitigation and management measures for the mine and indicates that an air quality management plan would be developed for the project. Reasonable and feasible air quality controls for the project are outlined in Table 11-1 of *Air Quality Impact Assessment – Marulan South Limestone Mine Continued Operations* and include proactive and reactive air quality management measures.

Recommendation

That the following condition be included in any approval:

All operations and activities occurring at the premises must be carried out in a manner that will prevent and or minimise the emission of air pollutants, including dust, from the premises.

Boral accepts this proposed condition.

6.5.5 Noise

The EPA has identified a number of concerns relating to the adequacy of the NBIA. The EPA recommends that the proponent provide a response to clarify these concerns and address any issues relating to the adequacy of the assessment.

Recommendation:

That the proponent addresses the matters highlighted below in bold text, in any response to submissions required as part of the planning process. Such a response should clarify these concerns and address any issues relating to the adequacy of the assessment.

Wilkinson Murray was engaged to address the EPA's comments on *Marulan South Limestone Mine Continued Operations Project – Noise and Blasting Assessment* (NBIA). Wilkinson Murray's response is summarised below and provided in Appendix F.

Calculation of rating background levels

The rating background levels have not been calculated using the methods in Fact Sheets A and B in the NPfl. The NBIA has used the median of a series of attended noise measurements to calculate a rating background level. Noise measurements were reported to be potentially affected by continued operations, hence attempts were made to measure over the three-day Christmas Shutdown period in 2014 which was affected by adverse weather. The method used is not in accordance with the NPfl and further justification is

required if the EPA is to consider a deviation from the established procedure. Specifically, the proponent needs to provide justification for the following:

- **Why the monitoring was not conducted according to the established method in the NPfl.**

The noise assessment was substantially completed using the *Industrial Noise Policy* (INP) consistent with the SEARs. DPIE requested the assessment be updated to be consistent with the *Noise Policy for Industry* (NPfl).

The aim of both the INP and NPfl is to identify rating background noise levels (RBLs). The procedure for establishing the RBLs between the two policies are principally the same, with the difference being that the INP requires the measurement of background noise in the absence of noise from the mine and the NPfl allows the background noise level to be measured with the existing premises operating (as long as the site is operational for a significant period and is considered a normal part of the acoustic environment).

As requested by DPIE, the NBIA was updated to be consistent with the NPfl apart from the establishment of the RBLs, because the RBLs had already been established in accordance with the INP, which is conservative as the background noise levels were established in the absence of the existing mine noise (when the mine operations were shut down or inaudible).

- **Why background levels were not derived using long term noise monitoring, for the minimum duration required by the NPfl.**

See response to first comment and response to attended monitoring comment below.

- **Section 6.3 of the NBIA states that it is unlikely that the mine influenced noise levels during attended measurements. Therefore, it follows that long-term noise measurements could have been conducted at potentially affected receivers since there was no influence from the mine. In the event that there was an influence, NPfl Fact Sheet A allows for noise from existing operations to be included in noise measurements under certain circumstances. Therefore, the reasons for not conducting noise measurements in accordance with the NPfl to derive the rating background levels is not clear and the proponent must justify this decision and method used.**

See response to first comment.

- **Attended noise monitoring was taken at different times of the day. The proponent should demonstrate that these measurements are representative of the quietest times during each assessment period if they are to be considered for a rating background level.**

The EPA requires confirmation that the RBLs derived in the NBIA are representative of the quietest times during each assessment period. Specifically, EPA appears to be concerned that the analysis was based on a series of attended noise measurements to calculate the RBL.

The background noise analysis was not based on a series of attended noise measurements, the analysis was primarily based on two days of unattended noise logging occurring at five locations around the mine and adjacent Peppertree quarry measured every three months for over five years. This data is shown in Table 6-4 of the NBIA.

To demonstrate that RBLs derived in the NBIA are representative of the quietest times during each assessment period the background noise level data was further analysed presenting assessment background levels (ABLs) and RBLs for the measured data for 2016 and 2017 (see Appendix A of Appendix F).

The noise logger graphs are presented in Appendix G of Appendix F so they can be easily inspected.

- **Why the minimum background levels in the NPfl were not adopted as a default in the absence of data suitable to derive rating background levels in accordance with the NPfl. Especially in consideration that some attended measurements were below the minimum background levels.**

See response to first comment and above comment.

- **Why measurements were not taken at locations potentially most affected by the development.**

For the identification of background noise levels, the area around the site was split into three noise catchments, namely:

1. North-western catchment;
2. Western catchment; and
3. Eastern catchment.

Refer to the figure in Appendix B of Appendix F for noise catchment areas. For the north-western catchment, noise measurements at locations R2 and R3 were considered in the NBIA. For the western catchment, noise measurements at locations R4, R8, B5 and R9 were considered. For the eastern catchment, noise measurements at R14 were considered.

It is considered that these locations are a good spatial distribution within the catchment areas and therefore are a good representation of the most affected locations to the development.

Given the proposal proposes a 30-year extension of mining operations in this area, it is considered prudent that the project noise trigger levels which are used to determine EPL noise limits are based on appropriate data using justifiable and robust methods.

As outlined above, it is believed the noise trigger levels were based on appropriate data and methods.

Noise modelling sources and location maps

A number of sources and proposed operations have not been adequately accounted for or described in the NBIA. The proponent should clarify the following points and update the NBIA accordingly.

- **The maps showing the location of noise sources in Appendix D of the NBIA do not match the names of the plant provided in Table 8-1. The names of the plant listed in Table 8-1 should match those on the maps in Appendix D.**

Refer to table in Appendix C of Appendix F, which has revised names.

- **The maps in Appendix D of the NBIA include a number of noise sources whose name or sound power levels are not included in Table 8-1, nor anywhere else in the report. These include, but are not limited to: the Kiln Exhaust, Kiln Discharge Building, Quickbin Crusher, Lime Hydration Plant, Radial Stacker, Small DC, Sand Plant Screen, Primary Crusher, Secondary Crusher building. The details of these sources should be included in the report, including the location of each source on a map.**

Refer to figures in Appendix D of Appendix F.

The figures in Appendix D of Appendix F have been updated to include a detailed overview of the Processing Area and the noise sources in the area. Appendix D of Appendix F now also provides labelled figures of line sources whereas the figures in the EIS only included point sources.

- **The information requested by the EPA in Attachment 2 of the SEARs requires that octave or one third octave band data for each source be provided.**

The 1/1 Octave band noise source data is presented in Appendix E of Appendix F. 1/1 Octave Band noise source data describes frequency composition of a noise source.

The common octave frequency bands are 31.5Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz and 8kHz and their composition is made up of the Lower Band Limit, Centre Frequency and Upper Band Limit.

- **The majority of the product from the mine is moved via rail, however no rail or rail related sources have been nominated in Table 8-1 or on the maps in Appendix B. The proponent should provide a justification for not including any rail loading related noise sources in the NPfl assessment.**

The rail loading related sources were included in the noise model in the NBIA; however, the operational noise emission from the rail rolling stock (i.e. locomotives and wagons) was omitted. The train source has been modelled and the results are presented in Table 6.6.

Table 6.6 Noise levels from train operating

Receiver	Noise levels from the train operating, $L_{Aeq, 15minutes}$
R1	15
R2	9
R3	17
R4	14
R5	7
R6	4
R7	10
R8	11
R9	7
R10	2
R11	1
R12	1
R13	9
R14	9
R15	10
R16	8
R17	7

The noise contribution from the rail rolling stock (i.e. locomotives and wagons) on-site is very low. The addition of rail rolling stock noise contribution does not change the noise predictions presented in the NBIA,

- **The proponent should provide a demonstration of the validation of the noise model. As all of the noise sources currently exist, and many noise measurements have been conducted over the years, the NBIA should include a demonstration of the validity of the model by comparing predicted and measured noise levels at reference locations.**

Refer to Appendix F of Appendix F for a noise validation assessment.

In order to validate the site noise model, the noise predictions for the mine under neutral meteorological conditions using the ENM noise prediction algorithm were compared to the measured noise data.

- **The shared road sales stockpile area only includes one source, a static truck. However, Table 8-1 nominates a CAT 980 loader to be at the road sales area. The proponent should review the source locations and update noise predictions accordingly.**

The source figures in the EIS had some incorrect labels. Appendix D in conjunction with Appendix C of Appendix F show the source locations modelled in the NBIA. The road sales stockpile source (misc3) includes a static truck and dog and a CAT 980 loader. On this basis the EIS noise predictions are correct and updated noise predictions are not required.

Meteorological conditions

The wind analysis presented in Table 8-4 essentially shows two prevailing wind directions. Easterlies are prevalent during Summer, Autumn and Spring; and North-westerlies prevalent during Autumn and Winter nights. A number of the wind vectors have percentages close to the threshold. Section D2 of the NPfl requires that wind analyses that use a 16 direction method should consider the two adjacent directions either side of the direction of interest. The proponent should confirm if the methodology in Section D2 of the NPfl was followed, or alternatively provide a revised analysis and update noise predictions.

Wilkinson Murray confirms that Section D2 of the NPfl was followed during the wind analysis.

Confirmation of predicted noise levels

The NBIA has identified two sources which generate the potentially highest maximum noise levels: trucks tipping overburden; and impact noise from material dropping into bins. Dozers reversing are also known to generate high maximum noise levels. The proponent is to confirm if these noise events are controlled by current practices at the mine, or have been addressed by other maximum noise level assessments, or should be included in an updated assessment.

Noise modelling was based on the typical worst-case equipment locations provided by Boral for the four stages during the life of the mine.

The EIS considered the following instantaneous noise sources and typical L_{AFMAX} sound power level (SWL) that may have the potential to disturb sleep:

- Trucks tipping on the overburden emplacements at the closest point to receivers, 120dBA L_{AFMAX} .
- Infrastructure area impact noise near crusher (e.g. rock falling into metal bin) 122dBA L_{AFMAX} .

Dozer track noise was not specifically identified in the EIS. However, dozer track noise can occur, specifically when a dozer is in 1st gear. Typical track noise for the type of dozer proposed (small to medium size) would range from 114 to 120dBA SWL. As such, the upper range of dozer track noise would be similar to that of trucks tipping overburden. On this basis the current assessment provides a reasonable indication of the range of likely maximum noise impacts, and an updated assessment is not required.

It was not clear in the NBIA if the location of L_{max} and L_{eq} noise sources were consistent for similar activities:

- Noise levels for Stage 3 include a dozer (SWL Leq,15min 116 dBA) operating closest to R12 with a predicted Leq,15min of between 26 and 29 dBA. However, the predicted maximum noise level is L_{max} 48 dBA with an SWL of 120 dBA for haul trucks. There is only a 4 dB difference in sound power levels, however the predicted noise levels differ by over 20 dB. The dozers and trucks would likely be operating in the same area (location and height) on the emplacement areas and therefore the large difference in noise levels would not be expected. If the difference is due to a duration correction for the $L_{eq,15min}$ noise level, this needs to be outlined in the report.

As indicated in the NBIA Section 9.5, the maximum noise level assessment was conducted only for Stage 1 operations and that the potentially worst impacted receivers are Receiver 9 and Receiver 12 when tipping occurs at the western extents of the western overburden emplacement.

There was an error in transcribing numeric values in Table 9-4 of the noise report. An updated table is provided below (Table 6.7) presenting the range of $L_{AF,Max}$ noise levels for one of the modelled worst case operating scenarios: Scenario Stage 1 Beginning and Scenario Stage 1 End.

Table 6.7 Maximum noise scenarios Stage 1 Beginning and Scenario Stage 1 End

Receivers	Trucks tipping		Process area		Screening level
	Stage 1 beginning	Stage 1 end	Rocks falling Stage 1 beginning	Rocks falling Stage 1 end	
R1	19	18	19	18	52
R2	27	29	26	24	52
R3	32	28	31	27	52
R4	28	29	27	24	52
R5	35	34	29	27	52
R6	33	35	27	28	52
R7	35	38	31	31	52
R8	37	39	33	32	52
R9	38	43	34	36	52
R10	37	36	31	30	52
R11	39	34	32	30	52
R12	43	39	34	33	52
R13	25	26	25	25	52
R14	33	33	33	33	52
R15	33	33	33	33	52
R16	32	32	32	32	52
R17	30	30	30	30	52

Noise is predicted to be less than the NPfI screening level at all receivers for the worst-case Stage 1 mine operations. Therefore, the project is not predicted to result in sleep disturbance at sensitive receivers.

- The propagation losses would likely be similar for each source. Therefore, it is questionable why a difference of 4 dB in source levels leads to a large difference at the receiver. The proponent should review the assumptions, equipment locations, and propagation paths for sources; provide an explanation for this discrepancy and update the NBIA accordingly.

See response to above comment.

The modelled location of plant on the expanded western overburden emplacement area should be confirmed to represent reasonable worst-case locations for R9 and R12.

Noise modelling was based on the typical worst-case equipment locations provided by Boral for four stages during the life of the mine.

Assessment of construction activities under the NPfl

The EPA does not agree that the relocation of the stockpile reclaim area and construction of the road sales stockpile area should be assessed under the Interim Construction Noise Guideline (ICNG). Since the operations are within the mine area, uses the same equipment fleet and is described in Section 11.2 of the NBIA as "generally indistinguishable from normal operation", they should be assessed under the NPfl. The assessment should be revised to include these activities in the NPfl assessment.

Construction of the road sales stockpile area would take place using equipment taken from the existing mining fleet. The exact plant that would be utilised and from what part of the operation they would be sourced is not yet known at this stage.

The construction activities of the stockpile reclaim area and the road sales stockpile are similar or further distances from the closest residential receivers compared to the overburden emplacement areas. Therefore, the overall operational noise would be less than that predicted in the NBIA Section 9.

Therefore, the operation of the mine during the construction of the stockpile reclaim area and construction of the road sales stockpile would be less than the project noise trigger levels at all sensitive receiver locations, given operations closer to sensitive receivers are not predicted to exceed the noise trigger levels.

6.6 WaterNSW

Based on its review of the EIS and a site inspection, WaterNSW has the following concerns about the project:

6.6.1 Marulan Creek flows

The potential reduction in flows in Marulan Creek of nearly 20% (from 1,023 to 829 ML/year) and the impact that this reduction would have on the ecology and thus water quality downstream in Barbers Creek.

Flows

Advisian provided the following advice on the flow regime and water quality impacts of reduced flows in Marulan Creek from operation of Marulan Creek dam.

The proposed Marulan Creek dam involves the construction of an earth fill embankment on Marulan Creek. Marulan Creek is in the Barbers Creek catchment, which discharges to the Shoalhaven River. The catchment area of the dam is approximately 20 km², compared to Barbers Creek catchment of approximately 90 km². Therefore, the catchment of the Marulan Creek dam makes up approximately 22% of the total Barbers Creek catchment.

The water balance modelling indicates 183 ML are required to provide reliable water supply from the dam. Total surface water entitlements in the Barbers Creek Management Zone are 1,176 ML, comprising 1,143 ML unregulated river and 32 ML stock and domestic. Boral holds a total of

86 ML unregulated river category water access licences (WAL25207 – 76 ML and WAL25373 – 10 ML) and 1 ML stock and domestic. Refer to Section 6.2.1 for a description of water trading rules in the management zone.

Water balance modelling indicates that 183 ML are required to provide reliable water supply from the dam. The purpose of the water sharing plan is to protect the health of rivers and groundwater while also providing the water users with perpetual access licences, equitable conditions and increased opportunities to trade through the separation of land and water. Boral proposes to purchase up to 183 ML from existing Water Access Licence holders within the Water Management Zone. No changes are proposed to total water entitlements within the water source, only trading between existing Water Access Licence holders within the Water Management Zone.

Water balance modelling assumes riparian release from the proposed Marulan Creek dam will be the same as conditions of consent for Peppertree Quarry's Tangarang Creek dam. The assumed release conditions from the proposed Marulan Creek dam are summarised in Table 6.8 (SWA Table 6.4).

Table 6.8 Assumed Marulan Creek dam riparian release rules

Upstream inflow	Downstream riparian release
<1 ML/day	= inflow
1–10 ML/day	1 ML/day
>10 ML/day	10% of inflow

Water balance modelling shows that the Marulan Creek dam will provide an average supply of 98 ML/year, while maintaining downstream flow of 829 ML/year. The modelled flow duration with the Marulan Creek dam is shown in Figure 6.9 (surface water assessment Figure 8.2) compared to the pre-dam conditions.

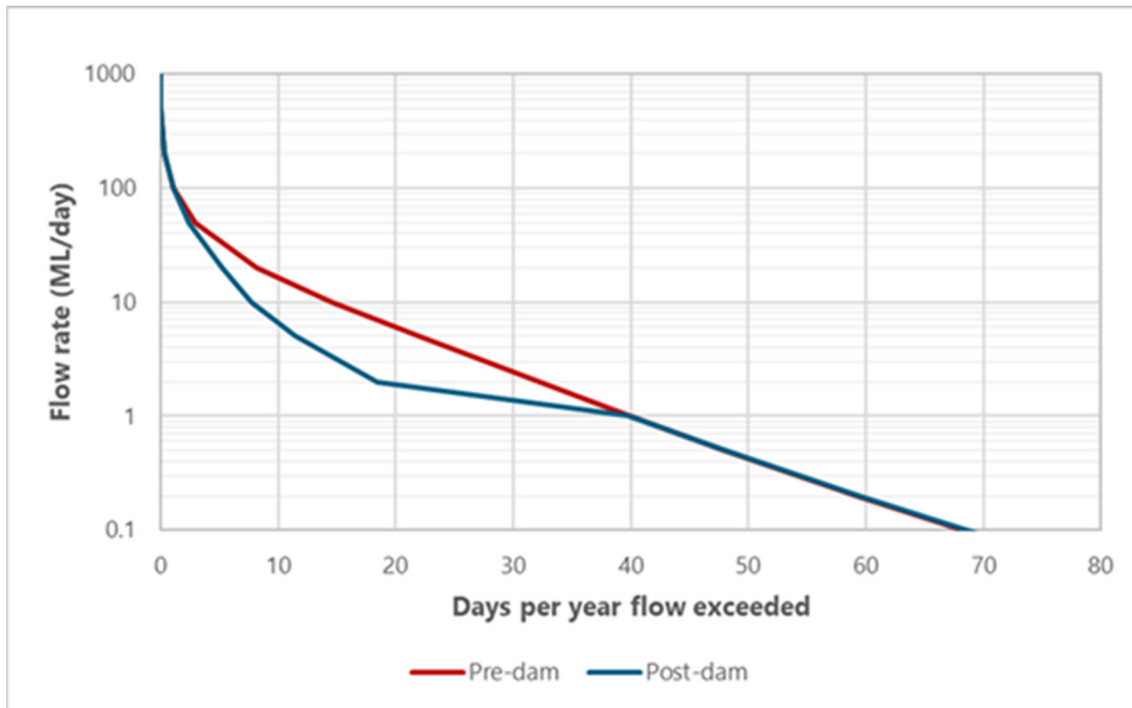


Figure 6.9 Marulan Creek flow duration curves for a 30-year climate period

Riparian releases from the dam mean that low flows (<1 ML/day) and high flows (>30 ML/day) will be unchanged. Mid-range flows will be maintained, however with reduced volume.

The total reduction in annual average flow in Marulan Creek of approximately 19% (from 1,023 ML/year to 829 ML/year) downstream of the proposed dam will have a diminished impact further downstream to the flow regime in Barbers Creek as the Marulan Creek dam catchment area only comprises approximately 22% of the total Barbers Creek catchment area.

Baseline water quality in Marulan Creek has been characterised as part of the surface water assessment. Potential impacts on water quality are described in Section 9.5.6 of the SWA. The dam will operate in a similar manner to Peppertree Quarry's Tangarang Creek dam, with riparian releases providing water quality and flow that are unlikely to be adversely impacting ecology of downstream systems or potential users in terms of stock watering or irrigation purposes. Riparian release from the Marulan Creek dam will be similar to baseline conditions, with seasonal variation in water quality parameters depending on catchment conditions and rainfall.

Aquatic biodiversity

Niche Environment and Heritage provided the following advice on impacts to aquatic biodiversity from potential changes to flow regime and water quality from operation of Marulan Creek dam.

The ecological response to this change to hydrology is likely to be minimal. There is not expected to be a loss in habitat type or the aquatic communities that utilise this habitat provided by this system. Barber's Creek naturally has extended periods of low flows and no surface flow, a substantial base flow, and as such has an ecology adapted to this flow regime.

The change in hydrology is expected to reduce a proportion of the volume of mid-flows. This may lead to a temporal reduction in surface water habitat. However, it is not expected to translate into altered faunal communities as the upstream catchment will still deliver variability to the system. The aquatic biodiversity assessment for the EIS found that Barber's Creek is in good stream health and as such expected to be resilient to the small change in flow regime and remain in good ecological condition.

Additionally, there will still be periods of stream connectivity where fish such as Mountain Galaxid (*Galaxias olidus*) can move through the system and it is expected there will be no change in the fish community.

As described above, water quality in Marulan Creek after construction of the dam is anticipated to be similar to the baseline water quality in Marulan Creek. The dam riparian release arrangement will be determined during detailed design, detailing the dam offtake points and how releases are made at different dam levels.

Riparian release water quality will be similar to the baseline conditions, with seasonal variation in water quality parameters depending on catchment conditions and rainfall. No impacts on downstream water quality are anticipated as a result of the operation of the dam.

The effect of reduced mid-flows on water quality is expected to be minimal as any minor changes in water quality if at all will be within the natural variation experienced within this system and as such not have a measurable effect on aquatic ecology.

6.6.2 Stability of overburden emplacements

The long-term stability (in relation to sheet, rill and gully erosion) of all proposed overburden emplacement areas. Specialist advice and appropriate management measures should be provided to ensure overburden emplacements areas are geomorphologically stable in the long term.

As described in Section 8.3.1 of the EIS, the principal surface water management measure is design and implementation of the water management system, with the key feature of this system to divert runoff from the overburden emplacements to sediment basins designed and operated in accordance with Department of Environment and Climate Change. (2008) *Managing Stormwater: Soils and Construction, Volume 2E – Mines and Quarries*.

Chapter 26 of the EIS details the design, rehabilitation strategy and associated management measures for overburden emplacements to ensure they are geomorphologically stable.

A water management plan for the mine will be prepared by specialists and in consultation with WaterNSW as a post approval requirement. Measures will be included to ensure ongoing monitoring on the stability of the emplacements that would be reported through the AEMR process.

6.6.3 Groundwater modelling and monitoring

As the quarry expands and gets deeper, there are increased risks to water quality. Therefore, it is suggested that the groundwater modelling and monitoring approach be re-evaluated every 5 years.

Boral acknowledges WaterNSW's comment and will consider the groundwater modelling and monitoring approach during preparation of the water management plan. The water management plan and mine operations plan will include provision for ongoing re-evaluation of the groundwater modelling and monitoring approach.

6.6.4 Sewage management

WaterNSW request that further details are provided on all on-site sewage management systems for the mine site as these systems do not appear to meet contemporary standards. These details would include type, size and location of each system including effluent land management areas, and the number of people each system is designed for.

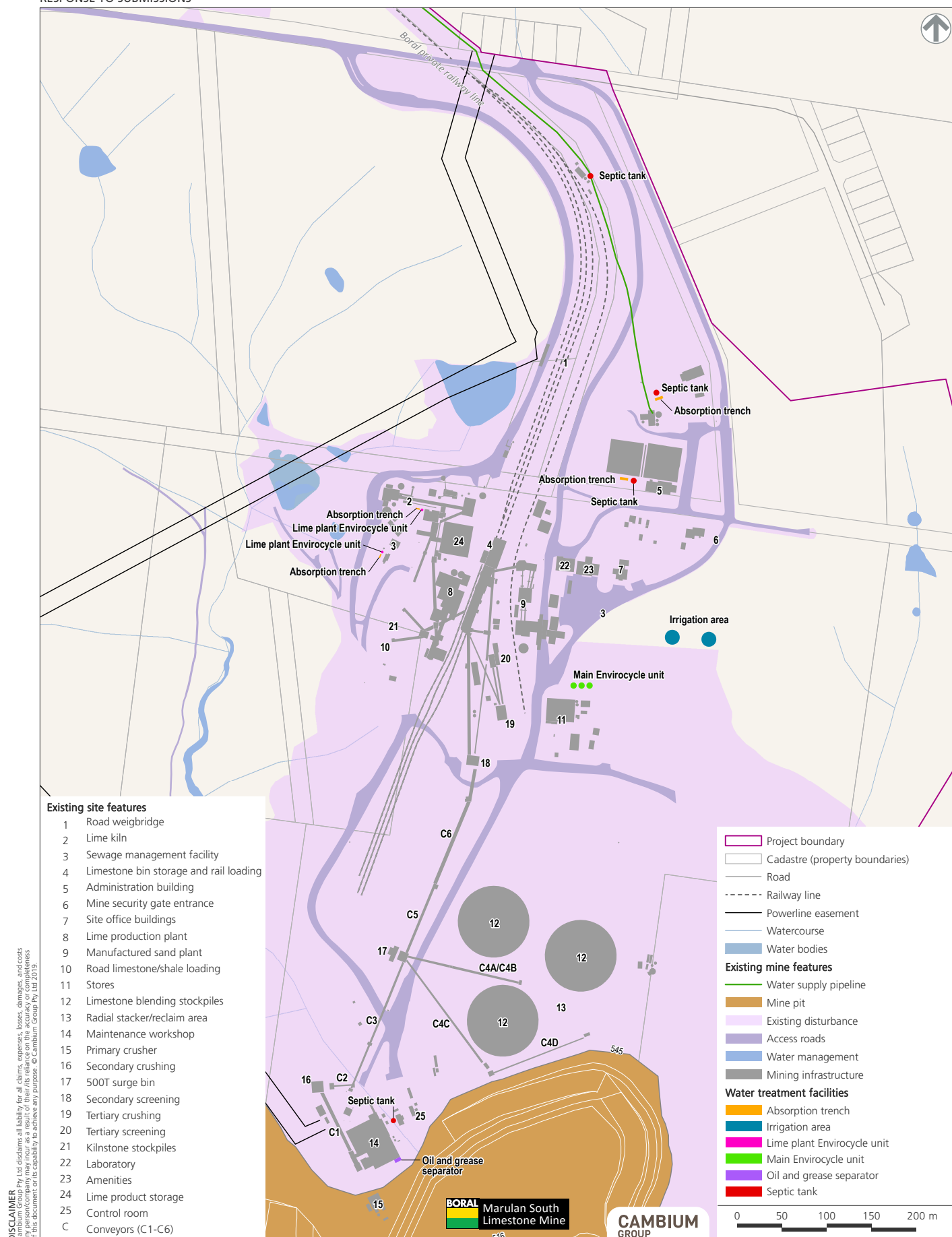
The on-site sewage management systems are described in Table 6.9 and shown on Figure 6.10.

Table 6.9 On-site sewage management systems

Facility	Type	Capacity	People serviced	Effluent disposal
Main envirocycle treating offices, laboratory, bathrooms, store and conference room	Super Treat AWT 2 tank	Septic 4,300 L, treatment 4,500 L	30	Irrigation
Two lime plant envirocycles treating kiln control room, hydration, dispatch and workshop areas	Super Treat	Septic 4,300 L, Treatment 4,500 L	10	Absorption trench
	Super Treat	Septic 4,300 L, Treatment 4,500 L	10	Absorption trench
Two septic tanks, one in machine shop/primary crusher and other near Fettle's Shed	Septic tank	3,000 L	20	Pump out - weekly
	Septic tank	4,500 L	2	Absorption trench
Two septic tanks in services department	Septic tank with absorption trench	4,500 L	10	Absorption trench
Oil and grease separator	Oil and grease separator	-	-	-

Figure 6.10
Existing operations - Water treatment facilities

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6.6.5 Neutral or beneficial effect on water quality

Notwithstanding the concerns listed above, WaterNSW considers that the project has the potential to achieve a neutral or beneficial effect (NorBE) on water quality, subject to the:

- provision of sufficient additional information, and
- the requirement for robust monitoring, reporting, and auditing programs and effective implementation of those programs.

In that regard, WaterNSW requests that the following documents be prepared in consultation with WaterNSW:

- the Water Management Plan, including the progressive development of a water management and monitoring systems for surface and groundwater, and
- the Construction Environmental Management Plan for the Marulan Creek dam.

It is further requested that WaterNSW remain a stakeholder for the proposal and any updates to relevant plans.

Boral acknowledges WaterNSW's comment and agrees to prepare the water management plan and construction environmental management plan in consultation with WaterNSW.

6.7 NSW Office of Environment and Heritage

6.7.1 Tallong dam

The proposal includes drawing significant amounts of water from Tallong Dam. Two threatened plant species Tallong Midge Orchid *Genoplesium plumosum* (Critically Endangered under NSW and Endangered under Commonwealth legislation, also a candidate SAli species) and Dwarf Kerrawang *Commersonia prostrata* (Endangered under NSW and Commonwealth legislation) are known to occur on the northern sandstone outcrops adjoining the dam. These species, particularly the Tallong Midge Orchid, may be significantly affected if water levels in the dam are lowered for prolonged periods either directly through lower water availability for the plants or indirectly by increasing access of people to what is currently largely inaccessible habitat.

The environmental assessment does not describe how the water level will vary as a result of the water extraction, so it is not possible to determine the likelihood of impact on these species. This matter should be addressed in the Biodiversity Development Assessment report (BOAR).

The Tallong dam is a bog wetland system area with considerable fringing wetland vegetation, which has developed as a result of the long-term operation of the dam. This area of native vegetation has been mapped as a sandstone swamp with tea tree wet health in OEH vegetation mapping for the site. This is potential an area of Montane Bog and Fen Endangered Ecological community that should be addressed in the BOAR. There is no mention of these impacts in the BOAR. If the development will result in a permanent change water levels in the Tallong dam resulting in long term impacts to this area of wetland, the area should be assessed appropriately and included in the BOAR.

As described in Section 5.1 of this report, while Boral will continue to use water from Tallong dam to support the operation of mine in its early stages of the project life there is no intention to use water from Tallong dam to fill the proposed Marulan Creek dam.

Therefore, continued extraction of water from Tallong dam for mine use will not result in impacts described by OEH. As there is no change in the use of water taken from Tallong dam, any further assessment of these matters would be beyond the scope of the project.

Further, Boral will likely cease extracting water from Tallong dam during stage 1 of the mine plan as Marulan Creek dam along with other on-site water storage dams will meet mine water demand after this time. Therefore, Boral will no longer impact this water body and downstream ecosystems reliant on it after stage 1 of the mine plan.

6.7.2 Offsets

OEH cannot comment on the offset calculations or if the offset is suitable as the BOAR provided with the Environmental Assessment includes the overburden areas which is currently being assessed in the Peppertree Modification 5 (PA 06_0074 MOD 5) development assessment. The offset calculations from this 'Peppertree area' need to be removed or at least made distinct from the calculations for the Marulan South Limestone before we can provide advice on the offset.

The offset calculations in the EIS included the northern overburden emplacement, which appears in the environmental assessment for Peppertree Quarry Modification 5 as the south-west overburden emplacement. The overlap of these emplacements is shown on Figure 6.11. Therefore, offset credits for biodiversity impacts in this area have been included in both assessments. The Peppertree Quarry credit requirements have been subtracted from the mine's credit requirements in this section to clarify the required biodiversity offset requirements for the mine.

The required credits for impacts to plant community types (PCTs) are shown Table 6.10 for the mine and Table 6.11 for Peppertree Quarry. The required credits for species credit species are shown in Table 6.12 for the mine and Table 6.14 for Peppertree Quarry. Note PCTs 1150, 731 and 1334, and *Solanum celatum*, do not occur in the area subject to Peppertree Quarry Modification 5.

Table 6.10 PCTs and required offsets – Marulan South Limestone Mine

Plant community type	Required credits
PCT 1334 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands (SR670)	1,466
PCT 778 Coast Grey Box – stringybark dry woodland on slopes of the Shoalhaven Gorges -Southern Sydney Basin (SR534)	1,042
PCT 1150 - Silvertop Ash - Blue-leaved Stringybark shrubby open forest on ridges, north east South Eastern Highlands Bioregion (SR624)	260
PCT 731 - Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion (SR524)	325
PCT 1334 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands (SR670) - Non-EEC water dependent	0

Table 6.11 PCTs and required offsets – Peppertree Quarry

Plant community type	Required credits
PCT 1334 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands (SR670)	428

Plant community type	Required credits
PCT 778 Coast Grey Box – stringybark dry woodland on slopes of the Shoalhaven Gorges -Southern Sydney Basin (SR534)	157

Table 6.12 Species credit species and required credits – Marulan South Limestone Mine

Species credit species	Required credits
<i>Solanum celatum</i>	2
Koala	2,941
Large-eared Pied Bat	4,567

Table 6.13 Species credit species and required credits – Peppertree Quarry

Species credit species	Required credits
Koala	487
Large-eared Pied Bat	731

PCT credit requirements for the mine after subtraction of those for Peppertree Quarry are shown in Table 6.14. Species credit requirements for the mine after subtracting those for Peppertree Quarry are shown in Table 6.15.

Table 6.14 Peppertree Quarry PCTs subtracted from Marulan South Limestone Mine PCTs

Plant community type	Required credits
PCT 1334 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands (SR670)	1,038
PCT 778 Coast Grey Box – stringybark dry woodland on slopes of the Shoalhaven Gorges -Southern Sydney Basin (SR534)	885
PCT 1150 - Silvertop Ash - Blue-leaved Stringybark shrubby open forest on ridges, north east South Eastern Highlands Bioregion (SR624)	260
731 - Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands Bioregion (SR524)	325
PCT 1334 Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands (SR670) - Non-EEC water dependent	0

Table 6.15 Peppertree Quarry species credits subtracted from Marulan South Limestone Mine species credits

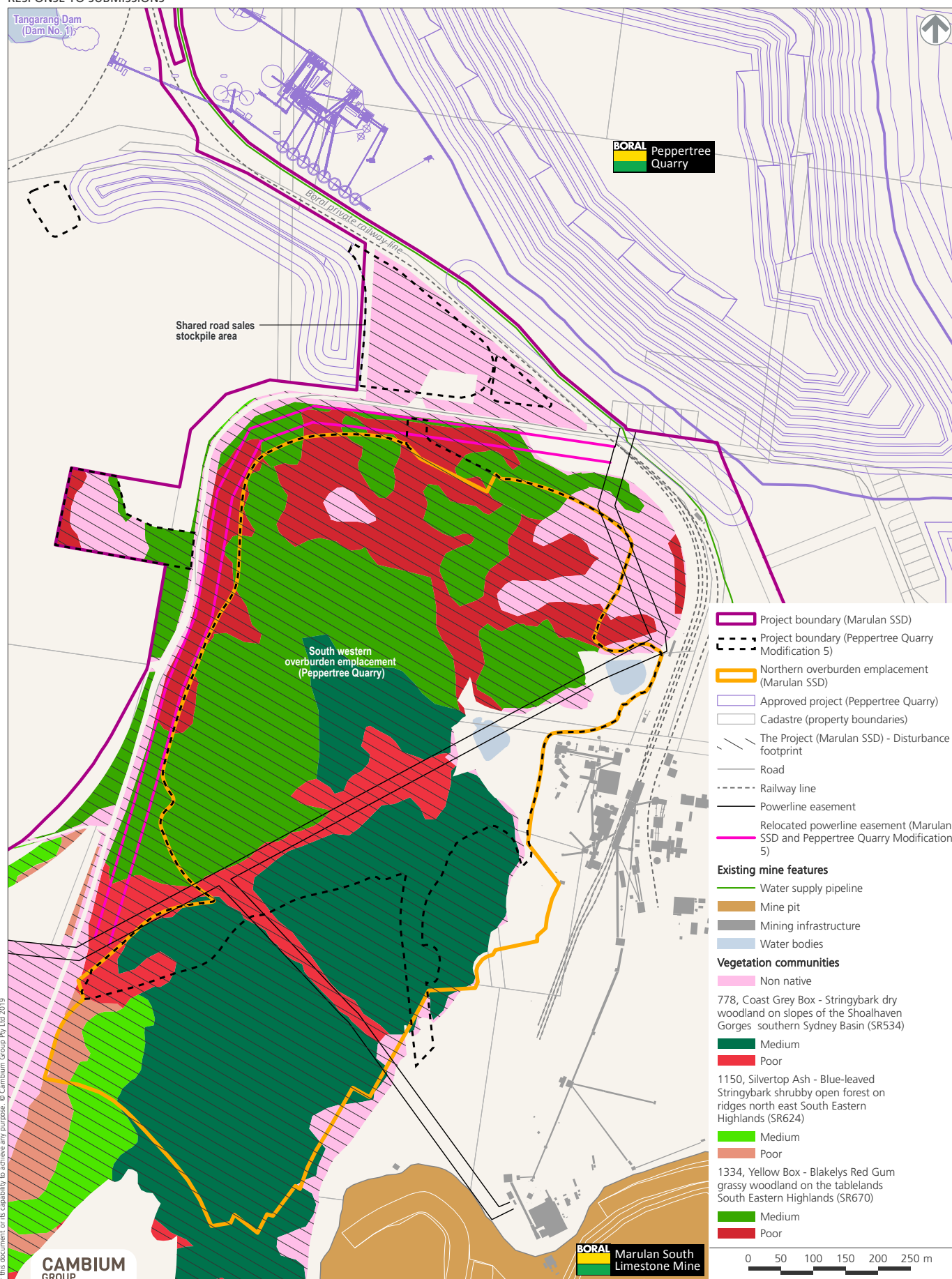
Species credit species	Required credits
<i>Solanum celatum</i>	2
Koala	2,454
Large-eared Pied Bat	3,836

Subtraction of Peppertree Quarry credits from those for the mine results in the following offset requirements:

- PCT 1334 – 1,038;
- PCT 778 – 885;
- PCT 1150 – 260 (unchanged);
- PCT 731 – 325 (unchanged);
- PCT 1334 – 0 (unchanged);
- *Solanum celatum* – 2 (unchanged);
- Koala – 2,454; and
- Large-eared Pied Bat – 3,836.

Figure 6.11
Project area overlap for Marulan South Limestone Mine and Peppertree Quarry Modification 5

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6.7.3 Controlled action

OEH notes that this referral is deemed a Controlled Action under section 75 of the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act). The Matters of National Environmental Significance (MNES) previously identified in the Peppertree MOD 5 that may be impacted by this project are listed as follows. Note, this list is not definitive:

- **White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland**
 - critically endangered
- **Regent Honeyeater (*Xanthomyza Phrygia*) - critically endangered**
- **Large-eared Pied Bat (*Chalinolobus dwyen*) – vulnerable**
- **Koala (*Pharscolarctus cinereus*) - vulnerable**

Boral acknowledges OEH's comment and notes the proposed action was referred to the Commonwealth Department of Environment and Energy on 14 July 2015.

6.7.4 Impacts

OEH notes that in relation to the application of the avoidance and minimisation principle, the chosen site presents the greatest loss to biodiversity values of all options.

Boral notes OEH's comment.

6.7.5 Floodplain risk management

Nil response

Boral acknowledges OEH's comment.

6.7.6 Aboriginal cultural heritage

OEH is satisfied that the Aboriginal consultation and assessment undertaken for the proposal area has been consistent with the methodologies already approved for the existing major projects associated with this site.

We support the preparation of an Aboriginal Heritage Management Plan (AHMP) to describe the ongoing measures required to manage both the tangible and intangible Aboriginal cultural heritage values across the Mine site. Preparation of the AHMP should be undertaken in consultation with the registered Aboriginal Parties and OEH. We note that further consultation regarding the Marulan Creek Women's Cultural Site is required in relation to the measures and controls required to protect the site. Consultation and protection measures need to be undertaken prior to any construction or impact activities occurring near the Cultural Site.

Boral acknowledges OEH's submission and will prepare the Aboriginal heritage management plan and carry out consultation in accordance with its requests.

6.8 NSW Heritage Council

The project SEARs required an assessment of the likely impact of the project on state or local heritage items. Review of the EIS indicates that there are no listed heritage items within the project area, twelve items of local significance were identified within the project area, all associated with historic mining activity and related to categories or former uses such as industrial, residential and road transport. It would be possible for the project to avoid five of the items, but seven of them would be removed. It has not been possible to avoid this because of the shape and formation of the limestone resource which is to be quarried.

Mitigation measures would include archival and photographic recording with information to be provided and shared with the local community. It is also proposed to complete archaeological investigations at some key sites and archaeological/topography surveys of others. Sites retained would be appropriately demarcated to protect them from inadvertent damage.

These measures are considered to be adequate to record the identified sites. It is recommended that the DPE consider imposing a condition of approval to require that future archaeological investigations should be undertaken by an appropriately qualified person who meets the Heritage Council Excavation Director Criteria for sites of local significance. Following the archival recording and the archaeological investigations final reports should be lodged with the Heritage Council of NSW.

Boral acknowledges the NSW Heritage Council's submission and commits to the mitigation measures described above, which will be documented in a heritage management plan.

6.9 NSW Department of planning and Environment Division of Resources and Geoscience

6.9.1 Resource and economic assessment

The Division has reviewed and assessed the information supplied in relation to the Project. The Division considers the Project meets the objects of the *Mining Act 1992* (NSW) (the Act) and the requirements of clause 15 of the State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 leading to an efficient development and utilisation of mineral resources which will foster significant social and economic benefits. The Division is satisfied that the Proponent's mine design and mining method submission for the Project adequately recovers mineral resources and provides an appropriate return to the state.

A resource and economic assessment was undertaken by the Division which details the resource utilisation and economic benefits of the Project.

Boral acknowledges the Division's submission.

6.9.2 Mining titles

Prescribed minerals under the Act include clay/shale, iron minerals, limestone, marble and structural clay. The Proponent must obtain the appropriate mining title(s), such as a mining lease, from the Division allowing for mineral extraction under the Act over the project extension area.

The Division notes that this Project is located within the existing operations area of Consolidated Mining Lease 16 (Act 1992) (CML 16) and Mining Lease 1716 (Act 1992) (ML 1716). The project extension area to the northwest of current operations is not currently held under title.

Boral acknowledges the Division's submission and notes it will submit a new mining lease application under the NSW *Mining Act 1992*.

6.9.3 Application of section 65 of the Mining Act 1992 - development consents under the Environmental Planning and Assessment Act 1979

A development application under the Environmental Planning and Assessment Act 1979 must be approved before a mining lease can be granted. A mining lease will only be granted for activities specified in the development consent.

Section 65 states:

The Minister must not grant a mining lease over land if development consent is required for activities to be carried out under the lease unless an appropriate development consent is in force in respect of the carrying out of those activities on the land.

Boral acknowledges the Division's submission and notes the EIS was prepared to facilitate the granting of development consent under Part 4 of the EP&A Act. An application under the *Mining Act 1992* will not be made until development consent has been granted.

6.9.4 Further Mining Titles required to undertake the Project

Opportunity for rationalisation of titles

Applying for additional mining title(s) provides an opportunity to rationalise the complex title areas within the freehold land of CML 16. The complexity of surface exceptions and depth restrictions associated with CML 16 (consolidating historic titles) may be reduced as part of the new mining lease application.

Boral acknowledges the Division's submission, these matters are the subject of going discussion with the DRG and will be considered during the mining lease application process.

Marulan Creek dam

The EIS proposes adjustments to the existing Marulan Creek Dam. The Division's preliminary view is that these activities will not trigger section 6 requirements of the Act. As such, the Proponent would not be required to hold an additional Mining Lease for ancillary mining activities or an 'off title' designated ancillary mining activity as prescribed by clause 7 of the Mining Regulation 2016. The Proponent is encouraged to seek independent advice to form a view as to the most appropriate way forward.

Boral acknowledges the Division's submission, which will be considered during the mining lease application process.

6.9.5 Biodiversity Offsets

The Division requests that the Proponent consider potential resource sterilisation in relation to any proposed biodiversity offsets areas. The Division requests consultation with both the Geological Survey of NSW and holders of existing mining and exploration authorities affected by planned biodiversity offsets.

Part of Boral's offset liability will be met through the establishment of a biodiversity stewardship site (offset site). Part of the process of establishing a stewardship site is to ensure that consent is obtained from all property interest holders, including holders of mining interests. No mining or exploration leases are known to occur on the proposed stewardship site.

6.9.6 Size and quality of resource

While generalised in nature, the resources of limestone quoted are considered appropriate for the commodity in this case.

No estimate of clay and shale in-situ has been provided.

Clay/shale and structural clay are Prescribed Minerals. Their quantities also materially affect the limestone resource. As such, a statement as to the expected tonnages in-situ and their location should be provided.

Overview

Clay/shale and structural clay resources at the mine have previously been referred to as the white shale and the brown shale occurrences in the sediments along the pit western batters and west of the north/south striking and steeply west dipping main Eastern Limestone body. Similar sedimentary materials along the pit's eastern batters east of the Eastern Limestone have generally not been included as mining in this area is currently depth restricted.

These clay/shale materials are predominantly in general mine overburden and have previously been classed as extractive materials. They were the subject of two separate extractive development applications approved in 1995 and in 1997 by the then Mulwaree Shire Council.

A limited quantity of these clay/shale materials is included with mine production. Currently Boral transports by road from the mine approximately 80,000 tpa of clay shale material, to be used predominately for blending at their cement plants. The balance, of typically 70,000 to 120,000 tpa, is combined at the mine with limestone for rail despatch. Royalty is paid on the mineral clay/shale despatched.

Geology

The clay/shale at the mine is taken to currently apply to, in particular, a white material that the mine has partially extracted from the sediments along the south western batters of the North Pit. The term clay/shale also applies to some brown material mined from the sediments all along the western batters for blending with limestone.

The white shale material has particular physical properties suitable for blending in off-white cement manufacture, being a consistent softish (free dig) shaly material with a fine-grained generally equi-granular texture and a distinct almost white colour. This material has been geologically interpreted as a volcanic air-fall tuff.

This white shale material is present as a fairly distinctive lens or layer within the more typical and pervasive brown, fine grained and finely layered sediments in the hanging-wall stratigraphically

above and west of the main Eastern Limestone body (which is north/south striking and steeply west dipping).

The great majority (by volume) of the sediment package is interpreted as originating from simple accumulation of fine water-borne sediments in shallow marine and fluvial settings. However, contemporaneous regional volcanism is interpreted as contributing sporadic pulses of volcano ejected material.

Where layers formed of virtually pure fine-grained ejecta (such as this white shale), the sedimentation process could either have been direct accumulation where volcanic ash fell from the air or by simple transportation as a fluidised gas or aqueous sediment a short distance from the volcano.

Both limestone and flanking sediments close to the current/original topography are generally strongly weathered (down to a rough and variable depth of approximately 50 m below surface). This weathering is typified by softening of the rock (resulting in the free-dig property mentioned above); distinct colour changes (limestone to whites and reds, and sediments from grey to browns); and conversion of rock types (crystalline limestone to plastic clay and lithified sediments back into semi-original forms). The limited quantities of clay/shale materials currently used as product by the mine come from the highly weathered sediments only.

As discussed above the materials considered clay/shale are generally removed as overburden.

Resources

Resource calculations on the non-limestone material at the mine depends on which portions of the material is considered as a mine product. This non-limestone material is generally considered as overburden at the mine and is hauled to various overburden emplacements. This practice is based on the historical basis of limestone (>96% CaCO_3) being the mine product that is railed to Boral's cement plant as the major material for cement manufacture.

In terms of simple blending with limestone destined for cement manufacture with a lower average calcium content (of 90-96% CaCO_3) then a portion of the limestone-bounding sediments (those with acceptable blending chemistry) may be used as product and therefore could contribute to the limestone resource.

Looking at all of the sediments in the mine's western batters only (because the current mine shape and the westerly limestone dip means they are the principal source of overburden or waste extracted to access limestone) it can be seen that they occupy an approximate 100 to 150 m thick conformable layer between the Eastern Limestone and the overlying Mt Frome Formation of limestones to the west. Occurring over the approximate 3 km strike length of the mine these sediments (both weathered and un-weathered) would exist in the hundreds of millions of tonnes within a conceptual life-of-mine pit shape.

During the 30 year mine plan an estimated 120 M tonnes of limestone, blended to primarily meet cement manufacture specification, is proposed to be mined. This requires a similar quantity of overburden to be removed. In addition, a relatively small quantity (5 M tonne) of clay/shale material is estimated to be mined separately for specific blending purposes.

6.9.7 Royalty calculation

The Project will produce limestone and shale and as such a royalty rate of \$0.40/tonne applies to limestone production, and \$0.35/tonne applies to shale production. There are no allowable deductions for limestone or shale.

An important aspect of future royalty calculation for the project is estimation of future annual production. The Proponent has estimated that if the Project is approved, around 118 million tonnes of limestone would be economically mined from Marulan South, and around four million tonnes of shale. The Division is of the opinion that the average production rates of 4 Mtpa of limestone and 0.14 Mtpa of shale for a period of 30 years are achievable from the Project area.

Using the above parameters, the Division has calculated that in a typical full production year the state will receive around \$1.65 million per annum of additional royalty and \$49 million over the life of the Modification. The net present value of this royalty stream would be \$20 million using a 7% real discount rate.

Boral acknowledges the Division's submission.

6.9.8 Summary of review

The Division has determined that should the Project be approved, sustainable, efficient and optimised resource outcomes can be achieved. Further, any identified risks or opportunities can be effectively regulated through the conditions of mining authorities issued under the Act.

The Division requests to review the draft conditions of approval before finalisation and any granting of development consent.

Boral acknowledges the Division's submission.

6.10 NSW Health – Murrumbidgee Local Health District

Thank you for the opportunity to comment on the Environmental Impact Statement (EIS) for the Marulan South Limestone Mine Continued Operations Project, located on Marulan South Road in the Goulburn Mulwaree Council Local Government Area. Murrumbidgee Local Health District makes the following submission for your consideration.

Murrumbidgee Local Health District has reviewed the EIS detailing the expansion of the mine void, increased disturbance, new overburden emplacement areas, road realignment, water storage dam and associated works to continue operation of the mine for an additional 30 year appears. It is found that the EIS comprehensively addresses any potential public health issues, particularly in relation to human health, air quality, noise and vibration assessments, and water quality.

The comments provided in this letter are contingent on confirmation by the NSW EPA that the methods employed to assess air quality and noise and vibration impacts are appropriate. If this was found not to be the case, our comments would need to be considered in light of the methodological issues identified by the NSW EPA.

Provided the proposed development complies with the recommendations of the Environmental Impact Statement, including the development of and adherence to comprehensive plans outlining appropriate monitoring, controls and mitigation measures including the Mining Operation Plan (MOP), Water Management Plan (WMP), Trigger Action Response Plan (TARP), Air Quality Management Plan (AQMP), and Construction Environmental Management Plan, this office would raise no objection to the proposed development.

It is noted that a number of permanent facilities exist at the Marulan South Limestone Mine for the use of employees and contractors. Under the provisions of the Public Health Act

2010, and Public Health Regulations 2012, the provision of water to employees utilising such facilities is considered to be a private water supply. In this regard, it is recommended that the following conditions are applied to any determination of this application:

- The applicant must demonstrate that the drinking water supplied to the site will consistently meet the Australian Drinking Water Guideline requirements; and
- The applicant must develop and adhere to a Quality Assurance Program, prepared in accordance with the requirements of the Public Health Act 2010, and the Public Health Regulations 2012.

The proposed conditions are considered unnecessary in the circumstance as all site drinking water is provided in bottled and packaged form dispensed by a commercial provider's cooling towers. All taps in kitchens and bathrooms are clearly labelled and identified as not being suitable for consumption.

As drinking water is provided in a bottled or packaged form, Boral is not a *supplier of drinking water* as defined by the *Public Health Act 2010* and therefore does not trigger the requirements of Division 2 Quality Assurance Programs of the Public Health Regulations 2012. As Boral does not propose to source drinking water from on-site it is willing accept a condition to this effect on any future approval as a means of providing certainty to NSW Health.

6.11 Roads and Maritime Services

6.11.1 Consultation

RMS has completed an assessment of the development, based on the information provided and focussing on the impact to the State Road Network. For this development, the key state road is the Hume Highway.

It is highlighted that RMS Land Use (Southern Region) have no record of being consulted during preparation of the EIS, noting that this was requested by Transport for NSW to be included in the Secretary's Environmental Assessment Requirements (SEAR's).

Boral acknowledges that it may not have consulted directly with RMS during the preparation of the EIS as the traffic assessment confirmed a minor change in hourly truck movements along Marulan South Road and through the Hume Highway intersection, which has a negligible effect on the level of service of the intersection.

6.11.2 SIDRA intersection modelling

RMS notes that the proposed development will generate additional traffic, in particular heavy vehicle movements, at the intersection of the Hume Highway and Marulan South Road. The EIS and supporting Traffic Assessment discuss the results of SIDRA intersection modelling which has been undertaken to assess the ongoing performance of this intersection. It is noted that the modelling has been undertaken using traffic volumes representing a 2025 future scenario. RMS requires the modelling be updated to reflect a 10-year post development scenario (with written justification of the volumes used) and electronic copies of the modelling be provided to RMS for review.

Transport and Urban Planning was engaged to update the traffic modelling to reflect the 10-year post development scenario, which is provided in full in Appendix E and summarised below. This information was provided to RMS on 6 June 2019 (Appendix H). RMS responded via email on 19 August 2019 that no further modelling is required to address the above submission.

The updated modelling used the project related traffic generation assumption in the EIS, which was an additional five inbound and five outbound heavy vehicle trips in a worst-case hour on a worst-case day at the Hume Highway/Marulan South Road intersections.

The 2029 base AM and PM peak hour volumes comprised the combination of the historical background growth rate at RMS' traffic counting station near Marulan with the addition of the maximum traffic volumes of approved quarries also using the interchange intersections which may not have been captured in the 2015 traffic count (Gunlake, Ardmore Park and Lynwood quarries).

Background traffic is estimated to increase from 19,604 in 2015 by 18.2% to 23,172 in 2029. The contributions from other quarries at the interchange intersections not counted in 2015 will be:

- Gunlake Quarry – 25 and 29 vehicles using the interchange to U-turn in the AM and PM peaks respectively.
- Ardmore Quarry – 7 in and 7 out trips using the Jerrara Road branch of the Marulan South Interchange.
- Lynwood Quarry – 50 in and 50 out trips heading to and from the north of the interchange.

The Signalised and Unsignalised Intersection Design and Research Aid (SIDRA) program for the project was updated based on the above traffic volumes. The SIDRA results are expressed as level of service (LoS), degree of saturation (DoS) and average vehicle delay (AVD). The (Roads and Maritime Services, 2002) intersection criteria are summarised in Table 6.16. A LoS D or better is the desirable design criteria for intersections.

Table 6.16: LoS criteria for intersections

LoS	AVD (seconds per vehicle)	Traffic signals, roundabout	Give way and stop signs
A	<14	Good operation.	Good operation.
B	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
C	29 to 42	Satisfactory.	Satisfactory, but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode.	At capacity, requires other control mode.
F	>70	Intersection is oversaturated.	Oversaturated, requires other control method.

Tables 2 and 3 in Appendix E demonstrate that the intersections in the Marulan South Interchange will continue to operate at a LoS A with very low vehicle delays in the AM and PM peak hours in 2029.

6.11.3 Possible deregistration of Marulan South Road and provision of traffic signals

It is noted that the proposal seeks to realign a section of Marulan South Road and possibly deregister the affected section of Marulan South Road, with the aim of creating a section of private road. If the affected section of road becomes a private road and (as suggested

in the EIS) future intersection operation is provided via traffic signal control, the following should be complied with:

- If there is uncontrolled access to the site and it is open to any vehicle wishing to enter the site, then even if the road (i.e. Marulan South Road) is privately owned, it is regarded as a road related area under the Road Transport Act 2013 and RMS must authorise any traffic signal installation. Hence the design, installation and operation must comply with RMS policy and guidelines and approval must be gained from RMS prior to their installation; or
- If there is a controlled access to the site via a barrier, gate, security checkpoint or any other means, then the road (i.e. Marulan South Road) within the site is deemed a private road, in which case RMS has no role in the authorisation of traffic signals and the property owner is not obliged to follow RMS policy or guidelines. In this situation the property owner carries all the risk and RMS staff will not audit or comment on the design, installation or operation of the traffic signals. Noting that RMS policy and guidelines in regard to the design, installation or operation of traffic signals do exist it would be good practice in this scenario to use these documents for guidance.

Boral intends to control access to the mine with a security gate so that it is not publicly accessible. The implementation of access controls is dependent on the timing of the proposed road closures that are subject to ongoing negotiation with GMC and Crown Lands. Due to the protracted nature of these discussions Boral requests a condition be applied to reflect the requirements of RMS. It is anticipated that the future intersection would be controlled by signage as opposed to signalisation.

Boral acknowledges the existence of RMS's traffic signal guidelines and will consider these if it is determined to install and operate signals.

6.11.4 Proposed changes to the Marulan South Road speed limits

RMS notes the EIS and Traffic Assessment suggests a possible extension of the 60km/h speed zone to include the proposed new intersection of the realigned Marulan South Road. It is advised that RMS is the sole authority responsible for the review, installation or change of permanent speed zones across New South Wales.

Boral acknowledges RMS's submission and notes that it proposes to deregister the section of Marulan South Road subject to the potential speed limit change. The change in the speed limit zone would only occur following deregistration.

6.12 Department of Industry – Crown Lands

6.12.1 Crown roads

The proponent should make an application to the Department of Industry (DoI) – Crown Lands to close and purchase any Crown roads impacted by this proposal. The proponent should consult with the Department and Goulburn Mulwaree Council regarding any alternate legal access that may be required to ensure parcels of land benefiting from the current Crown road network do not become land-locked by this process.

Boral has investigated the potential close and purchase option suggested by DPI – Crown Lands. However, due to the extent of the active mining pit and the tenure of surrounding land there are no viable alternatives to providing legal access to Crown Reserves east of the mine.

Boral will not be seeking to close and purchase the identified Crown Roads. Boral acknowledges that retaining the existing Crown Road network may require future licence agreements.

6.12.2 Aboriginal land claim

Crown reserves including; R95804 (Part Lot 282//750029) and R750029 Parish or County Reserve (Lot 98//750029) are currently subject to Aboriginal Land Claims which are incomplete, being ALC38823 lodged 9 June 2015 and ALC38751 lodged 20 April 2015. The department cannot support a development proposal where the Crown land is the subject of undetermined or incomplete Aboriginal Land Claims. The proponent should consult with the Claimant in each case to seek possible removal of the claim over the Crown land before any approvals for works can be given.

Lot 282 in DP 750029 is located to the north of Peppertree Quarry, which is located north of Marulan South Limestone Mine. Accordingly, the subject parcel is not land to which the subject application or project relates. In this regard, Aboriginal Land Claim (ALC) 38823 is not considered to be a limitation to the progression of the application.

Lot 98 DP 750029 is located within the area of operations of the existing open pit mine and forms part of the land to which current Mining Lease, CML 16, applies. CML16 was entered into on 23 April 2004 and extends until 26 February 2023. As set out in the submission of DPI – Crown Lands, ALC38751 was lodged on 20 April 2015.

In this regard, Boral seeks Crown Lands to consider whether Lot 98 in DP 750029 parcel meets the requirement of “*claimable Crown land*” under the provisions of the *Aboriginal Land Rights Act 1983* (ALR Act) given it was “*lawfully used or occupied*” at the time the claim was lodged.

Boral is seeking to engage with the NSW Aboriginal Land Council in relation to the claim on Lot 98 DP 750029. However, we ask that Crown Lands provide a clear reference to the provisions of the ALR Act that prevents the granting on consent for the reasons set out in their submission.

6.12.3 Crown waterway reserve

The proponent should consider the potential for impacts on the Crown Waterway reserve south of Lot 3 DP 247199 and north of Lot 282 DP 750029 to ensure that all measures are taken to avoid damage or pollution to these areas.

Boral notes that Lot 3 DP 247199 is approximately 10 km west of the project area and that the waterway adjacent to that lot does not pass within or near the project area.

Lot 282 DP 750029 is adjacent to Tangarang Creek at the northern extent of the Peppertree Quarry pit. As summarised in Table 8.4 of the EIS, the north-west corner of the northern overburden emplacement and northern section of the western overburden emplacement will drain to tributaries of Tangarang Creek, and subsequently Tangarang dam. Sediment basins N2 and W1 will capture runoff in these areas and will have controlled discharges during heavy rainfall. As described in Section 8.2.2 of the EIS, the proposed water management system will provide a level of treatment consistent with the requirements of WaterNSW's (2015) *Neutral of Beneficial Effect on Water Quality Assessment Tool, Consultants and Consultant Administrator's User Guide*. This treatment will prevent pollution of this waterway.

There will be no direct impacts to the section of Tangarang Creek adjacent to Lot 282 DP 750029.

6.12.4 Occupation license

A licence will be required by the proponent to use or occupy Crown land within the project area before works within these areas or occupation of these areas can proceed.

Boral acknowledges this requirement.

6.12.5 Guarantee of outcome

The department cannot provide any guarantee of outcome in respect to road closings, the sale of any Crown land, removal of any Aboriginal Land Claims occurring within the project area or the granting of a licence to authorise proposed activities.

Refer to comments in sections 6.12.1, 6.12.2 and 6.12.4.

6.12.6 Compensation agreement

All Crown land and Crown roads within a Mining Lease must be subject to a Compensation Agreement issued under Section 265 of the Mining Act 1992, to be agreed and executed prior to any mining activity taking place and within 12 months of Project/ Modification Approval. The Compensation Agreement may include conditions requiring the Mining Lease Holder to purchase Crown land impacted on by mining activity.

Boral acknowledges this requirement.

6.12.7 Access arrangement

All Crown land and Crown roads located within an Exploration Licence, where subject to exploration activity, must be subject to an Access Arrangement issued under Section 141 of the Mining Act 1992, to be agreed and executed prior to any exploration activity taking place.

Boral acknowledges this submission.

6.13 Department of Industry – Fisheries

6.13.1 Marulan Creek dam

Marulan Dam should be constructed to be a leaky structure so that it maintains environmental flows to the aquatic habitats downstream.

As described in Section 8.2.2 of the EIS, Marulan Creek dam has been designed to release 0.3 ML of riparian flow per day to Marulan Creek and the aquatic habitats downstream.

6.13.2 Construction environmental management plan

DPI Fisheries requests the opportunity to review the draft Construction Environmental Management Plan for the construction of Marulan Dam. Erosion and sediment control measures should be implemented in accordance with Landcom's (2004) Managing Urban Stormwater: Soils and Construction.

Boral accepts this request and will make the draft construction environmental management plan for the Marulan Creek dam available for review in consultation with DPIE.

As described in Section 8.3.1 of the EIS, Boral proposes to implement erosion and sediment controls during construction of the Marulan Creek dam in accordance with Department of Environment and Climate Change (2008) *Managing Stormwater: Soils and Construction, Volume 2E – Mines and Quarries*.

6.13.3 Water management plan

DPI Fisheries request the opportunity to review the draft Water Management Plan.

Boral accepts this request and will make the draft water management plan available for review in consultation with DPIE – Fisheries.

6.13.4 Aquatic biodiversity monitoring

DPI Fisheries requests some justification as to why it is only proposed to monitor aquatic biodiversity for one year following the commencement of the 30-year mine plan.

As described in Section 3.8 of Niche Environment and Heritage (2018) *Marulan South Limestone Mine Continued Operations – Aquatic Assessment* (EIS Appendix L), the sampling program was considered a limitation of the assessment as sampling was not replicated, having only occurred in autumn and spring over one year. This provided an indication of temporal variability of populations over the year, but the lack of replication meant that changes over time could not be measured or used as a factor in statistical analysis.

Therefore, it is proposed to monitor baseline aquatic biota in autumn and spring over one year prior to the start of the 30-year mine plan. This will add to the baseline data and further capture temporal variation in stream health to which future monitoring can be compared.

As described in Section 6.3 of EIS Appendix L and Section 13.4.2 of the EIS, if a water quality trigger threshold is exceeded in consecutive monitoring events (in accordance with the trigger action response plan) and if additional assessment finds that the change in water quality may be mining induced, then Boral will contact a suitable qualified aquatic ecologist to determine if the exceedance is likely to affect aquatic ecology and design/conduct an aquatic ecological monitoring program if required. Monitoring will:

- be conducted up and downstream of the site where the water quality threshold was triggered;
- be consistent with the biodiversity management plan and surface water management plan developed for the Project;
- use methods appropriate for the level of assessment; and
- be conducted at a frequency and over a timeframe appropriate for the level of assessment.

6.14 Rural Fire Service

The NSW Rural Fire Service (NSW RFS) has reviewed the information provided and advises no objections are raised in relation to the proposal subject to the development complying with the following:

- **The aim and objectives of *Planning for Bush Fire Protection (PBP 2006)* or any subsequent version:**
 - Aim – to use the NSW development assessment system to provide for the protection of human life (including firefighters) and to minimise impacts on property from the threat of bush fire, while having due regard to development potential, on-site amenity and protection of the environment.

Bushfire risks associated with the project were assessed in Section 23.4.1 of the EIS. As described in the EIS section and summarised below, bushfire poses a low threat to human life and Boral's property as:

- > no buildings are in proximity to areas of contiguous bush fire hazard vegetation;
- > buildings are separated from small areas of vegetation by cleared trafficable hardstand areas, access roads or managed grass; and
- > grass near buildings is mowed at appropriate times of the year to reduce fire risk.

Given the above, bushfire risk will not significantly impact the development potential of the land and, therefore, significant bushfire protection measures such as wide asset protection zones will not require implementation. As significant bushfire protection measures are not required, there will not be a significant environmental impact from implementation of bushfire management measures. The application is for continued and expanded use of the site for mining, therefore, on-site amenity is not a significant concern as there will not be any permanent residents.

- Objectives

- > Afford occupants of any building adequate protection from exposure to a bushfire:

No buildings are in proximity to areas of contiguous bush fire hazard vegetation. All buildings are equipped with firefighting systems in accordance with Australian standards.

- > Provide for a defensible space to be located around buildings:

Buildings are surrounded by cleared trafficable hardstand areas, access roads or managed grass which are wide enough to accommodate firefighters.

- > Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition:

No buildings are in proximity to areas of contiguous bush fire hazard vegetation and buildings are separated from small areas of vegetation by cleared trafficable hardstand areas, access roads or managed grass.

- > Ensure that safe operational access and egress for emergency service personnel and residents is available.

Emergency vehicles can access the site via the public Marulan South Road. Most internal roads can accommodate heavy fire fighting appliances. Local RFS brigades can access the site in liaison with site management. There will not be any permanent residents at the project.

- > Provide for ongoing management and maintenance of bush fire protection measures, including fuel loads in the asset protection zones:

Site buildings do not require asset protection zones as no buildings are in proximity to areas of contiguous bush fire hazard vegetation. Notwithstanding, grass near buildings is mowed at appropriate times of the year to reduce fire risk and buildings are separated from small areas of vegetation by cleared trafficable hardstand areas, access roads or managed grass.

- > Ensure that utility services are adequate to meet the needs of firefighters (and others assisting in bush firefighting).

As described in Table 3.3 of the EIS, there are four existing dams on-site with total volume of 93 ML which will be available to supply water during fire emergencies.

- **Identification and management of potential ignition sources during construction and operation of the development especially on days of Total Fire Ban or Catastrophic fire weather:**

Potential ignition sources during construction and operation of the project are described in Section 23.4.1 of the EIS and include grass fires sparked by the hot exhaust of vehicles driving or parking in long, dry grassland; fires sparked during hot work activities such as welding; clearing of vegetation for overburden emplacement activities; or stockpiling of removed vegetation and timber (prior to reuse in revegetation or rehabilitation) contributing to a fuel source for ignition.

As described in Section 23.5.1 of the EIS, sources such as exhaust of vehicles driving and parking in long grass and welding would not contribute to fire risk during total fire bans and catastrophic fire weather as these activities will be curtailed during these conditions.

- **Ensuring that the storage of fuels and other hazardous materials is undertaken so that their impact on a potential bush fire is minimised:**

As described in Section 23.3.1 of the EIS, combustible materials are stored and used in accordance with:

- Diesel, petrol, oils and grease – Australian Standard 1940:2004 The Storage and Handling of Flammable and Combustible Liquids.
- Liquid petroleum gas – Australian Standard/New Zealand Standard 1596:2008 The storage and handling of LP Gas.

These standards require combustible materials to be stored in a manner that prevents them from igniting and at distance from potential hazards. Therefore, these materials are not stored near bushfire prone vegetation and will not contribute to bushfire risk.

- **The implementation of a suite of bushfire protection measures for the development, including ongoing vegetation management and fire suppression capabilities:**

As described in Section 23.5.1 of the EIS, bush fire risk is assessed before the start of the bush fire season each year, which informs upcoming risk reduction activities and locations.

The existing Marulan South Operations Bushfire Management Plan contains a suite of bushfire response measures and will be updated for the project in consultation with the RFS.

- **The provision of adequate operational access for firefighting appliances to the site in accordance with *PBP 2006* or any subsequent version:**

Fire fighting vehicles will be able to access the site during a bush fire emergency. Internal and perimeter roads are maintained to a high standard to enable access for mine vehicles and can easily accommodate fire fighting vehicles.

- **The preparation of a Bush Fire Emergency Management and Evacuation Plan which is consistent with *Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan 2014*:**

As described in Section 23.5.1 of the EIS, Boral will update the existing Marulan South Operations Bushfire Management Plan for the project in consultation with the RFS. The update will include a gap analysis of the existing plan against *Development Planning – A Guide to Developing a Bush Fire Emergency Management and Evacuation Plan 2014* and revising the plan where necessary to be in accordance with this document.

CHAPTER 7

RESPONSE TO PUBLIC
SUBMISSIONS

7 RESPONSE TO COMMUNITY AND ORGANISATION SUBMISSIONS

7.1 Introduction

This chapter addresses the community and organisation submissions, which have been paraphrased and grouped into community and environmental themes as per the submissions matrix in Appendix A.

7.2 Water

7.2.1 Tallong dam

A significant proportion of all submissions received, objected to the use of water from Tallong dam to fill the proposed Marulan Creek dam and raised the following extenuating and related matters:

- the capacity difference between Tallong dam (85ML) and the proposed Marulan Creek dam (118ML);
- the impact of the “draining” of Tallong dam to fill the proposed Marulan Creek dam on firefighting capacity, biodiversity, and the impact on supply of water to Barber’s Creek;
- the loss of a public asset and resource including the loss of a recreational and scenic resource; and
- the intended use of the water for “storage” purposes only.

As described in Section 5.1 of this report, Boral will not use water from Tallong dam to fill the Marulan Creek dam and will continue to only extract water from Tallong dam within its existing 76 ML/year entitlement. As such the described impacts will not arise. Notwithstanding, each matter has been considered in turn below.

Use of Tallong dam to fill Marulan Creek dam

Most public submissions contained comments expressing concern about the impact of the project on Tallong dam and Barbers Creek from water extraction from Tallong dam to fill the proposed Marulan Creek dam. As described in Section 5.1 of this report, Boral will not use water from Tallong dam to fill the Marulan Creek dam and will continue to only extract water from Tallong within its existing 76 ML/year entitlement.

Further, Boral’s use of Tallong dam will reduce gradually in the early phases of the mine plan as Marulan Creek dam commences providing water to the mine. Impacts to Tallong dam and Barbers Creek downstream of the dam will remain the same as currently occurs for approximately the first three years of the mine plan. After that time, Boral will progressively reduce its use of water from Tallong dam, with a concurrent reduction in potential impacts on the dam or the section of Barbers Creek between the dam and the confluence with Marulan Creek.

Boral will transfer water from the Marulan Creek dam to the mine by a new connecting (offshoot) pipe from the proposed dam to the existing water supply pipeline. The water supply pipeline will not be used to supply water from Tallong dam to Marulan Creek dam.

Recreation use and value

Seven submissions raised the impact of draining Tallong dam on its recreational value. As described in this section, Boral will not drain or use Tallong dam to fill the proposed Marulan Creek

dam. Further, Boral's use of Tallong dam will progressively reduce. Therefore, Boral's activities will not impact the community's access to the recreational values of Tallong dam.

Public asset

Submissions stated that the water in Tallong dam is a public asset and not Boral's private asset and that taking water from the dam amounts to de facto privatisation of a public community asset. Tallong dam, as an infrastructure asset, is owned by Sydney Trains, which is a NSW statutory authority. As described in Section 5.1.1, Boral leases the dam from Sydney Trains and has a valid water access licence (WAL) that support the use water captured by the dam up to an within its entitlement and the condition of the licence.

Further, as described in Section 6.2.1 of this report, the dam is in the *Greater Metropolitan Region Unregulated Area Water Sharing Plan* and the water contained within is legally tradable within the Barbers Creek Management Zone of the plan. Boral holds 87 ML of entitlement within the management zone of which 76 ML can be extracted from Tallong dam per annum.

Therefore, Boral has legal rights to use the water in Tallong dam under its lease arrangement with Sydney Trains and WAL. Arguments relating to privatisation of public assets is outside the purview of this RTS, however, Boral notes that its lease arrangement of the dam with Sydney Trains is not preventing public use of the dam for recreation.

7.2.2 Need for Marulan Creek dam

Submissions have stated that Marulan Creek dam is proposed for "storage" purposes only and the mine will not require the proposed dam as water is already supplied from Tallong dam and on-site sources

The increased scale of the operation requires increased water supply of up to up to 183 ML of water per year. The proposed dam will support an average of 98 ML of water per year. A detailed water balance including demand is described in Section 8.2 of the EIS and Section 7.6 of the surface water assessment (EIS Appendix J). Without Marulan Creek dam the mine would have a significant short fall of water. Therefore, the proposed dam will not only be used for storage of water but will be an integral in meeting the mine's water demand.

As outlined in Chapter 8 of the EIS, dust suppression will account for approximately 60% of mine water use, providing a strong justification for the proposed mine water storage dams and the Marulan Creek dam, which are essential for dust suppression and minimising dust emissions.

Once Marulan Creek dam is operational, Boral will progressively reduce extraction of water from Tallong dam during Stage 1 and eventually cease use all together.

7.2.3 Water entitlements

A submission stated that Boral is not entitled to take water from Tallong dam. Boral has an existing entitlement to take 76 ML/year from Tallong dam (WAL25207).

The Marulan Creek dam will be in the Barbers Creek Management Zone and will require a surface water entitlement of up to 183 ML/year. Negotiations are ongoing to secure the additional entitlements.

7.2.4 Use of water by council

A submission expressed displeasure with council taking water from Barbers Creek. Boral notes it is a separate entity to council and does not influence its water use decisions.

7.2.5 Groundwater impacts

The following matters were raised in relation to groundwater use and impacts:

- two submissions raised concern that draining of Tallong dam would impact adjacent landowner's water bores; and
- one submission indicated that EIS was silent on controls and limits on groundwater use from groundwater production wells WP 16 and 17.

As described in sections 5.1 and 7.2 of this report, Boral does not intend to drain Tallong dam to fill the proposed Marulan Creek dam. As the described action does not form part of the development proposed it was not and is not required to be assessed for impact.

As described in Section 6.3.10 of the EIS, Boral holds WAL24697 to extract 12 ML/year from groundwater production wells WP 16 and 17. As described in Section 6.5.2 of this report, Boral may stop using groundwater production wells WP 16 and 17 after year 3 of the mine plan due to the northwards expansion of the pit. As described in Section 6.5.2 of this report, the northwards expansion of the pit will require the relocation of these wells for continued groundwater monitoring purposes.

7.3 Amenity

7.3.1 Overview

Submissions stated that the proposal will result in expanded mining and overburden emplacement areas which will create more noise, dust and is not compatible with the land use objectives of the RU1 zone. In terms of general amenity, submissions stated the proposal if approved would result in a severe community-wide diminution in amenity in an otherwise vibrant, scenic community.

The sections below summarise the noise and air quality results of the EIS to demonstrate that the project will not significantly impact sensitive receivers near the mine. Zoning matters are addressed in detail in Section 7.10 of this report, which demonstrates the project is generally compatible with the zone objectives.

Additionally, it is noted that the intent of the zone is to support resource utilisation and primary production activities and there is a reasonable expectation that primary production activities will generate a level of noise and dust.

The project will not significantly impact amenity and will be generally consistent with the zone objectives, the purpose of which is to maintain a rural/primary production landuse in the area with corresponding levels of amenity.

7.3.2 Noise impacts

Impacts

61 submissions stated that noise is currently heard in Tallong and Marulan beyond the northern side of Highland Way, and that adding to operations will adversely impact resident's comfort and amenity, and that no remedial or mitigation activities are proposed.

As described in Section 19.3.1 of the EIS, noise levels at Receiver 13 will be a maximum of 24 dB during the day and 25 dB at night, which is the nearest receiver along Highland Way (located south of the road) to the mine. These levels will be far below the day (40 dB) and night (35 dB) noise trigger levels. Therefore, it is very unlikely excessive noise will be experienced at residences north of Highland Way and their amenity will not be diminished.

The submissions seek additional management and mitigation measures including the provision of a vegetated noise buffer. As outlined above, given the predicted noise exposure of residential receivers is well below the established criteria these measures are not considered necessary.

Cumulative impacts

Submissions stated the cumulative effects of pollution will diminish resident and community amenity. The pollution related matters included noise.

Noise assessments under the *Noise Policy for Industry* inherently consider cumulative impacts as the noise trigger levels are derived from either the project intrusiveness or amenity noise level, whichever is determined to be lowest. The intrusiveness level seeks to not increase noise by more than 5 dB over background noise levels and the amenity level seeks to prevent the ambient noise level of all industrial noise sources in an area combined from exceeding a recommended level.

Residual noise impacts are determined by subtracting the noise trigger level from the noise predicted to be generated by the project. As described in Section 19.3.1 of the EIS, the mine will not result in residual noise impacts at any private receivers during the day, evening or night.

7.3.3 Air quality impacts

Impacts

Submissions raised air quality as a matter of general concern in connection with the proposed increase in operations and the emplacement of overburden.

As shown in Figure 4.7 of the EIS, the overburden emplacements will not be developed simultaneously. As described in Chapter 4 of the EIS, the overburden emplacements will start being rehabilitated soon after sections of each emplacement are complete. Therefore, only a small area compared to overall emplacement areas will be active and exposed at any one time, which will reduce opportunities for dust generation.

Other than minimising the area of disturbance (exposed soil) and staged rehabilitation, the primary management measure for minimising dust is suppression using a water cart on haul roads.

Cumulative impacts

Submissions stated the cumulative effects of pollution will diminish resident and community amenity. The pollution related matters included air quality.

Air quality assessments are required to assess the cumulative air quality impacts of proposals in reference to relevant criteria, that is, for PM_{2.5}/PM₁₀ emissions, total suspended solids and dust deposition emissions. The cumulative impacts refer to the combined potential impacts of the proposal plus all other air pollutant sources in the area.

These potential pollutants are described below:

- Particulate matter (PM_{2.5}/PM₁₀) – a mixture of solid and liquid particles suspended in the air from sources such as the burning of materials or mechanical breaking down of material like grinding and crushing of rocks. These particles are small enough that they can penetrate the respiratory system and cause irritation and other health effects. PM_{2.5} are particles with diameter less than 2.5 microns and PM₁₀ are particles with diameter less than 10 microns.
- Total suspended solids refers to the mass of all particulates in the air, including PM_{2.5}/PM₁₀ and larger particles. Sources include those described above plus other sources of dust such as wind and vehicle movements on unsealed surfaces.
- Deposited dust refers to any dust that falls out of the air and deposits on surfaces.

As described in Section 17.2.3 of the EIS, two widely used methods were used to estimate cumulative impacts from PM_{2.5} emissions as there is no prescribed method in NSW. One of these methods estimated PM_{2.5} emissions from the project would be 16.1 microgram per cubic metre (µg/m³) and the other estimated emissions of 8.2 µg/m³. Each estimate is well below the cumulative criterion of 25 µg/m³.

The assessment of PM₁₀ impacts over five days at the nearest privately-owned receivers (systemic impacts) showed the highest concentration at the nearest affected receiver will be 48 µg/m³, which is 2 µg/m³ below the 24-hour average criterion of 50 µg/m³.

Cumulative criteria for total suspended solids and dust deposition will not be exceeded at any privately-owned receivers.

7.4 Community engagement

7.4.1 Statutory exhibition

Two submissions raised concern regarding the exhibition of the application. The range of concerns included the adequacy of direct notification to all relevant communities, the availability of the EIS, the duration of the exhibition period and timing that coincided with school and public holidays when residents may have been absent.

Statutory exhibition timeframes and notification, including direct mail outs to communities is a matter addressed by Government and not the applicant. The application and the EIS was exhibited for the statutory period of 28 days from 4 April 2019 to 1 May 2019 this included notices in the locally circulating paper, the Goulburn Post.

The timing of the exhibition was not planned to coincide with the Easter and Anzac holidays. It was an outcome of other application processes that occur 'behind the scenes', including the DPIE 'test of adequacy' process that seeks to ensure that an EIS placed on exhibition has addressed the Secretary's environmental assessment requirements.

In this instance, as the application does not propose any change to the use of water currently drawn from Tallong dam, the community of Tallong may not have been directly notified through the statutory exhibition process. Boral further recognises that its consultation processes and engagement focus did not specifically target this group. Boral has subsequently reviewed its engagement strategy and adapted accordingly.

As set out in Section 4.1, Boral on becoming aware of community concern, particularly those of the Tallong community, took action to respond to these concerns.

7.4.2 Access to information

Submissions stated that the application documents were difficult to access and that review of them by a typical landholder is effectively impossible.

The EIS was made available on DPIE's website for electronic download and was also made available in hard copy at GMC civic centre at 184-194 Bourke Street, Goulburn and at DPIE offices at 320 Pitt Street, Sydney.

7.4.3 Boral communications

One submission has raised concern regarding communications with Boral during the statutory consultation period. The issues raised are generally summarised as followed:

- timeliness of response to direct enquiries;

- adequacy and accuracy of responses provided; and
- representations made by Boral in relation to the application.

The submitter first engaged with Boral on 15 April 2019 seeking clarity on several aspects of the proposal. The statements raised were made in email and for the purposes of clarity a copy of this email is provided in Appendix G. Boral responded on 23 April 2019, approximately four working days from receipt of the questions and six days before the end of the exhibition period.

Enquiries made by the submitter were focused on confirmation that the proposal related only to Marulan South Limestone, the extent of the mine pit, the location of overburden emplacements and proposed road transport limits.

The submitter alleges that Boral's Planning and Development Manager misled their client on the basis of the words "*without effect*" in terms of the extent of the expanded mine pit.

Boral's Planning and Development Manager's response sought to provide a clear and factual response that was supported by reference figures, taken directly from the EIS, aimed at allowing the submitter to make an informed judgement. At no time did Boral provide any commentary in relation to the potential for impact on adjacent landholdings as demonstrated in the correspondence provided in Appendix G, the phrase "*without effect*" is that of the submitter and not Boral.

7.5 Traffic and access

7.5.1 Traffic

Two submissions raised concerns in relation to traffic and access matters. The majority of the issues set out below are attributable to a single submission. Across the two submissions the only common issue raised was the increase in vehicle movements. The key sub-themes in relation to traffic included:

- the impact of existing heavy vehicle movements on other road users, in particular in relation to speed and safety;
- the potential impact of increasing road vehicle movements and the potential to cause congestion;
- noise impacts associated with increasing road vehicle movements;
- potential alternatives to avoid increasing road traffic movements; and
- upgrade works to Marulan South Road, delivery and mitigation for no. 450 Marulan South Road.

As described in Section 21.2.3 of the EIS, there will be total (existing plus additional) maximum of 266 two-way truck trips per day along Marulan South Road.

The Project will result in an additional 68 heavy vehicle movements (two-way trips) or 34 truckloads (one-way trips) per average day which equates to an additional 4–6 heavy vehicle movements (two-way trips) or 2–3 truckloads (one-way trips) per average hour.

The Project will result in an additional 116 heavy vehicle movements (two-way trips) or 58 truckloads (one-way trips) per worst case day, which equates to an additional 10 heavy vehicle movements (two-way trips) or 5 truckloads (one-way trips) per worst case hour.

The project would result in no more than one additional truck along Marulan South Road every 10-15 minutes on a typical (average) day and one additional truck every 6 minutes on a worst-case day. Therefore, people travelling along Marulan South Road between their properties and

the Hume Highway (maximum five kilometres one way) are only likely to pass up to one additional truck once the maximum heavy vehicle movements associated with the project are reached.

This increase in traffic will not change the average vehicle delay at the minor intersections along Marulan South Road. As described in Section 6.11.2 of this report, additional intersection modelling for the 10-year post-approval scenario demonstrated the intersections in the Marulan South Interchange with the Hume Highway will continue to operate at a level of service A (good operation) with very low vehicle delays in the AM and PM peak hours in 2029. This includes project related vehicles plus the vehicles associated with other sources of heavy vehicles such as Gunlake, Ardmore and Lynwood quarries.

As described in Section 19.3.3 of the EIS, the additional traffic will result in a 2 dB increase in noise levels at receivers along Marulan South Road during the day, and 1 dB at night. These increases are within the traffic noise criterion at all receivers. The *NSW Road Noise Policy* states that an increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

Dust emissions from road transport of mine products were not assessed as this potential source is a negligible contributor to regional air quality indicators given that trucks are and will continue to be covered with tarpaulins prior to departing site.

in relation to road safety, Boral proposes to upgrade Marulan South Road as described in Section 4.4.6 of the EIS. This will likely involve:

- widening sections of the road;
- rebuilding sections of the road in poor condition;
- resealing the road;
- widening and sealing driveways thereby improving school bus stopping and turning areas; and
- improved safety standards from those of the current road design and condition.

Boral continues to discuss the extent and scope of upgrades required to Marulan South Road with GMC. An initial condition survey is targeted for Q4 2019 that will inform the negotiation and delivery of these works. The concern of the community in the timing of the upgrades is noted, at this stage Boral envisages delivery of the upgrade works as soon as practicable following the completion of the necessary assessments and application approval. Boral would accept a condition of any future approval that prohibits additional truck movements until such time as the upgrades are complete.

7.5.2 Alternative access route

One submission raised the possibility of an alternative access route involving the upgrade of a portion of Marulan Creek Road and construction of a new road through Boral owned land.

This option was investigated by Boral and determined to be unviable.

7.6 Biodiversity

Biodiversity impact

A submission requested that bird life and other wildlife in the area be assessed. Biodiversity was assessed by Niche Environment and Heritage, with the biodiversity assessment report provided in Appendix K and summarised in Chapter 12 of the EIS, with impacts that cannot be avoided described below.

Submissions stated that the project will have a detrimental impact on flora and fauna in ecosystems in and around Tallong dam, Barbers Creek and the homestead dam. As described in Section 5.1 of this report, Boral will not be extracting any water from Tallong dam or the homestead dam additional to its existing entitlements under WAL25207 and WAL25373. Therefore, Boral's activities will not result in any additional impact to flora and fauna in and around the above water bodies.

A submission stated loss of 256 ha of habitat will adversely impact fauna. As described in Section 12.3 of the EIS, the project will involve clearing approximately 182.4 ha of native vegetation. Most of the vegetation to be affected by the project has been subject to historic clearing, grazing and other agricultural activities and is therefore thinned, fragmented and contains the introduced Serrated Tussock.

As described in Section 12.5 of the EIS, there will be residual biodiversity impacts from development of the project. A biodiversity offset strategy has been developed to offset these residual impacts and involves purchase of a 1000 ha and a 360 ha property in the Bungonia region. Biodiversity offset sites will be established on these properties and will be managed for biodiversity conservation purposes in perpetuity. The property selection process involves surveying vegetation on the properties to ensure it provides good quality habitat for communities and species potentially impacted by the project.

The project is unlikely to result in impacts to biodiversity in adjacent protected areas. At the closest point, vegetation clearing will be approximately 350 m from Bungonia NP, and over 750 m from Morton NP.

Rehabilitation

A submission stated that rehabilitation will not replace removed hollow bearing trees and their nesting habitat.

As described in Section 12.4.2 of the EIS, disturbed areas will be rehabilitated to a landscape dominated by White Box Yellow Box Blakely's Red Gum Grassy Woodland. As described in Section 26.1.3 of the EIS, previous rehabilitation at the mine has had mixed success and the proposed rehabilitation will be informed by lessons learned from previous programs, including:

- using appropriate soils;
- replicating natural slopes; and
- improving water supply.

Over time this rehabilitation will replace the habitat features lost from disturbance for mine establishment. Additionally, as described above, vegetation impacts will be offset through the purchase and protection of offsite vegetation which contains similar habitat values.

7.7 Visual impact and light pollution

A submission stated that visual impacts to residents and the community will result from the increased scale, addition of new pits to the north and addition of new overburden emplacements to the north, northwest and west. It also stated there will be light pollution from activities at night and the frequent use of explosives and other extractive techniques will result in regular billowing clouds of dust and colloidal pollutants.

Visual impacts

The expansion of the north pit slightly north, is relatively minor in nature and will not have the effect of expanding the entire project north as it is constrained by Marulan South Road and the adjacent Peppertree Quarry.

As summarised in Section 20.5 of the EIS, despite the scale of the disturbance footprint, the project has a low overall visual exposure to its visual catchment. Despite there being several rural properties and commercial operations within 3 km of the closest part of the project (medium viewing distance and sensitivity classes), there is low visual exposure of the project to those receivers and most have no views of it.

Parts of the project are exposed to views from two reserves, Bungonia and Morton national parks. There would be some residual visual impacts on these locations, as mitigation will reduce, but not eliminate impacts, especially during the construction of the overburden emplacements and during the establishment of vegetation on the emplacement slopes.

Potential visual impacts on homestead and outbuildings are addressed in Section 7.9 of this report.

A submission states that the areas of the mine viewable from the Bungonia Lookdown will commence rehabilitation around 2039 and requests that works be staged to 'repair' the view from the lookdown many years earlier. As described in Section 4.5.2 of the EIS, the in-pit section of the southern overburden emplacement (visible from the Bungonia Lookdown) will start being rehabilitated in Stage 1 of the project. As described in sections 4.5.3 to 4.5.5 of the EIS, this rehabilitation will continue during each stage of the project until the southern overburden emplacement, including in-pit sections, is completely rehabilitated.

Accelerating emplacement in the southern end of the south pit to complete it prior to emplacement in the western overburden emplacement would sterilise limestone resource, which would impact project economics and Boral's obligations to sustainably and efficiently extract the limestone.

Light pollution and blast impacts

As described in Section 3.2 of the EIS, current operations are 24-hours, 7 days per week. Existing general and security lighting would remain largely unchanged and would continue to have the same or similar visual effects.

As described in Section 8.3 of *Air Quality Impact Assessment – Marulan South Limestone Mine Continued Operations*, blasting was included in the mining activities that were modelled/assessed for their potential air quality impacts. According to Table 8.1 of the above document, blasting will represent approximately 0.2% of all dust potentially generated at the mine. Given that dust generated by the mine will be below criteria at nearby residences, as described in Section 7.3.3 of this report, and that dust from blasting represents a tiny proportion of all dust potentially generated by the mine, it corresponds that this tiny amount of dust will not significantly detract from the visual amenity of the area.

Additional to above, and as described in Section 17.2.6 of the EIS, the proposed sizes of blasts were compared to typical blasts at Hunter Valley coal mines to estimate potential fume impacts. The blasts at the project will be much smaller than those at the coal mines, which can impact up to 2 km from the mine conducting the blast. This comparison demonstrated blast impacts are unlikely to reach the nearest privately-owned receivers and impact their visual amenity.

7.8 Environmental audit

A submission requested DPIE to require Boral to audit the environmental performance of the mine prior to consideration of the EIS. The EIS technical studies are based on environmental data gathered at the mine over a number of years, which has allowed the specialists, Boral and DPIE to assess the mine's past environmental performance during the EIS production and review process.

It is typical for DPIE to condition the requirement for an independent environmental audit of mines a few years after the commencement of construction/operations, and for the preparation and public exhibition of annual environmental management reports.

Boral is required to make data gathered under the monitoring requirements of the mine's EPL publicly available, which it does so here (including a summary of compliance with the EPL conditions): <https://www.boral.com.au/our-commitment/environmental-reporting>.

Given the above, the requirement for Boral to undertake an audit of the environmental performance of the mine prior to DPIE considering the EIS would be unnecessary and unreasonable.

7.9 Historic heritage

General

A submission stated that the EIS has ignored the local heritage value of the Marulan and Tallong area.

Marulan township was officially gazetted on 11 March 1835. Tallong, originally known as Barbers Creek township, was significantly developed around 1878. Both towns have associations with historical development phases of Australian rural production and industry. As described in Section 2.4.2 of the EIS, there are no heritage items in the project boundary listed under an environmental planning instrument or legislation and the site is not in a heritage conservation area. The Homestead and outbuildings (listed as having local historical significance under the LEP) is a minimum of 2.4 km from any project components and there is unlikely to be any impacts to its heritage value.

In the wider area, there are listed heritage items around the Hume Highway/Marulan South Road Interchange, Marulan Village and Tallong village. Of these items, only those around the interchange will be near activities associated with the project, which will be vehicle movements in the interchange and along the Hume Highway. These vehicles will be using existing infrastructure, which is heavily used, and will not impact the curtilage of the heritage items.

Figure 1.1 of the EIS provides an overview of the developmental history of Marulan South Limestone. The timeline of the development commences in 1826 when the site was explicitly excluded from settler land grants to ensure that the limestone deposits could be accessed for resource extraction (as opposed to broad acre agriculture). Limestone mining commenced in 1830 and has been a feature of the area since representing a significant (past and present) contribution to the developmental history of the area.

The mine is intrinsically linked to the historical development of the region and its towns, employing generations of local residents and supporting local economic development.

The homestead and outbuildings

A submission has raised concern regarding the extent to which the EIS assessed the potential impacts of the development on a locally listed homestead and surrounding buildings both direct and indirect (identified in the assessment documentation as Receiver 13). These include:

- direct impacts associated with the northern overburden emplacement and scale of the operation on the heritage value of the buildings (the homestead and outbuildings) and their setting; and
- indirect impacts associated with dust associated with the northern overburden emplacement.

The Homestead, outbuildings is listed as a local item (I314) of significance under the Goulburn Mulwaree Local Environmental Plan 2009 (GMLEP2009). Boral was unable to verify the claims the property was both a State and Commonwealth item as it does not appear on any statutory inventory other than the LEP.

The LEP inventory listing indicates that the heritage value of the homestead and outbuildings is derived from the architectural style of the buildings (Georgian style country home) and the property's association with the history and economic development of the district. The listing does not extend to include the setting, gardens or grazing lands.

The homestead and outbuildings is located to the north and upslope of the mine at a distance of approximately 2 km to the proposed dam and approximately 4.8 km to the northern limit of the proposed overburden emplacement and pit extension.

On the basis of distance alone it is unlikely that the continuation and expansion of the mine pit would have an unreasonable impact (direct or indirect) on the built form and architectural value of the Homestead and outbuildings. Moreover, the mine has been active for approximately 160 years and predates the construction of the homestead (circa 1840). It is acknowledged that the mine extent has increased during this time, however, it is reasonable to infer that it is very much a part of the physical and visual landscape. In this regard, the proposal does not significantly alter the setting of the homestead property so as to cause a diminution of its heritage value.

This conclusion is supported by the assessment set out in in Section 20.3.3 and presented in Figure 20.18 of the EIS, that the northern overburden emplacement will have low visual impact on the homestead and outbuildings as, even though there will be direct visibility, it is approximately 4.8 km from these items and only the highest part of the emplacement has the potential to be visible. Additionally, it was the visual impact specialist's opinion that the viewscape has high physical absorption capacity and the emplacement has high mining/industrial compatibility and high rural/natural compatibility.

As described in Section 7.3.3 of this report, the homestead and outbuildings will not be significantly indirectly impacted by dust as quantities of potential pollutants will be below criteria at all private receivers near the mine.

7.10 Planning considerations

7.10.1 Land use zone and objectives

Three submissions stated the project conflicts with all the objectives of the RU1 Primary Production zone of GMLEP 2009 and is therefore incompatible with the zone.

The general purpose of the RU1 Primary Production zone is to utilise the natural resource base with the principal function of supporting and allowing primary production.

The existing and continued operation of the limestone mine involving the extraction of a 'mineral' is defined as an 'open cut mine' for the purposes of the GMLEP 2009 and is permissible within the zone. The general intent of the operation is to extract and utilise resources as a form of primary production. The described activity is therefore consistent with the general intent of the zone.

The land use table adopted by clause 2.3 (1) of GMLEP 2009 for land zoned RU1 Primary Production zone permits a range of uses from primary industry production (agricultural and resource extraction) to higher end uses such as light industry. This range of permitted uses is reflected in the immediate context of the mine, wherein the following uses are noted to have been approved and operate:

- an agricultural lime manufacturing facility;

- a quarry; and
- livestock grazing.

It follows that in order to enable the diversity of the land uses permitted that the objectives of the zone must also be broad. In this regard, not all objectives will be relevant to all land uses or applications and a consent authority has discretion in this regard, a fact recognised in the submission where only six of a possible 10 have been identified as being 'applicable'. This view is further supported by clause 2.3 (2) of the GMLEP that states the following:

*The consent authority **must have regard** to the objectives for development in a zone when determining a development application in respect of land within the zone.*

The construction of this clause is clear, there is no statutory requirement for development to demonstrate consistency with the objectives but rather a requirement for a consent authority to have regard to the same. Thereby this allows discretion to determine development to be compatible with a zone without the need for consistency with all objectives.

The proposed development, to continue and expand an 'open cut mine' is considered to be generally consistent with the relevant objectives of the zone. As outlined above, it is not required for the development to be consistent with all objectives, nor is it reasonable.

Each of the zone objectives are addressed below.

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.* The project will facilitate sustainable primary production by enabling the extraction of limestone and clay shale in a manner which does not prevent the use of natural resources on adjacent land. No land used for other purposes, such as agriculture, will be subsumed by the project.
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.* Continuation of mining will enable continuation of a diverse mix of primary production land uses in the area and in Marulan, which comprise the existing mine, Peppertree Quarry, quarries to the west of the mine, grazing and a poultry and turkey farm.
- *To minimise the fragmentation and alienation of resource lands.* The application reinforces the objective, proposing continuation of the use on appropriately sized allotments that support the orderly and economic use of resources land. Buffer land surrounding the mine serves to avoid and mitigate potential land use conflict with adjoining operations while supporting continued agricultural pursuits including livestock agistment and grazing.
- *To minimise conflict between land uses within this zone and adjacent zones.* The project will not result in conflict within the RU1 zone as the other activities in the zone are extractives (Peppertree Quarry) and the Aglime Fertiliser Facility, which uses mine products in its processes. As described in this report, the project will not result in significant direct or indirect impacts to adjacent lands preventing landholders from using those lands for primary production or public use of land zoned environmental management.
- *To promote the use of agricultural land for efficient and effective agricultural production.* As described above, the project will not prevent ongoing use of land surrounding the mine for continued or new agricultural activities or pursuits. Further, the project will enable continued supply of limestone to the agricultural lime facility, which will subsequently facilitate continued supply of fertilisers to agricultural producers.
- *To avoid or minimise impacts on the natural environment and protect environmentally sensitive land.* As described in the EIS and this report, the project will not have significant residual water, noise, air quality, visual, traffic, heritage or groundwater impacts. As described in Section 7.6 of this report, the project will have residual biodiversity impacts. However, a biodiversity offset strategy has been prepared to offset these impacts. As described in Section 7.1 of the EIS, a polycentric approach was taken to mine and assessment planning for the EIS. This involved mine planners describing their preferred project layout and specialists presenting potential environmental constraints and issues associated with the mine plans. The mine plans were

revised in an iterative manner so that environmental impacts were reduced to the lowest possible extent. The ultimate goal was to avoid all significant environmental impacts and where not possible to minimise and mitigate impacts, or as a last resort offset these impacts.

- *To allow development of non-agricultural land uses which are compatible with the character of the zone.* The project will facilitate continued extraction of limestone, which is a non-agricultural land use. As described in the introductory paragraphs of this section, the project is compatible with the character of the zone as resource extraction is one of the permissible uses within the zone, the project is to continue to extract and utilise resources as a form of primary production which is consistent with the general intent of the zone and resources will continue to be extracted from the site without any significant impact on other operations within the zone e.g. Aglime Fertilizers.
- *To allow the development of processing, service and value-adding industries related to agriculture and primary industry production.* This objective is directly relevant to the project. As set out above, the objectives have been drafted in response to a range of permissible land uses including 'light industry' that would facilitate 'value adding' and 'service' industries. As described in sections 3.1.5 and 4.4.1 of the EIS, the project will facilitate production of various limestone products from extracted limestone. Further, the project will enable continued supply of limestone to the agricultural lime facility, which will subsequently facilitate continued agricultural activity.
- *To protect and enhance the water quality of receiving watercourses and groundwater systems to reduce land degradation.* As described in Section 8.2.2 of the EIS, the proposed water management system will provide a level of treatment consistent with the requirements of WaterNSW's (2015) *Neutral of Beneficial Effect on Water Quality Assessment Tool, Consultants and Consultant Administrator's User Guide*. The proposed water management system will reduce sediment loads in the pit, which will result in less sediment discharge to groundwater and its receiving waters.
- *To minimise the visual impact of development on the rural landscape.* As described in Section 7.7 of this report, the project has a low overall visual exposure to its visual catchment.

The above assessment demonstrates the project generally does not conflict with the objectives of the RU1 zone.

7.10.2 Project merit

Two submissions state that the project lacks merit when weighed against the zone objectives, the potential impact on adjoining properties/community and lack of necessity for the proposed Marulan Creek dam.

As demonstrated above, the project is generally consistent with the objectives of the RU1 Primary Production zone proposing the continued operation of a permissible and non-agricultural use that represents orderly and economic use of resources and resource land.

The EIS contains a detailed assessment of the likely impacts of the proposal. These assessments have concluded that the potential for adverse impact on surrounding properties and communities due to excessive noise, dust and traffic is unlikely as the mine can operate well below statutory criteria.

As described in Section 7.2 of this report, the Marulan Creek dam is required to meet the mine's future water demand in years when there are deficiencies in the other mine water storage dams.

7.10.3 Application for a new development

A submission stated the application should be viewed as being for an entirely new enterprise.

As described in Chapter 4 of the EIS, the proposal is not for a new enterprise given existing infrastructure and mining areas will continue to be used. Additionally, the consent runs with the land and the appropriate pathway for consent has been followed. As described in Section 3.3.4 of the EIS, the application covers the entire project area and seeks to consolidate and modernise the consent framework.

7.11 Site analysis

A submission criticised the EIS for not regarding the northern boundary of the project area and the homestead property, which it states directly abuts the northern boundary of the applicant's mining operations. Boral notes the homestead property appears as Receiver 13 in the EIS (and supporting documentation) and was therefore thoroughly assessed during preparation of the EIS.

Boral's mining operation, defined by the northern extent of the pit, is approximately 4.8 km from the southern boundary of Receiver 13 and the northern boundary of Boral's holdings. Ancillary elements of Boral's operation are in closer proximity to Receiver 13, principally this is Boral's private railway line.

The nearest surface disturbance/new project component to Receiver 13 will be the Marulan Creek dam, which will be approximately 700 m south of the southern extent of the Receiver 13 property boundary.

7.12 Assessment and management measures

A submission requested that an appropriate environmental impact study be conducted. The publicly exhibited EIS was prepared in accordance with the requirements of clauses 6 and 7 of the NSW Environmental Planning and Assessment Regulation 2000, Secretary's environmental assessment requirements issued on 10 June 2015 and the Commonwealth Department of the Environment and Energy's requirements issued on 27 October 2015.

A submission stated that no remedial or other measure or safeguards are proposed. The environmental management and monitoring measures proposed to address the impacts described in chapters 8 to 26 in the EIS are summarised in Chapter 29 of the EIS.

A submission stated the EIS ignored the issue of air quality and requested that safeguards be conditioned to reduce pollution below EPA levels. As described in Section 17.1.2 of the EIS, the air quality modelling assumed best practice management measures will be implemented, which means management measures are incorporated into the model. As described in Section 7.3.3 of this report, air quality parameters are conservatively predicted to be below criteria at all private receivers.

CHAPTER 8

PROJECT EVALUATION AND
CONCLUSION

8 PROJECT EVALUATION AND CONCLUSION

The Marulan South Limestone Mine was opened in 1929 to supply limestone for cement, manufacturing and steel making. By 1953 two main pits (northern mine pit and southern mine pit) were well established and by the early 1970s the facets of the business included limestone for cement, steel making, agriculture, glass making, lime manufacturing, quicklime and hydrated lime.

The mine produces up to 3.38 Million tonnes (Mt) of limestone-based products per year for the cement, steel, agricultural, construction and commercial markets. Boral proposes to mine approximately 120 Mt over 30 years in an extension of the existing pit primarily towards the west.

The mine is a strategically important asset for Boral, as it supplies the main ingredient for the manufacture of cement at Boral's Berrima Cement Works. This is also a strategically important operation for Sydney based consumers of these products as this represents around 60% of the cement sold in NSW and feeds into more than 30% of concrete sold in Sydney. Major projects previously or currently supplied include Sydney Opera House, Barangaroo, Sydney Metro, and Pacific Highway upgrades.

The continued and expanded operations at the mine will provide the following key benefits:

- uninterrupted supply of essential construction materials to local and regional development projects at cost-effective prices;
- continued employment of 191 full time employees and truck/transportation drivers, with further jobs created through flow-on effects;
- optimal use of a regionally significant resource; and
- economic benefits to the local community through the purchase of goods and services and local expenditure both directly and indirectly through employee wages.

As the mine contains a limestone deposit significant enough to support ongoing operations until the end of this century, it is critical to Boral to ensure continued operations at the site.

All potential amenity impacts from the project on sensitive receivers, comprising noise, air quality and visual impacts, will be below relevant criteria or have low residual impacts. The project will not have significant impacts on some biophysical aspects such as surface and ground water, and aquatic and stygofauna biodiversity. However, the project will have residual impacts on the vegetation communities and threatened species habitat described in Section 6.7.2, which will be compensated through the proposed biodiversity offset strategy.

The project will also have residual impacts on Aboriginal and historic heritage. Areas of medium to high Aboriginal archaeological sensitivity will be salvaged and items of historic heritage significance to be impacted will be archivally recorded.

The project will have significant economic and social benefits and is in the public interest.

APPENDIX A

SUBMISSIONS MATRIX

APPENDIX B

TALLONG MEETING RECORD



MARULAN SOUTH LIMESTONE, SSD TALLONG COMMUNITY POST LODGEMENT CONSULTATION SUMMARY

1 Exhibition of the EIS

Following submission to the Department of Planning and Environment in March 2019, the SSD, DA was placed on public exhibition commencing 4 April 2019 and ceasing 1 May 2019.

1.1 Community response

On 25 April 2019 Boral became aware of concerns within the Tallong Community in relation to Boral's use of water stored in the Tallong dam and reservoir. In response to these concerns Boral arranged for a community meeting.

The meeting was held at the Tallong Community Hall on 1 May at 5.00pm. The meeting was attended by Boral representatives including:

- Dean Beltrame (DB), Marulan South Mine Manager;
- Angus Sheddon (AS), Peppertree Quarry Manager;
- Sharon Makin (SM), Environment and Community Manager; and
- Rachael Snape (RS), Planning and Development Manager, ACT/NSW

The meeting was informal and intended to provide community members with an opportunity to raise their concerns and receive feedback and to allow Boral to provide clarification of the scope of the proposal in relation to Tallong dam.

Both Angus Sheddon and Rachael Snape recorded questions raised throughout the evening. These are provided in **Attachment A**. These were circulated to community members in a summary email issued on 14 May 2019 (refer to **Attachment B**).

To date no further comments have been received in relation to the circulated question list. Responses to these questions are provided in section 4 of this summary.

The community responses set out in this summary seek to provide a response to questions raised on the evening of 1 May 2019 and provide a record of statements made in connection with the proposal that may be relevant in the consideration of the proposal.

2 Tallong Community Meeting

The following sections set out the matters raised by members of the Tallong Community. Questions have been grouped by issue and sub-issue.

Comments provided in response include comments made on the night by Boral representatives and where relevant have been expanded and clarified to include more relevant details.



2.1 Water

At the outset of the meeting, Sharon Makin acknowledged the concern of the Tallong Community and invited question or comments from attendees. Early on in the evening, it was confirmed by community members that matters relating to water were of primary concern.

A total of 37 questions were recorded in relation to water matters, these have been grouped into eight sub-issues as follows:

- Water source (to fill proposed Marulan Creek dam),
- Groundwater,
- Water demand,
- Alternative water sources,
- Water allocation,
- Water infrastructure and assets, and
- Peppertree water demand and capacity.

2.1.1 Water source

A key area of focus throughout the evening was how Boral would source water to fill the dam proposed to be constructed on Marulan Creek.

Will Boral be pumping water from Tallong dam to the proposed dam? [this is what the EIS says]

Boral acknowledged that there has been a miscommunication of intent within the Environmental Impact Statement summary document dated March 2019.

It was recognised on the evening that the “Water management” section on page 10 of the summary document had miscommunicated the proposal and Boral’s intent in relation to Tallong dam and use of the Tallong dam water supply.

Boral confirmed during the meeting that it was not and never was intended to use the Tallong dam water supply to fill the proposed Marulan Creek dam. A clarification has been included in the Response to Submissions report that clearly states how water for the proposed dam will be sourced refer to section 5.

When Boral builds the proposed dam, are they going to pump water from Tallong?

Boral will continue to use the Tallong dam water supply in accordance with the existing water access licence, This use of the Tallong dam water supply will continue while the Marulan Creek dam is being constructed and filled.

It has never been nor is it Boral’s intent to pump water from Tallong dam to the proposed Marulan Creek dam.



If you [Boral] are not taking water from Tallong dam to fill Marulan Creek dam, where will Boral be getting water from?

Water for the proposed dam will be captured through the natural flows of Marulan Creek and overland flows for the creeks catchment.

Will water be pumped from Barbers Creek (if not from the Tallong dam) to the proposed dam?

No. Water will not be pumped from Barber Creek to the proposed dam.

2.1.2 Groundwater

Is Boral tapping to groundwater to fill the proposed dam?

No. Boral will not be “tapping into” the groundwater system for the purpose of filling the proposed dam on Marulan Creek.

What about the groundwater? Is groundwater a better source? [as an alternative to or instead of Tallong Creek dam or surface water sources]

Boral has water access licences for both ground and surface water sources.

Does Boral have a licence to bore/use groundwater? (Question on notice)

Yes, Boral has a water access licence to extract groundwater. Offhand the exact amount that Boral has approval to extract could not be stated.

Boral currently has a water access licence to extract 838ML of groundwater.

Point of clarification: Boral has confirmed they currently have a water access licence to extract 838ML of groundwater.

2.1.3 Water demand

Is the proposed dam on Marulan Creek sufficient to meet Marulan South Limestone’s (MSL) water requirements?

The anticipated annual demand for water to support the operation at MSL is approximately 182ML. The proposed dam on Marulan Creek will have maximum capacity of 118 ML.

The dam’s storage capacity refers to the volume of water capable of being held at any one time. As water is pumped from the dam to MSL for use in operations and production, the volume being stored is reduced allowing for replenishment by natural water flows (creek and overland). Therefore the capacity of the proposed dam does not match the demand of the project. However, the technical assessment which assesses rainfall events and runoff has considered the capability of Marulan Creek dam to support a water take of 182ML.

Boral will require additional water allocations to access and use the proposed volume of water. It is Boral’s intent to seek existing water access allocations (i.e. through purchase and transfer from other holders) to avoid increasing water taken from within the catchment.

Does Boral vary the amount of water they take from Tallong in response to drought conditions?



Tallong dam has a storage capacity of 85ML. Boral currently has a water access licence to take up to 77ML of water per annum from Tallong dam.

Boral monitors water usage to ensure compliance with the water access licence terms and acts responsibly in the use and management of water assets available to them.

What happens when Boral cannot extract enough water from the Tallong dam to support Marulan South Limestone (MSL) and Peppertree Quarry (PTQ)?

In the event that water demand for either or both of the operations exceeds availability, alternatives would be investigated. Alternatives may involve water being tanked in (i.e. brought in on trucks).

Tallong Dam does not support Peppertree Quarry. Peppertree Quarry has its own 112 ML capacity dam and no external piped water supply.

Can Marulan Creek sustain the water demand of MSL and the future dam?

This is the intent. Investigation by surface water specialists indicates that there is sufficient water in the catchment to support the anticipated demand of MSL.

Will the Department of Planning and Environment (DPE) do anything due to the concerns of the Tallong community in relation to the dry period?

Boral cannot comment on behalf of the DPE.

It was explained that the DPE will undertake an assessment of potential impacts associated with the proposed development and refer the application to other government agencies including Water NSW and Department of Industry – Water. If these assessments of the technical information submitted, in particular the surface water assessments, identify potential impacts or concerns relating to water use or availability these will be raised as part of submissions and Boral will be required to respond in the response to submissions process.

2.1.4 Alternative water sources

Has Boral considered using/taking water from the Shoalhaven?

No. Given that the Shoalhaven River is a major trunk stream within the Sydney drinking water catchment it may not be possible. We are not sure that this option would be supported by the DPE or Water NSW.

Point of clarification: Given the distance and topography between the Shoalhaven River and the site, this option would most likely be uneconomical as a source of water and potentially, on balance, have an increased environmental impact associated with the construction works.

Has/will/can Boral considered alternatives to use of the Tallong dam or weir?

The proposed construction of a new dam on Marulan Creek is the alternative to relying on water currently drawn from the Tallong dam.

What is the timeline for the build? i.e. when will the proposed dam be constructed?



The mine plan that underpins the proposed development has a 30 year projection. The EIS states that the dam would be delivered “early” in this 30 year period. In this context “early” could be anywhere within the first 5 to 10 years.

The project is still in the preliminary stages of obtaining an approval. Accordingly the exact delivery timeframe for the dam has not been set.

2.1.5 Water allocation

Several members of the community present raised concern regarding the potential environmental impacts that may occur if water was pumped from Tallong dam under drought conditions. These questions focused on the terms of Boral’s existing water access licences and whether there were specific provisions that sought to regulate use under drought conditions.

On the evening, Boral representatives could not answer questions regarding the specific nature of the conditions of water access licences. These were taken as “Questions on Notice” (QoN) and are identified below.

What are the conditions of Boral Cement’s water licence? (QoN)

The conditions of the Tallong dam WAL are focused on the quantity of water that may be extracted and the methods required to be used to monitor and metre extraction.

What happens if the available water in Tallong dam is below Boral’s allocation?

Boral would need to source water by other means. To date this has not occurred at MSL. However, there are measures including the “tankering in” of water to the site. This involves bringing in water by truck to supplement water supplies in other quarry water storage devices. This has been used at Peppertree quarry during the recent dry periods.

Where is water metered? Where/how is water taken from the dam metered?

Boral’s take of water from the dam is metered at two points using a data logger and a water meter that is required to comply with the Australian Standards guidelines (AS4747: Meters for non-urban water supply).

Boral has two water meters fitted to water supply works, one at the point of water take at the Tallong Creek reservoir and the other at the mine site itself. Measuring extraction at both ends ensures that extraction is monitored at all possible points along the pipeline.

Are Boral able to exceed their allocation under this system?

No.

Is it Boral’s loss if there is a rupture in the pipeline?

Yes. If there is a break in the pipeline between the “pot” and the mine, Boral’s allocation remains fixed at 77ML. Any water lost due to a leak or rupture is still counted in the allocation.

Are there conditions on Boral’s licence that require them to reduce the take [of water] during drought conditions? (QoN)



The current WAL for Tallong dam does not include “cease to take” conditions.

Are there limits on Boral’s Water Access Licence (WAL) that says when they have to stop extracting (as to avoid causing impact on biodiversity – platypus etc) (QoN)

The Tallong dam WAL is restrained by the allocation limit of 77ML per annum. The allocation is split between the mine (76 ML) and the residential use (1 ML).

As set out above, the WAL does not have a “cease to take” condition.

2.1.6 Water infrastructure/assets

What will Boral do with the pipeline when/if you stop using Tallong dam? Will Boral cap off the pipeline when the cease to use it [the pipeline] will Boral cut it off?

Alternatives for the decommissioning of Boral’s water infrastructure assets are yet to be determined.

The current pipeline works on a gravity feed, cutting off or capping the pipeline will not stop the flow of water, as such these may not be suitable options.

Where are the pumps going? Where will the new pumps be located?

The pumps for the proposed dam will be wholly located within Boral land and within the mines land.

Is any water being pumped from Tallong Creek?

Boral will continue to pump water from Tallong Creek dam to MSL in accordance with the terms of their existing lease and water access licence. The use of Tallong dam will continue until the proposed new dam on Marulan Creek is constructed and filled.

The new dam will be filled using natural flows from the creek and surface water runoff (i.e. overland flow).

It is Boral’s intent to reduce reliance and use of water from Tallong Creek dam. The proposed Marulan Creek dam will ultimately replace Tallong Creek dam as a source of water for MSL.

In 2011 Boral did work on the pipeline, what was that for?

The work was to relocate the pipeline. The pipeline historically was located across the Peppertree Quarry approved pit footprint and therefore had to be relocated around the perimeter of this operation but still retained on Boral land.

What assets (i.e. “the pot”, the pipeline) are Boral owned? (Question on notice)

Boral owns the pipeline connecting Tallong reservoir (referred to as “the pot”) to the mine site. The pot and the dam are under lease to Boral from the Rail Infrastructure Corporation (RIC).

While Boral holds a lease over the aforementioned water infrastructure assets, the water access licence still limits the amount that can be taken for the purposes of mining and residential purposes.

When does Boral’s lease run out on the dam and associated infrastructure? When will Boral’s lease over the dam expire? Is the lease expired/finished?



Boral's lease over the Tallong dam water infrastructure has not expired. Boral is currently 1 year into a five year lease term with five year option to extend.

What is the diameter of the pipe?

The water pipeline has a diameter of six inches.

Is the pipeline checked at all? [for maintenance – leaks etc?]

Yes, Boral undertake regular maintenance checks and inspections along the pipeline.

2.1.8 Peppertree – capacity and use

What is Peppertree's current capacity? How much water can Peppertree take?

Peppertree Quarry does not have a licence to access water from the Tallong Dam and does not use this supply.

Peppertree Quarry has a 112ML dam located on Tangarang Creek with a water licence to access 145ML per annum from this dam.

2.2 Environmental Impact Statement

A couple of questions focused on how water usage was communicated in the Environmental Impact Statement (EIS) and sought feedback from Boral on how the EIS may change in response to the matters raised at the meeting.

Is there wording within the EIS that indicates water from Tallong will be used to supplement the Marulan Creek dam?

Boral does not believe the EIS or supporting technical information specifically states that water from Tallong dam would be used to fill the proposed dam on Marulan Creek. However, Boral has acknowledged that there has been a miscommunication within the summary EIS document.

The summary document was intended to improve accessibility of the EIS. The summary document would not form the basis of an assessment by the DPE or referral agencies and as such has a lesser importance in terms of how the application is being assessed. That is to say it has no statutory weight.

Boral and their consultants will review the technical information and EIS and where necessary make correcting statements within the Response to Submissions report and relevant supporting documents.

Will Boral be making amendments to remove "offending" statements from the EIS documents that indicate Boral are intending to pump water from Tallong to Marulan?

The source of miscommunication regarding Boral's proposal was a summary document. This document is not utilised for the purpose of assessment.

Boral and their consultant team will review the submitted documents to confirm if there are references to "pumping" of water from the Tallong dam to the proposed Marulan Creek dam. Where these comments are made they will be amended. If these comments are not present in the documentation there would be no need to amend.



Boral will provide clarifying statements within the response to submissions document to confirm their intent in relation to water use.

2.3 Consultation and Engagement

There was discussion early in the evening and throughout regarding the timing of the lodgement and exhibition of the application. There was a perception within the community that Boral had intentionally timed the application to coincide with the Easter/ANZAC break to limit the number of submissions.

RS explained that the timing of the final lodgement and exhibition was not intentional on Boral's part. It was explained that the submission process involves an initial review by the DPE called a "test of adequacy". This review is undertaken to confirm that the EIS documentation meets the standards of assessment set out in the Secretary's Environmental Assessment Requirement's and the DPE EIS guidelines.

In the case of this application there were two rounds of adequacy review, first on 18 December 2018 and the second on 21 March 2018.

As exhibition requires notices to be placed in both locally circulating and national papers there is often a delay between final submission and exhibition start.

Boral acknowledged the concern of the community and how the timing of the exhibition (to coincide with the public holiday period) may appear and provided assurance this was not intended.

Will Boral be seeking to extend the consultation period through the DPE?

Boral advised it was unlikely to seek a formal extension of the consultation period. The community was advised that despite the formal period ending on 1 May 2019, it is likely that submissions would still be accepted by the DPE after this date. The community was advised to make contact with the DPE to discuss any late submissions.

Why doesn't Boral extend the deadline/timeframe for submissions?

The decision to extend the exhibition period is not Boral's. Exhibition timeframes are set out in the legislation and the decision to extend these is made by a delegate within the DPE.

2.4 Planning Process

2.4.1 Determination pathway

In the event that 25 submissions are made to the DPE, will there be a public hearing?

Boral is not a position to make comment on whether a public hearing will be held.

Boral provided an overview of the determination pathways that may be triggered in response to the number of submissions made to the DPE. The response provided confirmed that where the DPE receives 25 or more submissions the determination of the application is referred to the Independent Planning Commission (IPC). The IPC will make the decision as to whether a public hearing is called.



2.4.2 Submission weight

Should I make a submission or will Boral's record of the evening count/have weight in the assessment by the DPE?

Boral is not in a position to make comment on behalf of the DPE. RS advised that Information recorded by Boral representatives throughout the meeting would be transcribed into a record of the events and where relevant and suitable provide additional information in response to questions or matters raised. The record would then be included in the response to submissions report to the DPE.

The decision of whether a community member should make a submission to the DPE is theirs to make. Boral advised that where a community member feels a concern has not been resolved or adequately addressed through the course of the meeting or in reviewing the proposal online they should exercise their right to make comment. A comment made direct from the community to the DPE would likely carry greater weight.

2.4.3 Ongoing consultation

Will the community get a copy of responses to their questions raised at this meeting? [The meeting held at Tallong memorial hall on 1 May 2019]

There followed some discussion around how Boral would provide feedback from the evening and what the community would like in terms of further engagement.

Boral indicated that the questions (captured by AS and RS) would be collated and transcribed and circulated to the community members who elected to leave their contact details (email addresses).

Responses to questions would be provided as part of the formal process of a response to submissions as this would allow for any amendments in the proposal to be captured and reported in a consolidated response.

Boral advised that they would provide community updates through the local newsletter as the application progressed. Notice would also be given to those who had provided their contact details when the response to submissions was being lodged with the DPE and copies would be available on Boral's Marulan South Operations webpage.

3 Follow up engagement

Following the meeting of 1 May 2019 Boral took the following actions to:

- Email engagement;
- Social media and website
- Local newsletters;
- Community Consultative Committee
- Direct mail.

2.3 Summary of ongoing engagement

Direct email

At the conclusion of the meeting on 1 May 2019, several members of the community elected to provide their email address to Boral. These community members combined with the Tallong Focus Group and key



local stakeholders for whom Boral had contact details were provided a list of questions asked throughout the evening.

The email included contact details of Boral's Stakeholder Relations Manager should any members of the community want to ask any further questions or receive additional information. A copy of this email is provided as **Attachment A**.

Social media and website

Following the meeting wherein we identified the core issue of concern, being water, the following statement was drafted and was posted to the, Boral's Marulan operations webpage and emailed to Boral's stakeholder contacts list.

We've become aware there is concern about the potential effects upon local water supplies if our State Significant Development (SSD) planning application for Marulan South Limestone is approved.

To clarify, at present the Limestone operations are supplied with water via a pipeline connected to the Tallong 'Dam' reservoir. This has been the case for almost 40 years.

The SSD seeks to allow us to build our own water storage so we can reduce our reliance on the Tallong reservoir, and eventually stop using it altogether. We certainly are NOT looking to connect the new yet-to-be-approved storage to the Tallong Dam.

You can find out more about the SSD application by visiting our Boral Marulan website - www.boral.com.au/marulan.

Newsletters

There are currently two newsletters that Boral contributes to that circulate throughout the community. These include:

- Discover Marulan; and
- Tallong Community Newsletter.

Discover Marulan is an e-newsletter that circulates within the communities of Marulan and Tallong. Boral supports the production of this newsletter through written contributions which include updates on projects as well as printing copies for distribution (for those who don't have email). This newsletter is distributed to "the midge" in Tallong (a popular local cafe), Marulan Cafe, Post Office, Doctor's surgery and the local butcher and various shops. The most recent edition of this newsletter is provided in Attachment E.

Tallong Community Newsletter Boral has not previously been a regular contributor to this newsletter. However, following the meeting on 1 May 2019, one submission regarding SSD 7009 have been made with the intent of keeping the Tallong community informed. A copy of this is provided in Attachment E, for the most recent edition issued in July 2019.

Community Consultative Committee (CCC)

The CCC met last on the 12 June 2019. SSD7009 was raised and discussed at this meeting like it has for the past 3 years. Those present at the meeting included Denzil Sturgis (Councillor Goulburn Mulwaree), Tino Foti (local business representative) and Charles Mendel (on teleconference). Geoff Clark (Tallong



Focus Group representative) and Russell Montgomery (community representative) were apologies for this meeting however have been present at previous meetings where MSL has been discussed.

Boral confirmed at this meeting that there is no intent to pump water from Tallong dam to Marulan Creek dam.

Direct Mail

On 24 June 2019, a direct mail out to the 53 members of the Tallong Community and eight residents of surrounding areas who elected to make their details public was undertaken. The letter sought to again confirm Boral's proposal in relation to water usage and seek any further comment or questions ahead of finalising and submitting the response to submissions report. Refer to Attachment C.

One response was received on 28 June 2019, thanking Boral for the letter. A copy has attached (refer to Attachment D) with personal information redacted. Should the Department of Planning, Industry and Environment (DPIE) require an unredacted version this can be provided on request under separate cover.

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Attachment A: Community questions, 1 May 2019

Meeting with Tallong Community: Tallong Memorial Hall

Wednesday, 1 May 2019 – 5.00pm – 7.00pm

Primary Issue	Sub-Issue	Questions
Water	Source of water to fill the new dam	
		Will Boral be pumping water from Tallong dam to the proposed dam? This is what the EIS says is proposed.
		When Boral builds the proposed dam, are we going to pump extra water from Tallong?
		If you are not taking water from Tallong dam to fill Marulan Creek dam, where will Boral be getting water from?
		Will Boral be supplementing the Marulan Creek dam with water from the Tallong pipeline?
		Will water be pumped from Barbers Creek (if not from Tallong dam) to fill the proposed dam?
	Groundwater	
		Is Boral tapping into groundwater to fill the proposed dam?
		What about the groundwater?
		Do we have a licence to bore/use groundwater?
		Is groundwater a better source? (as opposed to surface water creeks and dams)
	Demand	
		Is the proposed dam on Marulan Creek sufficient to meet MSL's water requirements?
		Does Boral vary the amount of water they take from Tallong in response to drought conditions?
		What happens when Boral cannot extract enough water from the Tallong dam to support Marulan South Limestone (MSL) and Peppertree Quarry (PTQ)?
		Can Marulan Creek sustain the water demand of MSL and the future dam?
		Will the Department of Planning and Environment (DPE) do anything due to the concerns of the Tallong community in relation to the dry period?
	Alternative water sources	
		Has Boral considered using/taking water from the Shoalhaven?
		Has/Will/Can Boral considered alternatives to use of the Tallong dam or weir?
		What is the timeline for the build? i.e. when will the proposed dam be constructed?
	Water allocation	

		What are the conditions of Boral Cement's water licence?
		What happens if the available water in Tallong is below Boral's allocation
		Where/how is water taken from the dam metered? Are Boral able to exceed their allocation under this system?
		Is it Boral's loss if there is a rupture in the pipeline?
		Are there conditions on Boral's licence that require them to reduce the take during drought conditions?
		Are there limits on Boral's Water Access Licence (WAL) that says when they have to stop extracting? (as to avoid causing impact on biodiversity – Platypus etc)
		Where is water metered?
	Water Infrastructure/Assets	
		What will Boral do with the pipeline when/if you stop using Tallong dam
		Where are the pumps going? Is any water being pumped from Tallong Creek
		In 2011 Boral did work on the pipeline, what was that for?
		What assets (i.e. "pot", "pipeline") are Boral owned?
		When does Boral's lease run out on the dam and associated water infrastructure?
		What is the diameter of the pipe
		When will Boral's lease over the dam expire?
		Is the lease expired/finished?
		Is the pipeline checked at all? (For maintenance – leaks etc)
		In the end what happens to the pipeline? Will Boral cap off the pipeline when they cease to use it? Will Boral "cut" it off?
		Who owns the pipeline and the pumps?
		Where will the new pumps be located?
Environmental Impact Statement	Peppertree	What is PTQ's current capacity? How much water can PTQ take?
		Is there wording in the EIS that indicates water from Tallong will be used to supplement the Marulan Creek dam.
Consultation and Engagement		Will Boral be making amendments to removed "offending" statements from the EIS documents that indicate Boral are intending to pump water from Tallong to Marulan?
	Exhibition timeframe	Will Boral be seeking to extend the consultation period through the DPE?

		Why doesn't Boral extend the deadline/timeframe for submissions?
	Direct consultation (by Boral)	Why didn't Boral send letters to all the residents of Tallong?
		Will Boral commit to a further meeting with the community to provide updates?
	Exhibition timing	Why did Boral advertise the proposal at Easter?
		You can see how looks to exhibit the application over a holiday period?
Planning Process		
	Determination pathway	In the event that 25 submissions are made to the DPE, will there be a public hearing?
	Submission weight	Should I make a submission or will Boral's record of the evening count/have weight in the assessment by the DPE?
	Response to concerns from meeting	Do the community get a copy of responses to their questions raised at this meeting (i.e. the meeting held with the Tallong community on 1 May 2019)?

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Attachment B: Follow up email to attendees of meeting, 1 May 2019



Makin, Sharon <sharon.makin@boral.com.au>

Follow up from Tallong meeting 1st May

1 message

Makin, Sharon <sharon.makin@boral.com.au>

14 May 2019 at 11:06

To: [REDACTED]

Dear Margaret

Thank you for giving us the opportunity to meet with you and fellow neighbours on 1 May to further explain our State Significant Development (SSD) application for the Marulan South Limestone operations. Hopefully you gained further information about the proposal and had some of your concerns addressed.

During the meeting, there were a lot of different questions asked which we've captured in the attached document. We're asking everyone to review this and ensure all of the relevant topics have been included, and to let us know if we've missed anything or haven't recorded it the right way.

We're keen for this list to be accurate as we'll need to address these issues through our 'Response to Submissions' (RtS). This will be submitted back to the Department of Planning and Environment and we'll be letting everyone know when this occurs. The RtS becomes a 'public' document as part of the process and will be where we respond to each of the questions raised.

We'll also post this question list on our website (www.boral.com.au/marulan), and integrate them and associated responses into our ongoing communications from the Marulan South operations. As a learning from the meeting, these existing channels will be enhanced to better reach neighbours at the northern end of our 'footprint' - we'll discuss opportunities to do this with the Tallong Community Focus Group, Marulan Residents Action Group and other contacts.

In the meantime, if you have any other questions, concerns or comments about any aspect of either of our two Marulan South sites, please send me an email or give me a ring. You can also contact my colleague **Paul Jackson**, our Stakeholder Relations Manager who has also worked with the sites for many years, via paul.jackson2@boral.com.au or **0401 894 097**.

Again, thank you for your interest and discussing your concerns with us.

Kind regards

SHARON MAKIN

Stakeholder and Environment Advisor - Marulan South

Telephone: 02 48411701

Mobile: 0401894185

Email: Sharon.Makin@boral.com.au



Peppertree Quarry
843 Marulan South Road, Marulan NSW 2579



**190501 MSTH Limestone Table Questions from Meeting with Tallong Community re
SSD.pdf**
211K

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Attachment C: Boral letters to submitters



24 June 2019

Boral Cement Ltd
ABN 62 008 528 523

<First Name><Last Name>
<Address>
<Suburb> NSW 2579

Boral Marulan South Limestone
Hume Street
Marulan South NSW 2579

T: +61 (02) 4820 3004
F: +61 (02) 4841 1617

www.boral.com.au

Dear <First Name>,

As you are aware, Boral is in the process of seeking approval from the Department of Planning and Environment (DPE) for State Significant Development (SSD) to support the continued and expanded operations of the Marulan South Limestone Mine.

In response to the formal exhibition of the proposal by the DPE between 4 April and 1 May 2019, Boral received 58 submissions from the Tallong community raising concern regarding the use of water taken from the Tallong dam.

The purpose of this letter is to clarify and confirm that Boral's Marulan South Limestone Mine is currently supplied with water via a pipeline connected to the Tallong 'Dam' reservoir. This has been the case for almost 40 years.

The SSD seeks to allow us to build our own water storage so we can reduce our reliance on the Tallong reservoir, and eventually stop using it altogether. We certainly are NOT looking to connect the new and yet-to-be-approved storage to the Tallong Dam.

This point of clarification will be reflected in the formal Response to Submissions (RtS) report to be lodged with the DPE in July 2019. This report will consider in detail all submissions received and provide feedback on the questions raised at the Tallong community meeting held on 1 May 2019.

Prior to the finalization of the RtS report, we are contacting all community members who made submissions to the DPE in response to exhibition seeking any further feedback or questions that may have in relation to the proposal or our operations.

If you have further questions or comments you wish to be considered as part of the response to submissions process we ask that you send these to feedback@boral.com.au by **Monday, 8 July 2019**. Alternatively, if you would like to speak with someone please contact the undersigned via Les.Longhurst@Boral.com.au or 0401 895 032. Alternatively, you may contact **Rachael Snape**, Planning and Development Manager (NSW/ACT) via Rachael.Snape@Boral.com.au or 0401 894 110.

All feedback given will be considered in the final RtS that will be made public by the DPE. The SSD application can be viewed in full at www.boral.com.au/marulan

Yours sincerely

Les Longhurst
Business Development Manager, Minerals & Mining
Boral Cement Limited



24 June 2019

Boral Cement Ltd
ABN 62 008 528 523

**Boral Marulan South
Limestone**
Hume Street
Marulan South NSW 2579

T: +61 (02) 4820 3004
F: +61 (02) 4841 1617

www.boral.com.au

<FIRST NAME><LAST NAME>
<ADDRESS 1>
<ADDRESS 2>
<SUBURB> NSW <POSTCODE>

Dear <PREFIX><LASTNAME>

As you are aware, Boral is in the process of seeking approval from the Department of Planning and Environment (DPE) for State Significant Development (SSD) to support the continued and expanded operations of the Marulan South Limestone Mine.

In response to the formal exhibition of the proposal by the DPE between 4 April and 1 May 2019, Boral received submissions from members of the Tallong community as well as some from surrounding areas, like your own, raising concern regarding the use of water taken from the Tallong dam.

The purpose of this letter is to clarify and confirm that Boral's Marulan South Limestone Mine is currently supplied with water via a pipeline connected to the Tallong 'Dam' reservoir. This has been the case for almost 40 years.

The SSD seeks to allow us to build our own water storage so we can reduce our reliance on the Tallong reservoir, and eventually stop using it altogether. We certainly are NOT looking to connect the new and yet-to-be-approved storage to the Tallong Dam.

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If you have further questions or comments you wish to be considered as part of the response to submissions process we ask that you send these to feedback@boral.com.au by **Monday, 8 July 2019**. Alternatively, if you would like to speak with someone please contact the undersigned via Les.Longhurst@Boral.com.au or 0401 895 032. Alternatively, you may contact **Rachael Snape**, Planning and Development Manager (NSW/ACT) via Rachael.Snape@Boral.com.au or 0401 894 110.

All feedback given will be considered in the final RtS that will be made public by the DPE. The SSD application can be viewed in full at www.boral.com.au/marulan

Yours sincerely

Les Longhurst
Business Development Manager, Minerals & Mining
Boral Cement Limited

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Attachment D: Response to Boral letters

I

----- Forwarded message -----

From: [REDACTED] >
Date: Fri, 28 Jun 2019 at 15:11
Subject: Tallong Weir
To: <feedback@boral.com.au>

Many thanks for your letter informing me of your real intentions re this project .
It's good to know that your community spirit is as I thought and that you had no intention of
doing anything so environmentally destructive

Cheers

[REDACTED]

Sent from my iPhone

APPENDIX C

DISCOVER MARULAN STATEMENT

Boral Marulan South Operations

An update for the community through *Discover Marulan*

July 2019

Boral's Marulan South Operations is pleased to present our valued neighbours and community with this regular update.

Connect with Boral Marulan South

Quarry: 4841 1701
Limestone: 4820 3003
Email: feedback@boral.com.au
Environment (Quarry): 4841 1701
Hours: 24 hours – see website.

Marulan South SSD

Our Planning team is working to finalise the 'Response to Submissions' (RtS) document on the State Significant Development (SSD) proposal for Marulan South Limestone ahead of its submission to the NSW Department of Planning and Environment (DPE).

The RtS is a regular part of the assessment process and outlines Boral's position on matters raised through the public exhibition of the planning documents. For Marulan South, this includes issues raised at the public meeting held on 1 May in Tallong about water management, specifically the way in which the proposed water storage would be filled.

As pointed out at the meeting, the purpose of the new storage is to reduce (and eventually stop) the Limestone site's reliance on the Tallong Dam for the water we have been piping to the mine for almost 40 years. The proposed new dam will not be connected to the existing pipeline, so won't be used for filling it.

We're aiming to submit the RtS to the DPE by July 2019. It will then be available on both the Department's Major Projects website and our Marulan South Operations website (www.boral.com.au/marulan).

Boral Paving the way to Sustainable Solutions

Even though Boral Asphalt operations are not widely seen in the Marulan area, we wanted to share the great work they are doing in regards to sustainable road Construction.

Recently in Perth, the Boral Asphalt Team undertook the construction of a suburban street using waste tyres, plastics, glass and recycled asphalt pavement.

This was the first time, Boral has used four sustainable materials in asphalt anywhere in Australia.

Processed beyond recognition of their first use, the tyres are similar in size to sugar, the glass is crushed to the size of tiny pebbles, plastic bottles are converted into flakes to the dimensions of rice and the asphalt pavements of Perth's former roads are recycled into aggregates.

Instead of likely being sent to landfill, the recycled materials used in the 500-metre street were the equivalent of:

- **58,000** 600ml plastic water bottles
- **316** tyres from 79 passenger cars
- **37,500** glass beer stubbies

The project was done in partnership with the City of Canning. It follows a successful trial of using plastic in asphalt in Stockton, NSW, earlier this year. Further trials will be held around the country as Boral continues to explore the use of sustainable materials in our roads.



Peppertree Quarry Community Consultative Committee

The Peppertree Quarry Community Consultative Committee met on the 12th June 2019 to review the quarry's operations and environmental performance since the last meeting in February 2019.

A copy of the minutes and the presentation are available at our Marulan South Operations website (www.boral.com.au/marulan).

More information? www.boral.com.au/marulan.

Like us on Facebook – @BoralAustralia.

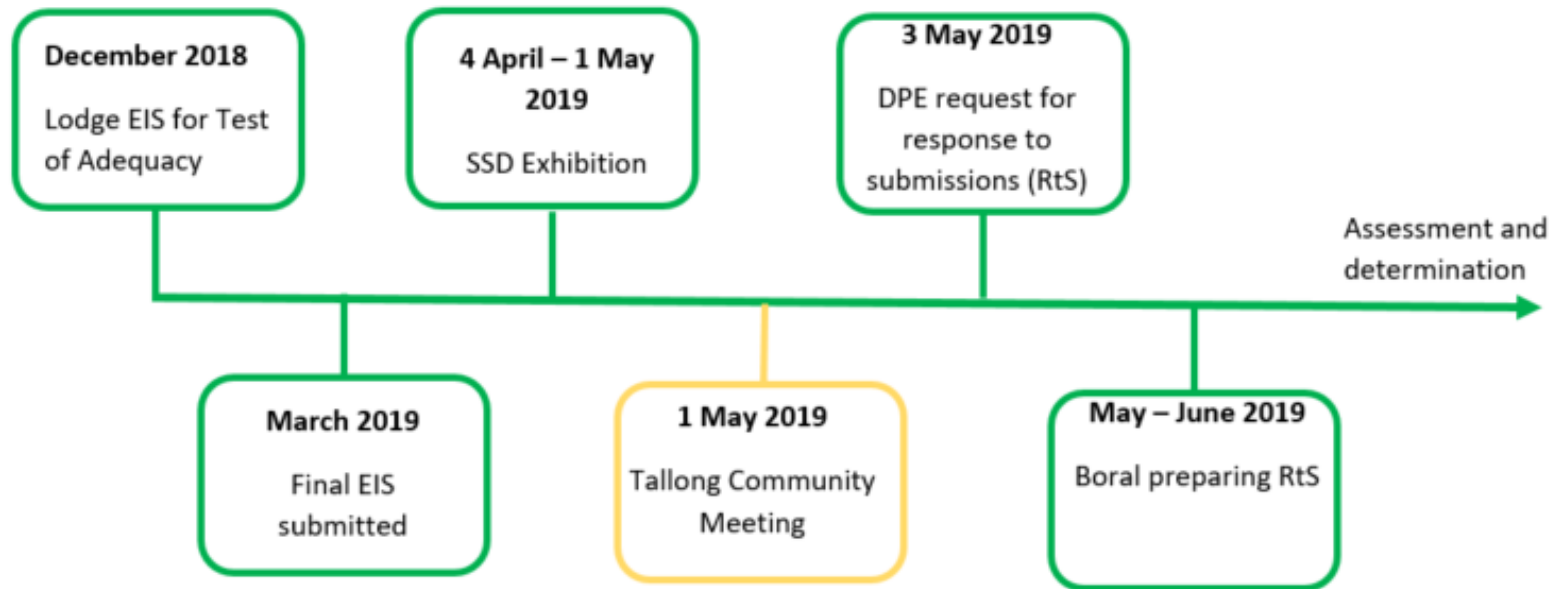


APPENDIX D

GOULBURN MULWAREE COUNCIL
POWERPOINT PRESENTATION

Marulan South Limestone Mine (SSD7009)

Project Status:



Community response & Boral's actions

- Boral became aware of the concerns of Tallong residents over the Easter and Anzac day holiday period via facebook;
- A community meeting was held on Wednesday, 1 May 2019;
- Two primary focus areas raised by the community:
 - Water (source, usage and volume); and
 - Consultation and exhibition of the proposal.

BORAL

Water: Confirmation of Scope & Intent

- MSL currently uses water from Tallong dam;
- Boral has a water access licence (WAL) allowing for 77ML of water to be extracted per year,
 - 76ML allocated to mine use; and
 - 1 ML for domestic use,
- A new dam with a storage capacity of 118 ML is proposed on Marulan Creek;
- If approved, Marulan Creek dam would be constructed early in the project life (i.e. the first 5 – 10 years) and be filled naturally;
- Boral **does not** propose to use Tallong dam to fill the proposed dam on Marulan Creek; and
- Boral's long term goal is to reduce reliance on Tallong dam.

Next Steps....

- Boral will circulate a copy of the questions raised during the community meeting – these are in the process of being collated;
- Community members who left their contact details will be emailed a copy;
- A response to submissions report (RtS) will be prepared by Boral's consultants, Element Environment;
- The RtS will include a record of the questions combined with responses and any necessary clarifications;
- Prior to submission the Tallong community will be updated on any relevant changes to or clarifications made in relation to the Tallong dam.

APPENDIX E

TRAFFIC ADDENDUM REPORT

**CONTINUED OPERATIONS
OF
MARULAN SOUTH LIMESTONE MINE
MARULAN SOUTH ROAD
MARULAN SOUTH
ADDITIONAL SIDRA TRAFFIC
MODELLING**

Ref. 14099R6

May 2019

Prepared By

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1.0 INTRODUCTION	1
2.0 PROJECT'S TRAFFIC GENERATION IN A BUSY HOUR	1
3.0 2029 BASE AM AND PM TRAFFIC VOLUMES	1
4.0 SIDRA MODELLING	2

APPENDICES

1. Figures from Traffic Impact Assessment Report dated 5 March 2019
2. SIDRA Modelling Outputs for 2029

1.0 INTRODUCTION

The RMS has requested additional SIDRA intersection modelling to be undertaken for the above project as follows.

“RMS notes that the proposed development will generate additional traffic in particular heavy vehicle movements, at the intersection of the Hume Highway and Marulan South Road. The EIS and supporting Traffic Assessment discuss the results of SIDRA intersection modelling which has been undertaken to assess the ongoing performance of this intersection. It is noted that the modelling has been undertaken using traffic volumes representing a 2025 future scenario. RMS requires the modelling be updated to reflect a 10 year post development scenario (with written justification of the volumes used) and electronic copies of the modelling be provided to RMS for review.”

This report documents the additional SIDRA modelling required by the RMS.

2.0 PROJECT'S TRAFFIC GENERATION IN A BUSY HOUR

The Project will generate an additional 5 one way heavy vehicle trips (ie. 5 inbound heavy vehicle trips and 5 outbound heavy vehicle trips) in a busy hour on a busy day that will travel via the Hume Highway / Marulan South Road Interchange Intersections.

Appendix 1 contains Figures 3 and 11 from the Traffic Impact Assessment report for the Project, which shows the Hume Highway Interchange Intersection (Figure 3) and the Additional Product Truck Volumes at the intersection during a busy hour (Figure 11).

3.0 2029 BASE AM AND PM TRAFFIC VOLUMES

The RMS has requested 10 year future traffic modelling which will be for the 2029 year.

Appendix 1 also contains Figures 6 and 7 from the Traffic Impact Assessment report which show the 2015 weekday AM and PM peak hour traffic volumes using the interchange intersections.

The 2029 Base AM and PM peak hour traffic volumes for the interchange intersections have been derived using the following methodology.

- Adopting the historical growth rate for traffic volume increase in the Hume Highway at the RMS's Traffic Counting Station 650 metres east of George Street Marulan (Station T0274-PR). This will account for background traffic growth; and
- Adding in the maximum hour traffic volumes of known approved quarry developments which will use the interchange intersections and which may not have been captured in the 2015 traffic count. This includes Gunlake Quarry Expansion, Ardmore Park Quarry and the full operation of Lynwood Quarry.

Between 2015 and 2019 traffic volumes in the Hume Highway at the above traffic counting station increased from 19,604 vehicles per day (vpd) to 20,617 vehicles per day (vpd).

This represents a 5.2% increase over the 4 year period and lineal average increase of 1.3% per year.

Adopting this increase for future traffic growth to 2029 indicates that for the 14 year period between 2015 and 2029 the total increase in background traffic growth will be 18.2%.

Gunlake Quarry's truck returning to the quarry from the east along the Hume Highway use the Marulan South Interchange to U-turn. The Transport Assessment for Gunlake Quarry Extension (EMM dated 10 February 2016) shows that a maximum of 25 and 29 additional trucks are expected to U-turn at the Interchange in the weekday AM and PM peak hours, respectively.

Ardmore Quarry's trucks use Jerrara Road and the Marulan South Interchange when travelling between the Quarry and the Hume Highway.

The most recent EIS for Ardmore Park Quarry Modification 3 (R W Corkery and Company dated July 2018) identified that the maximum hour for the quarry is up to 14 two way truck movements (ie. 7 one way trips in each direction) which is the same as the current approval.

As noted above the 2015 traffic counts did not capture the truck volumes of Ardmore Park Quarry, as no trucks associated with this quarry used the interchange during the AM and PM peak hours on the day of counts.

It is also noted that the 2015 traffic counts at the Hume Highway intersections did not capture Lynwood Quarry truck volumes operating at its maximum hour (ie. maximum hourly traffic generation).

The Traffic and Transport Impact Assessment report for Lynwood Quarry (Transport and Urban Planning dated April 2005) identified a maximum of 50 trucks per hour could arrive and depart the quarry in the maximum hour (ie. 50 in / 50 out) with 90% to and from the east towards Sydney and 10% to and from the west towards Goulburn / Canberra.

These trucks use the northern arm of South Marulan Road (ie. north leg of the interchange intersection).

So that a worst case is assessed for the Hume Highway interchange intersections in 2029 all of the above traffic volumes have been included in the 2029 AM and PM base traffic volumes for the interchange intersections, as well as the increase from background traffic.

This represents a very conservative assessment, with future 2029 AM and PM traffic volumes as modelled in this report, which are likely to be much higher than what is likely to use the interchange intersections in the 2029 AM and PM peak hours.

4.0 SIDRA MODELLING

SIDRA modelling has been undertaken for the 2 interchange intersections using the existing geometry for the intersections and the projected 2029 AM and PM traffic volumes as described in Sections 2 and 3 above.

SIDRA assesses the operational performance of intersections under traffic signal, roundabout or sign control. The best criteria for assessing intersections controlled by roundabout or sign control are Level of Service (LS), Degree of Saturation (DS) and Average Vehicle Delay (AVD). Table 1 shows the Level of Service Criteria for intersections as presented in the RMS (formerly RTA) Guide to Traffic Generating Developments.

For intersections controlled by roundabouts and Give Way/Stop signs, the Level of Service of the intersection is determined by the movement with the highest average vehicle delay and not the average vehicle delay for all vehicles using the intersection.

RMS Guidelines indicate that a Level of Service D operation, or better (i.e. A, B, C or D) is the desirable design criteria for intersections.

TABLE 1**LEVEL OF SERVICE CRITERIA FOR INTERSECTIONS**

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity and accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Intersection is oversaturated	Oversaturated, requires other control mode

Source: Table 4.1 RTA Guide to Traffic Generating Developments October 2002

The results of the traffic modelling are shown in Tables 2 and 3.

Reference to these tables show that both interchange intersections are predicted to operate at a Level of Service A operation (ie. very good operation) with low vehicle delays in the AM and PM peak hours in the future 2029 year.

The Boral proposal for the Continued Operations of Marulan South Limestone Mine will have minimal impact on the interchange intersections and both intersections will continue to operate at a very good level of service and low vehicle delays, with the additional traffic from the proposal.

The SIDRA modelling extracts are contained in Appendix 2 and electronic SIDRA files enclosed.

TABLE 2

SIDRA RESULTS FOR HUME HIGHWAY WESTBOUND RAMPS/MARULAN SOUTH ROAD/JERRARA ROAD INTERSECTION FOR THE 2029 BASE CONDITIONS AND WITH THE PROJECT DURING A BUSY HOUR IN THE AM AND PM PEAK HOURS.

AM PEAK HOUR

Movement	2029 Base				2029 With Project			
	DS	AVD (secs)	LS	95% Queue Length (m)	DS	AVD (secs)	LS	95% Queue Length (m)
South: Marulan South Road								
Left	0.015	4.5	A	0.6	0.025	5.0	A	1.2
Through	0.015	5.2	A	0.6	0.025	5.5	A	1.2
East: Westbound Off Ramp								
Left	0.224	4.3	A	11.8	0.229	4.4	A	12.3
Through	0.224	4.8	A	11.8	0.229	4.8	A	12.3
Right	0.224	9.5	A	11.8	0.229	9.5	A	12.3
North: Marulan South Road								
Through	0.059	4.1	A	2.0	0.062	4.1	A	2.1
Right	0.059	9.5	A	2.0	0.062	9.5	A	2.1
West: Jerrara Road								
Left	0.024	5.0	A	1.0	0.024	5.0	A	1.0
Right	0.024	9.2	A	1.0	0.024	9.2	A	1.0
All Vehicles	0.224	7.0	A	11.8	0.229	7.0	A	12.3

PM PEAK HOUR

Movement	2029 Base				2029 With Project			
	DS	AVD (secs)	LS	95% Queue Length (m)	DS	AVD (secs)	LS	95% Queue Length (m)
South: Marulan South Road								
Left	0.037	4.6	A	1.0	0.046	4.7	A	1.5
Through	0.037	4.8	A	1.0	0.046	4.9	A	1.5
East: Westbound Off Ramp								
Left	0.168	4.5	A	10.9	0.173	4.7	A	11.3
Through	0.168	4.4	A	10.9	0.173	4.5	A	11.3
Right	0.168	9.9	A	10.9	0.173	9.9	A	11.3
North: Marulan South Road								
Through	0.054	4.2	A	1.7	0.057	4.3	A	1.9
Right	0.054	8.9	A	1.7	0.057	8.9	A	1.9
West: Jerrara Road								
Left	0.032	4.6	A	1.1	0.032	4.6	A	1.1
Right	0.032	9.1	A	1.1	0.032	9.1	A	1.1
All Vehicles	0.168	7.3	A	10.9	0.173	7.2	A	11.3

Where: DS Degree of Saturation
 AVD Average Vehicle Delay in seconds
 LS Level of Service
 95%tile Queue Length 95%tile Back of Queue Length in metres

TABLE 3

**SIDRA RESULTS FOR HUME HIGHWAY EASTBOUND RAMPS / MARULAN SOUTH
ROAD INTERSECTION FOR THE 2029 BASE CONDITIONS
AND WITH THE PROJECT DURING A BUSY HOUR IN THE AM AND PM
PEAK HOURS.**

AM PEAK HOUR

Movement	2029 Base				2029 With Project			
	DS	AVD (secs)	LS	95% Queue Length (m)	DS	AVD (secs)	LS	95% Queue Length (m)
South: Marulan South Road								
Through	0.156	0.6	A	13.0	0.160	0.6	A	13.7
Right	0.156	7.3	A	13.0	0.160	7.3	A	13.7
North: Marulan South Road								
Left	0.046	6.6	A	0.0	0.046	6.6	A	0.0
Through	0.046	0.0	A	0.0	0.046	0	A	0.0
West: East Off Ramp								
Left	0.132	6.6	A	4.9	0.139	6.6	A	5.3
Through	0.132	6.4	A	4.9	0.139	6.4	A	5.3
Right	0.132	7.4	A	4.9	0.139	7.6	A	5.3
All Vehicles	0.156	4.7	A	13.0	0.160	4.8	A	13.7

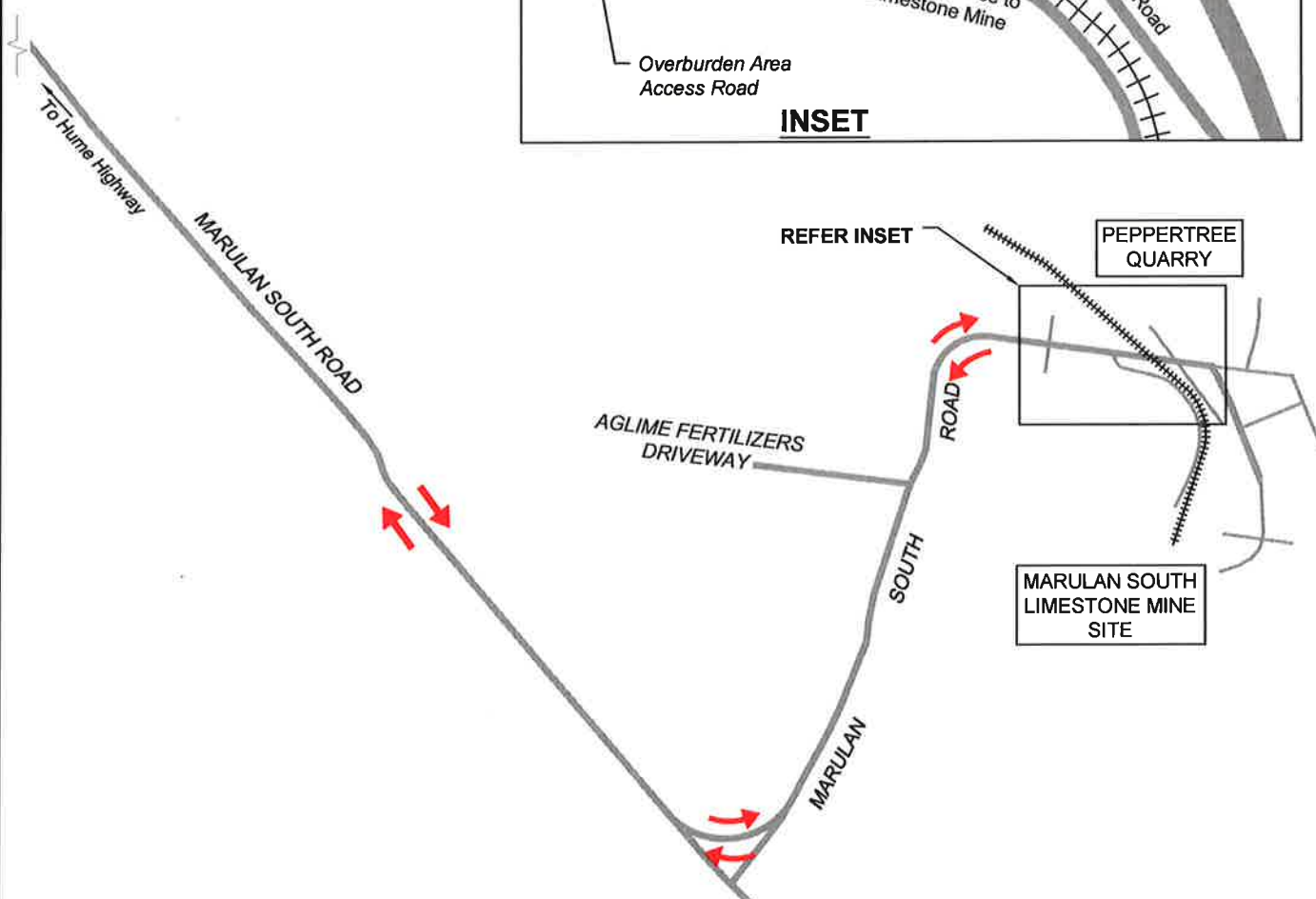
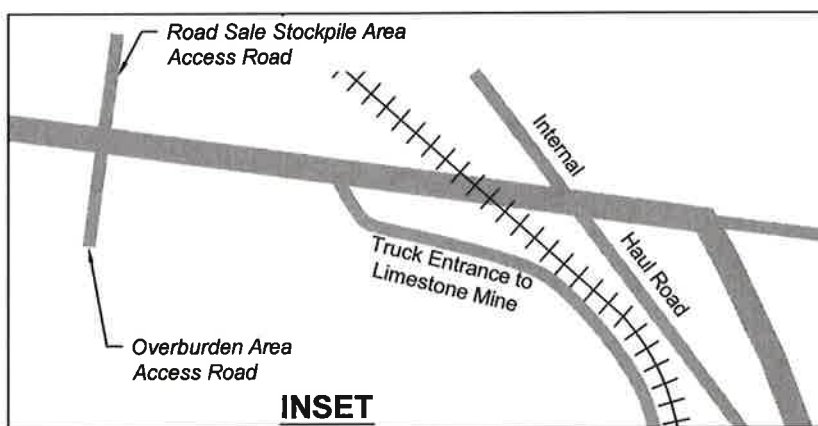
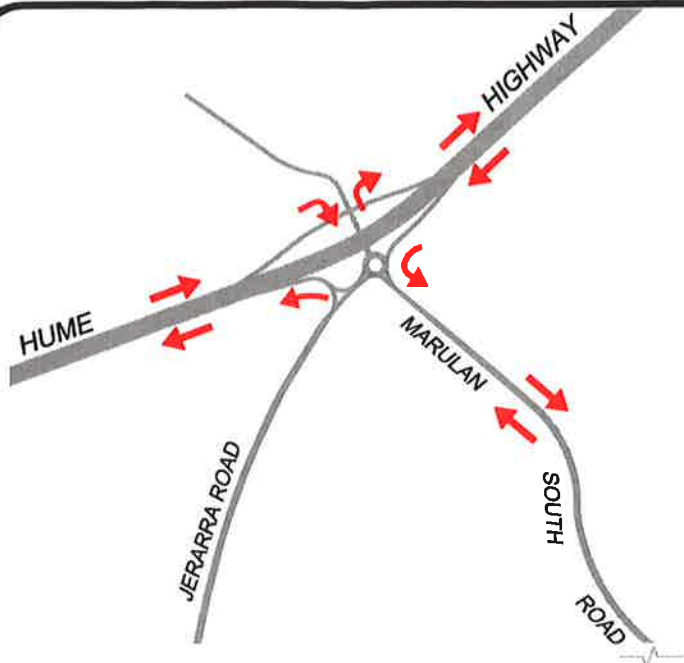
PM PEAK HOUR

Movement	2029 Base				2029 With Project			
	DS	AVD (secs)	LS	95% Queue Length (m)	DS	AVD (secs)	LS	95% Queue Length (m)
South: Marulan South Road								
Through	0.133	1.1	A	12.6	0.138	1.2	A	13.2
Right	0.133	7.4	A	12.6	0.138	7.5	A	13.2
North: Marulan South Road								
Left	0.077	6.2	A	0.0	0.077	6.2	A	0.0
Through	0.077	0.0	A	0.0	0.077	0.0	A	0.0
West: East Off Ramp								
Left	0.063	6.5	A	2.9	0.069	6.5	A	3.3
Through	0.063	6.3	A	2.9	0.069	6.3	A	3.3
Right	0.063	7.4	A	2.9	0.069	7.7	A	3.3
All Vehicles	0.133	4.9	A	12.6	0.138	5.0	A	13.2

Where: DS Degree of Saturation
 AVD Average Vehicle Delay in seconds
 LS Level of Service
 95%tile Queue Length 95%tile Back of Queue Length in metres

APPENDIX 1

FIGURES 3, 6, 7 AND 11 FROM TRAFFIC IMPACT ASSESSMENT REPORT DATED 5 MARCH 2019



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FIGURE 3

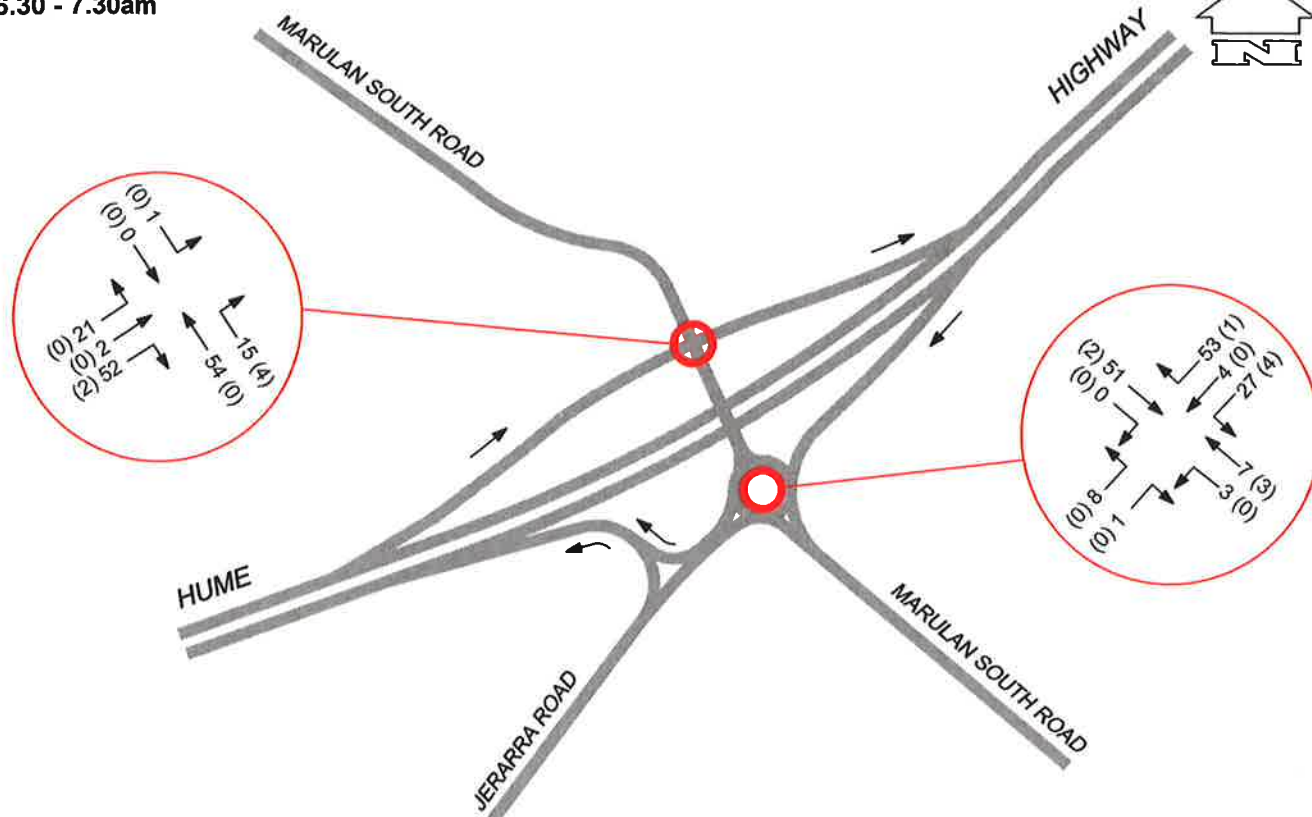
MARULAN SOUTH LIMESTONE MINE
CONTINUED OPERATIONS

ROAD TRANSPORT ROUTES

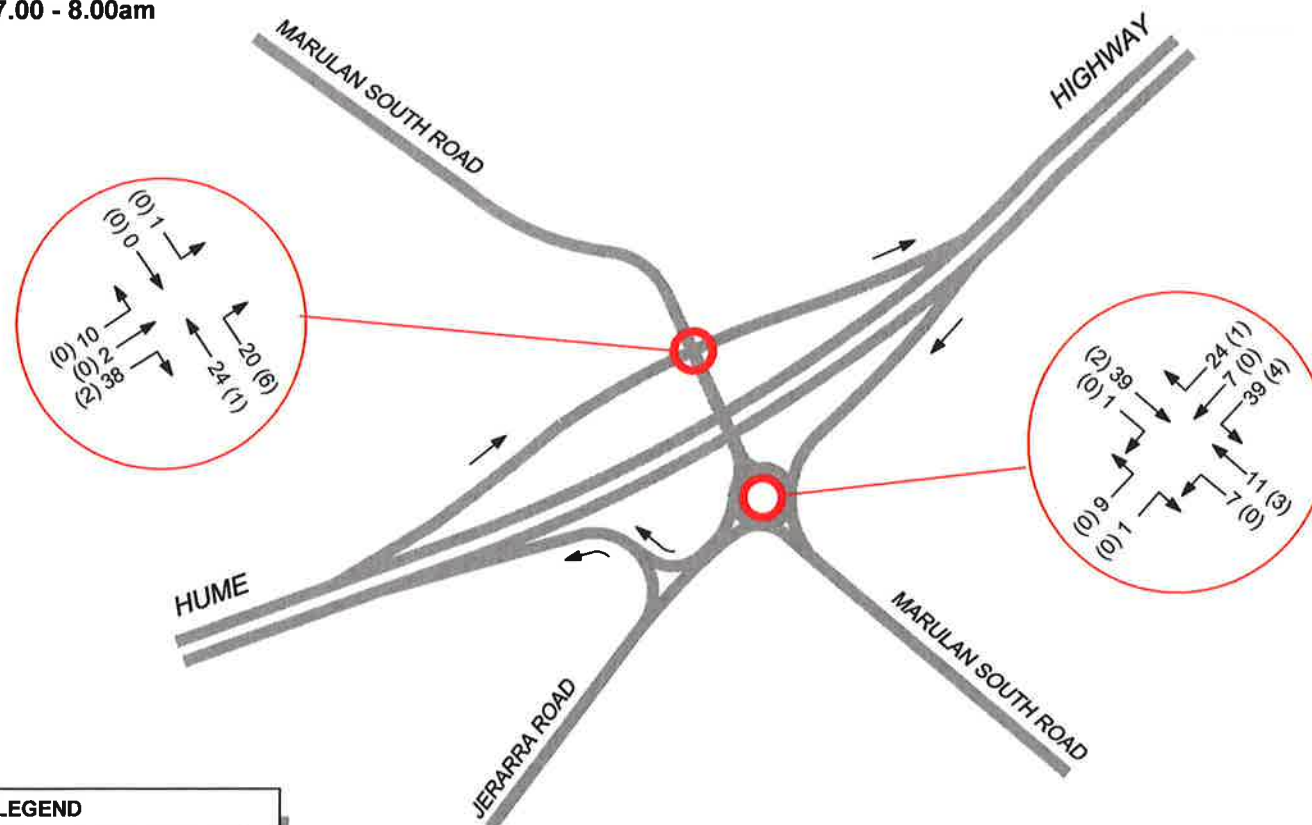
JOB NO.14099 R

13/08/18

AM PEAK HOUR
6.30 - 7.30am



AM PEAK HOUR
7.00 - 8.00am



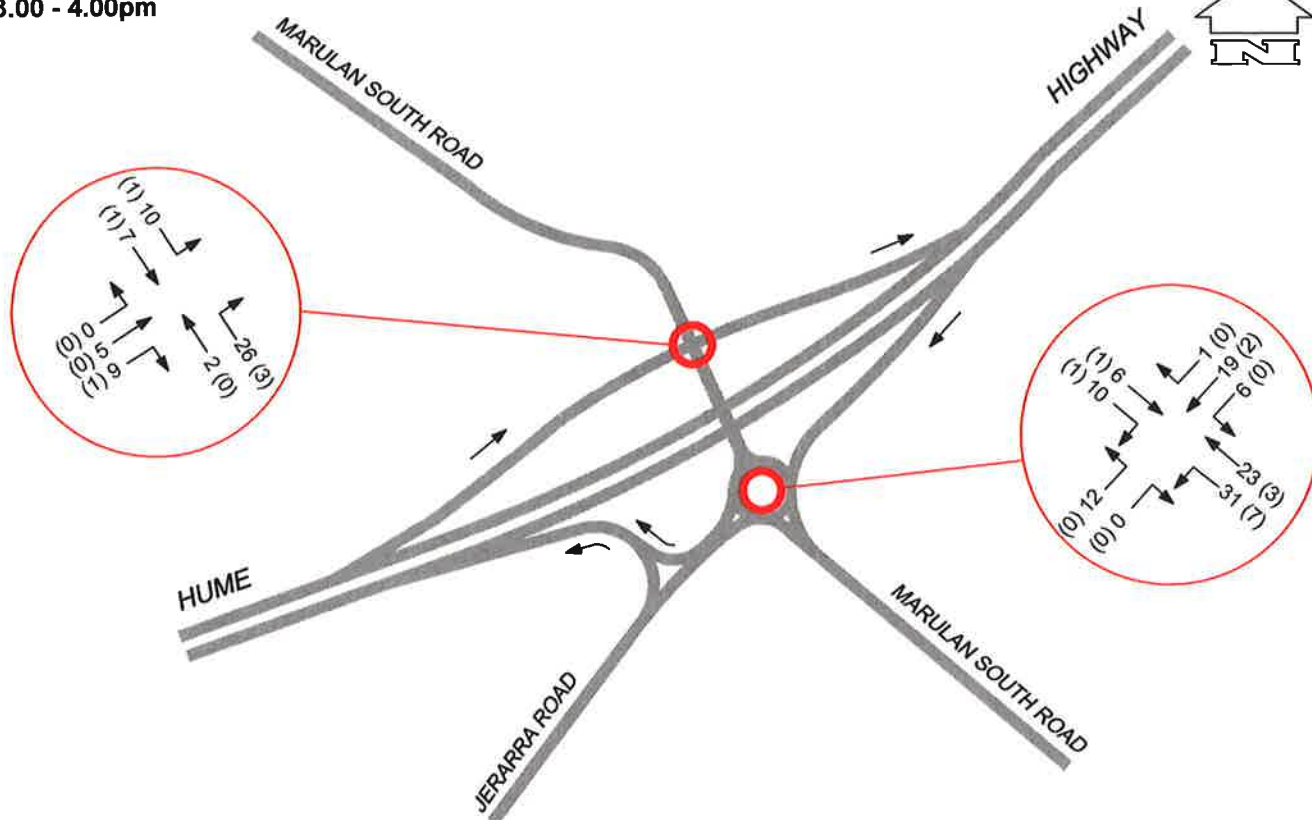
LEGEND

38 TOTAL VEHICLES
(2) HEAVY VEHICLES

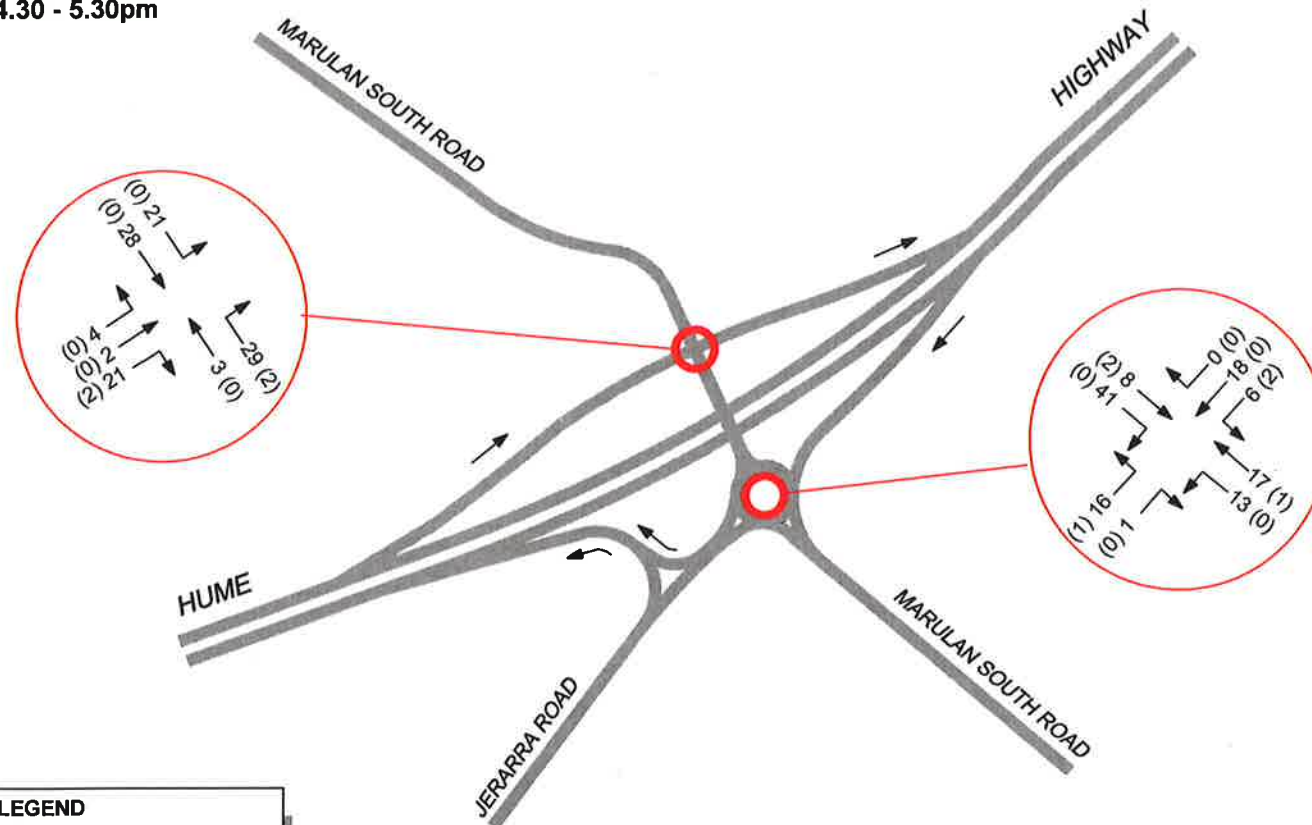
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FIGURE 6
MARULAN SOUTH LIMESTONE MINE
CONTINUED OPERATIONS
EXISTING WEEKDAY AM PEAK HOUR TRAFFIC VOLUMES
AT HUME HIGHWAY INTERCHANGE INTERSECTIONS
JOB NO.14099 R 13/08/18

PM PEAK HOUR
3.00 - 4.00pm



PM PEAK HOUR
4.30 - 5.30pm



LEGEND

38 TOTAL VEHICLES
(2) HEAVY VEHICLES

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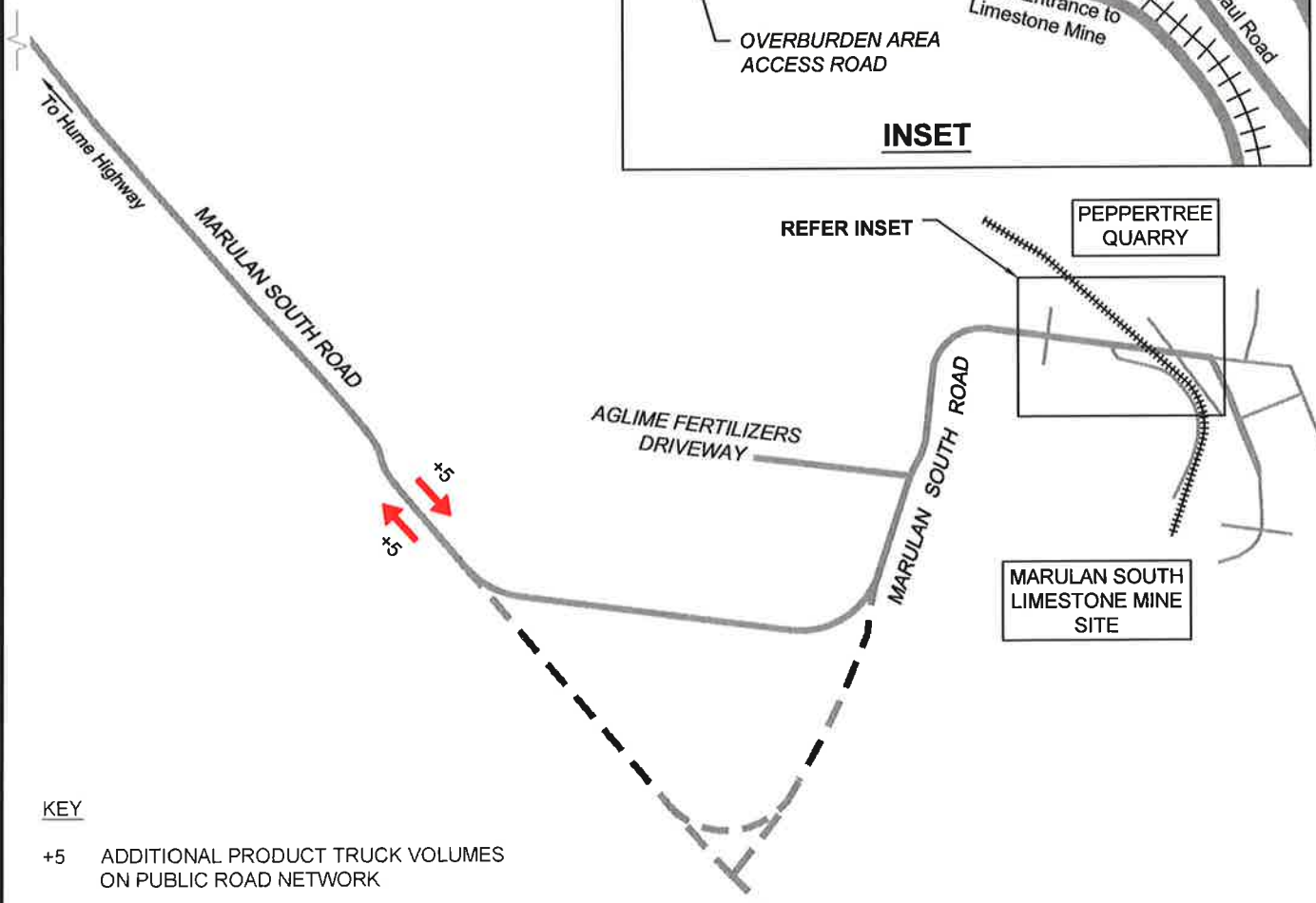
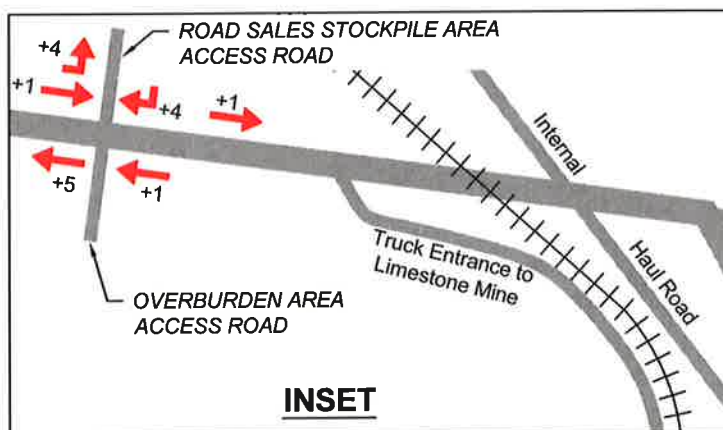
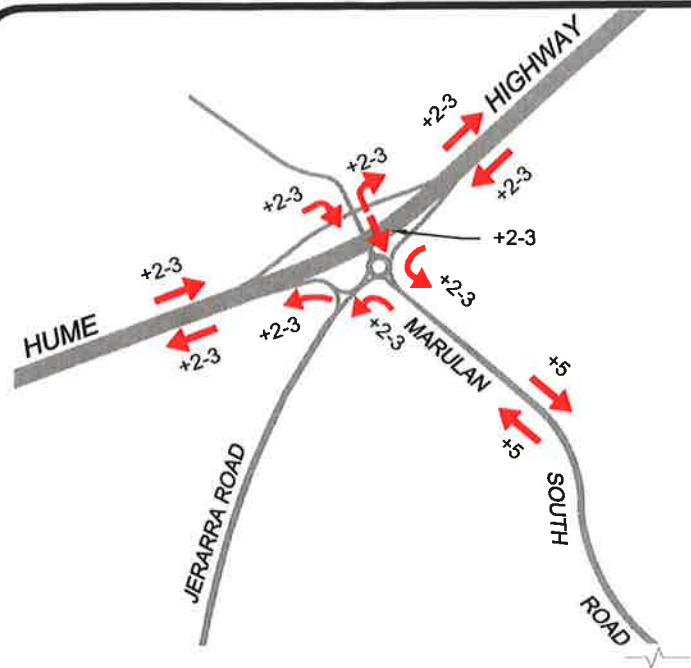
FIGURE 7

**MARULAN SOUTH LIMESTONE MINE
CONTINUED OPERATIONS**

**EXISTING WEEKDAY PM PEAK HOUR TRAFFIC VOLUMES
AT HUME HIGHWAY INTERCHANGE INTERSECTIONS**

JOB NO.14099 R

13/08/18



KEY

+5 ADDITIONAL PRODUCT TRUCK VOLUMES
ON PUBLIC ROAD NETWORK

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FIGURE 11

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS

**ADDITIONAL PRODUCT TRUCK VOLUMES ON
ROAD NETWORK DURING A BUSY HOUR**

JOB NO.14099 R

13/08/18

APPENDIX 2

SIDRA MODELLING OUTPUTS FOR 2029

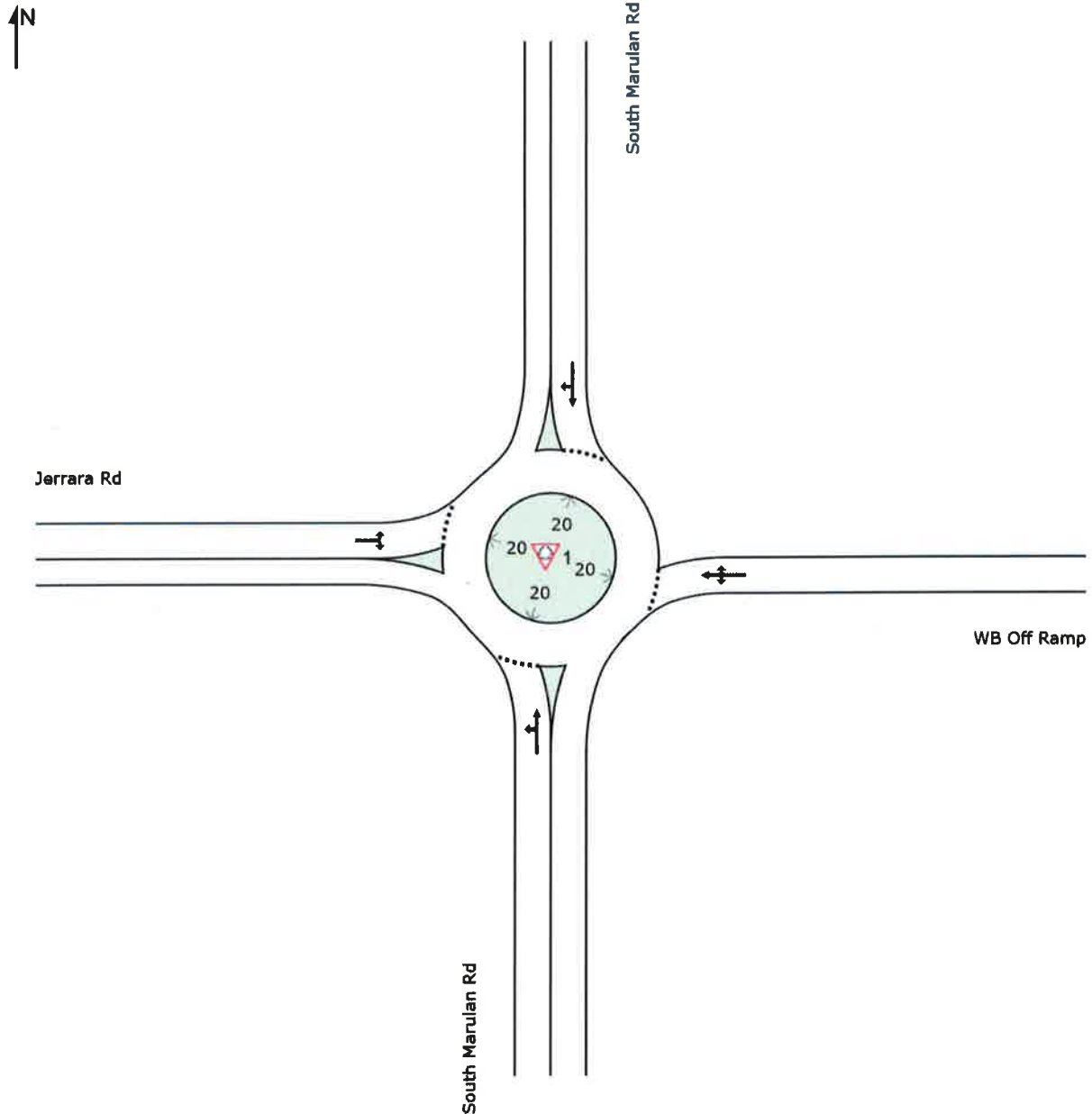
SITE LAYOUT

 Site: 1 [WB Ramps/SM Rd/J Rd- 2029 AM Base]

2029 AM Base

Site Category: (None)

Roundabout



MOVEMENT SUMMARY

 Site: 1 [WB Ramps/SM Rd/J Rd- 2029 AM Base]

2029 AM Base
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Marulan Rd												
1	L2	4	0.0	0.015	4.5	LOS A	0.1	0.6	0.29	0.46	0.29	54.2
2	T1	9	44.4	0.015	5.2	LOS A	0.1	0.6	0.29	0.46	0.29	54.5
Approach		14	30.8	0.015	5.0	LOS A	0.1	0.6	0.29	0.46	0.29	54.4
East: WB Off Ramp												
4	L2	38	13.9	0.224	4.3	LOS A	0.8	11.8	0.21	0.59	0.21	52.1
5	T1	14	53.8	0.224	4.8	LOS A	0.8	11.8	0.21	0.59	0.21	52.6
6	R2	154	55.5	0.224	9.5	LOS A	0.8	11.8	0.21	0.59	0.21	51.6
Approach		205	47.7	0.224	8.2	LOS A	0.8	11.8	0.21	0.59	0.21	51.8
North: South Marulan Rd												
8	T1	72	4.4	0.059	4.1	LOS A	0.2	2.0	0.02	0.44	0.02	56.5
9	R2	14	76.9	0.059	9.5	LOS A	0.2	2.0	0.02	0.44	0.02	53.3
Approach		85	16.0	0.059	5.0	LOS A	0.2	2.0	0.02	0.44	0.02	56.0
West: Jerrara Rd												
10	L2	19	38.9	0.024	5.0	LOS A	0.1	1.0	0.28	0.53	0.28	52.7
12	R2	2	0.0	0.024	9.2	LOS A	0.1	1.0	0.28	0.53	0.28	55.3
Approach		21	35.0	0.024	5.4	LOS A	0.1	1.0	0.28	0.53	0.28	53.0
All Vehicles		325	37.9	0.224	7.0	LOS A	0.8	11.8	0.17	0.54	0.17	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

 Site: 1 [WB Ramps/SM Rd/J Rd- 2029 AM Proposal]

2029 AM with Proposal

Site Category: (None)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Marulan Rd												
1	L2	6	33.3	0.025	5.0	LOS A	0.1	1.2	0.31	0.49	0.31	53.1
2	T1	13	58.3	0.025	5.5	LOS A	0.1	1.2	0.31	0.49	0.31	54.1
Approach		19	50.0	0.025	5.3	LOS A	0.1	1.2	0.31	0.49	0.31	53.8
East: WB Off Ramp												
4	L2	41	20.5	0.229	4.4	LOS A	0.8	12.3	0.22	0.59	0.22	51.9
5	T1	14	53.8	0.229	4.8	LOS A	0.8	12.3	0.22	0.59	0.22	52.5
6	R2	154	55.5	0.229	9.5	LOS A	0.8	12.3	0.22	0.59	0.22	51.6
Approach		208	48.5	0.229	8.2	LOS A	0.8	12.3	0.22	0.59	0.22	51.7
North: South Marulan Rd												
8	T1	74	7.1	0.062	4.1	LOS A	0.2	2.1	0.02	0.44	0.02	56.4
9	R2	14	76.9	0.062	9.5	LOS A	0.2	2.1	0.02	0.44	0.02	53.3
Approach		87	18.1	0.062	5.0	LOS A	0.2	2.1	0.02	0.44	0.02	55.9
West: Jerrara Rd												
10	L2	19	38.9	0.024	5.0	LOS A	0.1	1.0	0.29	0.53	0.29	52.7
12	R2	2	0.0	0.024	9.2	LOS A	0.1	1.0	0.29	0.53	0.29	55.3
Approach		21	35.0	0.024	5.4	LOS A	0.1	1.0	0.29	0.53	0.29	53.0
All Vehicles		336	39.8	0.229	7.0	LOS A	0.8	12.3	0.18	0.54	0.18	52.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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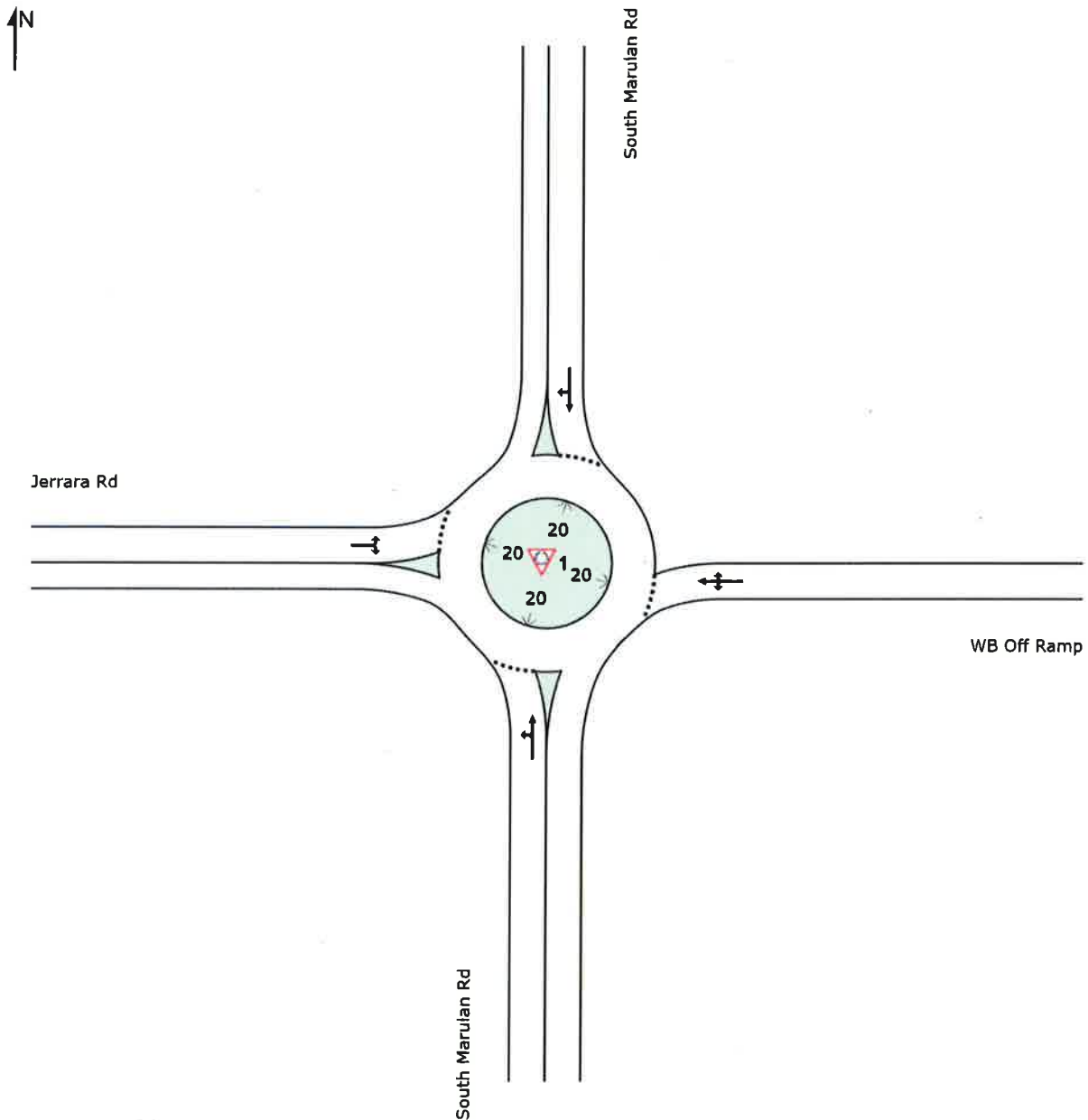
SITE LAYOUT

 Site: 1 [WB Ramps/SM Rd/J Rd- 2029 PM Base]

2029 PM Base

Site Category: (None)

Roundabout



MOVEMENT SUMMARY

 Site: 1 [WB Ramps/SM Rd/J Rd- 2029 PM Base]

2029 PM Base

Site Category: (None)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Marulan Rd												
1	L2	19	0.0	0.037	4.6	LOS A	0.1	1.0	0.27	0.48	0.27	54.3
2	T1	24	8.7	0.037	4.8	LOS A	0.1	1.0	0.27	0.48	0.27	55.5
Approach		43	4.9	0.037	4.7	LOS A	0.1	1.0	0.27	0.48	0.27	55.0
East: WB Off Ramp												
4	L2	7	42.9	0.168	4.5	LOS A	0.6	10.9	0.21	0.55	0.21	53.0
5	T1	33	22.6	0.168	4.4	LOS A	0.6	10.9	0.21	0.55	0.21	55.2
6	R2	86	98.8	0.168	9.9	LOS A	0.6	10.9	0.21	0.55	0.21	51.7
Approach		126	75.8	0.168	8.1	LOS A	0.6	10.9	0.21	0.55	0.21	52.6
North: South Marulan Rd												
8	T1	11	20.0	0.054	4.2	LOS A	0.2	1.7	0.02	0.63	0.02	53.2
9	R2	67	15.6	0.054	8.9	LOS A	0.2	1.7	0.02	0.63	0.02	53.0
Approach		78	16.2	0.054	8.2	LOS A	0.2	1.7	0.02	0.63	0.02	53.0
West: Jerrara Rd												
10	L2	31	24.1	0.032	4.6	LOS A	0.1	1.1	0.23	0.51	0.23	53.6
12	R2	2	0.0	0.032	9.1	LOS A	0.1	1.1	0.23	0.51	0.23	55.7
Approach		33	22.6	0.032	4.9	LOS A	0.1	1.1	0.23	0.51	0.23	53.7
All Vehicles		280	42.1	0.168	7.3	LOS A	0.6	10.9	0.17	0.55	0.17	53.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

 Site: 1 [WB Ramps/SM Rd/J Rd- 2029 PM Proposal]

2029 PM with Proposal

Site Category: (None)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Marulan Rd												
1	L2	21	10.0	0.046	4.7	LOS A	0.2	1.5	0.29	0.49	0.29	54.0
2	T1	27	19.2	0.046	4.9	LOS A	0.2	1.5	0.29	0.49	0.29	55.2
Approach		48	15.2	0.046	4.8	LOS A	0.2	1.5	0.29	0.49	0.29	54.6
East: WB Off Ramp												
4	L2	11	60.0	0.173	4.7	LOS A	0.6	11.3	0.22	0.55	0.22	52.5
5	T1	33	22.6	0.173	4.5	LOS A	0.6	11.3	0.22	0.55	0.22	55.1
6	R2	86	98.8	0.173	9.9	LOS A	0.6	11.3	0.22	0.55	0.22	51.7
Approach		129	76.4	0.173	8.1	LOS A	0.6	11.3	0.22	0.55	0.22	52.6
North: South Marulan Rd												
8	T1	13	33.3	0.057	4.3	LOS A	0.2	1.9	0.02	0.62	0.02	52.9
9	R2	67	15.6	0.057	8.9	LOS A	0.2	1.9	0.02	0.62	0.02	53.0
Approach		80	18.4	0.057	8.1	LOS A	0.2	1.9	0.02	0.62	0.02	52.9
West: Jerrara Rd												
10	L2	31	24.1	0.032	4.6	LOS A	0.1	1.1	0.24	0.51	0.24	53.6
12	R2	2	0.0	0.032	9.1	LOS A	0.1	1.1	0.24	0.51	0.24	55.7
Approach		33	22.6	0.032	4.9	LOS A	0.1	1.1	0.24	0.51	0.24	53.7
All Vehicles		291	44.2	0.173	7.2	LOS A	0.6	11.3	0.18	0.55	0.18	53.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

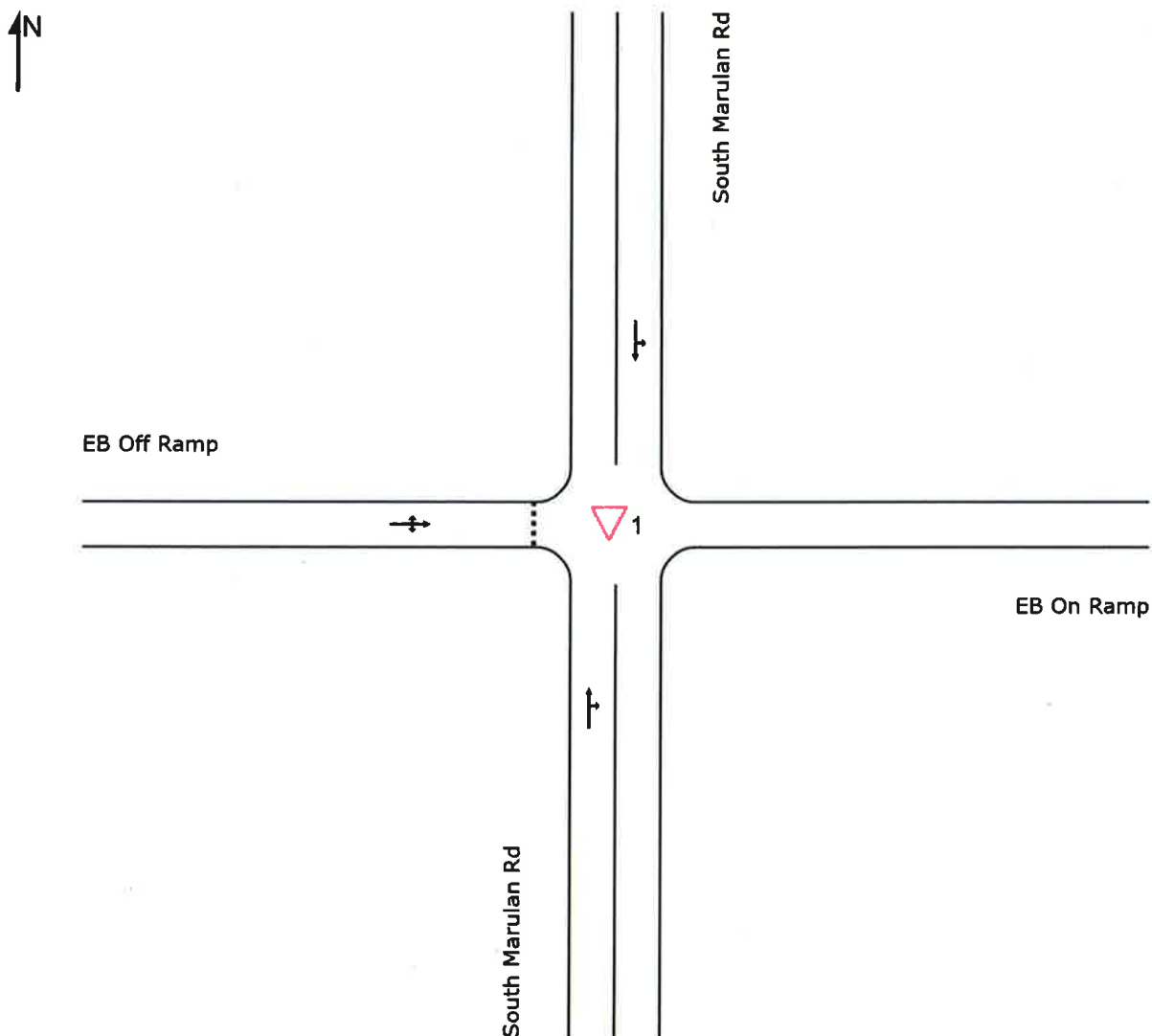
SITE LAYOUT

▽ Site: 1 [EB Ramps/S M Rd- 2029 AM Base]

2029 AM Base

Site Category: (None)

Giveaway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 1 [EB Ramps/S M Rd- 2029 AM Base]

2029 AM Base

Site Category: (None)

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h	
South: South Marulan Rd													
2	T1	118	35.7	0.156	0.6	LOS A	0.9	13.0	0.22	0.19	0.22	58.2	
3	R2	71	77.6	0.156	7.3	LOS A	0.9	13.0	0.22	0.19	0.22	52.8	
Approach		188	51.4	0.156	3.1	NA	0.9	13.0	0.22	0.19	0.22	56.0	
North: South Marulan Rd													
7	L2	44	95.2	0.046	6.6	LOS A	0.0	0.0	0.00	0.44	0.00	51.7	
8	T1	13	83.3	0.046	0.0	LOS A	0.0	0.0	0.00	0.44	0.00	57.4	
Approach		57	92.6	0.046	5.2	NA	0.0	0.0	0.00	0.44	0.00	52.9	
West: EB Off Ramp													
10	L2	39	27.0	0.132	6.6	LOS A	0.6	4.9	0.36	0.62	0.36	51.3	
11	T1	3	0.0	0.132	6.4	LOS A	0.6	4.9	0.36	0.62	0.36	52.8	
12	R2	73	4.3	0.132	7.4	LOS A	0.6	4.9	0.36	0.62	0.36	52.0	
Approach		115	11.9	0.132	7.1	LOS A	0.6	4.9	0.36	0.62	0.36	51.8	
All Vehicles		360	45.3	0.156	4.7	NA	0.9	13.0	0.23	0.37	0.23	54.1	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: C:\Users\Terry\Documents\14099-3 RMS.sip8

MOVEMENT SUMMARY

Site: 1 [EB Ramps/S M Rd- 2029 AM Proposal]

2029 AM with Proposal

Site Category: (None)

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Marulan Rd												
2	T1	118	35.7	0.160	0.6	LOS A	0.9	13.7	0.23	0.19	0.23	58.1
3	R2	74	78.6	0.160	7.3	LOS A	0.9	13.7	0.23	0.19	0.23	52.8
Approach		192	52.2	0.160	3.2	NA	0.9	13.7	0.23	0.19	0.23	55.9
North: South Marulan Rd												
7	L2	44	95.2	0.046	6.6	LOS A	0.0	0.0	0.00	0.44	0.00	51.7
8	T1	13	83.3	0.046	0.0	LOS A	0.0	0.0	0.00	0.44	0.00	57.4
Approach		57	92.6	0.046	5.2	NA	0.0	0.0	0.00	0.44	0.00	52.9
West: EB Off Ramp												
10	L2	39	27.0	0.139	6.6	LOS A	0.6	5.3	0.37	0.63	0.37	51.3
11	T1	3	0.0	0.139	6.4	LOS A	0.6	5.3	0.37	0.63	0.37	52.7
12	R2	75	7.0	0.139	7.6	LOS A	0.6	5.3	0.37	0.63	0.37	51.8
Approach		117	13.5	0.139	7.2	LOS A	0.6	5.3	0.37	0.63	0.37	51.6
All Vehicles		365	46.1	0.160	4.8	NA	0.9	13.7	0.24	0.37	0.24	54.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

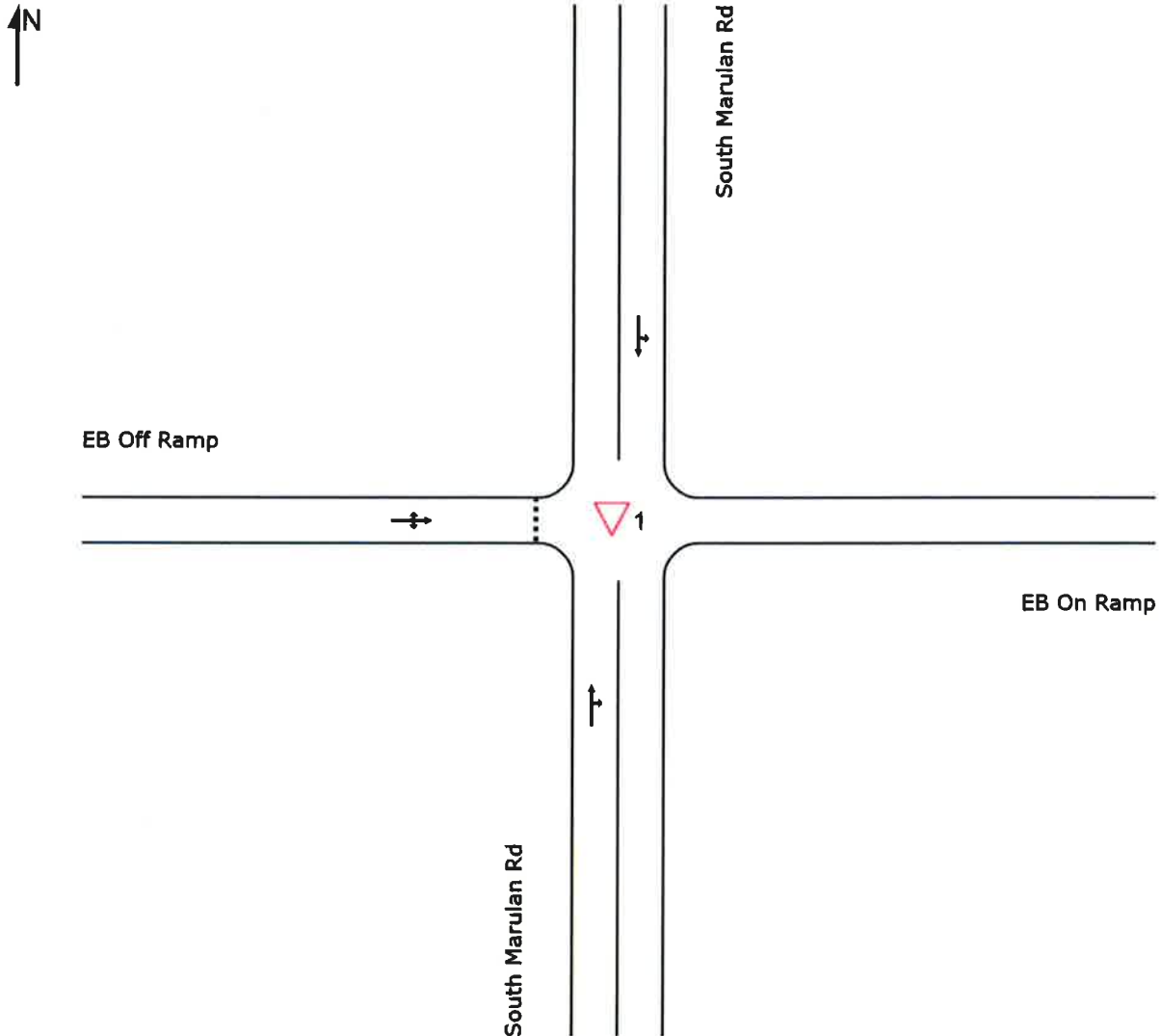
SITE LAYOUT

▽ Site: 1 [EB Ramps/S M Rd- 2029 PM Base]

2029 PM Base

Site Category: (None)

Giveaway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 1 [EB Ramps/S M Rd- 2029 PM Base]

2029 PM Base

Site Category: (None)

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Marulan Rd												
2	T1	48	87.0	0.133	1.1	LOS A	0.7	12.6	0.34	0.43	0.34	54.5
3	R2	93	56.8	0.133	7.4	LOS A	0.7	12.6	0.34	0.43	0.34	50.6
Approach		141	67.2	0.133	5.3	NA	0.7	12.6	0.34	0.43	0.34	51.9
North: South Marulan Rd												
7	L2	72	58.8	0.077	6.2	LOS A	0.0	0.0	0.00	0.34	0.00	53.5
8	T1	49	21.3	0.077	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	57.7
Approach		121	43.5	0.077	3.7	NA	0.0	0.0	0.00	0.34	0.00	55.2
West: EB Off Ramp												
10	L2	16	66.7	0.063	6.5	LOS A	0.3	2.9	0.28	0.60	0.28	49.9
11	T1	3	0.0	0.063	6.3	LOS A	0.3	2.9	0.28	0.60	0.28	52.9
12	R2	31	10.3	0.063	7.4	LOS A	0.3	2.9	0.28	0.60	0.28	51.8
Approach		49	27.7	0.063	7.0	LOS A	0.3	2.9	0.28	0.60	0.28	51.3
All Vehicles		312	51.7	0.133	4.9	NA	0.7	12.6	0.20	0.42	0.20	53.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 1 [EB Ramps/S M Rd- 2029 PM Proposal]

2029 PM with Proposal

Site Category: (None)

Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: South Marulan Rd												
2	T1	48	87.0	0.138	1.2	LOS A	0.7	13.2	0.35	0.43	0.35	54.5
3	R2	96	58.2	0.138	7.5	LOS A	0.7	13.2	0.35	0.43	0.35	50.6
Approach		144	67.9	0.138	5.4	NA	0.7	13.2	0.35	0.43	0.35	51.8
North: South Marulan Rd												
7	L2	72	58.8	0.077	6.2	LOS A	0.0	0.0	0.00	0.34	0.00	53.5
8	T1	49	21.3	0.077	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	57.7
Approach		121	43.5	0.077	3.7	NA	0.0	0.0	0.00	0.34	0.00	55.2
West: EB Off Ramp												
10	L2	16	66.7	0.069	6.5	LOS A	0.3	3.3	0.29	0.60	0.29	49.8
11	T1	3	0.0	0.069	6.3	LOS A	0.3	3.3	0.29	0.60	0.29	52.8
12	R2	33	16.1	0.069	7.7	LOS A	0.3	3.3	0.29	0.60	0.29	51.4
Approach		52	30.6	0.069	7.2	LOS A	0.3	3.3	0.29	0.60	0.29	51.0
All Vehicles		317	52.5	0.138	5.0	NA	0.7	13.2	0.20	0.42	0.20	52.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

APPENDIX F

NOISE ADDENDUM REPORT

27 June 2019

WM Project Number: 14099-S

Our Ref: EE14099-Sltr27062019

Email: mark.roberts@elementenvironment.com.au

Mr Mark Roberts
Element Environment
PO Box 1563
WARRIEWOOD NSW 2102

Dear Mark

Re: Marulan South Limestone Mine Continued Operations Project - Responses to Submissions

This letter addresses the information requests issued by NSW Environment Protection Authority (EPA) dated 1 May 2019 (DOC19/288059) on the noise and blasting impact assessment (NBIA) report (Wilkinson Murray 2019) for the Marulan South Limestone Mine Continued Operations Project.

EPA have made the following request for further information, in relation to the NBIA:

EPA COMMENT		RESPONSE
I. Rating background levels were not calculated in accordance with the Noise Policy for Industry (NPfI).		
I(i)	Why the monitoring was not conducted according to the established method in the NPfI.	<p>The noise assessment was substantially completed using the Industrial Noise Policy (INP) consistent with the Secretary's Environmental Assessment Requirements (SEARs). DPE requested the assessment be updated to be consistent with the NPfI.</p> <p>The aim of both the INP and NPfI is to identify rating background noise levels (RBLs). The procedure for establishing the RBLs between the two policies are principally the same, with the difference being that the INP required the measurement of background noise in the absence of noise from the mine and the NPfI allowing the background noise level to be measured with the existing premises operating (as long as the site is operational for a significant period and is considered a normal part of the acoustic environment).</p> <p>As requested by DPE, the NBIA was updated to be consistent with the NPfI apart from the establishment of the RBLs, because the RBLs had already been established in accordance with the INP, which is conservative as the background noise levels were established in the absence of the existing mine noise (when the mine operations were shut down or inaudible).</p>
I(ii)	Why background levels were not derived using long term noise monitoring, for the minimum duration required by the NPfI.	Refer to response I(i) and I(iv).
I(iii)	Therefore, the reasons for not conducting noise measurements in accordance with the NPfI to derive the rating background levels is not clear and the proponent must justify this decision and method used.	Refer to response I(i).

EPA COMMENT	RESPONSE
<p>I(iv) The proponent should demonstrate that these measurements are representative of the quietest times during each assessment period if they are to be considered for a rating background level.</p>	<p>The EPA require confirmation that the background noise levels (RBLs) derived in the NBIA are representative of the quietest times during each assessment period. Specifically, EPA appear to be concerned that the analysis was based on a series of attended noise measurements to calculate the RBL.</p> <p>The background noise analysis was not based on a series of attended noise measurements, the analysis was primarily based on two days of unattended noise logging occurring at five locations around the mine and adjacent Peppertree quarry measured every three months for over five years. This data is shown in Table 6-4 of the NBIA.</p> <p>To demonstrate that background noise levels (RBLs) derived in the NBIA are representative of the quietest times during each assessment period further analysis has been conducted to the background noise level data presenting Assessment Background Levels (ABLs) and RBLs for the measured data for 2016 and 2017 (See Appendix A).</p> <p>The noise logger graphs are presented in Appendix G so they can be easily inspected.</p>
<p>I(v) Why the minimum background levels in the NPfI was not adopted as a default in the absence of data suitable to derive rating background levels in accordance with the NPfI.</p>	<p>Refer to response I(i) and I(iv).</p>
<p>I(vi) Why measurements were not taken at locations potentially most affected by the development.</p>	<p>For the identification of background noise levels, the area around the site was split into three noise catchments, namely:</p> <ol style="list-style-type: none"> 1. North-western catchment; 2. Western catchment; and 3. Eastern catchment. <p>Refer to the figure in Appendix B for noise catchment areas. For the north-western catchment, noise measurements at locations R2 and R3 were considered in the NBIA. For the western catchment, noise measurements at locations R4, R8, B5 and R9 were considered. For the eastern catchment, noise measurements at R14 were considered.</p> <p>It is considered that these locations are a good spatial distribution within the catchment areas and therefore are a good representation of the most affected locations to the development.</p>
<p>II. Sources included in the noise modelling not consistent with proposed operations or source location maps.</p>	
<p>II(i) The names of the plant listed in Table 8-1 should match those on the maps in Appendix D.</p>	<p>Refer to the table in Appendix C.</p>
<p>II(ii) The details of these sources should be included in the new report, including the location of each source on a map.</p>	<p>Refer to the figures in Appendix D.</p> <p>The figures in Appendix D have been updated to include a detailed overview of the Processing Area and the noise sources in the area. Appendix D now also provides labelled figures of line sources whereas the figures in the EIS only included point sources.</p>

EPA COMMENT	RESPONSE																																				
<p>II(iii) The information requested by the EPA in Attachment 2 of the SEARs requires that octave or one third octave band data for each source be provided.</p>	<p>1/1 Octave band noise source data is presented Appendix E.</p> <p>1/1 Octave Band noise source data describes frequency composition of a noise source.</p> <p>The common octave frequency bands are: — 31.5Hz, 63Hz, 125Hz, 250Hz, 500Hz, 1kHz, 2kHz, 4kHz and 8kHz – and their composition is made up of the Lower Band Limit, Centre Frequency and Upper Band Limit.</p>																																				
<p>II(iv) The proponent should provide a justification for not including any rail loading related noise sources in the NPfI assessment.</p>	<p>The rail loading related sources were included in the noise model in the EIS NBIA; however, the operational noise emission from the rail rolling stock (i.e. locomotives and wagons) was omitted.</p> <p>The train source has been modelled and the results are presented in the table below.</p> <table> <tr> <th>Receiver</th><th>Noise levels from the train operating, $L_{Aeq,15minutes}$</th></tr> <tr><td>R1</td><td>15</td></tr> <tr><td>R2</td><td>9</td></tr> <tr><td>R3</td><td>17</td></tr> <tr><td>R4</td><td>14</td></tr> <tr><td>R5</td><td>7</td></tr> <tr><td>R6</td><td>4</td></tr> <tr><td>R7</td><td>10</td></tr> <tr><td>R8</td><td>11</td></tr> <tr><td>R9</td><td>7</td></tr> <tr><td>R10</td><td>2</td></tr> <tr><td>R11</td><td>1</td></tr> <tr><td>R12</td><td>1</td></tr> <tr><td>R13</td><td>9</td></tr> <tr><td>R14</td><td>9</td></tr> <tr><td>R15</td><td>10</td></tr> <tr><td>R16</td><td>8</td></tr> <tr><td>R17</td><td>7</td></tr> </table> <p>The noise contribution from the rail rolling stock (i.e. locomotives and wagons) on site is very low. The addition of rail rolling stock noise contribution does not change the noise predictions presented in the EIS NBIA,</p>	Receiver	Noise levels from the train operating, $L_{Aeq,15minutes}$	R1	15	R2	9	R3	17	R4	14	R5	7	R6	4	R7	10	R8	11	R9	7	R10	2	R11	1	R12	1	R13	9	R14	9	R15	10	R16	8	R17	7
Receiver	Noise levels from the train operating, $L_{Aeq,15minutes}$																																				
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R5	7																																				
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R13	9																																				
R14	9																																				
R15	10																																				
R16	8																																				
R17	7																																				
<p>II(v) The proponent should provide a demonstration of the validation of the noise model.</p>	<p>Refer to Appendix F for a noise validation assessment.</p> <p>In order to validate the site noise model, the noise predictions for the Marulan South Limestone mine under neutral meteorological conditions using the ENM noise prediction algorithm was compared to the measured noise data.</p>																																				
<p>II(vi) The shared road sales stockpile area only includes one source, a static truck. However, Table 8-1 nominates a CAT 980 loader to be at the road sales area. The proponent should review the source locations and update noise predictions accordingly.</p>	<p>The source figures in the EIS had some incorrect labels.</p> <p>Appendix D in conjunction with Appendix C show the source locations modelled in the NBIA.</p> <p>The road sales stockpile source (misc3) includes a static truck and dog and a CAT 980 loader. On this basis the EIS noise predictions are correct and updated noise predictions are not required.</p>																																				
<p>III. Assessment of meteorological conditions requires further clarification.</p>																																					
<p>III(i) The proponent should confirm if the methodology in Section D2 of the NPfI was followed, or alternatively provide a revised analysis and update noise predictions.</p>	<p>The meteorological conditions assessment was consistent with NPfI, Fact Sheet D.</p>																																				

EPA COMMENT		RESPONSE																																																																																																																
IV. Predicted noise levels requires confirmation that all potential sources and locations have been considered.																																																																																																																		
IV(i)	<p>The NBIA has identified two sources which generate the potentially highest maximum noise levels: trucks tipping overburden; and impact noise from material dropping into bins. Dozers reversing are also known to generate high maximum noise levels.</p> <p>The proponent is to confirm if these noise events are controlled by current practises at the mine or have been addressed by other maximum noise level assessments or should be included in an updated assessment.</p>	<p>Noise modelling was based on the typical worst-case equipment locations provided by Boral for the four stages during the life of the mine.</p> <p>The EIS considered the following instantaneous noise sources and typical L_{AFMAX} SWL that may have the potential to disturb sleep:</p> <ul style="list-style-type: none">- Trucks tipping on the overburden emplacements at the closest point to receivers, 120dBA L_{AFMAX}.- Infrastructure area impact noise near crusher (e.g. rock falling into metal bin) 122dBA L_{AFMAX}. <p>Dozer track noise was not specifically identified in the EIS. However, dozer track noise can occur, specifically when a dozer is in 1st gear. Typical track noise for the type of dozer proposed (small to medium size) would range from 114 to 120dBA SWL. As such, the upper range of dozer track noise would be similar to that of trucks tipping overburden. On this basis the current assessment provides a reasonable indication of the range of likely maximum noise impacts, and an updated assessment is not required.</p>																																																																																																																
		<p>As indicated in the NBIA section 9.5, the maximum noise level assessment was conducted only for Stage 1 operations and that the potentially worst impacted receivers are Receiver 9 and Receiver 12 when tipping occurs at the western extents of the WOE.</p> <p>There was an error in transcribing numeric values in Table 9-4. An updated table is provided below presenting the range of $L_{AF,Max}$ noise levels for Scenario Stage 1 Beginning and Scenario Stage 1 End.</p>																																																																																																																
IV(ii)	<p>Noise levels for Stage 3 include a dozer (SWL $L_{eq,15min}$ 116dBA) operating closest to R12 with a predicted $L_{eq,15min}$ of between 26 and 29dBA. However, the predicted maximum noise level is L_{max} 48dBA with an SWL of 120dBA for haul trucks. There is only a 4dB difference in sound power levels, however the predicted noise levels differ by over 20 dB. The dozers and trucks would likely be operating in the same area (location and height) on the emplacement areas and therefore the large difference in noise levels would not be expected. If the difference is due to a duration correction for the $L_{eq,15min}$ noise level, this needs to be outlined in the report.</p>	<p>Table 9-4 Night Time Impact Noise Predictions L_{AFMAX} dBA</p> <table><tr><th rowspan="2">Receiver</th><th colspan="2">Trucks Tipping</th><th colspan="2">Process Area</th><th rowspan="2">Screening Level</th></tr><tr><th>Stage 1 Beginning</th><th>Stage 1 End</th><th>Rocks falling Stage 1 Beginning</th><th>Rocks falling Stage 1 End</th></tr><tr><td>R1</td><td>19</td><td>18</td><td>19</td><td>18</td><td>52</td></tr><tr><td>R2</td><td>27</td><td>29</td><td>26</td><td>24</td><td>52</td></tr><tr><td>R3</td><td>32</td><td>28</td><td>31</td><td>27</td><td>52</td></tr><tr><td>R4</td><td>28</td><td>29</td><td>27</td><td>24</td><td>52</td></tr><tr><td>R5</td><td>35</td><td>34</td><td>29</td><td>27</td><td>52</td></tr><tr><td>R6</td><td>33</td><td>35</td><td>27</td><td>28</td><td>52</td></tr><tr><td>R7</td><td>35</td><td>38</td><td>31</td><td>31</td><td>52</td></tr><tr><td>R8</td><td>37</td><td>39</td><td>33</td><td>32</td><td>52</td></tr><tr><td>R9</td><td>38</td><td>43</td><td>34</td><td>36</td><td>52</td></tr><tr><td>R10</td><td>37</td><td>36</td><td>31</td><td>30</td><td>52</td></tr><tr><td>R11</td><td>39</td><td>34</td><td>32</td><td>30</td><td>52</td></tr><tr><td>R12</td><td>43</td><td>39</td><td>34</td><td>33</td><td>52</td></tr><tr><td>R13</td><td>25</td><td>26</td><td>25</td><td>25</td><td>52</td></tr><tr><td>R14</td><td>33</td><td>33</td><td>33</td><td>33</td><td>52</td></tr><tr><td>R15</td><td>33</td><td>33</td><td>33</td><td>33</td><td>52</td></tr><tr><td>R16</td><td>32</td><td>32</td><td>32</td><td>32</td><td>52</td></tr><tr><td>R17</td><td>30</td><td>30</td><td>30</td><td>30</td><td>52</td></tr></table> <p>Noise is predicted to be less than the NPfI screening level at all receivers for the worst-case Stage 1 mine operations. Therefore, the Project is not predicted to result in sleep disturbance at sensitive receivers.</p> <p>Refer to Appendix C Table Notes, for usage factors. Usage factor is the approximate percentage of time equipment is operational.</p>	Receiver	Trucks Tipping		Process Area		Screening Level	Stage 1 Beginning	Stage 1 End	Rocks falling Stage 1 Beginning	Rocks falling Stage 1 End	R1	19	18	19	18	52	R2	27	29	26	24	52	R3	32	28	31	27	52	R4	28	29	27	24	52	R5	35	34	29	27	52	R6	33	35	27	28	52	R7	35	38	31	31	52	R8	37	39	33	32	52	R9	38	43	34	36	52	R10	37	36	31	30	52	R11	39	34	32	30	52	R12	43	39	34	33	52	R13	25	26	25	25	52	R14	33	33	33	33	52	R15	33	33	33	33	52	R16	32	32	32	32	52	R17	30	30	30	30	52
	Receiver	Trucks Tipping		Process Area		Screening Level																																																																																																												
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R8	37	39	33	32	52																																																																																																													
R9	38	43	34	36	52																																																																																																													
R10	37	36	31	30	52																																																																																																													
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R12	43	39	34	33	52																																																																																																													
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R17	30	30	30	30	52																																																																																																													

EPA COMMENT	RESPONSE
<p>IV(iii) The proponent should review the assumptions, equipment locations, and propagation paths for sources; provide an explanation for this discrepancy and update the NBIA accordingly.</p>	<p>Refer to the Response in IV(ii).</p>
<p>IV(iv) The modelled location of plant on the expanded western overburden emplacement area should be confirmed to represent reasonable worst-case locations for R9 and R12.</p>	<p>Noise modelling was based on the typical worst-case equipment locations provided by Boral for four stages during the life of the mine.</p>
<p>V. Construction activities using a similar fleet indistinguishable from operations should be assessed under the NPfI.</p>	
<p>V(i) The EPA does not agree that the relocation of the stockpile reclaim area and construction of the road sales stockpile area should be assessed under the Interim Construction Noise Guideline (ICNG). Since the operations are within the mine area, uses the same equipment fleet and is described in Section 11.2 of the NBIA as "generally indistinguishable from normal operation", they should be assessed under the NPfI. The assessment should be revised to include these activities in the NPfI assessment.</p>	<p>Construction of the road sales stockpile area would take place using equipment taken from the existing mining fleet.</p> <p>The exact plant that would be utilised and from what part of the operation they would be sourced is not yet known at this stage.</p> <p>The construction activities of the stockpile reclaim area and the road sales stockpile are similar or further distances from the closest residential receivers compared to the overburden emplacement areas. Therefore, the overall operational noise would be less than that predicted in the NBIA Section 9.</p> <p>Therefore, the operation of the mine during the construction of the stockpile reclaim area and construction of the road sales stockpile would be less than the project noise trigger levels at all sensitive receiver locations, given operations closer to sensitive receivers are not predicted to exceed the noise trigger levels.</p>

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully

WILKINSON MURRAY



John Wassermann

Director

APPENDIX A – Review of Background Noise Levels

The EPA require confirmation that the background noise levels (RBLs) derived in the NBIA are representative of the quietest times during each assessment period. Specifically, EPA appear to be concerned that the analysis was based on a series of attended noise measurements to calculate the RBL.

The background noise analysis was not based on a series of attended noise measurements, the analysis was primarily based on two days of unattended noise logging occurring at five locations around the quarry/mine measured every three months for over five years. This data is shown in Table 6-4 of the NBIA.

To demonstrate that background noise levels (RBLs) derived in the NBIA are representative of the quietest times during each assessment period further analysis has been conducted to the background noise level data presenting Assessment Background Levels (ABLs) and RBLs for the measured data for 2016 and 2017. For completeness the noise logger graphs are presented in Appendix G so they can be easily inspected. The noise logger graphs were not presented in the NBIA as the data is available on the Boral website and it would have made the NBIA a very large document.

The unattended background ($L_{A90,period}$) noise monitoring results from 2016 to 2017 are presented in Table A-1, in the form of daily ABLs for each period and the calculated RBL. The assessment has been conducted in accordance with the NPfI.

Additionally, Wilkinson Murray conducted four weeks of unattended noise logging between 20 May 2016 and 17 June 2016 at location B5, which used to be a private residence and has since been acquired by Boral. Table A-2 shows the calculated long term ABL and RBL for the measurement conducted at B5. These noise logger graphs are also presented in Appendix G.

A comparison of the estimated RBLs presented in the EIS's NBIA, with the analysis of unattended noise logging data between 2016 and 2017 for the three noise catchments, is presented in Table A-3.

From Table A-3 it can be seen that the typical background noise levels estimated in the EIS are generally lower than those identified in the specific analysis of the 2016 and 2017 data, apart from the Eastern catchment. The revised RBLs for the eastern catchment are marginally lower than the levels reported in the EIS. This however has no real consequence for the NBIA as the EPA considers the minimum background for daytime to be 35dBA and 30dBA for evening and night-time when developing intrusive noise criteria.

It is therefore considered that the background noise levels presented in the EIS represent the typical RBLs for the catchments consistent with the NPfI and are representative of the quietest times during each assessment period.

It should be noted for the Eastern catchment, that Boral propose to adopt 30dBA as the RBL for evening period as this is lower than the reported level in the EIS.

Table A-1 ABLs Calculated Peppertree Quarry & Marulan South Limestone Mine Noise Logging

Date	B5 – Ordasi			R2 – Bartolo			R3 – Cooper			R8 – Pace			R17 - Meyer			R4 – McClean		
	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night	Day	Eve	Night
2 February 2016	-	30	36	-	-	-	-	31	-	-	28	36	-	-	-	-	34	41
3 February 2016	30	39	34	-	-	-	-	-	-	34	38	35	-	-	-	34	32	31
10 May 2016	-	38	38	-	-	-	-	41	40	-	41	39	-	-	-	-	46	46
11 May 2016	40	41	38	-	-	-	44	41	41	43	42	41	-	-	-	49	48	48
16 August 2016	-	35	34	-	-	-	-	47	39	-	32	31	-	-	-	-	43	40
17 August 2016	32	37	33	-	-	-	38	44	39	34	33	30	-	-	-	42	42	39
25 October 2016	-	-	-	-	44	40	-	37	40	-	35	32	-	30	30	-	37	34
26 October 2016	-	-	-	41	43	40	37	39	38	33	34	31	32	33	27	34	38	33
8 February 2017	-	-	-	-	34	35	-	44	39	-	36	42	-	29	27	-	38	41
9 February 2017	-	-	-	41	39	40	41	42	47	32	29	39	28	27	29	36	37	40
16 May 2017	-	-	-	-	39	39	-	31	29	-	25	30	-	25	25	-	30	35
17 May 2017	-	-	-	31	35	40	29	32	32	31	34	34	-	-	-	29	37	32
11 July 2017	-	-	-	-	29	29	-	31	27	-	30	27	-	<20	21	-	-	-
12 July 2017	-	-	-	30	30	36	27	31	33	30	33	30	23	22	20	-	-	-
12 December 2017	-	-	-	-	34	42	-	31	39	-	38	38	-	32	30	-	31	37
13 December 2017	-	-	-	40	41	44	31	35	38	-	33	37	33	32	32	34	32	34
RBL	36	39	37	36	35	40	37	37	39	33	34	35	30	29	27	34	37	38

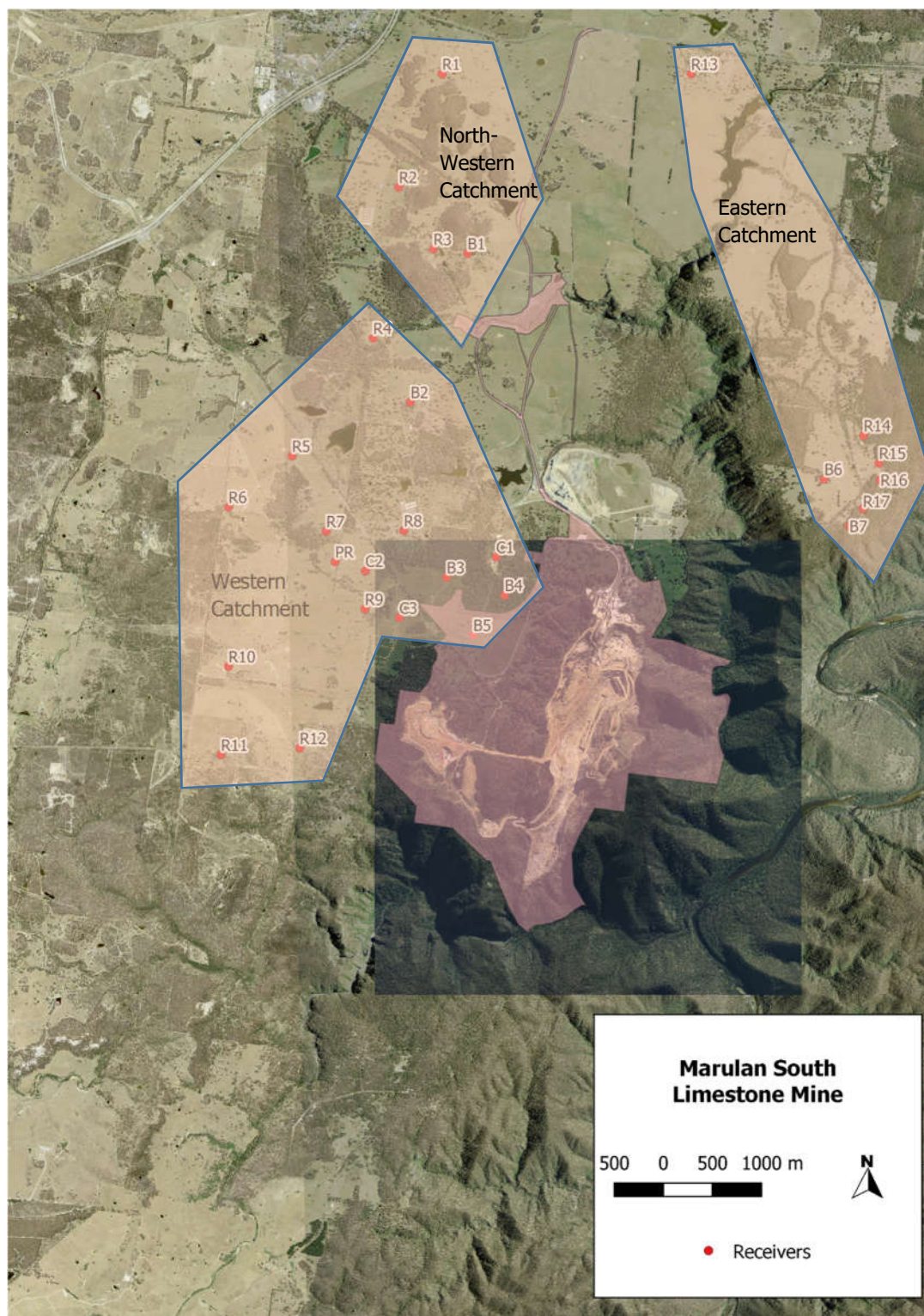
Table A-2 Background Levels (ABL and RBL) Measured at B5

Date	Day	Evening	Night
20-May-16	29.1	28.3	32.4
21-May-16	35.5	34.4	31.1
22-May-16	28.5	28.5	29.8
23-May-16	40.9	41.1	30.4
24-May-16	39.7	38.6	28.6
25-May-16	35.1	30.4	29.3
26-May-16	39.6	35.6	37.5
27-May-16	46.4	39.1	25.4
28-May-16	29.5	32.2	29.7
29-May-16	30.6	33.6	31.2
30-May-16	38.5	37.5	35.2
31-May-16	42.3	41.3	36.2
01-Jun-16	30.8	35.5	28.2
02-Jun-16	32.0	33.6	24.3
03-Jun-16	30.9	36.6	35.9
04-Jun-16	43.6	41.1	39.9
05-Jun-16	51.0	46.2	42.7
06-Jun-16	47.8	42.4	40.6
07-Jun-16	40.8	42.1	40.1
08-Jun-16	39.9	42.6	43.1
09-Jun-16	43.4	44.6	41.2
10-Jun-16	39.5	40.4	36.9
11-Jun-16	37.7	35.5	24.8
12-Jun-16	27.2	37.1	31.0
13-Jun-16	30.2	39.8	34.0
14-Jun-16	35.1	29.9	29.3
15-Jun-16	37.4	34.3	33.4
16-Jun-16	36.6	35.0	35.4
17-Jun-16	39.0		
ALL	38	37	33

Table A-3 Comparison of EIS estimated Background & Additional Monitoring provided in Appendix G

Catchment	Period	EIS	B5	B5 (Wilkinson Murray)	R8	R4	R2	R3	R17
North- Western Catchment	Day	35					36	37	
	Evening	34					35	37	
	Night	34					40	39	
Western Catchment	Day	35	36	38	33	34			
	Evening	33	39	37	34	37			
	Night	33	37	33	35	38			
Eastern Catchment	Day	31							30
	Evening	31							29
	Night	30							27

APPENDIX B – Noise Catchments



APPENDIX C – Equipment Sound Power Levels

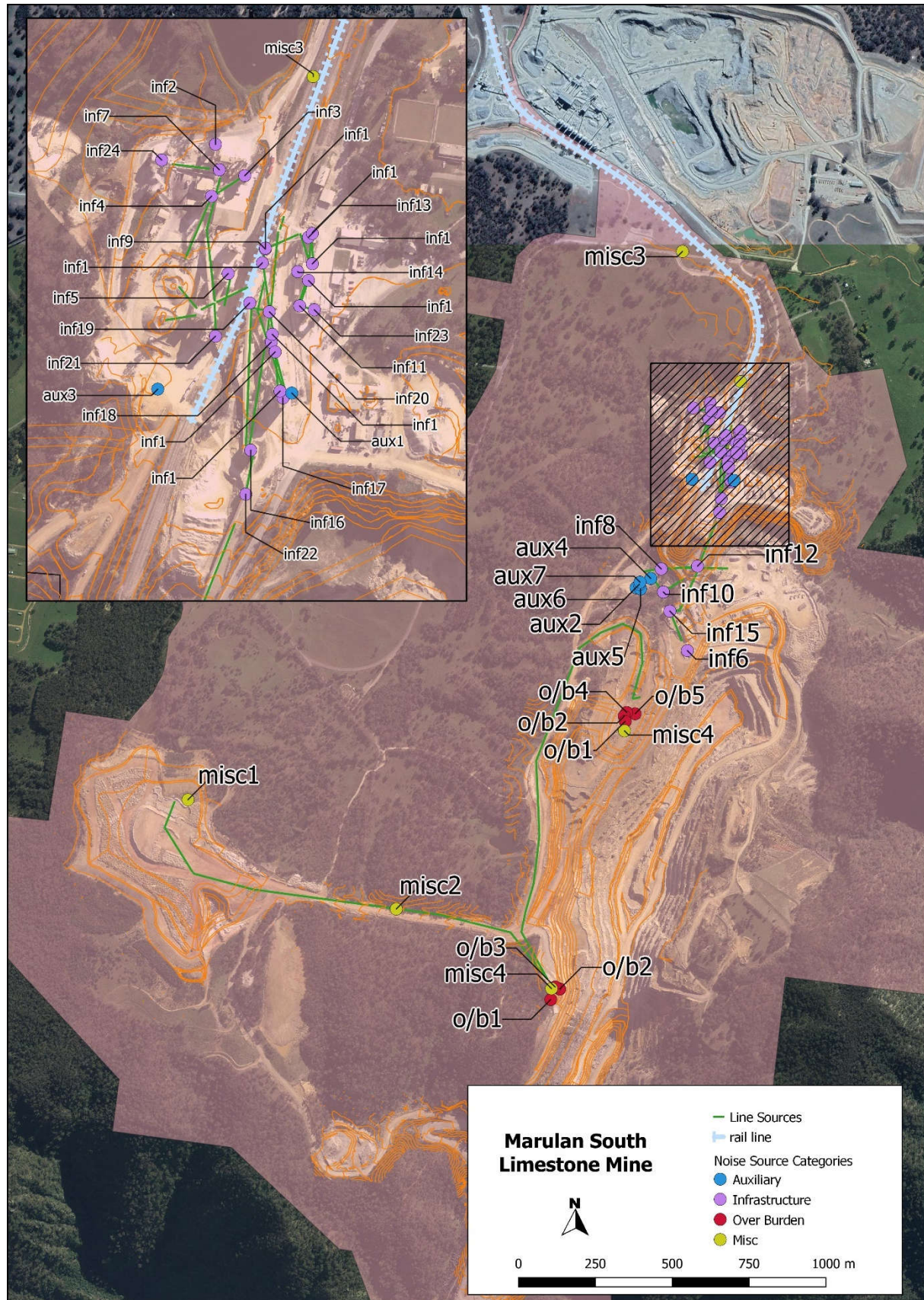
ID	Fleet Item	Description	Location	Sound Power Level	Reference
aux1	Auxiliary Plant	Auxiliary Plant Tadano Crane Mitsubishi FD50 Forklift Ford UF MAY 96 Kanga CAT 432D Backhoe Bobcat S220 Isuzu NPS250 Truck Hinto Truck Road Sweeper Mower	Processing Area	115	Site Survey
aux2	Front End Loader	CAT 980	Reclaim Stockpile Area	110	Site Survey
aux3	Front End Loader	CAT 988G	Product sales at Processing Area	112	Site Survey
aux4	Front End Loader	CAT 993	Reclaim Stockpile Area	113	Site Survey
aux5	Mobile Crusher	Kleeman Mobile Jaw	Reclaim Stockpile Area	115	Site Survey
aux6	Mobile Screen	Kleeman MS19	Reclaim Stockpile Area	110	Site Survey
aux7	Mobile Transfer Conveyor	Ezystak Conveyor Belt Feeder	Reclaim Stockpile Area	100	Site Survey
inf1	Infrastructure	Dust Collector	Processing Area	92	Site Survey
inf2	Infrastructure	Kiln Exhaust	Processing Area	110	Site Survey
inf3	Infrastructure	Kiln Pre-heater	Processing Area	108	Site Survey
inf4	Infrastructure	Kiln Screen 2	Processing Area	117	Site Survey
inf5	Infrastructure	Lime Hydration Plant	Processing Area	105	Site Survey
inf6	Infrastructure	Primary Crusher (underground)	Processing Area (underground)	90	Site Survey
inf7	Infrastructure	Quickbin Crusher	Processing Area	100	Site Survey
inf8	Infrastructure	Radial Stacker	Processing Area	102	Site Survey
inf9	Infrastructure	Rail Dispatch	Processing Area	106	Site Survey
inf10	Infrastructure	Transfer Station	Processing Area	100	Site Survey
inf11	Infrastructure	Sand Plant Air Classifier	Processing Area	105	Site Survey
inf12	Infrastructure	500t Surge Bin	Processing Area	109	Site Survey
inf13	Infrastructure	Sand Plant Crusher	Processing Area	95	Site Survey
inf14	Infrastructure	Sand Plant Screen	Processing Area	108	Site Survey
inf15	Infrastructure	Secondary Crushing Building	Processing Area	120	Site Survey
inf16	Infrastructure	Secondary Screen Building	Processing Area	109	Site Survey
inf17	Infrastructure	Tertiary Crusher Building	Processing Area	115	Site Survey

ID	Fleet Item	Description	Location	Sound Power Level	Reference
inf18	Infrastructure	Tertiary Screen Building	Processing Area	115	Site Survey
inf19	Infrastructure	Trommel Screen Building	Processing Area	111	Site Survey
inf20	Infrastructure	Transfer Station	North of Tertiary Screen Building	100	Site Survey
inf21	Infrastructure	Bulk Loading Bins	Processing Area	110	Site Survey
inf22	Infrastructure	Transfer Station	South of Secondary Screen Building	99	Site Survey
inf23	Loading	Truck Loading	Processing Area	97 ¹	Site Survey
inf24	Infrastructure	Kiln Discharge Building	Processing Area	108	Site Survey
o/b1	ANFO Truck	Iveco Accp 2350G	Limestone in pit	104	Site Survey
o/b2	Drill Rig	Cubex QXR920	Limestone in pit	114	Site Survey
o/b5	Excavator	65t CAT Excavator	Overburden removal in pit	115	Site Survey
o/b6	Excavator	40t CAT 235 with rock breaker	Limestone removal in pit	122	Site Survey
o/b7	Front End Loader	CAT 993K	Limestone & overburden removal in pit	113	Site Survey
misc1	Dozer	Komatsu D375A-5	Overburden emplacement	116 ²	Site Survey
misc2	Grader	CAT 140H	Haul roads	108	Site Survey
misc3	CAT 980 Haul Truck	FEL loading Truck & Dog	Sealed road between Shared Road Sales Stockpile Area / Processing Area and site entrance and between Sand Plant and Peppertree Quarry Processing Plant	110 102	WM Database
misc4	Loading	Truck Loading	Limestone removal in pit	113 ³	Site Survey
Haul Truck	CAT 777	Overburden Haulage	Haul road	114	WM Database
Rail line	Train	Train moving slowly along the rail line	Processing Area	103	Site Survey Peppertree

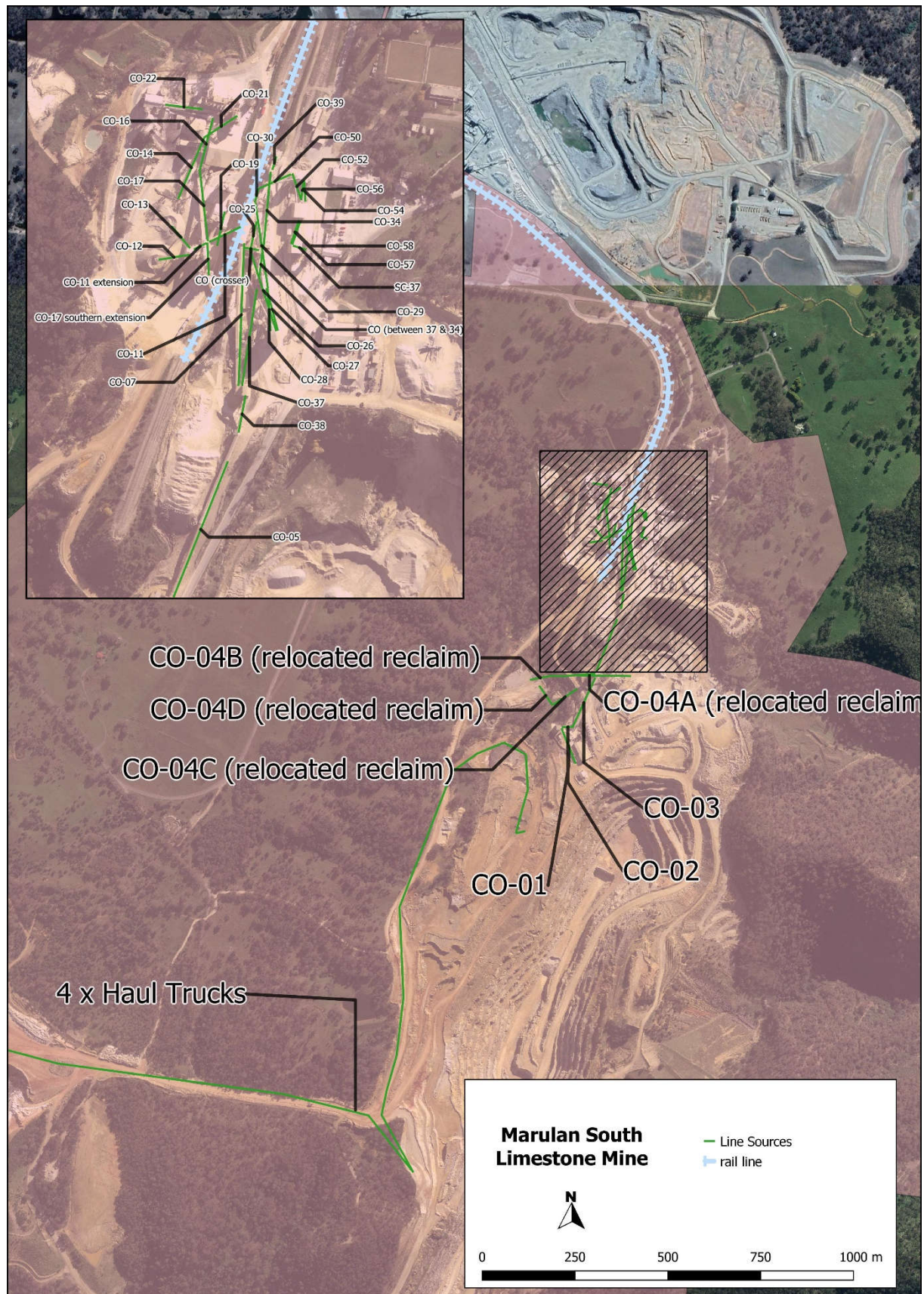
Note: 1 – Usage factor – 20 seconds in 15 minutes.
2 – Usage factor of 50 percent (-3dB) to account that the dozer would not operate at 100% for an entire 15-minute duration.
3 – Usage factor for the two haul trucks being loaded were assumed to be idling for approximately two minutes, and their sound power level for the 15-minute assessment period was set at L_{Aeq,15min} 113dBA (rather than 114dBA for full power for 15 minutes).

APPENDIX D – Location of Plant & Equipment

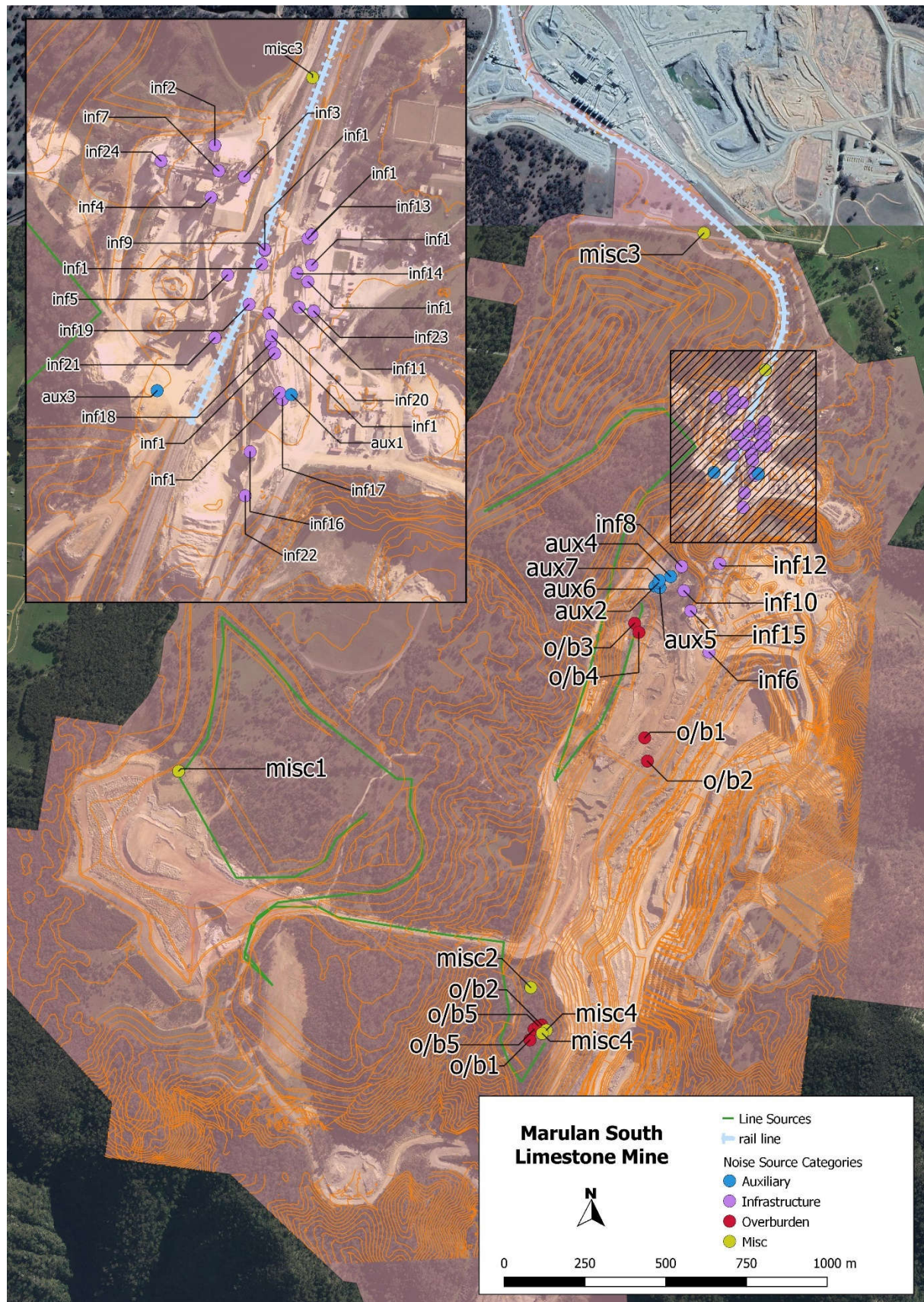
Stage 1 – Beginning – Point Sources



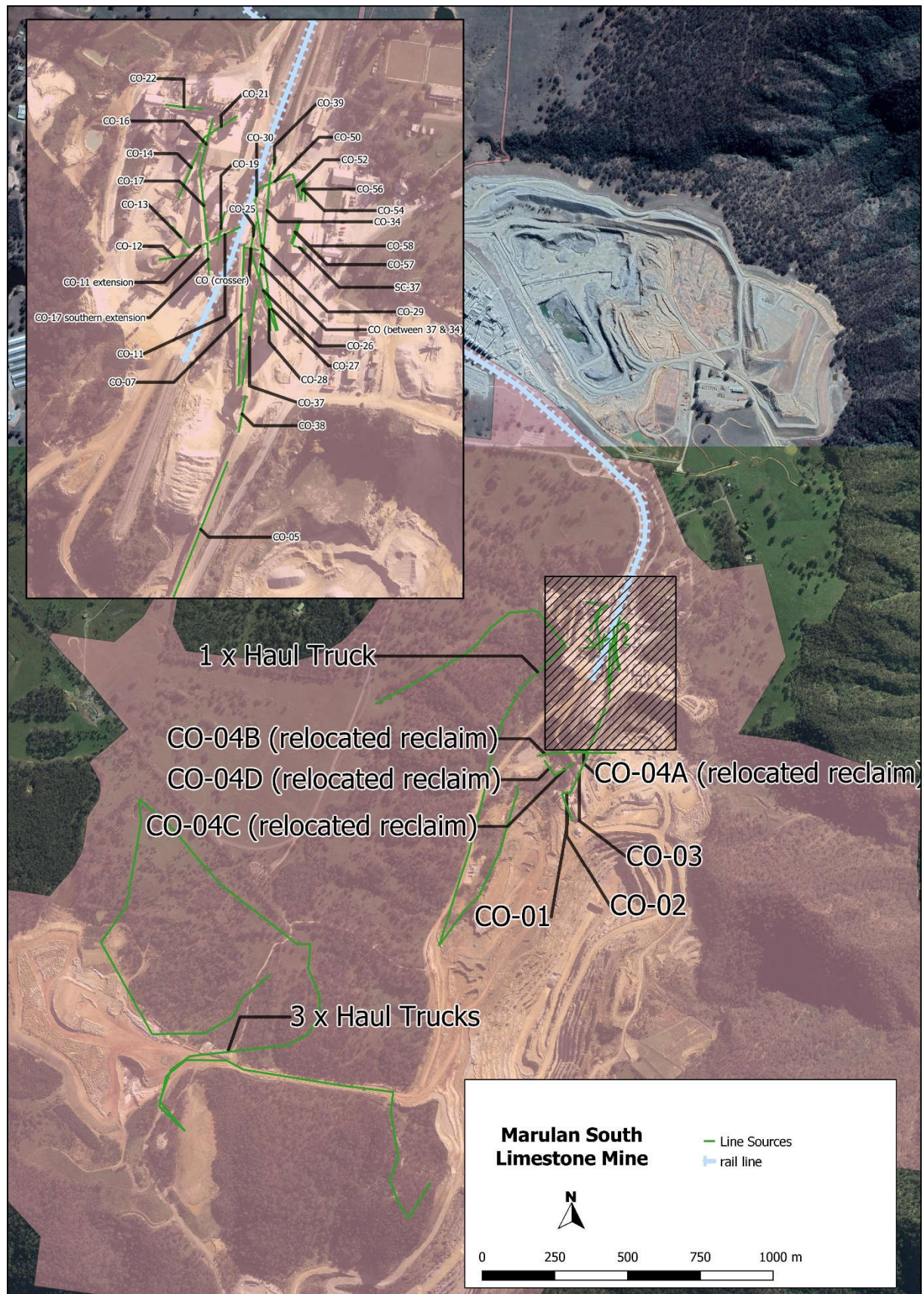
Stage 1 – Beginning – Line Sources



Stage 1 – End – Point Sources



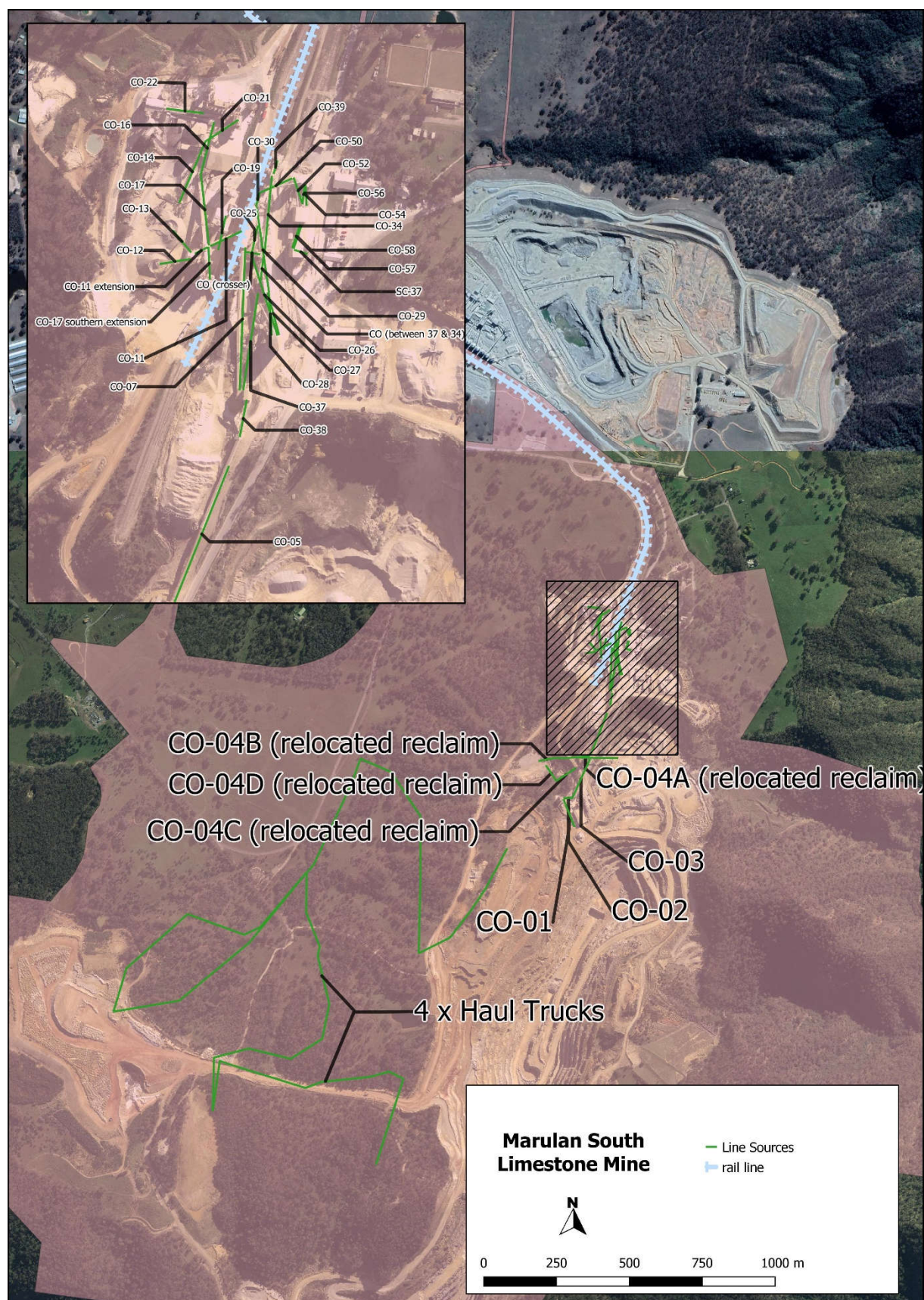
Stage 1 – End – Line Sources



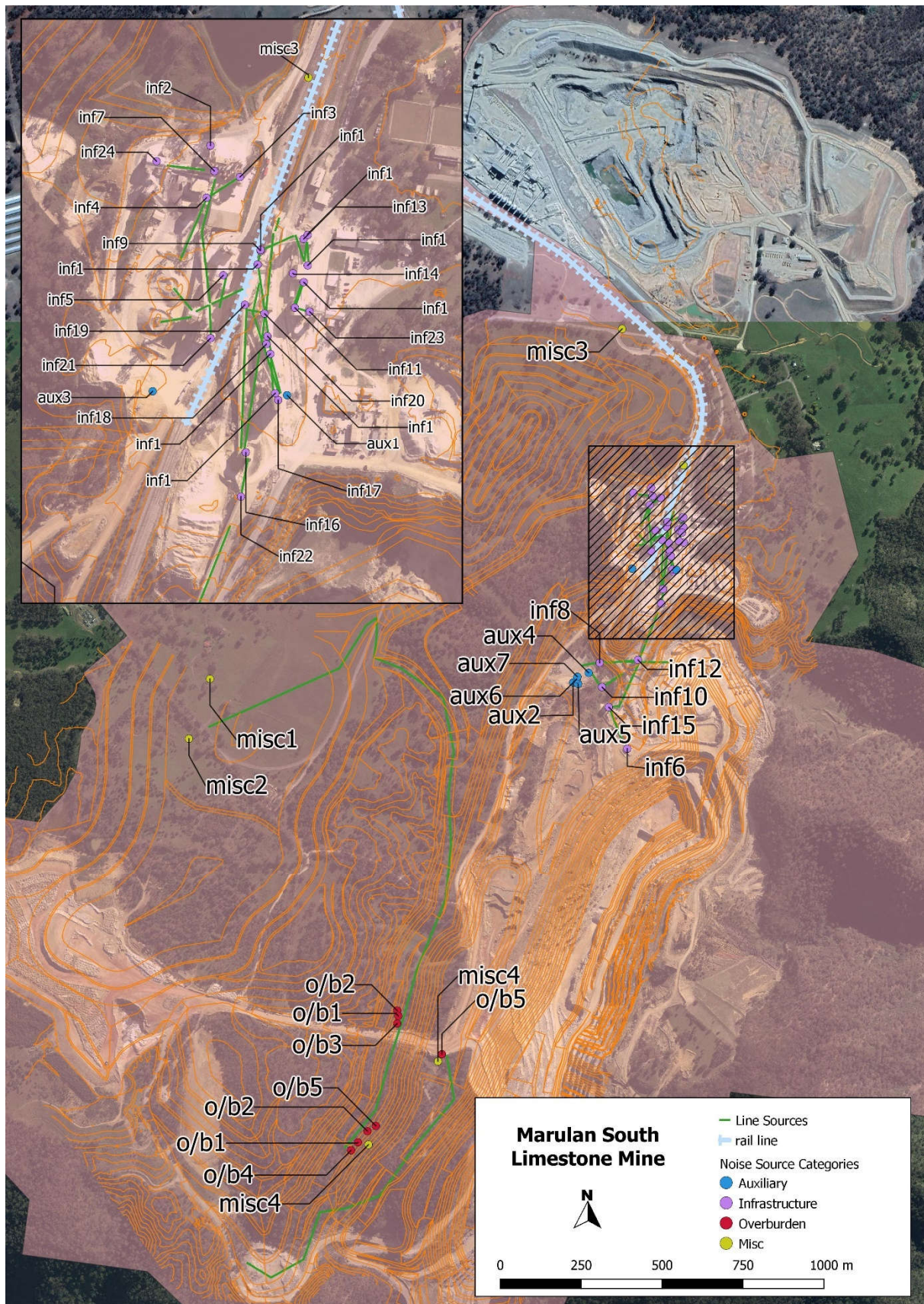
Stage 2 – Point Sources



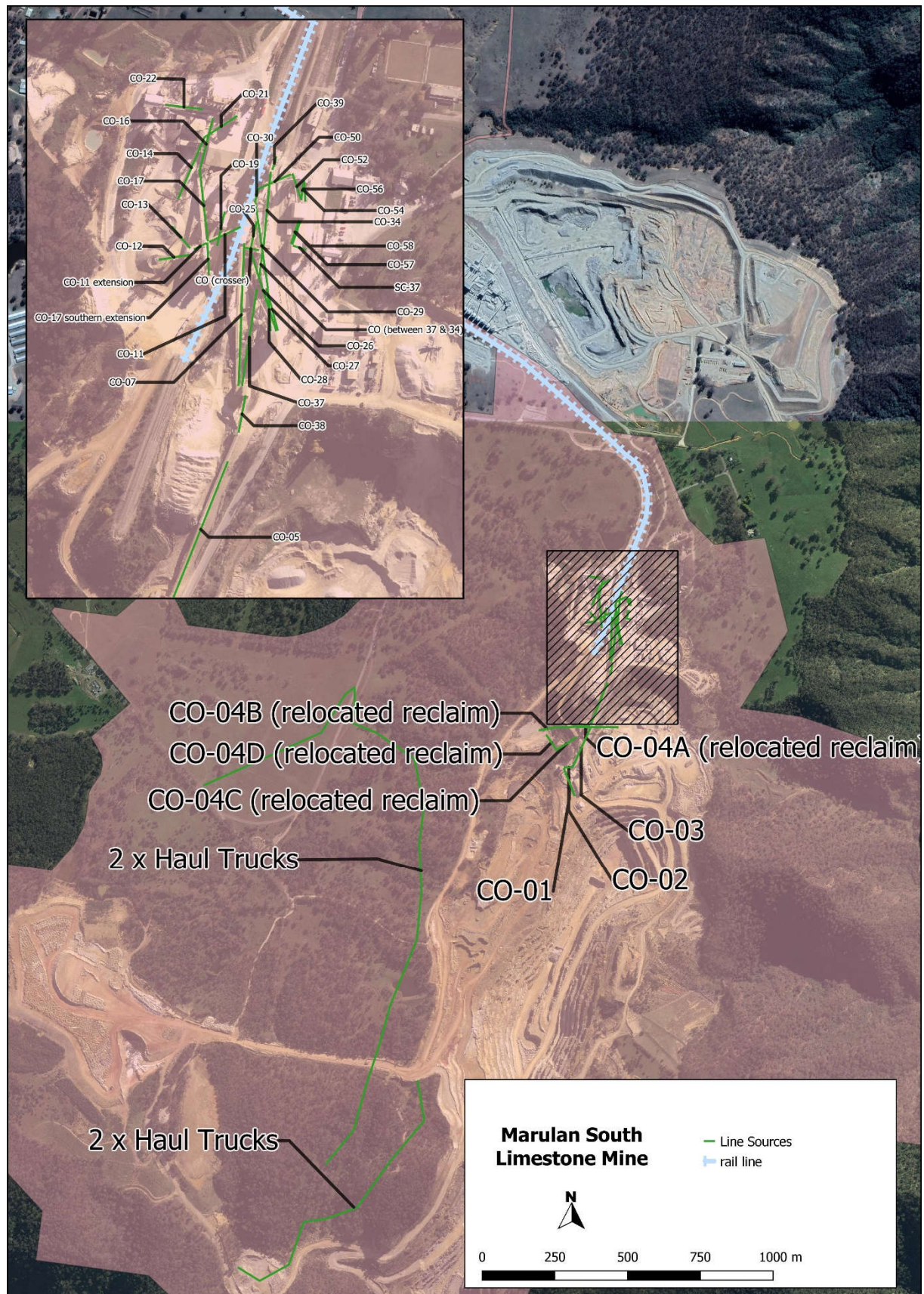
Stage 2 –Line Sources



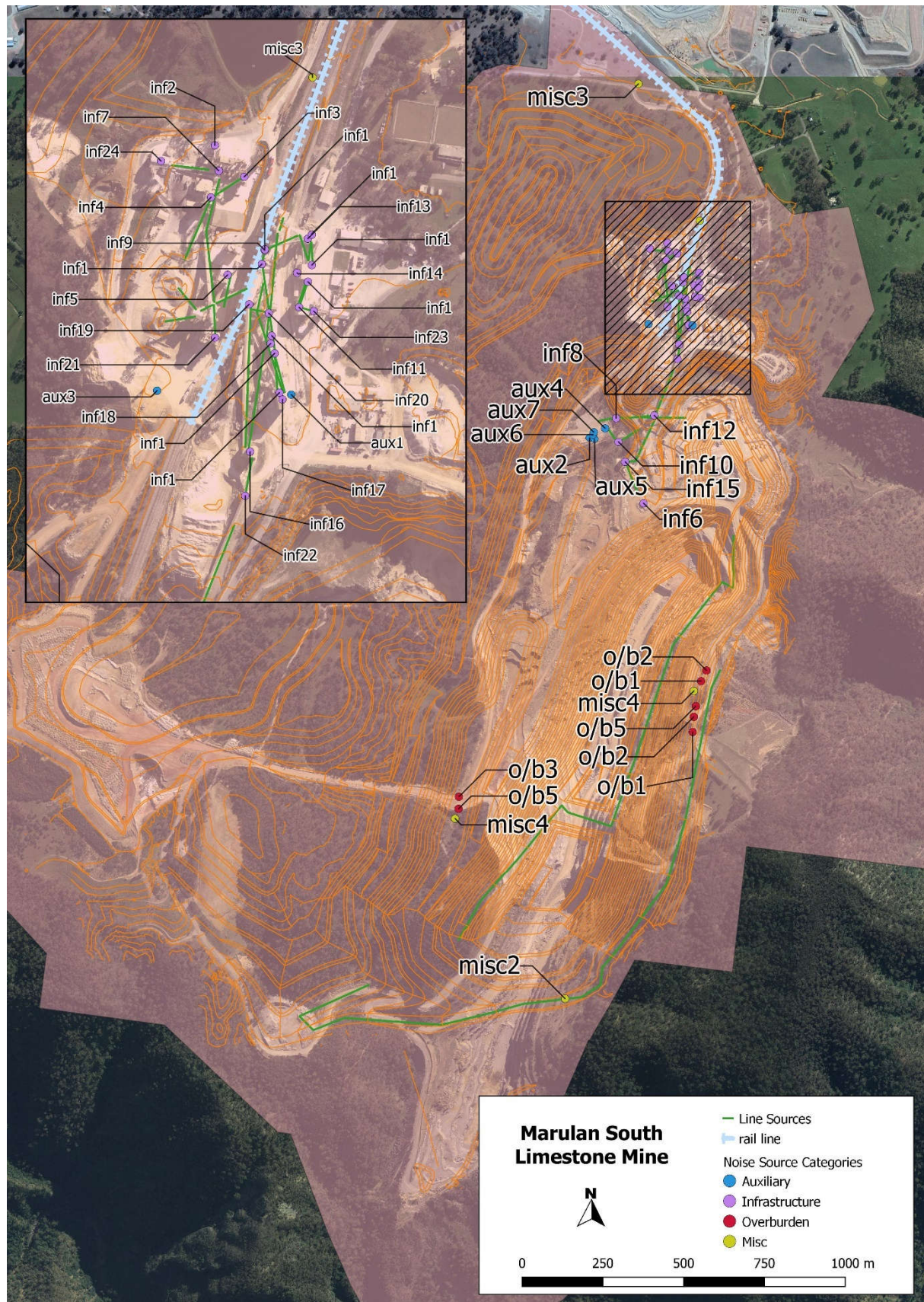
Stage 3 – Point Sources



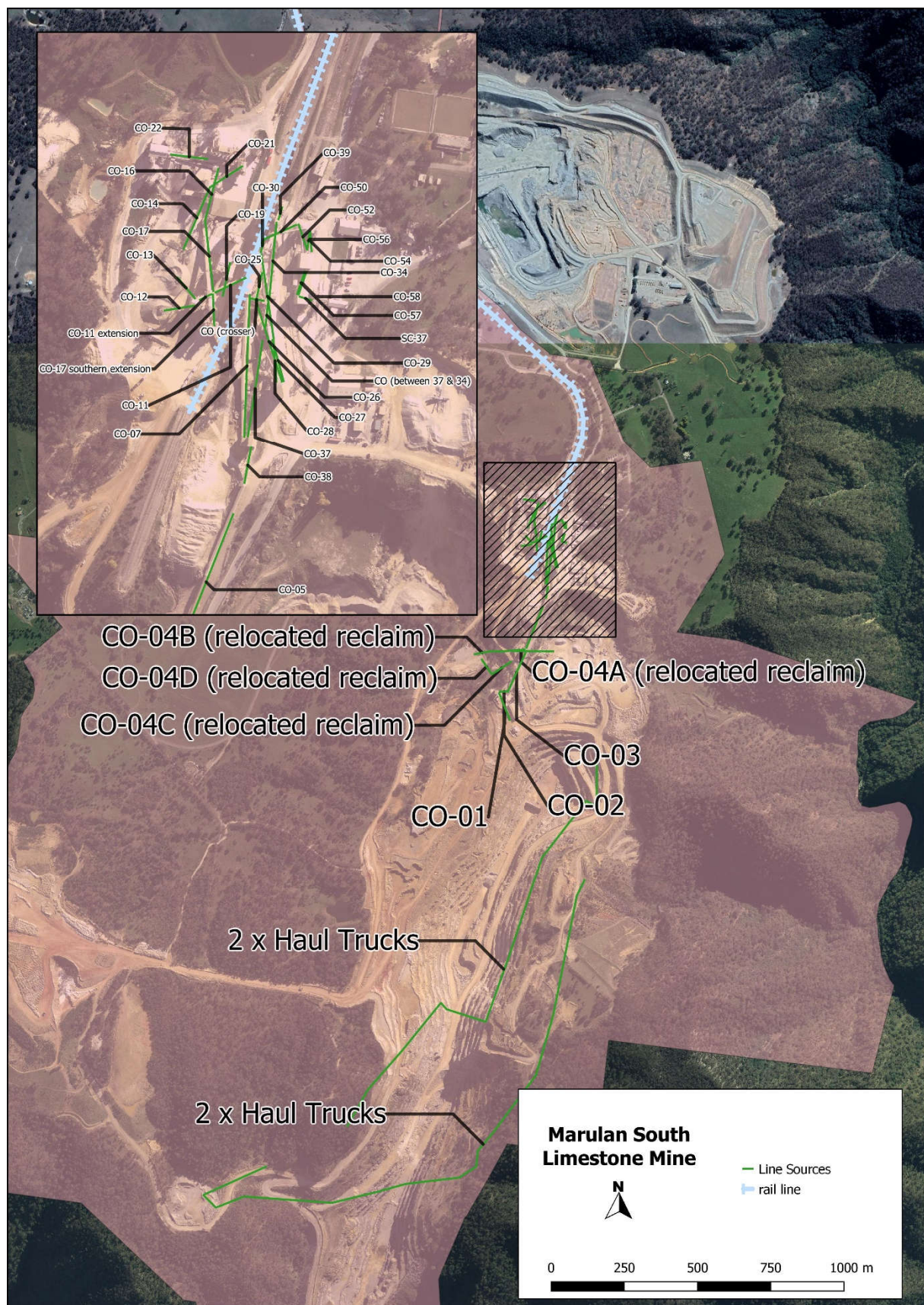
Stage 3 – Line Sources



Stage 4 – Point Sources



Stage 4 – Line Sources



APPENDIX E – Equipment Spectra

Item	A- Weighted	Octave Band Centre Frequency (Hz) dBA								
		31.5	63	125	250	500	1K	2K	4K	8K
Dust Collector	92	48	57	66	74	84	89	85	81	72
Sand Plant Crusher	95	69	77	90	89	86	87	84	80	72
Transfer Station	99	69	76	83	90	94	93	92	88	75
Mobile Transfer CV	100	68	79	87	94	95	94	91	81	69
Reclaim Transfer Station	100	70	77	84	91	95	94	93	89	76
Quickbin Crusher	100	74	82	95	94	91	92	89	85	77
Radial Stacker (relocated)	102	56	69	79	86	92	95	96	96	94
ANFO Truck	104	85	86	94	96	99	97	95	92	87
Sand Plant Air Classifier	105	74	82	92	95	98	101	98	94	83
Lime Hydration Plant	105	64	77	83	90	96	97	98	101	93
Rail Dispatch	106	70	85	88	94	100	100	100	98	89
Sand Plant Screen	108	77	85	95	98	101	104	101	97	86
Kiln Discharge Building	108	77	84	88	98	102	103	102	98	85
Kiln Pre-heater	108	68	82	86	97	106	100	98	94	84
Grader	108	71	92	98	100	102	101	101	95	88
500t Surge Bin	109	72	82	92	98	105	104	100	93	85
Secondary Screen Building	109	74	82	91	96	102	104	104	99	86
FEL CAT980	110	72	80	96	98	103	105	105	96	88
Mobile Screen	110	77	91	99	98	105	104	103	99	91
Kiln Exhaust	110	64	75	83	93	109	103	95	89	79
Bulk Loading Bins	110	63	82	88	96	109	101	98	92	82
Road Truck	110	76	87	103	100	105	104	102	95	84
Trommel Screen Building	111	73	92	90	97	103	105	106	103	93
FEL CAT988G	112	74	82	98	100	105	107	107	98	90
FEL CAT993	113	75	83	99	101	106	108	108	99	91
FEL CAT993K	113	75	83	99	101	106	108	108	99	91
Dozer	116	78	93	99	106	113	110	107	100	92
Haul Truck	114	80	91	107	104	109	108	106	99	89
Drill Rig	114	95	96	96	94	106	108	109	107	92
Auxilliary Plant	115	74	89	103	104	110	109	110	103	94
Mobile Crusher	115	82	96	104	103	110	109	108	104	96
Tertiary Crusher Building	115	69	82	92	99	105	108	109	109	107
Tertiary Screen Building	115	77	82	92	97	103	106	110	111	105
EXC CAT 65t	115	76	91	98	105	112	109	106	99	90
Kiln Screen 2	117	69	81	89	98	106	112	114	108	97
Secondary Crushing Building	120	78	93	102	109	116	115	112	105	90
40t CAT 235	122	75	95	105	113	116	118	114	110	102
CO (between 37 & 34)	93	60	71	80	86	87	87	83	74	62

Item	A- Weighted	Octave Band Centre Frequency (Hz) dBA								
		31.5	63	125	250	500	1K	2K	4K	8K
CO (crosser)	91	58	69	78	84	85	85	81	72	60
CO-01	99	67	78	86	92	94	93	90	80	68
CO-02	93	61	72	81	87	88	88	84	75	63
CO-03	101	68	79	88	94	95	95	91	82	70
CO-04A (relocated reclaim)	104	72	83	91	98	99	99	95	86	74
CO-04B (relocated reclaim)	96	64	75	83	90	91	91	87	78	66
CO-04C (relocated reclaim)	98	66	77	85	92	93	93	89	80	68
CO-04D (relocated reclaim)	97	64	76	84	90	92	91	87	78	66
CO-05	101	68	80	88	94	96	95	91	82	70
CO-07	101	68	79	88	94	95	95	91	82	70
CO-11	94	62	73	82	88	89	89	85	76	64
CO-11 extension	90	58	69	77	84	85	84	81	71	59
CO-12	94	61	73	81	87	89	88	84	75	63
CO-13	94	61	73	81	87	89	88	84	75	63
CO-14	97	65	76	85	91	92	92	88	79	67
CO-16	96	64	75	84	90	91	91	87	78	66
CO-17	98	65	76	85	91	92	92	88	79	67
CO-17 southern extension	94	62	73	81	88	89	88	85	75	63
CO-19	94	62	73	82	88	89	89	85	76	64
CO-21	95	62	74	82	88	90	89	85	76	64
CO-22	95	62	74	82	88	90	89	85	76	64
CO-25	94	61	72	81	87	88	88	84	75	63
CO-26	98	66	77	86	92	93	93	89	80	68
CO-27	95	63	74	83	89	90	90	86	77	65
CO-28	95	63	74	83	89	90	90	86	77	65
CO-29	98	66	77	86	92	93	93	89	80	68
CO-30	90	58	69	77	84	85	85	81	72	60
CO-34	98	66	77	85	91	93	92	89	79	67
CO-37	99	67	78	86	93	94	93	90	80	68
CO-38	95	62	74	82	88	90	89	85	76	64
CO-39	90	58	69	77	83	85	84	81	71	59
CO-50	94	62	73	82	88	89	89	85	76	64
CO-52	93	61	72	80	87	88	88	84	75	63
CO-54	92	60	71	79	85	87	86	83	73	61
CO-56	92	59	71	79	85	87	86	82	73	61
CO-57	93	60	72	80	86	88	87	83	74	62
CO-58	93	60	72	80	86	88	87	83	74	62
SC-37	90	58	69	77	83	85	84	81	71	59

APPENDIX F – Validation of the Noise Model

In order to validate the noise model, a survey of noise was carried out at receiver location B5 from 29 March to 31 March 2015. Noise was measured using the BarnOwl® directional noise monitor. The BarnOwl® allows discrimination of separate noise sources coming from different directions. In this way, the noise level of the mine could be separated from the overall ambient noise level during the measurement period.

Separately to the noise measurement, Boral has provided the meteorological conditions which occurred on site during the same period, including wind speed and direction, and atmospheric stability.

Boral has also provided a schedule of operations that occurred during the noise survey, and these are listed in Table F-1.

Table F-1 Mine Operations during BarnOwl Noise Survey

Dates (2015)	Operations
29, 30, 31 March 2015	<ul style="list-style-type: none"> • 1x Cat 993 Cat (24hrs) – Front End Loader • 4x 777 Cat (24hrs) – Haul Trucks • 1x Water Cart (24hrs) • 1x Dozer (daytime) • Emplacement of overburden on the Western Overburden emplacement

In order to validate the site noise model, the noise predictions for the Marulan South Limestone mine under neutral meteorological conditions using the ENM noise prediction algorithm was compared to the measured BarnOwl data. The comparison of the measured noise levels and predicted noise level using neutral conditions are presented in Figures F-1 to F-3.

Figure F-1 Comparison of Predicted Neutral Noise Levels & Measured Mine Operational Noise using BarnOwl for 29 March 2015

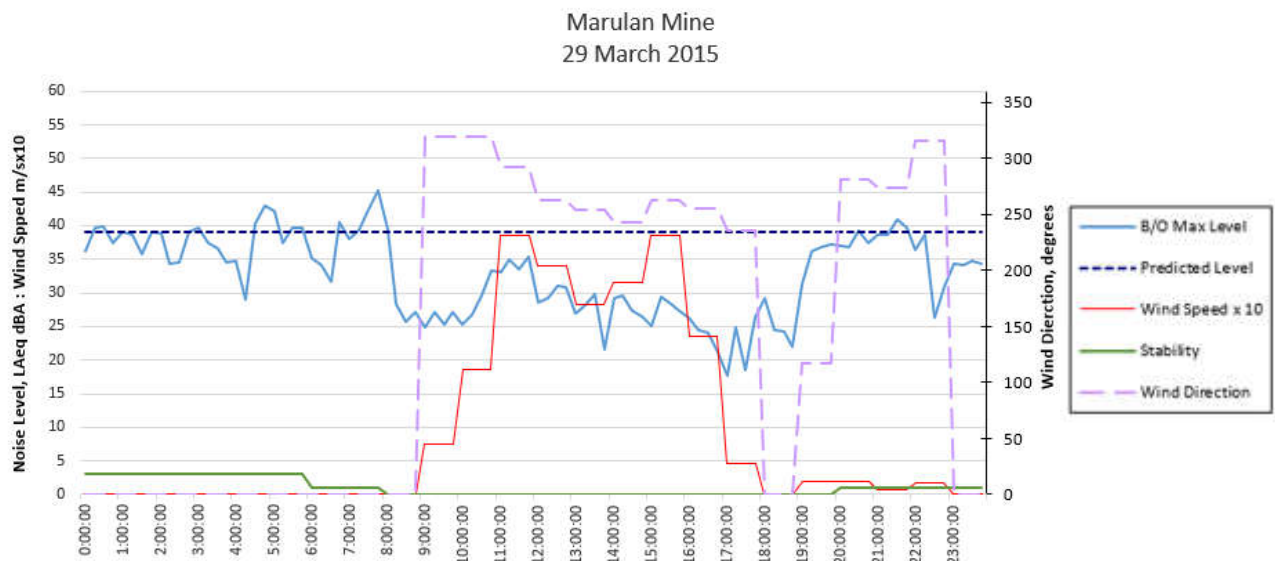


Figure F-2 Comparison of Predicted Neutral Noise Levels & Measured Mine Operational Noise using BarnOwl for 30 March 2015

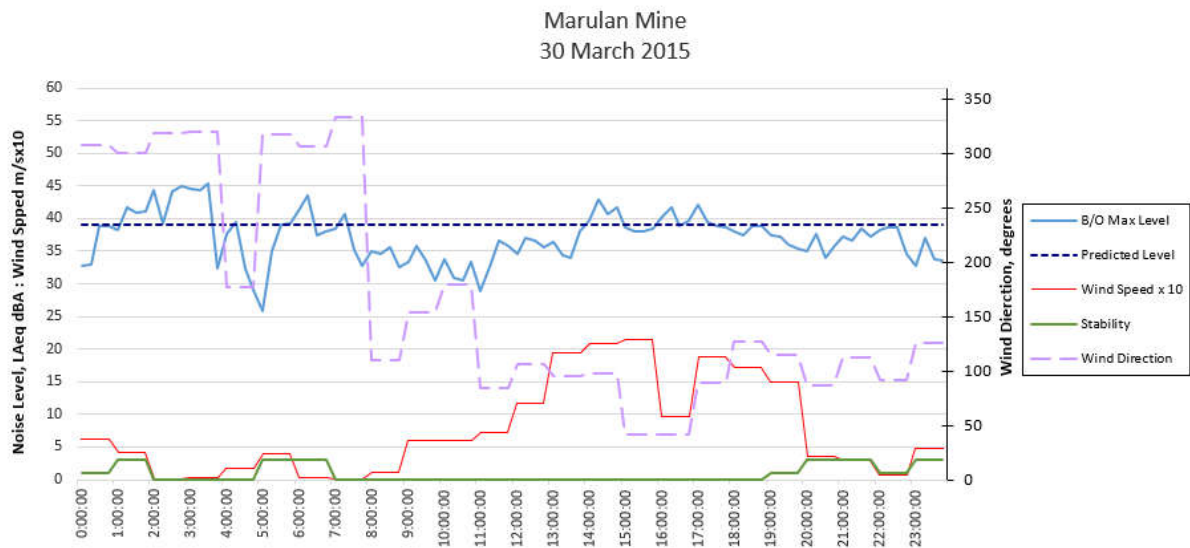


Figure F-3 Comparison of Predicted Neutral Noise Levels & Measured Mine Operational Noise using BarnOwl for 31 March 2015



The predicted noise levels under neutral conditions are generally less than the measured levels with an occasional higher level that is no greater than 5dB. As such, it is considered that the ENM noise prediction shows good correlation with the measured noise levels.

APPENDIX G – Noise Logger Graphs

APPENDIX G

EMAIL FROM OWNER OF TOMASY
PLANNING

Subject: Fwd: Marulan South Limestone Operations
From: "Snape, Rachael" <rachael.snape@boral.com.au> **To:**

Date Sent: Tuesday, April 23, 2019 10:56:46 AM GMT+10:00

Date Received:

Attachments: MSL SSD 7009_Stages 0 - 4.pdf,image001.jpg

Good morning Denis,

Further to our brief telephone conversation of April 15 2019, unfortunately I did not receive your email with your questions so I asked Sharon to pass it on to me for response. As discussed, Sharon does not support the operation and management of Marulan South Limestone. As mentioned in our discussion, I am one of Boral's Planning and Development Managers, my role is to support the various Boral businesses through the planning process as a client side (in house) urban/environmental planner and project manager.

Please find below responses to your enquiries, if you require any further information please feel free to get in contact using the numbers below or return email.

The current proposal only relates to the Marulan South Limestone mine

The SSD application seeks to consolidate the existing consents of Marulan South Limestone and extend the pit and operations (refer below). The application does not relate to the quarry pit at Peppertree.

As mentioned on the phone in our brief discussion, there is some crossover between the two operations, however these are minor in nature. In relation to the SSD this is limited to the dispatch/export of material from the site by road and a shared overburden area (referred to in the Peppertree Mod 5 application as the South Western Overburden Emplacement). The current proposal includes provision for Peppertree to move 150,0000 of quarry materials tonnes per annum.

The pit is to be widened and deepened over time, but only to the south, not to the north and therefore without effect to [REDACTED]

The primary expansion of the limestone pit is to the west and south. However, there is a minor northern increase in the extent of the pit that can be seen in the proposed stage 1 figure, refer to Figure 4.12 p. 112 in section 4.5.2 of the EIS document. Alternatively for ease of reference I have attached the relevant figures showing Stage 0 - 4 of the proposal.

Approval to use overburden generated at the site to fill the southernmost end of the existing pit

The proposal involves the emplacement of overburden both "*in pit*" and "*out-of-pit*". The "*out of pit*" overburden emplacement will be to the west, south west and north-west of the limestone pits (as set out in response to your query below). "*In-pit*" refers to the use of overburden within the southern most portions of the pit. The "*in pit*" emplacement is confined to the southern portion.

All areas of emplacement are shown in the attached figures.

Creating embankments for additional overburden to the west and north-west of the site

As set out above, the project includes the establishment of overburden emplacement areas to the west, north west and the south west. These are shown in Figures 4.12, 4.14, 4.16 and 4.18. These are attached in chronology for ease of reference.

Allowing up to 6,000 tonnes of material to be transported each year by road.

Under the current consent MSL can transport up to 450,000 tonnes per annum. The proposal

seeks consent to move up to 720,000 tonne by road. In total there will be 270,000 tonne increase.

Vehicle movements as generally distributed as follows:

- 600,000 tonne per annum of material (limestone and hardrock products) along Marulan South Road to the Hume Highway. Approximately 150,000 tpa of this will be product from Peppertree, and
- 120,000 tonne limestone product to the adjacent Aglime Facility approximately 1 kilometre west of MSL on Marulan South Road.

I trust the above provides clarity to your questions. However, as mentioned earlier should you have any further questions please feel free to get in contact.

Regards,

--

RACHAEL SNAPE

Planning and Development Manager NSW/ACT



Telephone: (02) 9033 4401

Mobile: + 61 401 894 110

Fax: (02) 9033 5305

Email: Rachael.Snape@boral.com.au

Boral Land & Property Group

Triniti T2 Level 5

39 Delhi Road, North Ryde NSW 2113.

www.boral.com.au

----- Forwarded message -----

From: **Denis Smith**

Date: Mon, 15 Apr 2019 at 15:26

Subject: Marulan South Limestone Operations

To: <Sharon.Makin@boral.com.au>

Cc: Charles Mendel

Hi Sharon

You may recall [REDACTED], who is the owner of [REDACTED], and I met with you in late August last year regarding the proposed expansion of the Marulan South Limestone mine.

We note that the subject proposal, which is of State significance, is currently on exhibition for representation and submission purposes for a 28-day period from 3 April 2019.

We have reviewed relevant documentation currently available for public review; however, we

seek your clarification on a number of matters:

- The current proposal only relates to the Marulan South Limestone mine
- The pit is to be widened and deepened over time, but only to the south, not to the north and therefore without effect to Glenrock
- Approval to use overburden generated at the site to fill the southernmost end of the existing pit
- Creating embankments for additional overburden to the west and north-west of the site
- Allowing up to 6,000 tonnes of material to be transported each year by road.

It would be sincerely appreciated if you could confirm the above assumptions are correct.

Kind regards

Denis

Denis Smith

Director, Planning and Property



Figure 3.3
Existing operations - Stage O (Pre SSD approval)

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS - SSD APPLICATION
ENVIRONMENTAL IMPACT STATEMENT

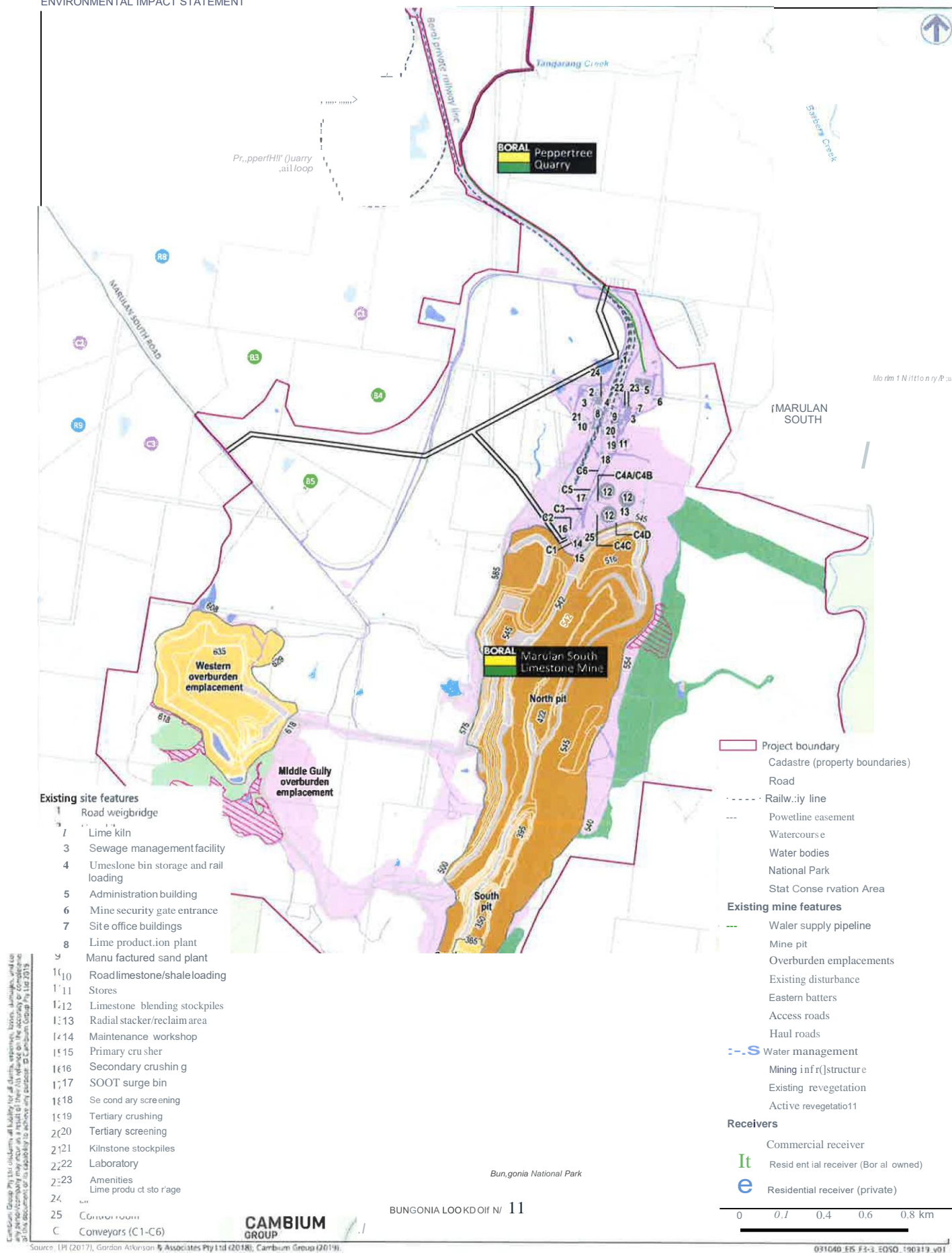


Figure 4.12
The Project - Stage 1 (5 years)

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS - SSD APPLICATION
ENVIRONMENTAL IMPACT STATEMENT

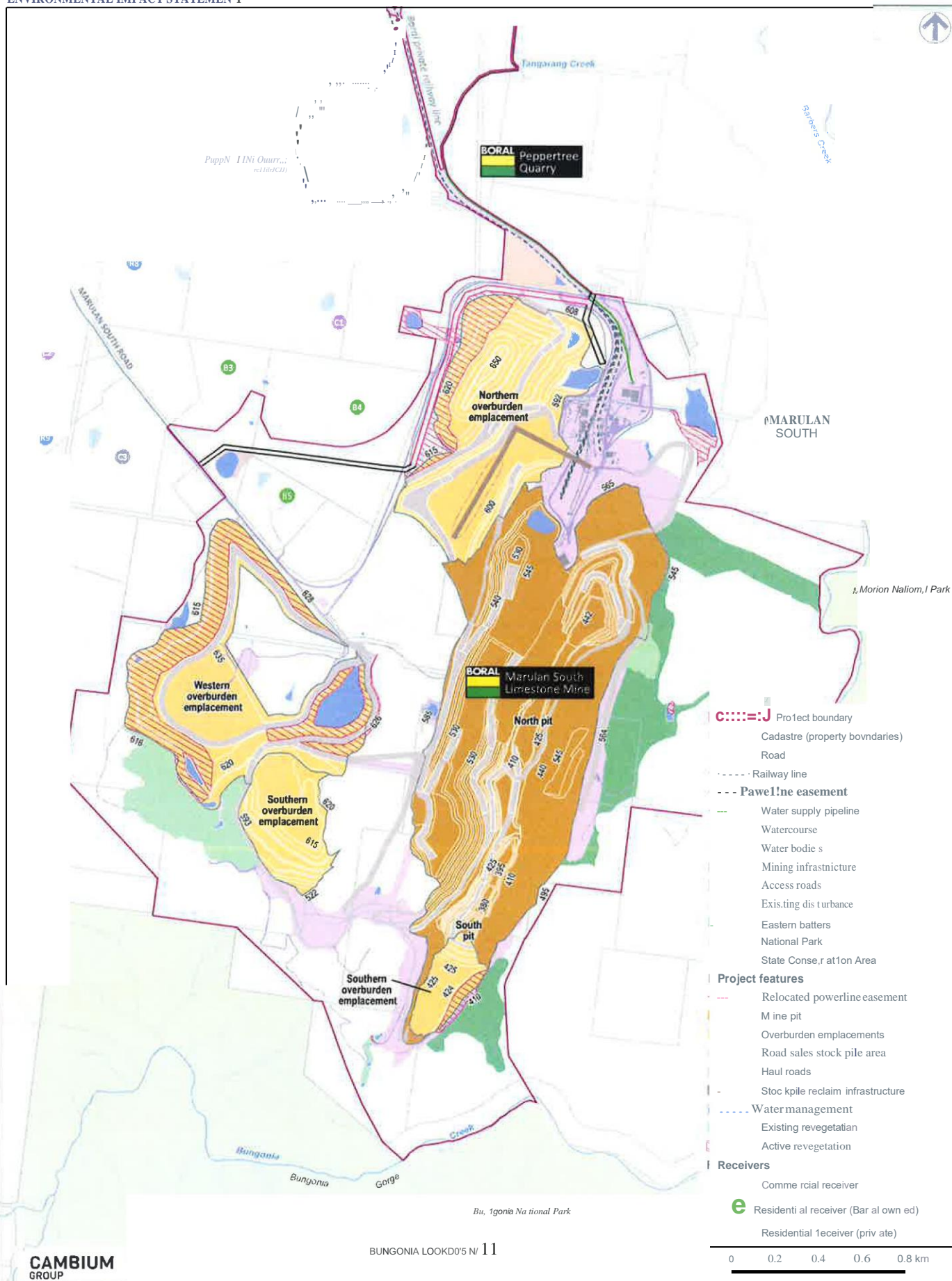


Figure 4.14
The Project - Stage 2 (8 years)

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS • SSD APPLICATION
ENVIRONMENTAL IMPACT STATEMENT

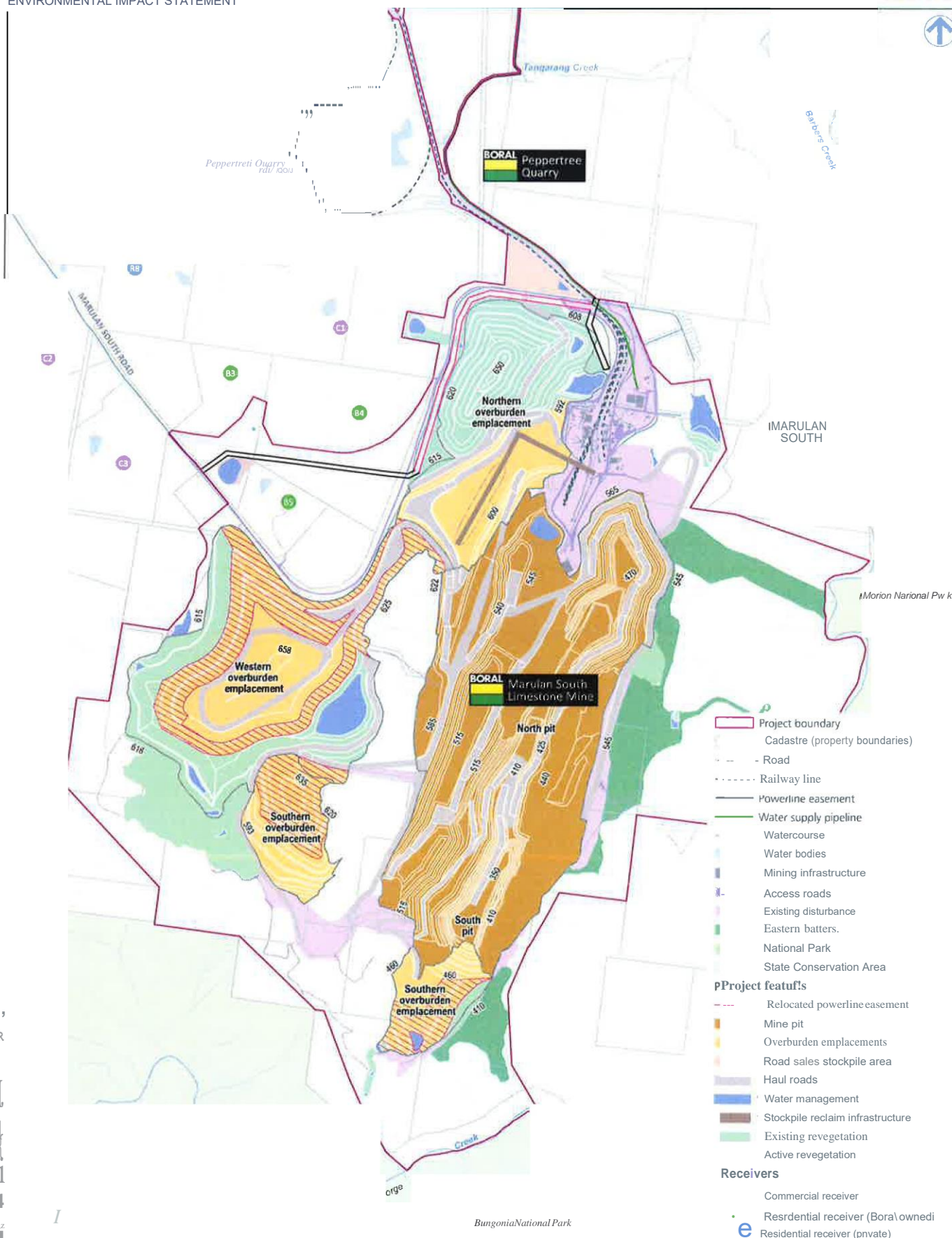
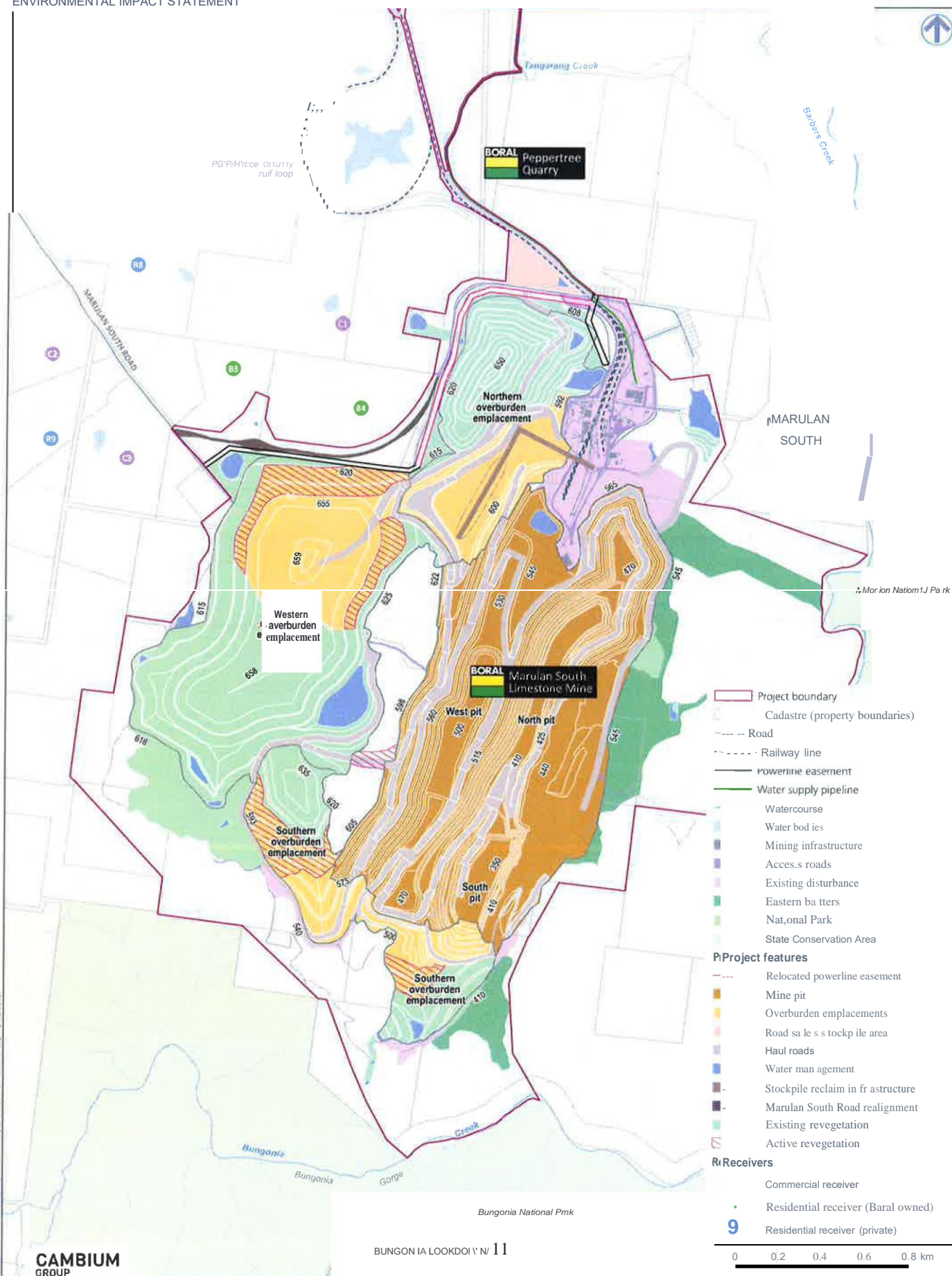
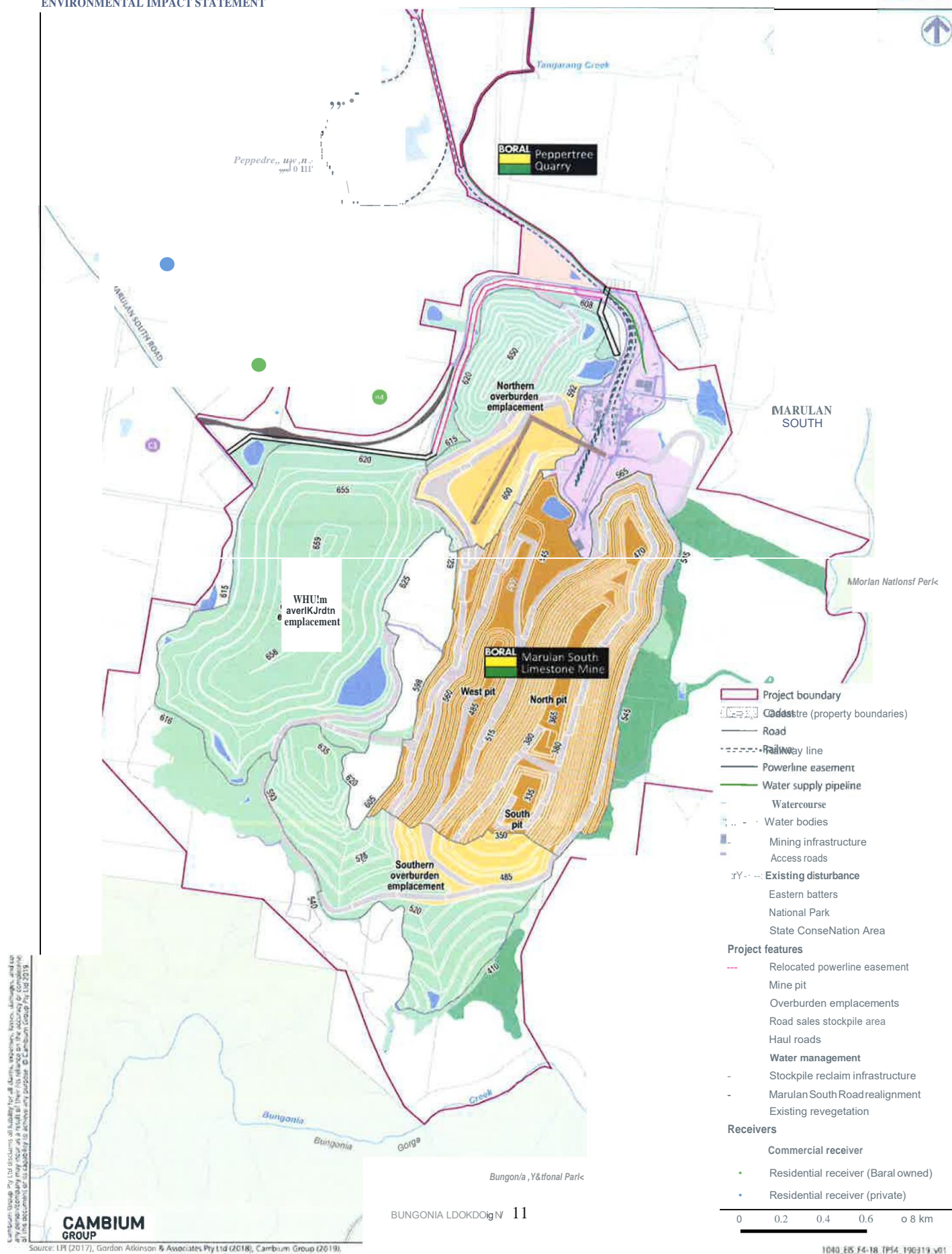


Figure 4.16
The Project - Stage 3 (6 years)

MARULAN SOUTH LIMESTONE MINE CONTINUED OPERATIONS - SSD APPLICATION
ENVIRONMENTAL IMPACT STATEMENT





APPENDIX H

RMS CORRESPONDENCE

From: Melissa Steep <Melissa.Steep@rms.nsw.gov.au>
Sent: Monday, 17 June 2019 9:39 AM
To: Mark Roberts <mark.roberts@elementenvironment.com.au>
Cc: Development Southern <development.southern@rms.nsw.gov.au>
Subject: RE: STH13/00010 - Marulan South Limestone Mine reply to RMS exhibition comment

Hello Mark,

RMS ref: STH13/00010/05

RMS notes the provided updated modelling and will finalise its assessment of the application upon receipt of the Response to Submissions Report.

Kind regards,
Melissa Steep
Development Assessment Officer
Customer Services | Southern Region
T: 02 4221 2771
www.rms.nsw.gov.au
Every journey matters Roads and Maritime Services
90 Crown Street Wollongong NSW 2500

Please be advised I currently work part time – Monday, Thursday (half day) & Friday.
For urgent enquiries on non-working days please contact 4221 2548

From: Mark Roberts [<mailto:mark.roberts@elementenvironment.com.au>]
Sent: Thursday, 6 June 2019 9:53 AM
To: Development Southern
Cc: PR17; Neville Hattingh; Les Longhurst; Snape, Rachael; Lauren Evans
Subject: STH13/00010 - Marulan South Limestone Mine reply to RMS exhibition comment

Hello,

RMS made the below submission on Boral's recently exhibited Marulan South Limestone Mine EIS (SSD 7009). Please see the requested modelling and explanatory report attached, which will be summarised in the response to submissions report. The other parts of the RMS submission will also be addressed in the report.

"RMS notes that the proposed development will generate additional traffic, in particular heavy vehicle movements, at the intersection of the Hume Highway and Marulan South Road. The EIS and supporting Traffic Assessment discuss the results of SIDRA intersection modelling which has been undertaken to assess the ongoing performance of this intersection. It is noted that the modelling has been undertaken using traffic volumes representing a 2025 future scenario. **RMS requires the modelling be updated to reflect a 10 year post development scenario (with written justification of the volumes used) and electronic copies of the modelling be provided to RMS for review.**"

Please contact us if you have further queries.

Regards
Mark Roberts
Senior Environmental Scientist
0414 670 254



SYDNEY NEWCASTLE CENTRAL COAST TOWNSVILLE
elementenvironment.com.au

