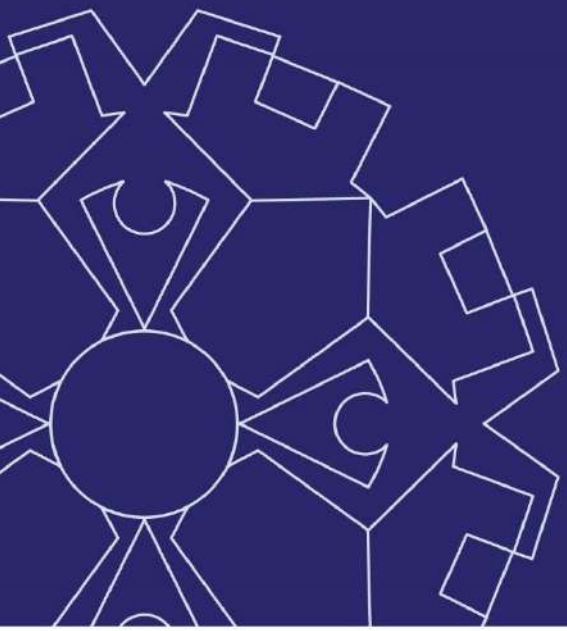
ENVIRONMENTAL IMPACT STATEMENT
GOONUMBLA QUARRY EXPANSION

PREPARED FOR
AUSROCK QUARRIES PTY LTD

MARCH 2018



• Civil, Environmental & Structural Engineering • Surveying • Environmental • Planning • Architecture

ENVIRONMENTAL IMPACT STATEMENT

GOONUMBLA QUARRY EXPANSION

WYATTS LANE, GOONUMBLA

PREPARED FOR:

AUSROCK QUARRIES PTY LTD

MARCH 2018

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Report Title:	*Environmental Impact Statement*
Project:	*Goonumbla Quarry Expansion*
Client:	*Ausrock Quarries Pty Ltd*
Report Ref.:	*215453_EIS_001B.docx*
Status:	*Final*
Issued:	*14 March 2013*

Geolyse Pty Ltd and the authors responsible for the preparation and compilation of this report declare that we do not have, nor expect to have a beneficial interest in the study area of this project and will not benefit from any of the recommendations outlined in this report.

The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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Authors Certification

Author's Certification for the submission of an Environmental Impact Statement prepared in accordance with the *Environmental Planning and Assessment Act 1979*.

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Name:	Ausrock Quarries Pty Ltd
Address:	"Davys Plains" CUDAL NSW 2864
Address of the land	Lot 32 DP816454
Project overview	
Proposed expansion of an existing operational extractive industry (open-cut pit) including development of associated access roads and processing infrastructure.	
Assessment of environmental impact:	
The assessment of environmental impacts of the proposal includes the matters referred to in the Secretary's Environmental Assessment Requirements provided on 27 June 2016.	
Declaration:	

I, Chloe Bigg, declare that I have prepared the contents of this EIS and to the best of my knowledge:

- the statement has been prepared in accordance with Schedule 2 of the *Environmental Planning and Assessment Regulation 2000*;
- the statement contains all available information that is relevant to the environmental assessment of the proposal; and
- the information contained in the statement is neither false nor misleading.

Signature: [redacted]

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Date: 14 March 2018

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ABBREVIATIONS

Acronyms	
AHIMS	Aboriginal Heritage Information Management System
AMG	Assured Monitoring Group
ANL	Acceptable Noise Levels
AoS	Assessment of Significance
ASRIS	Australian Soil Resource Information System
ARTC	Australian Rail Track Corporation
ARQ	Ausrock Quarries Pty Ltd
AUL	Auxillary Left-Turn Treatment
BBAM	BioBanking
BC Act	The Biodiversity Conservation Act 2016
Biosis	Biosis Pty Ltd
BOM	Bureau of Meteorology
BSAL	Biophysical Strategic Agricultural Land
CEEC	Critically Endangered Ecological Community
CH_4	Methane
CHL	Channelised Left-Turn Treatment
CHR(S)	Channelised Right-Turn Treatment
CO_2	Carbon dioxide equivalent
$CO_{2\text{-}e}$	Carbon dioxide equivalent
CRTN	Calculation of Road Traffic Noise
CSP	Community Strategic Plan
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CWORP	Central West and Orana Regional Plan
CWRAP	Central West Regional Action Plan
DA	Development Application
DCP	Development Control Plan
DECC	NSW Department of Environment and Climate Change
DECCW	Department of Environment, Climate Change and Water
DEE	Department of the Environment and Energy
DEM	Digital Elevation Model
DoE	Commonwealth Department of Environment
DoEE	The Department of the Environment and Energy
DoI	NSW Department of Industry
DPE	NSW Department of Planning and Environment
DPI	NSW Department of Primary Industries
EEC	Endangered Ecological Community
EIS	Environmental Impact Statement
ELVIS	Elevation Information System
EMP	Environmental Management Plan
EPA	NSW Environment Protection Authority

EP&A Reg	Environmental Planning and Assessment Regulation 2000
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development
FM Act	Fisheries Management Act 1994
GHG	Green House Gas
GSV	Ground Surface Visibility
HFC	Hydrofluorocarbon
INP	Industrial Noise Policy
JRPP	Joint Regional Planning Panel
LALC	Local Aboriginal Land Council
LSC	Land and Soil Capability
LEP	Local Environmental Plan
LGA	Local Government Area
LPI	NSW Land and Property Information
MOP	Mining Operations Plan
NES	National Environmental Significance
NOA	Naturally Occurring Asbestos
NSESD	National Strategy for Ecological Sustainable Development
NSW	New South Wales
NPfI	NSW Environmental Protection Authority NSW Noise Policy for Industry
OEH	NSW Office Environment and Heritage
PBFP	Planning for Bushfire Protection 2006
PCT	Plant Community Type
PIRMP	Pollution Incident Response Management Plan
POEO Act	Protection of the Environment Operations Act 1997
pphm	Parts per hundred million
QGIS	Quantum GIS
RBL	Rating Background Level
RCE	Rehabilitation Cost Estimate
RCS	Respirable Crystalline Silica
RFS	NSW Rural Fire Service
RMS	NSW Roads and Maritime Service
RNP	NSW Road Noise Policy
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SHR	NSW State Heritage Register
SIS	Species Impact Statement
SRD	State and Regional Development
SSD	State Significant Development
SWL	Standing water level
SWMP	Surface Water Management Plan
TAPM	The Air Pollution Model

TSP	Total Suspended Particles
WBCSD	World Business Council for Sustainable Development
WBZ	Water Bearing Zones
WRI	World Resources Institute
Units of measure	
^oC	degrees Celsius
dB	Decibel
dB(A)	A-weighted decibel
Ha	Hectare
Kg	Kilogram
kL	Kilolitre
kWh	Kilowatt Hours
L	Litre
m	Metres
m^3	Cubic metres
mAHD	Metres Australian Height Datum
MIC	Maximum instantaneous charge
m/s	Metres per second
mm/s	Millimetres per second
RMS	Root mean square
t/m^3	Tonnes per cubic metre
tph	Tonners per hour
$\mu g/m^3$	Micrograms per cubic metre
VDV	Vibration Dose Value

Executive Summary

Ausrock Quarries Pty Ltd (ARQ) propose to expand the existing Goonumbla Quarry operation, located approximately 12 km north-west of Parkes in Central West NSW. The proponent Ausrock Quarries have been operating the Goonumbla quarry since gaining approval in 2013. The proposed quarry expansion would allow continued extraction from the quarry and generate higher volumes of quarry product to meet the increasing local market demand for aggregate, road base and ballast. The quarry operation is well located to serve the local market and potentially the Inland Rail project.

The proposal would expand the existing open-cut pit to allow for higher rates of extraction and processing. Expansion of the quarry would allow for total extraction of up to 724,700 cubic metres (1,956,690 tonnes) of the basalt resource. The annual maximum extraction rate would be 300,000 tonnes, and at that rate the quarry operational life would be approximately 6-7 years. Under slower extraction rates, the quarry operational life would be up to 10-15 years (i.e. approximately 150,000 tonnes per year). In terms of a maximum number of heavy vehicle movements in a day, quarry expansion would double heavy vehicle numbers (i.e. 30 heavy vehicles – 60 movements) with up to 1,000 tonne of product transported from the quarry in a day.

The proposal would disturb a total area of 5.2 ha, including 1.9 ha for the quarry expansion (open-cut pit area), 30 m wide bunding around the expanded pit (1.43 ha), an access road around the pit expansion (0.41 ha) and an access road to a future potential rail siding site (1.45 ha).

The access road to a future rail siding site is proposed to allow for the potential supply of quarry product to Australian Rail Track Corporation (ARTC) for the Inland Rail project, for which ARQ have tendered for the contract. The Inland Rail project rail corridor is directly adjacent to the subject site, providing an opportunity to directly supply product to ARTC via internal access roads and therefore minimise transport via public roads. The expansion of the quarry and higher extraction/processing rate would put ARQ in a favourable position to supply ballast material to ARTC. ARQ communication with ARTC has confirmed that the quarry is well situated to supply ballast for both the Parkes – Narromine line and the Narromine – Narrabri line. It is noted that the use of the access road to a future rail siding is not proposed via this development application (DA) and would be dealt with by future DA modification.

The proposal is consistent with the current land use (existing quarry) and does not impact high value agricultural land, nor is it inconsistent with the aims of the *Parkes Local Environmental Plan 2012* (LEP) or the land use zone objectives. The proposal would maximise the economic and productive use of land containing a viable geological resource. The proposal is also consistent with the intent and goals of key strategic plans for the Parkes and Central West region, including the *Parkes Development Control Plan 2013*, *Parkes Shire 2030+ Community Strategic Plan*, *Central West and Orana Regional Plan* and *Central West Regional Action Plan*. All plans promote economic growth and diversification within the region and support actions to drive future job growth in mining and related industries, and to maximise flow on socio-economic benefits. The proposal will generate positive economic impacts via employment of staff and contractor use, and provides the opportunity for flow on effects to the community.

Detailed assessments of key environmental issues have been undertaken, including noise and vibration, air quality, biodiversity and heritage. The costs of the development in terms of potential biophysical and socio-economic impacts have been avoided and minimised through accommodating site constraints, consulting with neighbours and providing appropriate mitigation measures. The capacity and proposal footprint has been refined through the identification of constraints and opportunities mapped through the environmental impact assessment process.

The proposal represents an ecologically sustainable development. There is no risk of serious or irreversible environmental damage, biological diversity and ecological integrity is being protected, the health, diversity and productivity of the environment is being maintained and enhanced for future generations, and the opportunity to supply ballast to a future rail siding site minimises environmental costs associated with off-site transport of quarry product.

Introduction

1.1 BACKGROUND

The Goonumbla Quarry is within Lot 32 DP816454 (subject site), Wyatts Lane, Goonumbla, located approximately 12 km north-west of Parkes in Central West NSW.

The quarry was disused prior to the proponent seeking approval in 2012-2013 to commence quarrying operations. Development Consent No. DA12097 was granted by Parkes Shire Council on 16 July 2013, approving the disturbance of 1.8 ha and extraction of 21,700 m^3 per year (58,590 tonnes based on a density of 2.7 tonnes/m^3).

1.2 DEVELOPMENT OVERVIEW

ARQ proposes to expand the existing quarry and extract and process at higher rates than the current approval (DA12097). The proposal comprises the following:

- Expansion of the existing quarry to extract up to 724,700 cubic metres (m^3), increasing the quarry footprint by 1.90 hectares (ha).
- Establish bunding and an access road around the quarry pit extension, disturbing 1.84 ha.
- Establishment of additional processing equipment and an aggregate plant.
- Construction of a 7 m wide compacted gravel access road (1.45 ha) to a potential future rail siding site (to be constructed by Australian Rail Track Corporation [ARTC]). The use of this access road is not proposed via this development application (DA). The use of this access road would be addressed by a future DA modification.

1.3 APPROVAL PROCESS

The *Environmental Planning and Assessment Regulation 2000* (EP&A Reg) provides a framework for the assessment of the environmental impact of development in NSW.

The proposal is permitted with consent pursuant to the *Parkes Local Environmental Plan 2012* (LEP) and is designated development pursuant to Clause 19 of Schedule 3 of the EP&A Reg. The development is subject to the provisions of Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

On the basis that the development is designated, an EIS is required to accompany the DA and must be prepared in accordance with the Department of Planning and Environment (DPE) Secretary's Environmental Assessment Requirements (SEARs). The SEARs were issued on the 27 June 2016 and remain valid for 2 years (until 27 June 2018) after which time further consultation with the DPE is required and updated SEARs are required.

As the proposal is an extractive industry that is classified as a designated development, the proposal is also classified as Regional Development under the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). As a result, the determining authority for the proposal will be the Western Joint Regional Planning Panel (JRPP).

The development also represents the continuation of a scheduled activity in accordance with clause 19, Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act).

This EIS has been prepared to address the specific requirements of the SEARs and a checklist identifying where each issue is addressed is provided in **Appendix B**. A full copy of the SEARs is provided in **Appendix A**.

As noted in correspondence from Parkes Shire Council in the SEARS, if this development application is approved, Council requests that development consent DA 12097 is surrendered to prevent inconsistencies between consents. ARQ has no objection to this requirement.

1.4 CONSULTATION

As required by the SEARs, the following consultation has been undertaken:

- Consultation with surrounding landowners that may be impacted by the development.
- Consultation with the Peak Hill Local Aboriginal Land Council (LALC).
- Consultation with all public authorities who provided environmental assessment requirements to the NSW Department of Planning & Environment (DPE), including:
  - Parkes Shire Council
  - NSW Department of Primary Industries (DPI) – Agricultural Land Use Planning
  - NSW DPI Water
  - NSW Department of Industry (DoI) – Resources & Energy
  - NSW Environment Protection Authority (EPA)
  - NSW Office of Environment & Heritage (OEH)
  - NSW Rural Fire Service (RFS)
  - Roads & Maritime Services (RMS)

Further details on consultation undertaken by Geolyse is provided in **Section 4**.

1.5 STRUCTURE

This EIS has been prepared pursuant to Schedule 2 of the EP&A Reg and is provided in the following format:

- **Section 2** provides a summary of existing quarry operation;
- **Section 3** outlines the proposal;
- **Section 4** details the consultation undertaken;
- **Section 5** details the planning framework applicable to the subject site and proposal;
- **Section 6** provides a summary of environmental issues;
- **Section 7 - 21** provides an assessment of impacts associated with the proposal;
- **Section 23** provides a summary of environmental management measures proposed; and
- **Section 24** provides a conclusion to the EIS including a development justification.

Existing Quarry

2.1 LOCATION

The quarry is within Lot 32 DP816454 (subject site), Wyatts Lane, Goonumbla, located approximately 12 km north-west of Parkes in Central West NSW.

Access to the subject site is from Wyatts Lane via Bogan Road, which connects with the Newell Highway approximately 9 km south of the Bogan Road and Wyatts Lane intersection. Site access is located approximately 900 m from Bogan Road.

Part of the western boundary of the subject site is bound by the Parkes – Narromine railway line, which is to become part of the Inland Rail project.

The subject site is depicted in its regional context in **Figure 1** and the immediate site locality is depicted in **Figure 2**.

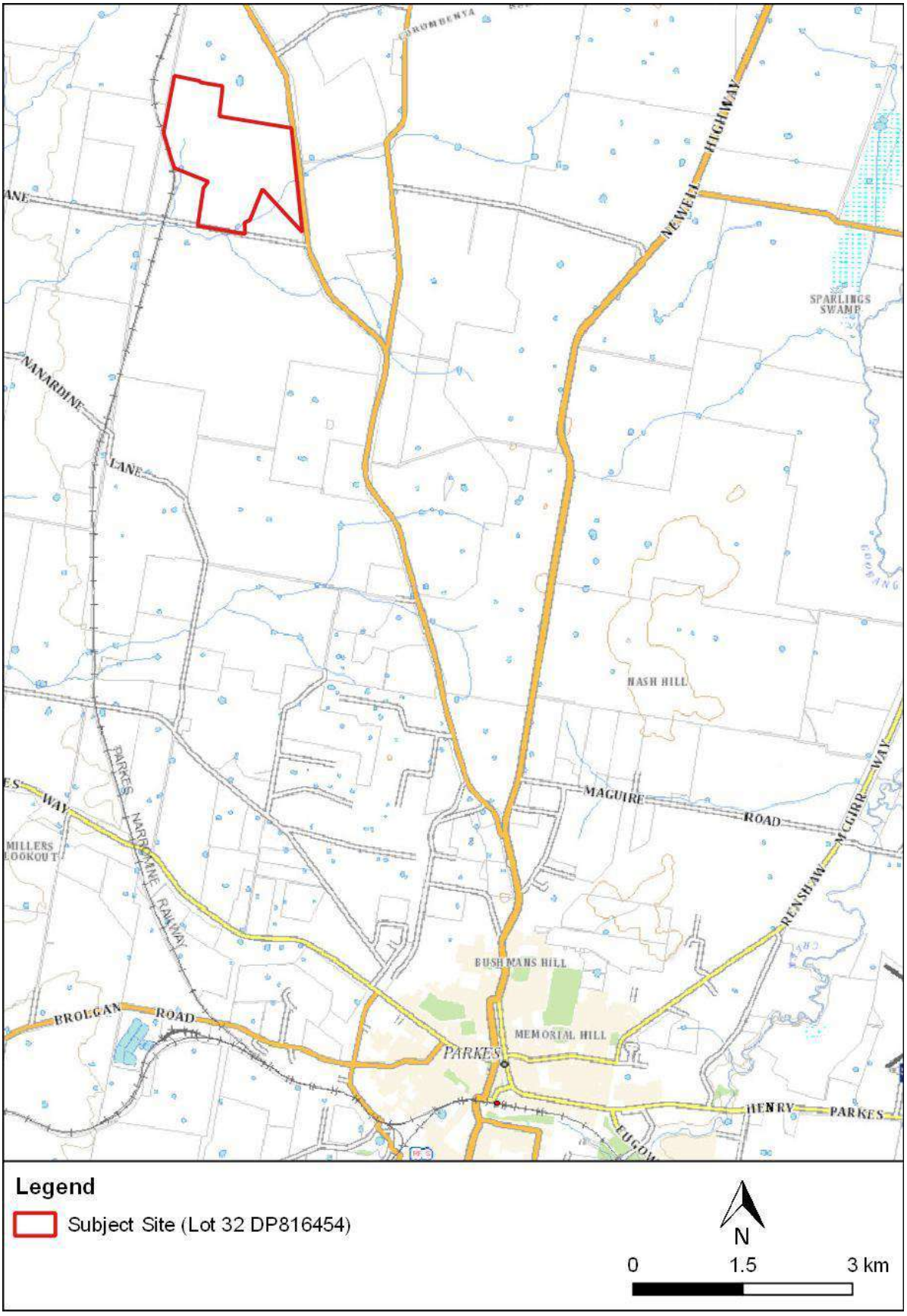

Figure 1: Regional Location

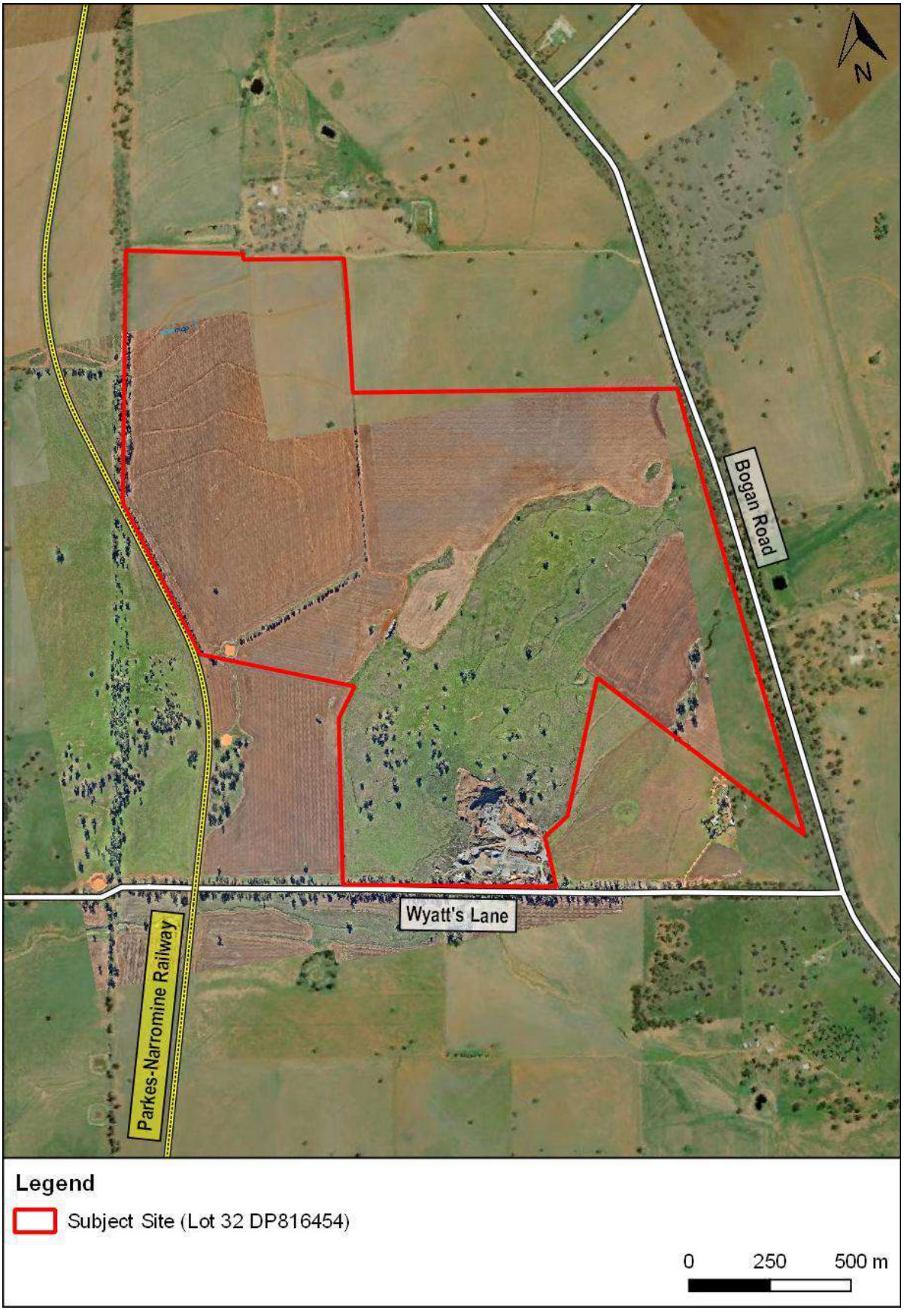

Figure 2: Immediate Site Locality

2.2 APPROVAL HISTORY

2.2.1 DEVELOPMENT CONSENT

The quarry was disused prior to proponent seeking approval in 2012-2013 to commence quarrying operations. Development Consent No. DA 12097 was granted by Parkes Shire Council on 16 July 2013, approving the disturbance of 1.8 ha and extraction of 21,700 m^3 per year.

A copy of DA 12097 is provided as part of the SEARs in **Appendix A**.

The existing approved quarry operation is described in **Section 2.3**.

2.2.2 ENVIRONMENT PROTECTION LICENCE

Environment Protection Licence (EPL) 20288 was issued by the NSW Environment Protection Authority (EPA) on 31 July 2013 for processing and extraction activities at the quarry. The EPL authorises the carrying out of the following scheduled activities at the premise:

- Crushing, grinding or separating: >30,000 – 100,000 tonnes processed
- Extractive activities: >30,000 – 50,000 tonnes extracted, processed or stored

Review of the NSW EPA's online 'POEO Public Register' confirms that no non-compliances have been recorded for annual returns submitted since the proponent commenced quarry operations in 2013.

2.3 EXISTING DEVELOPMENT

2.3.1 SITE LAYOUT

2.3.1.1 Site Access

Existing access to the subject site is provided from Wyatts Lane via Bogan Road, which connects with the Newell Highway approximately 9 km south of the Bogan Road and Wyatts Lane intersection. Site access is located approximately 900 m from Bogan Road.

2.3.1.2 Quarry Layout

The existing quarry contains the following areas:

- Open cut pit and bunding
- Loading/Stockpile area
- Site compound
- Gravel access road and access tracks
- Parking area
- Sediment basin

The existing quarry layout is depicted in **Figure 3** overleaf.

2.3.1.3 Chemical Storage

An existing bunded container capable of holding 1400 L is located next to the site compound. This container stores the following:

- 205 L of engine oil
- 205 L of hydraulic oil
- 40 L of transmission oil

Figure 3: Existing Quarry Layout

2.3.2 OPERATIONAL ACTIVITIES

2.3.2.1 Drilling and Blasting

As approved, there are three drill and blast campaigns annually, with each occasion restricted to 2-3 days in duration.

In accordance with EPL 20288, blasting is undertaken between 9:00 am – 5:00 pm Monday to Friday and does not occur on weekends or public holidays.

2.3.2.2 Extraction

As approved, extraction has been undertaken by progressing north from the original open cut pit without any significant lateral east/west expansion. The pit has been worked in progressive benches to create a three-sided enclosure within which all extraction and processing activities have been undertaken.

The current pit has an average floor level of 319.30 m and the northern boundary of the open cut pit has level of approximately 352 m, which gives an approximate depth of 33 m.

Under the current approval, a maximum of 21,700 m^3 can be extracted per year. With a density of 2.7 tonnes per cubic metre (t/m^3), that equates to a maximum extraction rate of 58,590 tonnes per year.

2.3.2.3 Processing

As approved, all processing activities are undertaken within the open-cut pit, including crushing and screening.

2.3.2.4 Stockpiling

Extracted material is stockpiled in the open-cut pit until that material is ready for processing. Processed material is stockpiled in the loading/stockpile area at the southern extent of the quarry site.

Waste rock material and overburden is stockpiled in the bunding around the edges of the pit.

2.3.2.5 Loading and Haulage (on-site)

Processed material is loaded by a front-end loader and hauled to the loading/stockpile area at the southern extent of the quarry site.

2.3.2.6 Product Delivery

Product material is loaded on truck-dog trailers (32 tonne capacity) at the loading/stockpile area. Product is hauled off-site via Wyatts lane (to the east only) and onto Bogan Road.

2.3.3 EQUIPMENT

The following equipment is provided on site:

- Dozer with heavy ripper (1)
- Excavator (2)
- Front end loader (2)
- Mobile jaw crusher (2)
- Cone/Screen mobile plant (2)
- Haulage trucks (1)
- Conveyors

2.3.4 OPERATING HOURS

Current operating hours are provided in **Table 2.1**.

Table 2.1 – Existing and Proposed Operating Hours

Activity	Days	Current Hours of Operation (as per EPL 20288)
All loading activities at the premises	Monday to Friday	0700 - 1800
	Saturday	0700 - 1500
	Sundays or Public Holidays	Never
All extraction and processing work at the premises	Monday to Friday	0900 - 1700
	Saturday	Never
	Sundays or Public Holidays	Never
Blasting	Monday to Friday	0900 - 1700
	Saturday	Never
	Sundays or Public Holidays	Never

Transport activities are restricted to outside school bus times, specifically excluding transport of quarry products between 8:00 – 9:00 am and 3:30 – 4:30 pm on school days.

2.3.5 EMPLOYMENT

The proponent employs 3 staff for the current operation of the quarry.

2.3.6 TRAFFIC GENERATION

Up to 3 employee vehicles currently travel to and from the subject site daily.

32 tonne capacity truck-dog trailers transport product off-site to customers.

Existing vehicle movements are outlined in **Table 2.2**.

Table 2.2 – Existing Maximum Traffic Movements

Maximum Movements	Light Vehicle Movements	Approved Heavy Vehicle Movements	Total
Daily	6	30	36
Weekly (6 working days)	36	180	216
Annual	1,872	9,360	11,232

2.3.7 WATER MANAGEMENT

Surface water management is undertaken in accordance with an existing *Soil and Water Management Plan* (Geolyse, 2017). The existing quarry has a sediment basin consistent with the relevant approvals. Site runoff is captured in the existing sediment basin.

Perimeter bunds and drains are used to divert clean water from external areas away from disturbed areas, and to contain runoff from disturbed areas and direct it to the sediment basin.

Surface water captured from site runoff is used for dust suppression and process water.

2.3.8 AMENITIES

An existing site compound (office) and portable toilet are provided at the site.

2.3.9 SERVICES

2.3.9.1 Electricity

An overhead electricity transmission line is provided to the site.

2.3.9.2 Water Supply

There is no reticulated water supply to the site. Potable water is brought onto site.

2.3.9.3 Sewerage

No sewerage are services required. A portable toilet is provided at the site.

Proposal Description

3.1 PROPOSAL

3.1.1 SITE LAYOUT

The proposed site layout would be consistent with **Figure 4** and **Figure 5** overleaf.

3.1.2 OPEN CUT PIT EXPANSION

The proposal involves extension of the existing open-cut pit. Activities involved in the expansion are described in the following sub-sections.

3.1.2.1 Site Clearing and Stripping

Clearing and stripping will only be undertaken within the quarry expansion area, and only the minimum area necessary will be cleared/stripped to conduct operations.

The subject site will be surveyed and marked out before the proposed quarry expansion commences.

All stripped soils will be separated (topsoil and subsoils) and stockpiled in the proposed bunding area for future rehabilitation works.

3.1.2.2 Drilling and Blasting

Recovery of hard rock material from the quarry will be undertaken primarily through drill and blast techniques. This process involves drilling and blasting by a qualified contractor to generate fragmented rock suitable for processing.

Given the capacity and expected production of the quarry, it is anticipated that approximately 6 blasts per year would be required. Each of these blast events would be undertaken following approximately one week of drilling activity to produce the necessary hole depth and pattern required to obtain the desired 30,000 – 50,000 tonnes of fragment rock material. Fragment rock material created by the blast would be loaded by excavator into haul trucks for transport to the mobile crushing plant located within the pit for processing.

In accordance with EPL 20288, blasting will continue to be undertaken between 9:00am – 5:00pm Monday to Friday and will not occur on weekends or public holidays.

3.1.2.3 Pit Design

Pit design will be consistent with the detailed designs provided in the **Drawing Schedule**, and as shown in **Figure 4**.

Figure 4: Proposed Quarry Layout

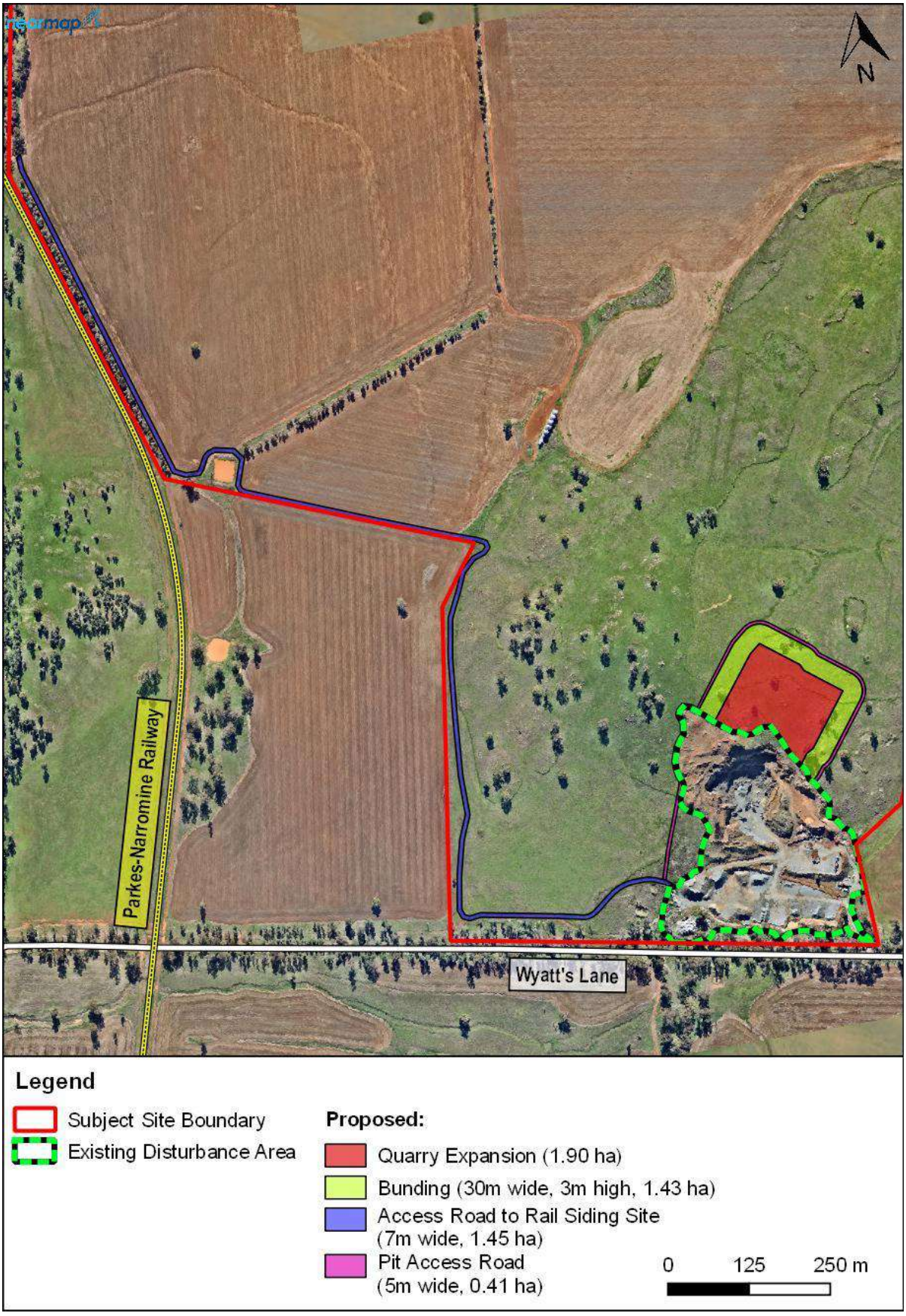

Figure 5: Proposed Access Road to Future Rail Siding Site

3.1.2.4 Extraction and Staging

The proposed quarry expansion stages are detailed in the **Drawing Schedule**. The proposed quarry expansion will disturb 1.90 ha (quarry area only).

The proposed extraction area would have the following design criteria:

- Maximum length (quarry floor): 205 m (Stage 1) and 189.7 m (Stage 2)
- Maximum width (quarry floor): 105 m (Stage 1) and 85 m (Stage 2)
- Volume: 724,700 m^3
- Indicative angle of final faces: approximately 63°

The pit would be worked in progressive benches with berms, in accordance with the NSW Department of Environment and Climate Change (DECC) *Managing Urban Stormwater: Soils and Construction Volume 2E Mines and Quarries*.

Stage 1 extraction involves extraction of 10 m cuts down to the existing quarry floor level and allows for a 1% grade on the quarry floor. Stage 2 involves taking a 10 m cut to the quarry floor.

Stage 1 involves hard rock excavation of 545,000 m^3 and Stage 2 involves hard rock excavation of 179,700 m^3 (10 m floor cut).

Dependent on the rate of extraction, the quarry is expected to have an operational life of approximately 6-7 years under the maximum annual extraction rate (300,000 tonnes per year) and up to 10-15 years under slower extraction rates (i.e. approximately 150,000 tonnes per year). These estimates are based on a rock density of 2.7 t/m^3.

The peak daily processing rate is 2,000 tonnes per day for the life of the quarry.

3.1.3 BUNDING

A 30 m wide bund will be provided around the quarry extension to stockpile stripped overburden and to act as a safety bund wall. The bund will have a maximum height of 3 m and will disturb 1.43 ha.

3.1.4 STOCKPILES

Extracted material will be stockpiled in the open-cut pit until that material is ready for processing.

Primary crushing and screening (ballast production) will continue to be undertaken in the pit by mobile crushing equipment. The mobile crushers will continue to move into the pit as it progresses.

Aggregate production (using semi-mobile crushing and screening plant) will be undertaken adjacent to the entrance of the pit, as shown on **Figure 4**.

Processed material will be stockpiled in the loading/stockpile area at the southern extent of the quarry site.

Waste rock material and overburden will be stockpiled in the bunding around the edges of the pit.

3.1.5 PROCESSING

Hard rock processing will occur in two phases:

- Primary crushing and screening (in the open-cut pit)
- Aggregate plant processing (outside open-cut pit, as shown in the **Drawing Schedule**)

3.1.5.1 Primary Crushing and Screening (in pit)

Primary crushing and screening activities will be undertaken within the open-cut pit.

Blasted material will be loaded directly into the primary mobile jaw crusher by an excavator. Crushed material would then be conveyed into a mobile cone crusher and screen. Product from the primary crushing includes ballast (20-65 mm) and fines (<20 mm). The plant (which is currently operational at the site) has a capacity of 300 tonnes per hour (tph).

3.1.5.2 Aggregate Plant

The proposed aggregate plant will be located within the existing quarry disturbance area.

The aggregate plant will be used to further process the 'fines' from the primary crusher. Following loading into the aggregate plant feed hopper, the material passes through a cone crusher and onto two screens to separate the different aggregates (e.g. 20/14 mm, 10 mm, 7 mm, 5 mm, manufacturer sand, and road base). The plant has a capacity of 180 tph.

The location of the aggregate plant is provided in **Figure 4** in **Section 3.1.1**, and the proposed layout of equipment is provided in **Figure 6** overleaf.

3.1.6 LOADING AND HAULING (ON-SITE)

Blasted rock will be crushed at the pit face by mobile crushing and screening plant and hauled by a dump truck to the aggregate plant for processing.

Processed material will be loaded by a front-end loader and hauled to the loading/stockpile area at the southern extent of the quarry site.

Loading of the quarry product will continue to be undertaken at the loading/stockpile area.

3.1.7 PRODUCT DELIVERY

Product material will continue to be loaded on truck-dog trailers (32 tonne capacity) at the loading area. Product will continue to be hauled off-site via Wyatts lane (to the east only) and onto Bogan Road.

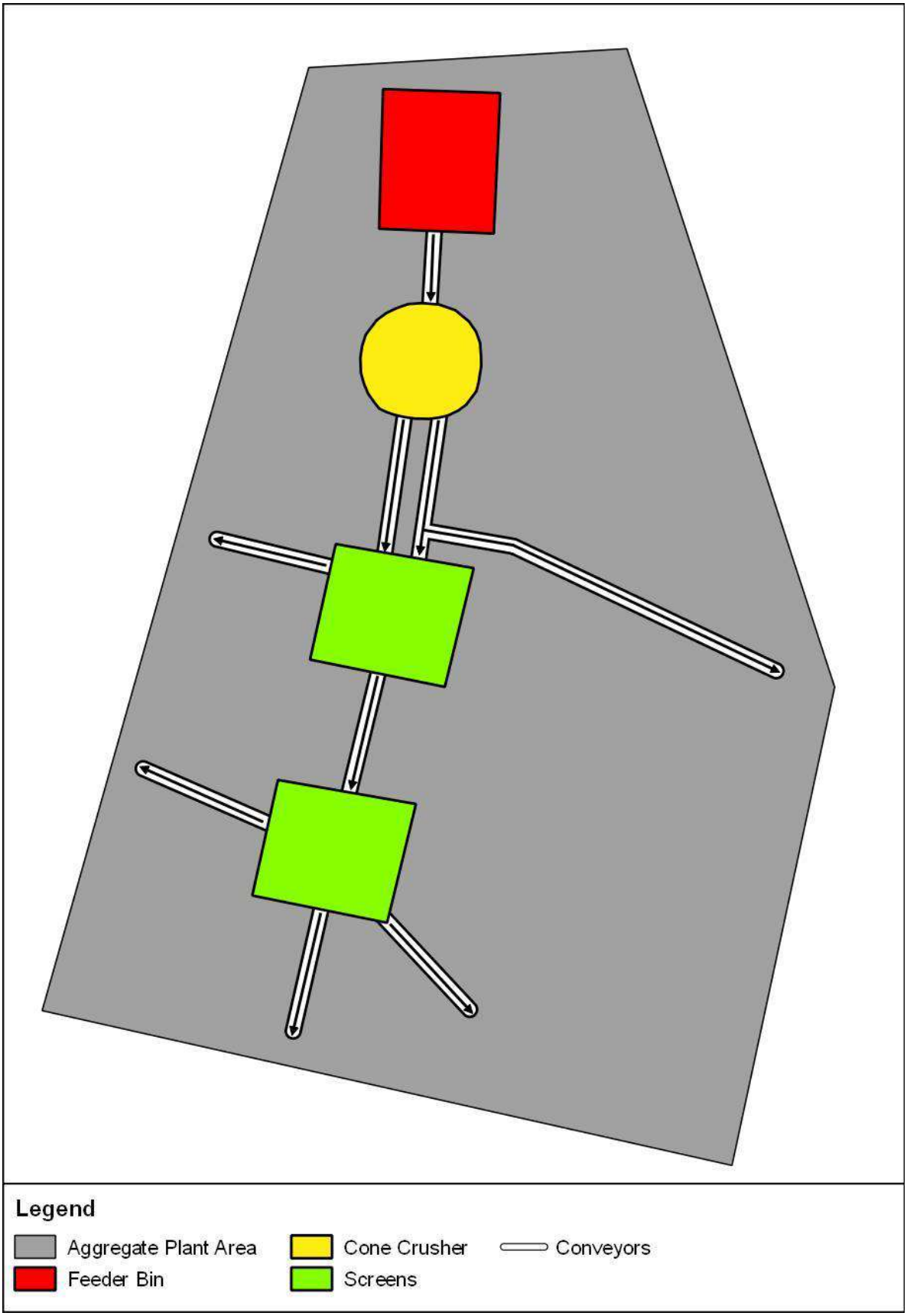

Figure 6: Proposed Aggregate Plant Layout

3.1.8 ACCESS

3.1.8.1 Site Access and Parking

As stated in **Section 2.3.1.1**, an existing access to the subject site is provided from Wyatts Lane via Bogan Road. No change to the access point is proposed.

Sufficient space is available at the site for staff vehicles, quarry equipment and haulage trucks.

3.1.8.2 Internal Quarry Access

Internal access to the quarry extension would utilise the existing quarry access roads.

3.1.8.3 Pit Access Road

A 5 m compacted gravel access road from the stockpile/loading area will be established around the quarry extension. This road will provide access around the bund area and will disturb 0.41 ha.

3.1.8.4 Access Road to Future Rail Siding

A 7 m wide compacted gravel road will be established to a potential future temporary rail siding site (to be constructed by ARTC). The access road would disturb 1.45 ha.

The road would not be elevated above the natural surface. This would ensure that surface water flows across the site are not impacted. Topsoil will be scraped back and replaced with road base from the quarry. Topsoil will be stockpiled at the quarry site for future rehabilitation purposes.

Use of this access road is not proposed via this development application. This would be dealt with by future DA modification. ARQ has tendered for an ARTC contract for the supply of ballast material to a future temporary rail siding site.

3.1.9 TRAFFIC GENERATION

Up to seven (7) employee vehicles will travel to and from the subject site daily.

32 tonne capacity truck-dog trailers will transport product off-site to customers. An annual maximum of 150,000 tonnes of product would be transported off-site via public roads. The additional 150,000 tonnes of the annual extraction tonnage (300,000 tonnes) would be stored at the subject site for the potential future supply of ballast material to the temporary rail siding site. The transport of product to the rail siding site would be on internal access roads only and would be subject to a future DA modification.

Daily heavy vehicle movements will vary over the life of the quarry in response to demand and contracts. Notwithstanding, the cap on annual tonnage transported from the quarry by heavy vehicle via public roads, as part of the proposed expansion, is 150,000 tonnes.

Spread evenly throughout the year this equates to an average of 15 heavy vehicles (30 movements) a day, six days a week. In terms of a maximum number of heavy vehicle movements in a day, the opportunities provided through the quarry expansion would see a doubling of these heavy vehicle numbers (i.e. 30 heavy vehicles – 60 movements) with up to 1,000 tonne of product transported from the quarry in a day.

An increase in light vehicles would also result because of the 4 additional employees driving to and from the site each day.

No over size and over mass vehicles and loads are required for the operation of the proposal.

3.1.10 WATER MANAGEMENT

Water management for the proposed quarry expansion will be undertaken in accordance with the Soil and Water Management Plan provided in **Appendix H**.

3.1.11 WATER DEMAND

A site water balance was undertaken as part of the SWMP. Water balance results concluded:

- There is adequate capacity in the augmented surface water management system to supply the water demands across the site. This indicates there is adequate water on site to ensure effective dust control.
- The spill frequency from the sediment basin meets design requirements. Table 6.2 in *Volume 2E Mines and quarries* (DECC, 2008) indicates that the indicative average annual sediment basin overflow frequency for a 95th percentile design criteria is 1-2 spills/year. The sediment basin spills on average once every year.
- It is concluded from this assessment that the proposed augmentation to the existing surface water management system can be managed to meet relevant design guidelines.

On the basis that there is no requirement for additional water supply, an assessment of volumetric water licensing requirements is not provided in this assessment.

As per existing surface water management, perimeter bunds and drains will be used to divert clean water from external areas away from the site and to contain runoff from disturbed areas and direct it to the sediment basin. Surface water captured from site runoff will be used for dust suppression and process water.

3.1.12 ADDITIONAL EQUIPMENT

In addition to the existing equipment provided at the subject site (refer **Section 2.3.3**), the following additional equipment is required for the proposed aggregate plant:

- Cone crusher (1)
- Feeder (1) and screens (2)
- Conveyors

3.1.13 CHEMICAL STORAGE

A bunded container for a 30,000 L diesel fuel tank is proposed as part of the development for re-fuelling purposes. The bunded container will be located adjacent to the site compound.

No explosives required for blasting will be stored on site. Blasting will be undertaken by a qualified contractor.

3.1.14 OPERATING HOURS

Proposed operating hours are provided in **Table 3.1**.

Table 3.1 – Existing and Proposed Operating Hours

Activity	Days	Current Hours of Operation (as per EPL 20288)	Proposed Hours of Operation
All loading activities at the premises	Monday to Friday	0700 - 1800	0700 - 1800
	Saturday	0700 - 1500	0700 - 1500
	Sundays or Public Holidays	Never	Never
All extraction and processing work at the premises	Monday to Friday	0900 - 1700	0700 - 1700
	Saturday	Never	0700 - 1500
	Sundays or Public Holidays	Never	Never
Blasting	Monday to Friday	0900 - 1700	0900 - 1700
	Saturday	Never	Never
	Sundays or Public Holidays	Never	Never

Consistent with the existing approval (DA 12097) transport activities will continue to be restricted to outside school bus times, specifically excluding transport of quarry products between 8:00 – 9:00 am and 3:30 – 4:30 pm on school days.

3.1.15 EMPLOYMENT

The proposed quarry expansion will require an additional 3-4 employees, bringing the total number of employees to 6-7 employees. This excludes employment of contractors for the off-site transport of product to customers.

3.1.16 AMENITIES

No additional amenities are proposed as part of the development. An existing site compound (office) and portable toilet will continue to be provided at the site.

3.1.17 SERVICES

Electricity

No upgrade or extension of existing transmission lines is required for the proposal.

Telecommunications

No fixed telecommunication service is required as operational communications would continue to take place by UHF radio and mobile phones.

Water Supply

No additional water supply is proposed as part of the development. Potable water will continue to be brought to the subject site.

Sewerage

No sewerage services are proposed as part of the development. The portable toilet will continue to be provided at the site. Sewerage will continue to be collected and emptied by a licenced contractor.

3.2 REHABILITATION

3.2.1 REHABILITATION PLAN

A Rehabilitation Plan would be prepared to address progressive and final rehabilitation of the existing and expanded quarry, and would form part of the Environmental Management Plan (EMP) prepared prior any works commencing.

The Rehabilitation Plan would incorporate all relevant mitigation measures identified in this EIS and any relevant consent conditions, and would incorporate relevant advice from the following guidelines:

- Department of Environment & Climate Change (DECC) (2008) *Managing urban stormwater: Soils and construction, Volume 2E Mines and quarries*.
- Commonwealth of Australia (2016) *Leading Practice Sustainable Development Program for the Mining Industry guidelines for mine closure and mine rehabilitation*.
- NSW Trade & Investment (2013) *ESG3: Mining Operations Plan (MOP) Guidelines*.

The following sections describe the proposed rehabilitation objectives, final landform and strategy, and measures that will be undertaken to ensure financial resources are available to implement rehabilitation.

3.2.2 REHABILITATION OBJECTIVES

The following are the key objectives for rehabilitation of the quarry:

- To produce a final landform that achieves a stable and functional drainage system at the site, and minimises erosion and sedimentation.
- To provide rehabilitation areas that are similar to surrounding native vegetation communities, and providing suitable habitat for native fauna.
- To eliminate impacts from weeds and feral pests.
- To maintain site security and perimeter bunding to ensure public safety and stock exclusion.
- To improve visual amenity from surrounding residences.

3.2.3 FINAL LANDFORM & STRATEGY OVERVIEW

The final landform would consist of the following elements and strategies:

- **Final Void:**
  - A final void from the open-cut pit would remain and would be consistent with the quarry design plans in the **Drawing Schedule**.
  - As the final stage of extraction is a 10 m cut to the final quarry floor, water falling within the pit will be contained in the final void.
  - A point of access will be maintained on the southern boundary of the open-cut pit for the purpose of monitoring water levels post-closure.
- **Quarry Disturbance Area:**
  - The quarry disturbance area (including the aggregate plant area, tracks within the quarry, loading/stockpile area, site compound area and sediment basin) would be reshaped to reflect the natural slope from the side of the ridgeline.
  - All infrastructure and equipment constructed/owned by ARQ would be removed.
  - Post removal of bunded hydrocarbon storage areas validation sampling will be undertaken.
  - Existing powerlines (that service other areas) will be retained.
  - The existing unregistered groundwater bore will be addressed in accordance with mitigation measures provided in **Section 13.3**.

  - Bunding would be removed around this area to allow natural surface drainage to return.
  - Selected access tracks will be maintained to allow vehicle access for monitoring of rehabilitation progress post-closure.
  - Appropriate sediment and erosion controls will be determined and implemented to minimise potential adverse impacts.
- **Bunding around Quarry Disturbance Area:**
  - Bunding will be maintained around the final void to restrict unsafe access and exclude stock. Bunding will also act as a visual screen and once vegetated will improve integration with the surrounding landscape.
  - Fencing will be provided around the bunded area to restrict access over the bunds.
  - Where necessary, bunding will be reshaped to provide a suitable surface for revegetation.
  - A revegetation plan would be prepared by a suitably qualified professional as part of a Rehabilitation Plan.
- **Access Roads external to the Final Void**
  - The access road around the open cut pit would be maintained until revegetation of bunding reaches completion and does not require further monitoring. After successful completion of rehabilitation, this road would be deep-ripped and seeded with native species in accordance with a revegetation plan.
  - The access road to the rail siding site would be maintained as it would be located on existing farm tracks used by the land owner, and would allow emergency services (i.e. Rural Fire Service) to cross the site if required.
  - The proposed final landform does involve retaining a final void. This is considered an appropriate rehabilitation measure as the quarry operation does not generate enough waste material for backfilling the void, and battering of slopes to achieve a more natural landform would require further clearing and impact to surrounding native vegetation.

A conceptual final landform plan is provided in **Figure 7**.

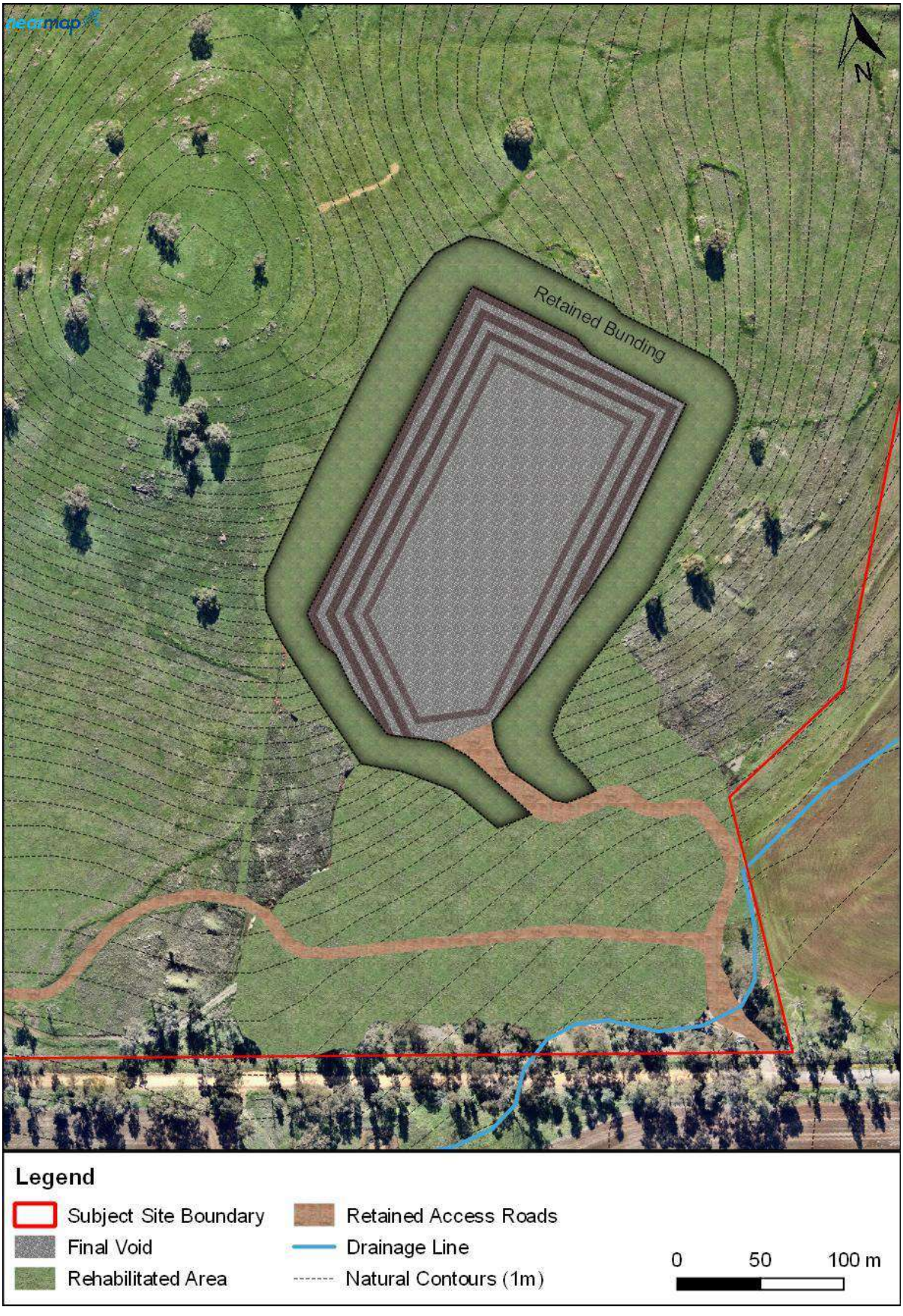

Figure 7: Conceptual Final Landform

3.2.4 FINANCIAL RESOURCES FOR REHABILITATION

As part of a Rehabilitation Plan, a Rehabilitation Cost Estimate (RCE) will be prepared in accordance with the Department of Resource and Energy's Rehabilitation Cost Estimation Tool. Despite this tool being applicable to mining operations, the activities for quarry rehabilitation are essentially the same.

The RCE will provide an estimate of rehabilitation costs for ARQ so that sufficient financial resources are reserved for rehabilitation activities.

Consultation

4.1 SURROUNDING LAND OWNERS

Consultation with all surrounding land owners was undertaken by Geolyse via phone communication.

A summary of consultation undertaken is provided in **Table 4.1** and land ownership is depicted in **Figure 8**.

Table 4.1 – Consultation with Surrounding Land Owners

Land Owner	Property	Comments	Addressed in EIS
R6	Subject Site (Lot 32 DP816454) and Lot 2 DP1166919	No concerns about the existing or proposed quarry operation.	N/A
R1	Lot 31 DP816454	Only issue raised is his concern about his western fence line could wash away in a flood event. He suggested rock could be put down to protect his fence line.	Section 13 Appendix H
R4	Lot 103 &104 DP750161	The only issue raised is rock being dropped on the road from trucks leaving the quarry.	Section 10.9
R5	Lot 108 DP750161	No concerns about the existing or proposed quarry operation.	N/A
R2 and R3	Lot 1 DP1049836 (includes two dwellings)	Only issue raised is an existing concern about water crossing over Wyatts Lane that flows down the road (towards the west) and can block and wash away his driveway on the southern side of Wyatts Lane (approximately 320 m from the quarry access point).	Section 13 Appendix H

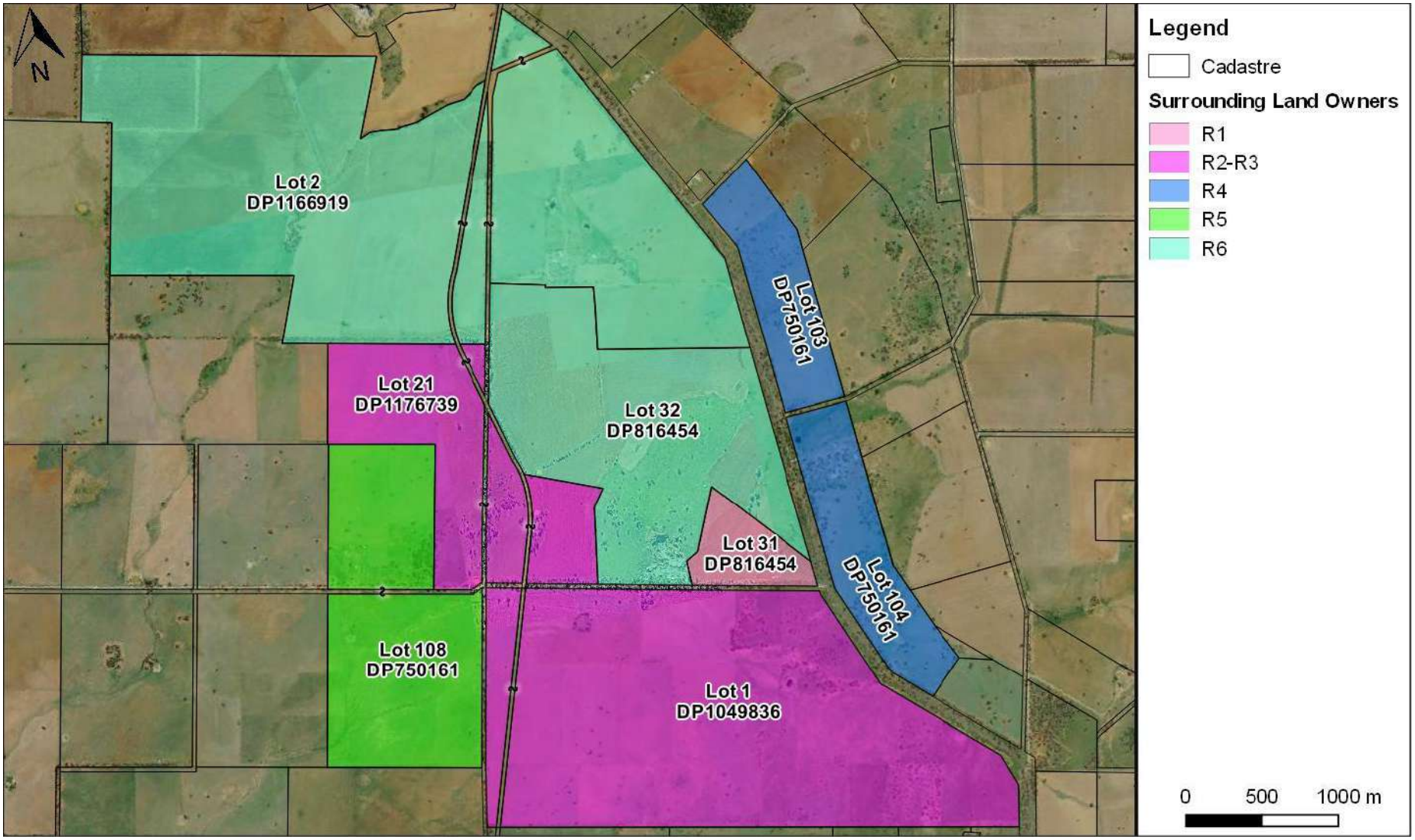

Figure 8: Land Ownership

4.2 PUBLIC AUTHORITIES

Consultation with relevant public authorities was undertaken by Geolyse via phone and email communication. A summary of consultation undertaken is provided in **Table 4.2**.

Table 4.2 – Consultation with Public Authorities

Public Authority	Contact	Comments	Addressed in EIS
Parkes Shire Council	Michael Carter	No comments in addition to those provided in the SEARs other than consider the current Section 94 Contributions Policy for Shire roads.	Section 5.12
NSW DPI – Agricultural Land Use Planning	Mary Kovac	No comments in addition to those provided in the SEARs other than to consider Biophysical Strategic Agricultural Land (BSAL).	Section 15.4
NSW DPI Water	Rachel Daly	No response received	N/A
NSW DoI – Resources & Energy	Cressida Gilmore & Erin Foate	No comments in addition to those provided in the SEARs.	N/A
NSW EPA	Josh Loxley (on behalf of Bradley Tanswell)	No comments in addition to those provided in the SEARs.	N/A
NSW OEH	Michelle Howarth	No comments in addition to those provided in the SEARs.	N/A
NSW RFS	Simon Derevnin	No comments in addition to those provided in the SEARs.	N/A
RMS	Andrew McIntyre	No comments in addition to those provided in the SEARs.	N/A

4.3 AUSTRALIAN RAIL TRACK CORPORATION

Consultation was also undertaken with ARTC as they are responsible for the management of the Parkes-Narromine Rail corridor adjoining the subject site to the west. No response has been received.

4.4 PEAK HILL LOCAL ABORIGINAL LAND COUNCIL

Consultation with the Peak Hill LALC was undertaken by Biosis Pty Ltd (Biosis) in accordance with the NSW DECCW (2010) *Aboriginal community consultation requirements for proponents*, as part of the Aboriginal Heritage Due Diligence Assessment (refer **Appendix D**).

Peak Hill LALC were contacted prior to the archaeological survey to invite a representative to attend. A representative accompanied the Biosis archaeologist for the entirety of the field survey, although no feedback or cultural information regarding the study area was provided.

4.5 INFRASTRUCTURE AND SERVICE PROVIDERS

The SEARs require consultation with infrastructure and service providers that may be impacted by the development. A title search of the subject site (Lot 32 DP816454) confirms that there are no easements within the subject site.

A *Dial Before You Dig* search confirms that the only infrastructure within the subject site is an Essential Energy overhead powerline that crosses the existing quarry site. The proposal does not require any augmentation to the existing electricity supply. Therefore, consultation with Essential Energy was not undertaken.

Statutory Planning Framework

5.1 ENVIRONMENTAL PLANNING AND ASSESSMENT ACT 1979

In New South Wales (NSW) the relevant planning legislation is the *Environmental Planning and Assessment Act 1979* (EP&A Act). The EP&A Act instituted a system of environmental planning and assessment in NSW and is administered by the Department of Planning & Environment (DPE).

5.1.1 OBJECTS OF THE ACT

The objects of the EP&A Act are discussed in the context of the proposal in **Table 5.1**.

Table 5.1 – Objects of the EP&A Act

Object	Comment
1.3(a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The development design, impact mitigation and management measures detailed in this EIS allow for the proper management, development and conservation of the natural and human environment.
1.3(b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	The principles of ESD are considered in Section 23.1.
1.3(c) to promote the orderly and economic use and development of land.	The quarry expansion would be a continuation of an existing quarry and would not impact high value agricultural land (refer **Section 15**).
1.3(d) to promote the delivery and maintenance of affordable housing.	Not relevant to the proposal.
1.3(e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	The proposal has been designed to minimise impacts on the environment, including threatened species, populations and ecological communities and their habitats. Mitigation measures are provided to minimise impacts to biodiversity (refer **Section 7**).
1.3(f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	No Aboriginal or non-indigenous heritage items or sensitive areas have been identified within the subject site. Mitigation measures are provided to address unexpected finds (refer **Section 8**).
1.3(g) to promote good design and amenity of the built environment.	No building elements are proposed. However, the quarry design represents a logical extension of the current open-cut pit design and has considered the DECC (2008) *Managing urban stormwater: Soils and construction, Volume 2E Mines and quarries.* The SWMP has been prepared in accordance with DECC (2008) Managing urban stormwater: Soils and construction, Volume 2E Mines and quarries and Landcom (2004) Managing urban stormwater: Soils and construction, Volume 1.
1.3(h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants	Not relevant to the proposal.
1.3(i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Not relevant to the proposal.
1.3(j) to provide increased opportunity for community participation in environmental planning and assessment.	Neighbouring land owners were consulted by Geolyse (refer **Section 1.4**).

5.2 PERMISSIBILITY

The subject site is currently zoned RU1 – Primary Production under the *Parkes Local Environmental Plan 2012* (LEP).

The LEP provides the following definitions relevant to the proposal:

> ***extractive industry*** *means the winning or removal of extractive materials (otherwise than from a mine) by methods such as excavating, dredging, tunnelling or quarrying, including the storing, stockpiling or processing of extractive materials by methods such as recycling, washing, crushing, sawing or separating, but does not include turf farming.*
>
> ***extractive material*** *means sand, soil, gravel, rock or similar substances that are not minerals within the meaning of the Mining Act 1992.*

Review of the *Mining Act 1992* and *Mining Regulation 2016* confirms that the extractive material (basalt) is not a mineral within the meaning of the *Mining Act 1992*.

A review of the LEP confirms that extractive industries are permitted with consent within the RU1 zone.

Section 5.8 contains an assessment of relevant matters pursuant to the LEP.

5.3 DESIGNATED DEVELOPMENT

The proposal is classified as an extractive industry pursuant to Clause 19, Part 1, Schedule 3 of the EP&A Reg, specifically:

> *(1) Extractive industries (being industries that obtain extractive materials by methods including excavating, dredging, tunnelling or quarrying or that store, stockpile or process extractive materials by methods including washing, crushing, sawing or separating):*
>
> *(a) that obtain or process for sale, or reuse, more than 30,000 cubic metres of extractive material per year, or*
>
> *(b) that disturb or will disturb a total surface area of more than 2 hectares of land by:*
>
> *(i) clearing or excavating, or*
>
> *(ii) constructing dams, ponds, drains, roads or conveyors, or*
>
> *(iii) storing or depositing overburden, extractive material or tailings, or*
>
> *(c) that are located:*
>
> *(i) in or within 40 metres of a natural waterbody, wetland or an environmentally sensitive area, or*
>
> *(ii) within 200 metres of a coastline, or*
>
> *(iii) in an area of contaminated soil or acid sulphate soil, or*
>
> *(iv) on land that slopes at more than 18 degrees to the horizontal, or*
>
> *(v) if involving blasting, within 1,000 metres of a residential zone or within 500 metres of a dwelling not associated with the development, or*
>
> *(vi) within 500 metres of the site of another extractive industry that has operated during the last 5 years.*

The proposal meets the criteria for 1(a), 1(b) and 1(c)(i) and is therefore designated development. By reference to Clause 2, Part 2, Schedule 2 of the EP&A Reg, an Environmental Impact Statement (EIS) must accompany the development application. This document fulfils that requirement.

5.4 INTEGRATED DEVELOPMENT

Section 4.46 of the EP&A Act states that integrated development is development (not being State significant development or complying development) that, in order for it to be carried out, requires development consent and one or more of the approvals listed in that section.

Consideration of the requirement for the relevant approvals is provided in the following sections:

- **Section 5.7.3** – *Protection of the Environment Operations Act 1997*
- **Section 5.7.5** – *Water Management Act 2000*
- **Section 5.7.6** – *Fisheries Management Act 1994*
- **Section 5.7.7** - *National Parks and Wildlife Act 1974*
- **Section 5.7.8** – *Heritage Act 1977*
- **Section 5.7.9** – *Roads Act 1993*

The proposal is integrated on the basis that an Environment Protection Licence is required under Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act).

5.5 CONSENT AUTHORITY

The proposal is not classified as a State Significant Development, pursuant to Clause 7 of Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP) (refer **Section 5.7.1.1**).

Section 4.5 of the EP&A Act identifies developments for which a JRPP is authorised to exercise the consent authority function of Council. As the proposal is an extractive industry that is classified as a designated development, the proposal is classified as Regional Development under the SRD SEPP.

Therefore, the Western JRPP, pursuant to statutory planning requirements under the EP&A Act, is the appropriate consent authority.

5.6 COMMONWEALTH LEGISLATION

5.6.1 ENVIRONMENT PROTECTION BIODIVERSITY CONSERVATION ACT 1999

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (NES) protected under the EPBC Act.

Nine matters of NES are identified under the EPBC Act:

- world heritage properties
- national heritage places
- wetlands of international importance (also known as 'Ramsar' wetlands)
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas
- the Great Barrier Reef Marine Park
- nuclear actions (including uranium mining)
- a water resource, in relation to coal seam gas development and large coal mining development.

The development does not involve any actions that would have a significant impact on any matters of National Environmental Significance (NES). An assessment of the proposal against the following matters of NES was completed by Biosis Pty Ltd as part of the Flora and Fauna Assessment (refer **Section 7**):

- Threatened species (flora and fauna)
- Threatened ecological communities
- Migratory species

The assessment concluded that it is unlikely that a significant impact on a matter of NES would result from the proposal and a referral under the EPBC Act is not required.

5.6.2 NATIVE TITLE ACT 1993

The subject site is located on freehold land and not subject to any lodged native title claims.

5.7 STATE LEGISLATION

5.7.1 STATE ENVIRONMENTAL PLANNING POLICIES

5.7.1.1 State Environmental Planning Policy (State and Regional Development) 2011

The proposal does not meet the requirements for SSD as it does not meet the criteria identified in clause 7, Schedule 1 of the *State Environmental Planning Policy (State and Regional Development) 2011* (SRD SEPP). Specifically, the proposal would not result in the extraction of more than 500,000 tonnes of extractive materials per year, would not extract more than 5 million tonnes from a total resource, or extract from an environmentally sensitive area of State significance.

Pursuant to clause 7, Schedule 7 of the SRD SEPP, the proposal does meet the requirement for Regional Development as it is designated development.

5.7.1.2 State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The aims of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007* (Mining SEPP) are identified as:

> *(a) to provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State, and*
>
> *(b) to facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources, and*
>
> *(b1) to promote the development of significant mineral resources, and*
>
> *(c) to establish appropriate planning controls to encourage ecologically sustainable development through the environmental assessment, and sustainable management, of development of mineral, petroleum and extractive material resources, and*
>
> *(d) to establish a gateway assessment process for certain mining and petroleum (oil and gas) development:*
>
> > *(i) to recognise the importance of agricultural resources, and*
> >
> > *(ii) to ensure protection of strategic agricultural land and water resources, and*
> >
> > *(iii) to ensure a balanced use of land by potentially competing industries, and*
> >
> > *(iv) to provide for the sustainable growth of mining, petroleum and agricultural industries.*

The policy applies to all land within the site.

Clause 9 and Schedule 1 outline those developments that are prohibited by virtue of the Mining SEPP: the subject site is not identified in Schedule 1 and is therefore not prohibited.

Pursuant to clause 7(3) of the Mining SEPP, the proposal may be carried out with development consent as it is located on land zoned for Primary Production (RU1).

Part 3 of the Mining SEPP identifies those matters for consideration in the assessment of a development application to which the Mining SEPP applies. These are addressed in detail in **Table 5.2**.

Part 4AA of the Mining SEPP relates to development on strategic agricultural land. A review of the strategic agricultural land mapping associated with the Mining SEPP confirms that the site is not located on strategic agricultural land and therefore Part 4AA is not applicable to this application.

Table 5.2 – Mining SEPP Matters for Consideration

Clause	Description	Assessment
12AA	Repealed	N/A
12AB	Non-discretionary development standards for mining (1) The object of this clause is to identify development standards on particular matters relating to mining that, if complied with, prevents the consent authority from requiring more onerous standards for those matters (but that does not prevent the consent authority granting consent even though any such standard is not complied with).	
	(2) The matters set out in this clause are identified as non-discretionary development standards for the purposes of section 79C (2) and (3) of the Act in relation to the carrying out of development for the purposes of mining. Note. The development standards do not prevent a consent authority from imposing conditions to regulate project-related noise, air quality, blasting or ground vibration impacts that are not the subject of the development standards.	
	(3) Cumulative noise level The development does not result in a cumulative amenity noise level greater than the acceptable noise levels, as determined in accordance with Table 2.1 of the Industrial Noise Policy, for residences that are private dwellings.	A quantitative Noise and Vibration Impact Assessment is provided in **Section 9**. Modelling demonstrates compliance can be achieved with the recommended mitigation measures.
	(4) Cumulative air quality level The development does not result in a cumulative annual average level greater than 30 µg/m3 of PM10 for private dwellings.	A quantitative Air Quality Impact Assessment is provided in **Section 10**. The results of the modelling confirm that the predicted annual cumulative average PM_{10} concentrations are significantly below the 25 $\mu g/m^3$ criteria for private dwellings, and therefore meet the Mining SEPP requirement.
	(5) Airblast overpressure Airblast overpressure caused by the development does not exceed: (a) 120 dB (Lin Peak) at any time, and (b) 115 dB (Lin Peak) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver.	The Noise and Vibration Impact Assessment identified that a maximum instantaneous charge (MIC) of 100 kg results in predicted compliance with the criteria of 115 dB (Lin Peak) at all nearby receptors. Compliance with the requirements of the Mining SEPP are achieved.
	(6) Ground vibration Ground vibration caused by the development does not exceed: (a) 10 mm/sec (peak particle velocity) at any time, and (b) 5 mm/sec (peak particle velocity) for more than 5% of the total number of blasts over any period of 12 months, measured at any private dwelling or sensitive receiver.	The Noise and Vibration Impact Assessment identified that: Applying the maximum instantaneous charge as determined from the air blast overpressure calculation of 100 kg, the ground vibration level predicted to occur at receptor R1 is 2 mm/s, which complies with the criteria of 5 mm/sec and the long term regulatory goal of 2 mm/s. Compliance with the requirements of the Mining SEPP are achieved.

Table 5.2 – Mining SEPP Matters for Consideration

Clause	Description	Assessment
	(7) Aquifer interference Any interference with an aquifer caused by the development does not exceed the respective water table, water pressure and water quality requirements specified for item 1 in columns 2, 3 and 4 of Table 1 of the Aquifer Interference Policy for each relevant water source listed in column 1 of that Table. Note. The taking of water from all water sources must be authorised by way of licences or exemptions under the relevant water legislation.	Assessment against the Aquifer Interference Policy has been completed and the proposal is considered compliant – refer **Section 13**.
	(8) The Minister is to review a non-discretionary development standard under this clause if a government policy on which the standard is based is changed.	No changes are proposed
12	Compatibility of proposed mine, petroleum production or extractive industry with other land uses Before determining an application for consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must: (a) consider:	
	(i) the existing uses and approved uses of land in the vicinity of the development, and	Existing land use is addressed in Section 15.
	(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development, and	The preferred land uses in the locality are likely to be agriculture, mining, extractive industry and natural resource management. Given that the quarry is an extension of an existing approved land use that does not impact high quality agricultural land or any known valuable mineral resources, it is considered to be a suitable use of the land.
	(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses, and	As above - it is considered to be a compatible development with respect to existing approved land use and preferred land use.
	(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a) (i) and (ii), and	Public benefit associated with the development includes positive contributions to the local economy, including continued local employment opportunities. Given the minor nature of impacts to land uses (refer **Section 15**), it is considered that the public benefit associated with the proposal outweighs these impacts.
	(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).	An assessment of compatibility with existing land uses is provided in **Section 15**. A range of measures to mitigate or manage impacts is summarised in **Section 22**
12A	Consideration of voluntary land acquisition and mitigation policy (1) In this clause: the voluntary land acquisition and mitigation policy means the policy by that name published by the Minister in the Government Gazette on 19 December 2014.	No voluntary land acquisition is proposed by ARQ.
	(2) Before determining an application for consent for State significant development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider any applicable provisions of the voluntary land acquisition and mitigation policy and, in particular:	N/A
	(a) any applicable provisions of the policy for the mitigation or avoidance of noise or particulate matter	N/A

Table 5.2 – Mining SEPP Matters for Consideration

Clause	Description	Assessment
	impacts outside the land on which the development is to be carried out, and	
	(b) any applicable provisions of the policy relating to the developer making an offer to acquire land affected by those impacts.	N/A
	(3) To avoid doubt, the obligations of a consent authority under this clause extend to any application to modify a development consent for State significant development for the purposes of mining, petroleum production or extractive industry.	N/A
	(4) This clause extends to applications made, but not determined, before the commencement of this clause.	N/A
13	Compatibility of proposed development with mining, petroleum production or extractive industry (1) This clause applies to an application for consent for development on land that is, immediately before the application is determined: (a) in the vicinity of an existing mine, petroleum production facility or extractive industry, or	The proposal is an extension of an existing quarry operated by the proponent. The quarry expansion represents a logical extension of the current open-cut pit.
	(b) identified on a map (being a map that is approved and signed by the Minister and copies of which are deposited in the head office of the Department and publicly available on the Department's website) as being the location of State or regionally significant resources of minerals, petroleum or extractive materials, or Note. At the commencement of this Policy, no land was identified as referred to in paragraph (b).	The site is not located on a site of state or regionally significant resources of minerals, petroleum or extractive materials. Not applicable.
	(c) identified by an environmental planning instrument as being the location of significant resources of minerals, petroleum or extractive materials. Note. Sydney Regional Environmental Plan No 9—Extractive Industry (No 2—1995) is an example of an environmental planning instrument that identifies land as containing significant deposits of extractive materials.	As above
	(2) Before determining an application to which this clause applies, the consent authority must: (a) consider: (i) the existing uses and approved uses of land in the vicinity of the development, and	The current approved quarry operation is described in Section 2. Existing land use is addressed in Section 15.
	(ii) whether or not the development is likely to have a significant impact on current or future extraction or recovery of minerals, petroleum or extractive materials (including by limiting access to, or impeding assessment of, those resources), and	Potential impacts to the geological resource are addressed in **Section 14**. Consideration of existing exploration titles and applications is provided in **Section 15**.
	(iii) any ways in which the development may be incompatible with any of those existing or approved uses or that current or future extraction or recovery, and	Given that the quarry is an extension of an existing approved land use that does not impact high value agricultural land or any known valuable mineral resources, it is considered to be a compatible land use.

Table 5.2 – Mining SEPP Matters for Consideration

Clause	Description	Assessment
	(b) evaluate and compare the respective public benefits of the development and the uses, extraction and recovery referred to in paragraph (a) (i) and (ii), and	The current use of the affected land is for grazing purposes; the area of the quarry expansion is not located on high value agricultural land due to significant outcropping rock and shallow soils. Protecting this current use in favour of the proposed use would not confer any public benefit. In fact it would forgo public benefit arising from the proposal by virtue of providing local employment and through additional revenue into the locality economy. On balance, the public interest is best served by the carrying out of the development as proposed. As the application seeks to extract materials from land where an exploration licence application is current, it follows that the development would not inhibit or restrict access for any other recovery of materials, except to the extent allowed via a development consent. The development is therefore acceptable in this regard.
	(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph (a) (iii).	No incompatibility noted. Control measures are provided throughout the EIS that would be implemented to minimise and residual impacts.
14	Natural resource management and environmental management (1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following: (a) that impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimised to the greatest extent practicable,	Details of mitigation measures in respect of surface and ground water impacts provided in **Section 13**.
	(b) that impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable,	Details of mitigation measures in respect of biodiversity impacts provided in **Section 7**.
	(c) that greenhouse gas emissions are minimised to the greatest extent practicable.	A detailed assessment of potential greenhouse gas emissions (refer **Section 11**) demonstrates emissions are minimal in the overall context of emissions nationally.
	(2) Without limiting subclause (1), in determining a development application for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider an assessment of the greenhouse gas emissions (including downstream emissions) of the development, and must do so having regard to any applicable State or national policies, programs or guidelines concerning greenhouse gas emissions.	A detailed assessment of potential greenhouse gas emissions is provided in **Section 11**.
	(3) Without limiting subclause (1), in determining a development application for development for the purposes of mining, the consent authority must consider any certification by the Chief Executive of the Office of Environment and Heritage or the Director-General of the Department of Primary Industries that measures to mitigate or offset the biodiversity impact of the proposed development will be adequate.	OEH and DPI comments as provided via the SEARs process are considered throughout the EIS, as addressed in the SEARs Checklist in **Appendix B**.

Table 5.2 – Mining SEPP Matters for Consideration

Clause	Description	Assessment
15	Resource recovery (1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider the efficiency or otherwise of the development in terms of resource recovery.	The proposal would generate minimal waste rock due to the quality of the rock available at the quarry. Overburden and topsoil material will be reused on site for bunding and rehabilitation purposes. The proposal also provides an opportunity to efficiently supply product to a future rail siding, thereby minimising off-site transport (and associated emissions) for the duration of the contract to supply ballast to ARTC.
	(2) Before granting consent for the development, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at optimising the efficiency of resource recovery and the reuse or recycling of material.	Noted
	(3) The consent authority may refuse to grant consent to development if it is not satisfied that the development will be carried out in such a way as to optimise the efficiency of recovery of minerals, petroleum or extractive materials and to minimise the creation of waste in association with the extraction, recovery or processing of minerals, petroleum or extractive materials.	Mitigation measures are considered to be sufficient in this regard.
16	Transport (1) Before granting consent for development for the purposes of mining or extractive industry that involves the transport of materials, the consent authority must consider whether or not the consent should be issued subject to conditions that do any one or more of the following:	
	(a) require that some or all of the transport of materials in connection with the development is not to be by public road,	Internal transfer of materials between the extraction point and the processing area would not be via a public road. Material leaving the site would be via Wyatts Lane and Bogan Road. The proposal also provides an opportunity to reduce transport of quarry product via public roads by supplying ballast to a future rail siding site for ARTC via internal access roads.
	(b) limit or preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,	Haulage hours are restricted to avoid haulage in school bus times.
	(c) require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.	A Driver's Code of Conduct would be prepared and included as part of an Environmental Management Plan (EMP) for the quarry.
	(2) If the consent authority considers that the development involves the transport of materials on a public road, the consent authority must, within 7 days after receiving the development application, provide a copy of the application to:	Noted
	(a) each roads authority for the road, and	
	(b) the Roads and Traffic Authority (if it is not a roads authority for the road). Note. Section 7 of the Roads Act 1993 specifies who the roads authority is for different types of roads. Some roads have more than one roads authority.	
	(3) The consent authority: (a) must not determine the application until it has taken into consideration any submissions that it receives in response from any roads authority or the Roads and Traffic Authority within 21 days after they were provided with a copy of the application, and	

Table 5.2 – Mining SEPP Matters for Consideration

Clause	Description	Assessment
	(b) must provide them with a copy of the determination.	
	(4) In circumstances where the consent authority is a roads authority for a public road to which subclause (2) applies, the references in subclauses (2) and (3) to a roads authority for that road do not include the consent authority.	
17	Rehabilitation (1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring the rehabilitation of land that will be affected by the development.	Rehabilitation is addressed in Section 3.2
	(2) In particular, the consent authority must consider whether conditions of the consent should: (a) require the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated, or	A Rehabilitation Plan will be prepared and would form part of the EMP. Details on rehabilitation are provided in **Section 3.2**.
	(b) require waste generated by the development or the rehabilitation to be dealt with appropriately, or	Waste management is addressed in Section 18.
	(c) require any soil contaminated as a result of the development to be remediated in accordance with relevant guidelines (including guidelines under section 145C of the Act and the *Contaminated Land Management Act 1997*), or	No contamination is considered likely to result from the proposal.
	(d) require steps to be taken to ensure that the state of the land, while being rehabilitated and at the completion of the rehabilitation, does not jeopardize public safety.	A Rehabilitation Plan will be prepared and would form part of the EMP. Details on rehabilitation are provided in **Section 3.2**.

By reference to the above assessment, it is considered that the development is compatible with the intent and requirements of the Mining SEPP.

5.7.1.3 State Environmental Planning Policy No 55—Remediation of Land

State Environmental Planning Policy No. 55 (SEPP 55) aims to provide a State-wide planning approach to the remediation of contaminated land. SEPP 55 requires that all remediation work complies with specified standards, and that local councils are notified prior to the carrying out of remediation work and once it is finished.

Clause 7(1)(a) of SEPP 55 states that a consent authority is required to consider whether or not land is contaminated when determining applications. A review of the EPA Contaminated Land Record under Section 58 of the *Contaminated Land Management Act 1997* (CLM Act) and the List of NSW contaminated sites notified to EPA under Section 60 of the CLM Act does not identify any registered contaminated sites, or potential contaminated sites notified to the EPA, at or near the subject site.

The Central West Councils Environment and Waterways Alliance has recently developed the Contamination Central Project for the alliance Councils, which includes Parkes Shire Council. The project has resulted in the development of the *Central NSW Regional Contaminated Land Policy Template*. Appendix A of the policy template contains a list of potentially contaminating land uses.

An assessment of existing and potential contamination is provided in **Section 15**. Of particular note, there is an existing waste dump at the site (present prior to quarrying) that will be impacted by the proposal. Appropriate mitigation measures are provided in **Section 15.9**.

5.7.1.4 State Environmental Planning Policy No 33 – Hazardous and Offensive Development

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures, would (or potentially would) pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment.

In accordance with *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP 33), the hazardous materials to be held or used within the subject site are required to be identified and classified in accordance with the risk screening method contained within the Appendix 4 of *Hazardous and Offensive Development Application Guidelines - Applying SEPP 33* (DoP, 2011). Hazardous materials are defined within that document as substances falling within the classification of the *Australian Code for the Transportation of Dangerous Goods by Road and Rail* (Dangerous Goods Code) (National Transport Commission, 2017).

Potentially hazardous goods that would be used or stored within the subject site would include diesel and other hydrocarbons, specifically:

- 205 L of engine oil
- 205 L of hydraulic oil
- 40 L of transmission oil
- 30,000 L diesel fuel

Review of Safety Data Sheets (SDS) confirms that engine oil, hydraulic oil, transmission oil and diesel fuel are not dangerous goods. In addition, engine oil, hydraulic oil and transmission oil are not identified as hazardous substances. Diesel fuel is classified as a C1 combustible liquid for the purpose of storage and handling. As noted in the DoP (2011) SEPP 33 guidelines, " if combustible liquids of class C1 are present on site and stored in a separate bund or storage area where there are no flammable materials stored they are not considered to be potentially hazardous" (p. 16). On the basis that the proposed diesel storage would be contained in its own bund, it is not considered to be hazardous. A preliminary hazard analysis is not required for the proposal and the development is not a potentially hazardous or offensive industry.

5.7.1.5 State Environmental Planning Policy (Rural Lands) 2008

Pursuant to this SEPP the proposal does not:

- Compromise the orderly and economic use and development of rural lands for rural and related purposes.
- Compromise the proper management, development and protection of rural lands for the purpose of promoting the social, economic and environmental welfare of the State.
- Increase land use conflicts.
- Impact on State significant agricultural land.

5.7.1.6 State Environmental Planning Policy No. 44 – Koala Habitat Protection

SEPP No. 44 aims to encourage the conservation and management of natural vegetation areas that provide habitat for koalas to ensure permanent free-living populations will be maintained over their present range and to reverse the current trend of koala-population decline. The SEPP applies to areas of native vegetation greater than one hectare and in councils listed in Schedule 1 to the SEPP. Parkes LGA is listed under Schedule 1 and therefore SEPP No. 33 applies.

As part of the Flora and Fauna Assessment prepared by Biosis, koala habitat was assessed (refer **Appendix C**). Biosis made the following conclusions:

- The study area supported one Koala feed tree species, White Box (*Eucalyptus albens*).

- Koala feed trees make up 15 per cent of the total number of trees in the upper or lower strata of the tree component. Therefore the vegetation within the study area would be considered potential Koala habitat as defined under SEPP No. 44.
- Field investigations did not identify a resident population of Koalas in the study area and therefore the vegetation in the study area does not constitute core Koala habitat.
- No further consideration is required.

5.7.2 BIODIVERSITY CONSERVATION ACT 2016

The *Biodiversity Conservation Act 2016* (BC Act) commenced on the 25th of August 2017 and has replaced the *Threatened Species Conservation Act 1995* and the *Native Vegetation Act 2003*.

The BC Act aims to maintain a healthy, productive and resilient environment consistent with the principles of ecologically sustainable development. The Act aims to conserve biological biodiversity, maintain the diversity and resilience of ecosystems, assess the extinction risk of threatened species and encourage their conservation. The Act contains lists of critically endangered, endangered, and vulnerable species, populations and ecological communities, as well as a list of key threatening processes in NSW.

Transitional arrangements under Part 7 (provisions relating to biodiversity assessment and approvals under the EP&A Act) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017 (BC Regulation*) apply to those projects that commenced prior to the enactment of the BC Act or within a certain timeframe of the enactment. In summary, for pending or interim planning applications (as defined by clause 27(1) of the BC Regulation, the former planning provisions continue to apply.

This application is considered to represent a pending or interim planning application on the basis that it:

> *(b) an application for planning approval (or for the modification of a planning approval) made within 18 months after the commencement of the new Act if an environmental impact statement is to be submitted in connection with the application and the Secretary of the Department of Planning and Environment issued, before the commencement of the new Act, environmental assessment requirements for the preparation of the statement,*

SEARs for the proposal were issued on the 27 June 2016 and therefore the proposal satisfies the above definition.

As such, consideration of the BC Act via this EIS is not provided. Instead the proposal is assessed against the provisions of the, now repealed, *Threatened Species Conservation Act 1995* (TSC Act) (refer **Section 7** and **Appendix C**).

5.7.3 PROTECTION OF THE ENVIRONMENT OPERATIONS ACT 1997

Pursuant to Section 4.46 of the EP&A Act, the proposal is integrated if it requires an EPL under Section 48 of the *Protection of the Environment Operations Act 1997* (POEO Act) to authorise the carrying out of the scheduled activity (i.e. extractive industry) at the premise.

The proposal is a scheduled activity in accordance with clause 19, Schedule 1 of the POEO Act as it would involve extraction and processing of more than 30,000 tonnes per year of extractive materials.

5.7.4 THREATENED SPECIES CONSERVATION ACT 1995

The *Threatened Species Conservation Act 1995* (TSC Act) was repealed on 25 August 2017. The *Biodiversity Conservation Act 2016* (BC Act) was introduced to replace the repealed legislation. However, as discussed in **Section 5.7.2**, the TSC Act remains applicable for pending or interim planning applications, such as this one. The TSC Act is therefore applicable to the assessment.

5.7.5 WATER MANAGEMENT ACT 2000

5.7.5.1 Water Supply Work and Water Use Approvals

No additional water supply (surface or groundwater) is required for the proposal. An expanded sediment basin will supply sufficient water for the quarry operation (refer **Section 13**).

On the basis that there is no requirement for additional water supply, an assessment of volumetric water licensing requirements is not provided in this EIS and no water supply work or water use approvals are required under the *Water Management Act 2000* (WM Act).

5.7.5.2 Controlled Activity Approval

Under the WM Act, a controlled activity means:

a) *the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979), or*

b) *the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or*

c) *the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or*

d) *the carrying out of any other activity that affects the quantity or flow of water in a water source.*

The WM Act defines waterfront land as the bed of any river, lake or estuary and any land within 40 metres of the river banks, lake shore or estuary mean high water mark.

The proposed access road to a future rail siding site does cross a Strahler first order drainage line. The existing quarry access road also crosses a Strahler second order drainage line. A culvert is proposed (as part of the SWMP) where the existing road crosses this drainage line to prevent water being impounded.

Pursuant to clause 21, Part 2, Schedule 5 of the *Water Management (General) Regulation 2011* (WM Reg), the proposed crossing of the first order drainage line would be exempt from requiring a Controlled Activity Approval (CAA) on the basis that it is a minor stream located within a rural zone (RU1 – Primary Production) and it would not impound water (refer **Section 3.1.8.4**). A description of this minor stream is provided in **Section 13**. It is also considered that the installation of a culvert on the existing approved quarry access track would be exempt from requiring a CAA on the same basis: that the proposed works are on an access track on a minor stream within a rural zone and (as a result of installing a culvert) will not impound water.

> ***21 Activities connected with construction of fencing, crossings or tracks***
>
> *Any activity carried out in connection with the construction or use of fencing, or of a vehicular crossing or an access track, that does not impound water, being an activity carried out in, on or under waterfront land:*
>
> *(a) relating to a minor stream, and*
>
> *(b) within a rural zone (other than a rural village) under an environmental planning instrument.*

A minor stream is defined under the WM Reg under clause 3:

> ***minor stream** means:*
>
> *(a) any stream or part of a stream:*
>
> *(i) the location of which is represented on any of the topographic maps listed in Part 2 of Schedule 2, and*
>
> *(ii) that is a first or second order stream, or part of such a stream, as determined in accordance with the system set out in Part 1 of Schedule 2, and*

(iii) which does not maintain a permanent flow of water, being a visible flow which occurs on a continuous basis, or which would so occur if there were no artificial abstractions of water or obstruction of flows upstream, and

(iv) which does not at any time carry flows emanating from a third, fourth or higher order stream as determined in accordance with the system set out in Part 1 of Schedule 2, and

(b) any stream or part of a stream the location of which is not represented on a topographic map listed in Part 2 of Schedule 2.

For the purposes of paragraphs (a) (i) and (b), the streams are shown as watercourses on the topographic maps according to the legend.

5.7.5.3 Aquifer Interference Approval

The desktop groundwater assessment and observations from the existing quarry area (refer to **Sections 13.1.2** and **13.2.2**) infers that the development would not result in aquifer interference and an aquifer interference approval is not required.

5.7.6 FISHERIES MANAGEMENT ACT 1994

The Biosis (2018) Flora and Fauna Assessment state that no threatened species, populations or ecological communities listed under the *Fisheries Management Act 1994* (FM Act) are considered likely to occur within the study area. The first order stream and farm dam within the study area are not considered key fish habitat.

As the proposal does not impact any areas of key fish habitat, a permit under the FM Act is not required.

5.7.7 NATIONAL PARKS AND WILDLIFE ACT 1974

The potential impacts to native flora and fauna and Aboriginal heritage, pursuant to the *National Parks and Wildlife Act 1974* are considered in **Section 7, Appendix C** and **Appendix D**. No approvals are required.

5.7.8 HERITAGE ACT 1977

The site does not contain and is not located near to any sites of State heritage significance, and as such, no approvals pursuant to the *Heritage Act 1977* are required.

5.7.9 ROADS ACT 1993

No approvals under the *Roads Act 1993* are required as all proposed works are internal to the site. For the avoidance of doubt, no changes to the access location from the Bogan Road via Wyatts Lane are required as the current access is assessed as being acceptable in the context of proposed vehicle movements.

5.7.10 BIOSECURITY ACT 2015

The objective of the *Biosecurity Act 2015* is to manage biosecurity risks from flora and fauna pests and diseases by preventing, containing or minimising the threat posed by these pests and diseases.

No priority weeds for the Central West Region, which includes the Parkes Shire LGA, have been recorded in the study area (Biosis, 2018).

Appropriate mitigation measures are provided to address pest and weed management.

5.7.11 EP&A AMENDMENT (SIDING SPRING OBSERVATORY) REGULATION 2016

On the 5 August 2016, the *Environmental Planning and Assessment Amendment (Siding Spring Observatory) Regulation 2016* came into effect, resulting in an amendment of the EP&A Reg. The impact of this amendment is to insert clause 92(1)(d) of the EP& Regulations, which states:

> ***Clause 92 Additional matters that consent authority must consider***
>
> *(d) in the case of the following development, the Dark Sky Planning Guideline:*
>
> *(i) any development on land within the local government area of Coonamble, City of Dubbo, Gilgandra or Warrumbungle Shire,*
>
> *(ii) development of a class or description included in Schedule 4A to the Act, State significant development or designated development on land less than 200 kilometres from the Siding Spring Observatory require Council to have regard for the Dark Sky Planning Guideline prepared by the Department of Planning*

The proposal is 213 kilometres from the Siding Springs observatory. No further consideration required.

5.8 PARKES LOCAL ENVIRONMENTAL PLAN 2012

5.8.1 INTRODUCTION

The subject site is located within the Parkes LGA and therefore the *Parkes Local Environmental Plan 2012* (LEP) is the appropriate local environmental planning instrument applying to the site.

5.8.2 AIMS AND OBJECTIVES

The aims of the LEP are:

> *(a) to protect, enhance and conserve agricultural land through the proper management, development and conservation of natural and man-made resources,*
>
> *(b) to encourage a range of housing, employment, recreation and facilities to meet the needs of existing and future residents of Parkes,*
>
> *(c) to promote the efficient and equitable provision of public services, infrastructure and amenities,*
>
> *(d) to conserve, protect and enhance the environmental and cultural heritage of Parkes,*
>
> *(e) to promote the town of Parkes as a major commercial and community service centre,*
>
> *(f) to encourage the sustainable growth of the villages of Parkes,*
>
> *(g) to encourage industrial development that is matched by adequate land supply for long-term needs, is linked with key services and infrastructure, provides for a diversity of employment and increases the number of skilled jobs in Parkes,*
>
> *(h) to raise the profile of Parkes to broaden the economic base, improve its attractiveness as a tourist destination, encourage longer stays and greater local spending and promote a wider understanding of Parkes as a place to live and invest,*
>
> *(i) to acknowledge the contribution of mining to Parkes and the role of Parkes as a mining centre for the region.*

The land use objectives of the RU1 – Primary Production zone include:

> • *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
>
> • *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
>
> • *To minimise the fragmentation and alienation of resource lands.*
>
> • *To minimise conflict between land uses within this zone and land uses within adjoining zones.*
>
> • *To encourage eco-tourism enterprises that minimise any adverse effect on primary industry production.*
>
> • *To permit non-agricultural uses that support the primary production purposes of the zone.*
>
> • *To permit small scale rural tourism uses associated with primary production and environmental conservation with minimal impact on primary production and the scenic amenity of the area.*

- *To encourage the provision of tourist accommodation in association with agricultural activities.*
- *To provide opportunities for employment-generating development that adds value to local agricultural production and integrates with tourism.*

It is considered that the proposal is consistent with the aims of the LEP and objectives of the land use zone as the proposal:

- utilises land suitable for extractive industry;
- would not impact viable agricultural land or alienate it;
- provides employment opportunities and contribute to the Parkes economy;
- supports the LEP aim that acknowledges the role of Parkes as a centre for mining/extractive industry; and
- subject to the implementation of mitigation measures that form part of the proposal, it is concluded that impacts associated with the development are manageable and acceptable.

Mapping associated with the LEP has been reviewed and relevant constraints identified and discussed in the following sections.

5.8.3 MAPPING

A review of the LEP mapping identifies the following environmental constraints that apply to the subject site. Those matters of relevance are discussed further in the relevant sections noted in **Table 5.3**.

Table 5.3 – LEP Mapping Review

Map	Relevance	Section Discussed
Land Application Map	The subject site is identified as located within the Parkes LGA.	No further discussion required.
Land Zoning Map	The subject site is zoned RU1 – Primary Production.	Refer Section 5.1
Lot Size Map	The subject site has a minimum lot size of 400 hectares.	No subdivision is proposed, no further discussion required.
Heritage Map	The subject site does is not located on or near mapped heritage items.	No further discussion required.
Land Reservation Acquisition Map	Not Applicable	No further discussion required.
Groundwater Vulnerability Map	The subject site is not located on or near groundwater vulnerable land.	No further discussion required.
Parkes Township Buffer Map	The subject site is not within a buffer area.	No further discussion required.
Terrestrial Biodiversity Map	The subject site contains areas mapped as biodiversity.	Refer Section 5.8.3.1
Watercourse Map	The subject site does is not located on or near a mapped watercourse.	No further discussion required. Notwithstanding, impacts to drainage lines in the subject site is provided in **Section 13**.
Wetlands Map	The subject site does is not located on or near a mapped wetland.	No further discussion required.

The above matters of relevance, together with any other matters arising from a review of the LEP, are discussed in the following sections.

5.8.3.1 Terrestrial Biodiversity

Part of the subject site contains areas mapped as biodiversity, as shown on **Figure 9** overleaf.

Figure 9: Terrestrial Biodiversity

Pursuant to Clause 6.2(3) of the LEP, before determining a development application for development on land containing biodiversity, the consent authority must consider:

(a) whether the development is likely to have:

(i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and

(ii) any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and

(iii) any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and

(iv) any adverse impact on the habitat elements providing connectivity on the land, and

(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

Potential impacts to biodiversity and mitigation measures are addressed in **Section 7**.

5.9 DRAFT ENVIRONMENTAL PLANNING INSTRUMENTS

Review of the NSW DPE LEP Tracking System confirms that there are no current proposals to amend environmental planning instruments affecting the Parkes LGA.

5.10 DEEMED ENVIRONMENTAL PLANNING INSTRUMENTS

There are no deemed environmental planning instruments affecting the Parkes LGA.

5.11 PARKES SHIRE DEVELOPMENT CONTROL PLAN 2013

The *Parkes Shire Development Control Plan 2013* (DCP) provides specific development controls for commercial, industrial, residential and subdivision developments. No specific development controls relevant to the proposal are provided in the DCP. Section 1.2 of the DCP provides general principles for development and these are considered in **Table 5.4**.

Table 5.4 – Consideration of DCP General Principles for Development

General Principle	Assessment
Consider the character of the neighbourhood - When designing your development, take into account where appropriate the style and character of the neighbourhood including landscaping, building setbacks, materials and roof forms.	No buildings proposed. Existing land uses have been considered in **Section 15**.
Maintain the quality of the streetscape - Attractive streetscapes, comprising trees, gardens, building facades (i.e. the exterior of the building), fences and walls need to be maintained and where possible enhanced.	The proposal does not impact on streetscape. Visual amenity is considered in **Section 12**.
Use the site's attributes to your advantage - Take advantage of the attributes of the site; use its slope, its orientation, its established visual or landscape quality to enhance the development	The proposed quarry expansion is a logical extension of an existing quarry containing a suitable geological resource.
Ensure appropriate building height, bulk and form - The scale and form of new buildings should be in keeping with the predominant surrounding buildings. Roof forms and building heights should match those of neighbouring buildings. Minimise building bulk and height on or near boundaries to avoid overshadowing and overlooking of neighbours.	Not applicable – no buildings proposed.
Protect Heritage - Protect existing heritage buildings, streetscapes or the curtilage of heritage buildings. Use related building forms, matching materials and window and door proportions to complement existing heritage buildings. Keep any new building as far as possible from any heritage gardens. New work should not dominate the streetscape.	No impacts to heritage – refer Section 8.

Table 5.4 – Consideration of DCP General Principles for Development

General Principle	Assessment
Ensure landscape qualities are retained - Retain established trees and vegetation where possible. Limit the extent of hard paving, car parking and driveways to prevent increased stormwater run-off.	The proposed quarry expansion and access roads have been design to avoid, where possible, impact to established vegetation. Impacts to biodiversity are addressed in **Section 7**.
Provide for good solar access - Provide for good solar access in all new developments and avoid overshadowing of neighbours.	The proposed quarry expansion would not result in overshadowing.
Maximise views, however respect privacy - Maintain views and privacy as well as to those of your neighbours. Use screens, planting and walls, to maintain visual privacy to neighbours and to reduce noise.	Views from the site are not relevant for the proposal. However, visual amenity is a consideration for surrounding landowners and has been addressed in **Section 12**.
Safer by Design – focus on the planning and design of developments to provide safety and security to the wider community. This is achieved by creating environmental and social conditions that aim to create the perception or reality of capable guardianship within the built environment.	The proposal design has considered the relevant guidelines for quarry and surface water management design, and has considered hazards and public safety in **Section 17**.

5.12 PARKES SHIRE SECTION 94 CONTRIBUTIONS PLAN 2016

The *Parkes Shire Section 94 Contributions Plan 2016* (Contribution Plan) applies to the subject site as it is located on land to which the plan applies (RU1) and is a development that generates heavy haulage vehicle movements.

By reference to the exemptions listed in the Contribution Plan, the proposal is not considered to be exempt as it would exceed an average annual output of 5000 m^3 and would haul more than 7,500 tonnes annually, but would be capped at 150,000 tonnes annually.

5.13 STRATEGIC PLANNING DOCUMENTS

5.13.1 CENTRAL WEST AND ORANA REGIONAL PLAN

The *Central West and Orana Regional Plan* (CWORP) (DPE, 2017), released in June 2017, provides 4 goals for 20 Local Government Areas (LGAs) in the Central West and Orana regions, including the Parkes LGA. These goals include the following:

1. *The most diverse regional economy in NSW*
2. *A stronger, healthier environment and diverse heritage*
3. *Quality freight, transport and infrastructure networks*
4. *Dynamic, vibrant and healthy communities*

Direction 8 of Goal 1 is to 'Sustainably manage mineral resources'. The CWORP identifies the following actions to achieve the goal:

***8.1** Consult with the Division of Resources and Geosciences when assessing applications for land use changes (strategic land use planning, rezoning and planning proposals) and new development or expansions.*

***8.2** Protect areas with potential mineral and energy resources extraction through local land use strategies and local environmental plans.*

***8.3** Protect infrastructure that facilitates mining from development that could affect current or future extraction.*

***8.4** Support communities that transition out of mining to manage change in population and demand for services, and explore new economic opportunities.*

***8.5** Work with councils to scope the application and implementation of a scenario planning or impact modelling tool to be applied at a regional level to help communities plan for the impacts of mining.*

The proposal is consistent with the intent of Direction 8 under Goal 1 of the CWORP. Consideration of the geological resource and existing mineral exploration activity is provided in **Section 14** and **15.6** (respectively).

5.13.2 CENTRAL WEST REGIONAL ACTION PLAN

The Central West Regional Action Plan (CWRAP) is an initiative of the NSW State Government and supports the intent of the NSW 2021 plan.

The proposal is consistent with the CWRAP priority action to 'support economic growth within the region'. The proposal will support the priority actions to drive future job growth in mining and related industries, and maximise the flow on socio-economic benefits.

5.13.3 COMMUNITY STRATEGIC PLAN

The *Parkes Shire 2030+ Community Strategic Plan* (CSP) sits above all other Council plans and policies in the planning hierarchy. The purpose of the plan is to identify the community's main priorities and aspirations for the future, and plan strategies to achieve them.

The CSP has 8 key future directions and each of the future directions have strategies for how they can be achieved. Strategies for future directions relevant to the proposal are outlined below:

Table 5.5 – Consideration of Relevant Strategies for CSP Future Directions

Future Direction	Strategy/Council Comments	Assessment/Comment
4. Grow and diversify the economic base	**4.1** – By having a strong local businesses sector. Council is committed to supporting all of the diverse range of economic activities in the Shire. The economic benefits and the flow on improvements to the Shire community quality of life, are embedded on ensuring the reliability and sustainability of the Parkes Shire Economic Base.	Whilst the proposal is not itself a new business investment in the shire, it would allow for an expanded operation that would generate additional staff and contractor employment (i.e. blast contractors). The potential supply of ballast to ARTC for the Inland Rail project would also provide an investment into a business operating in the Shire.
	4.3 – By attracting business investment into the Shire	
5. Develop Parkes as a National Logistics Hub	**5.3** – By advocating and promoting the Melbourne to Brisbane Inland Rail project	Although the proposal does not directly support the development of the Inland Rail Project, the potential supply of ballast to ARTC for the Inland Rail project would support the advancement of the project in the region.

Environmental Issues

6.1 PRELIMINARY RISK ASSESSMENT

The process commenced with a preliminary desktop risk assessment that identified the likely planning and environmental issues associated with the development. A number of site inspections were then completed to ground truth the biophysical data sourced from the desktop assessment and inspect the features in and around the subject site. The proposal has been refined to accommodate site constraints.

In May 2016, a formal request for SEARs was prepared and lodged with the DPE. The following were identified as key potential environmental issues:

- Noise and vibration
- Visual amenity
- Traffic
- Water
- Air quality
- Cumulative impact
- Aboriginal heritage
- Biodiversity

Other environmental issues that were considered less likely to affect the development, but still requiring consideration, included:

- Land use
- Soils
- Historic heritage
- Bushfire risk
- Contamination
- Loss of resources
- Socio-economic impacts
- Waste management

6.2 SECRETARY'S REQUIREMENTS

SEARs were subsequently issued on 27 June 2016 and identified the following as the key specific issues that must be addressed in the EIS:

- Water
- Air
- Noise and blasting
- Biodiversity
- Heritage
- Transport
- Land
- Waste
- Public safety
- Visual
- Social and economic
- Rehabilitation

Biodiversity

7.1 INTRODUCTION

Biosis prepared a Flora and Fauna Assessment for the proposal.

A full copy of this assessment is provided in **Appendix C**. The following sections summarise the results of the assessment.

7.2 ASSESSMENT SCOPE

The objectives of this investigation included the following:

- Describe the vascular flora (ferns, conifers, and flowering plants), vertebrate fauna (birds, mammals, reptiles and frogs).
- Map native vegetation and other habitat features.
- Threatened flora or fauna species or populations (biota) assessment.
- Review the implications of relevant biodiversity legislation and policy.
- Identify potential implications of the proposal and provide recommendations to assist with development design.
- Recommend any further assessments of the site that may be required (such as targeted searches for threatened biota).

7.3 STUDY AREA

The study area assessed by Biosis included the existing quarry and the proposed quarry expansion (including the pit access road and access road to a future rail siding), existing quarry area, road reserve in the southern boundary and native vegetation north of the subject site. The subject site is defined by Biosis as the area of impact for proposed works.

The study area and subject site are depicted in **Figure 10**.

Figure 10: Study Area and Subject Site (Source: Biosis)

7.4 LEGISLATIVE APPROACH

The proposal has not been classified as State Significant Development and, as SEARs were issued for the proposal before the commencement of the *Biodiversity Conservation Act 2016* (BC Act) on the 25 August 2017, the proposal meets the definition of a pending or interim planning application under Part 7 (Section 27) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*.

As the DA will be submitted within 18 months following commencement of the BC Act, approval is to be assessed in accordance with the former planning provisions (i.e. the provisions of the EP&A Act in force prior to commencement of the BC Act) and Part 7 of the BC Act does not apply.

7.5 LITERATURE AND DATA REVIEW

In order to provide a context for the study area, information about flora and fauna from within 10 km (the 'locality') was obtained from relevant public databases. Records from the following databases were collated and reviewed:

- Department of the Environment and Energy (DEE) Protected Matters Search Tool for matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- NSW BioNet - the database for the Atlas of NSW Wildlife, OEH (TSC Act).
- BirdLife Australia, the New Atlas of Australian Birds 1998-2013 (BA).

Database searches were undertaken in January 2018.

Other sources of biodiversity information were also reviewed including:

- Central West / Lachlan Regional Native Vegetation Map Version 1.0 VIS ID 4358 (OEH, 2015).
- Commonwealth Listing Advice on:
  - White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands (TSSC, 2006).Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia (TSSC, 2010).
- NSW Scientific Committee final determinations for threatened biota, including (but not limited to):
  - White box yellow box Blakely's red gum woodland - endangered ecological community listing (NSW Scientific Committee 2002).
  - Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (NSW Scientific Committee, 2007).

7.6 ASSESSMENTS

7.6.1 FLORA ASSESSMENT

The flora assessment was undertaken on 22 January and 05 February 2018 using a combination of 20 x 20 metre quadrats, BioBanking (BBAM) transects, spot locations and random meanders to determine the vegetation types present.

General classification of native vegetation in NSW used in this report is based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type the finest grouping. The grouping referred to in this report is Plant Community Type (PCT) as defined by the BBAM and commonly used across NSW since 2016.

The vegetation types were stratified into PCTs broadly based on previous vegetation mapping, and the vegetation boundaries marked with hand-held (uncorrected) tablet units (Samsung Galaxy Tab 3) using the ArcGIS Collector application and aerial photo interpretation. Appropriate PCTs were selected on the

basis of species composition and structure, known geographical distribution, landscape position, underlying geology, soil type, and any other diagnostic features. A list of flora species was compiled for each vegetation type.

The general condition of native vegetation was observed as well as the effects of current seasonal conditions. Notes were made on specific issues such as weed infestations, evidence of management works, current grazing impacts and the regeneration capacity of the vegetation.

7.6.2 FAUNA ASSESSMENT

The study area was investigated on 22 January and 05 February 2018 to determine its values for fauna. These were determined primarily on the basis of the types and qualities of habitat present. All species of fauna observed during the assessment were noted and active searching for fauna was undertaken. This included direct observation, searching under rocks and logs, examination of tracks and scats and identifying calls. Particular attention was given to searching for threatened biota and their habitats. Fauna species were recorded with a view to characterising the values of the site and the investigation was not intended to provide a comprehensive survey of all fauna that has potential to utilise the site over time.

The study area was assessed for the presence of aquatic habitat. The proposed quarry expansion is situated on the slope of a hill and no obvious creeks or drainage lines were detected during habitat assessment. A small second order ephemeral stream runs from east to west outside the southern boundary of the study area. This creek line is currently impacted by damming on neighbouring farms, a public unsealed road (Wyatts Lane) and the drainage line has been diverted around the quarry disturbance area. A small first order stream traverses the proposed siding access road where the road diverts around a small farm dam.

All trees within the study area were inspected for any signs of Koala activity including inspecting trees for Koala's and searching for signs such as scratches. The base of all trees within the study area were searched within a 1 metre radius for scats. Field investigations did not identify a resident population of Koalas in the study area and therefore the vegetation in the study area does not constitute core Koala habitat.

Trees within the study area were assessed for hollows using the BBAM assessment methodology and any containing hollows were marked and details collected. Hollows located did not show signs of recent use by nesting birds such as chewing of the bark surrounding the hollow.

Targeted searches for the Pink-tailed Legless Lizard (*Aprasia parapulchella*) were undertaken in accordance with the relevant state and commonwealth guidelines (CoA 2011, DECC, 2004). Targeted searches for the Pinktailed Legless Lizard were undertaken over two separate days due to adverse conditions during the initial field investigation. Survey undertaken on January 22 were conducted in sub-optimal conditions from 11am to 3pm and included a total of 163 partially embedded rocks rolled and dirt underneath carefully raked, in addition raking was conducted around some grass clumps adjacent to suitable rocks. The survey during 5 February was conducted between 6am and 9am under ideal conditions, a total of 318 partially embedded rocks were rolled within the study area with an additional 10 incidental rocks rolled during flora survey.

7.6.3 LIMITATIONS

The current flora and fauna assessment was conducted in summer, which is an optimal time for survey. Database searches, and associated conclusions on the likelihood of species to occur within the study area, are reliant upon external data sources and information managed by third parties.

Weather conditions were not ideal for the targeted fauna survey during the 22 January due to high temperatures, an extensive repeated survey on the 5 February was conducted to ensure optimal conditions for detection of target species.

7.6.4 RESULTS

7.6.4.1 Vegetation Communities and Fauna Habitat

The vegetation and fauna habitat throughout the majority of the subject site has been modified by past disturbances which have included mining, cropping and grazing.

The subject site supports a range of ecological values including areas of remnant native vegetation, scattered hollow-bearing trees and rocky outcrops. The ecological values are described in **Table 7.1**.

Table 7.1 – Vegetation Communities likely to occur in the Subject Site

White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	
PCT	267
Extent within subject site	Approximately 3.6 ha of White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland was recorded within the planned quarry expansion area, proposed bunding, and siding road access.
Description including fauna habitat	This community is an open woodland remnant of the White Box - White Cypress Pine -Western Grey Box shrub/grass/forb woodland where the canopy consists mainly of scattered White Box *Eucalyptus albens* and Kurrajong *Brachychiton populneus* trees. The shrub layer is absent suggesting past clearing. The ground cover is dominated by exotics species Bearded *Oats Avena barbata* and Saffron Thistle *Carthamus lanatus*. However, several native ground cover species are also present like Red Grass*, Bothriochloa macra* Queensland Bluegrass Dichanthium sericeum, Sprawling Bluebell *Wahlenbergia gracilis* and Umbrella Grass *Digitaria divaricatissima*. Three hollow-bearing trees recorded within the proposed quarry expansion area and rock outcropping are potential fauna habitat within this community.
Condition	The community is generally in poor condition due to previous clearing for grazing and cropping and prevalence of exotic annual grasses and forbs.
Associated soils, rainfall and landscape position	This community is located in a hill crest and rolling hills of the study area. The soils consist of stony volcanic clay loams.
Threatened ecological community	Commonwealth EPBC Act: Critically Endangered. NSW TSC Act: Endangered. Justification: The hill crest landscape position, location in the western slopes and dominance of White Box in the canopy is consistent with the NSW listed *White box yellow box Blakely's red gum woodland* endangered ecological community. Application of EPBC Act policy statement 3.5 (DEH 2006) flow chart for determining if land contains Box Gum CEEC identifies the presence of the EPBC Act listed ecological community on the basis that: • The presence of White Box; a listed common Box Gum overstorey species • The patch has a predominant native understorey (as defined by DEH 2006). • The patch is greater than 2 hectares. • There is natural regeneration of the dominant overstorey eucalypt (as defined by DEH 2006) within the patch. Note: The 'patch' here includes the approximately 66.3 hectares of vegetation extends beyond the subject site.
Threatened species habitat	This community is considered to provide marginal habitat for threatened flora and fauna species.
Disturbed land	
PCT	N/A
Extent within subject site	Approximately 1.6 ha of previously disturbed land was recorded along the proposed access road sections and proposed siding road.
Description including fauna habitat	This area consists of the previously disturbed existing tracks. Most of the tracks are cleared of vegetation with some patches recolonised by exotic grasses, herbaceous species. And small numbers of native grasses. This area does not provide habitat for fauna species.
Condition	The area is in poor condition due to past clearing an existing track disturbance

Table 7.1 – Vegetation Communities likely to occur in the Subject Site

Associated soils, rainfall and landscape position	This community is located in the floodplain transitional zone, at the foot slope of the study area as well as mid slopes along the access track to the pit and quarry expansion.
Threatened ecological community	Commonwealth EPBC Act: Not applicable NSW TSC Act: Not applicable
Threatened species habitat	This community is considered to provide negligible habitat for several threatened flora and fauna species.

7.6.4.2 Threatened Biota

Threatened biota includes all flora and fauna species, populations and ecological communities listed under the EPBC Act and TSC Act.

The subject site does not provide habitat for threatened flora due to a series of factors that include a lack of recent records in the locality, high level of degradation, incorrect habitat and soil type. An assessment of the likelihood of these species occurring in the study area, and an indication of the likelihood of the proposal resulting in a significant impact/effect, is included in **Appendix C**.

The subject site provides limited habitat for threatened fauna species. The proposed access roads are within land that has been previously cleared, with sections that have been cropped and have existing tracks. As such the proposed access road sections of the subject site contain only marginal foraging habitat for some threatened fauna species such as raptors. The quarry expansion section of the subject site contains limited habitat for threatened fauna in the form of partially embedded rocks, rock outcrop, large flowering eucalypt foraging habitat and three hollow-bearing trees.

One threatened species, the Grey-crowned Babbler was recorded during field survey within the road reserve to the south of the study area.

The Pink-tailed Legless Lizard was not detected during targeted survey and as such is considered to have a low likelihood of occurrence. White Box is listed as a secondary koala food tree species in the Central West Local Land Services area (OEH, 2017a). Field investigations did not identify a resident population of Koalas in the study area.

No areas of critical habitat for flora or fauna have been declared within the study area. One EEC and four fauna species have been identified as having a medium or greater likelihood of occurrence. **Table 7.2** discusses areas of value and potential impacts for all species with a medium or greater likelihood of occurrence, and determines the need for an assessment of significance.

Table 7.2 – Threatened Biota likely to occur in the Subject Site

Species Name	EPBC Status	TSC Status	Relevance to study area and potential for impact
Ecological Communities			
White box yellow box Blakely's red gum woodland	CEEC	EEC	The 3.6 hectares of PCT *267 White Box - White cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion* within the subject site is consistent with the TSC Act-listed White box yellow box Blakely's red gum woodland EEC and EPBC Act listed Box Gum Woodland CEEC. The EEC/CEEC is considered to be in low to moderate condition owing to the very sparse canopy and dominance of weeds in the groundcover.
Fauna			
Grey-crowned Babbler Pomatostomus temporalis		V	Recorded in roadside vegetation adjacent to existing quarry site. Study area contains moderate-quality habitat in the form of isolated paddock trees, development will not fragment habitat or movement corridors. This species has potential to forage within the subject site on occasion but is unlikely to nest or roost. Higher quality foraging habitat exists within the road reserve and it is unlikely the proposal will have a significant impact on the local population.

Table 7.2 – Threatened Biota likely to occur in the Subject Site

Species Name	EPBC Status	TSC Status	Relevance to study area and potential for impact
Little Pied Bat Chalinolobus picatus		V	Likely to forage across the study area and may also roost within hollow-bearing trees within the study area. Roadside vegetation outside of the study area provides foraging habitat and contains abundant hollows likely to be suitable for roosting. It is unlikely that removal of the hollow-bearing trees within the subject site will significantly impact on the local population.
Superb parrot Polytelis swainsonii	VU	V	3.6 hectares of marginal habitat occurs within the subject site. This species was previously recorded within 500 metres of the study area. This species may occasionally forage and rest within the study area, however, the road reserve to the south and east, and remnant vegetation on top of the hill to the north-west of the subject site provide abundant hollows for nesting and large eucalypts for foraging. It is unlikely that removal of isolated paddock trees within the subject site will significantly impact on this species.
Swift Parrot Lathamus discolor	CE	E1	May occasionally forage within the subject site, however, more abundant resources are available in the road reserve to the south and east of the study area, and remnant vegetation on top of the hill to the north-west. The Swift parrot breeding habitat is in Tasmania and it is unlikely that removal of habitat in the form of isolated paddock trees within the subject site will have a significant impact on this species.

7.6.5 AQUATIC HABITATS

One unnamed non-perennial stream (Strahler Order 1) traverses the proposed siding access road in the north-west section of the subject site. This stream channel is undefined upstream of the subject site and remains poorly defined downstream. The stream is highly modified owing to its location within a routinely cropped and grazed agricultural landscape. No flowing or standing water was observed within the stream at the time of survey and aquatic habitat within the stream was lacking.

The first order stream feeds a small farm dam around the northern edge of which the siding access road travels (refer **Plate 1** – **Plate 2**). At the time of survey, the dam was edged by a small area of muddy substrate which transitioned into dense grass sward of mostly exotic grasses. No fringing, or submerged native aquatic plants were observed nor were any instream habitat structures such as logs or rocks. The depth of the farm dam at time of survey is not known.

A second order unnamed stream traverses the existing quarry disturbance footprint to the south of the proposed quarry expansion area and does not traverse the proposal footprint. The stream has been modified by agricultural land uses upstream of the existing quarry and has been diverted around the quarry disturbance area.

Plate 1: Mapped Waterway (Strahler Order 1) crossing the Subject Site (Source: Biosis)

Plate 2: Existing Dam and Waterway (Strahler Order 1) crossing the Subject Site (Source: Biosis)

7.6.6 GROUNDWATER DEPENDENT ECOSYSTEMS

The study area sits within the Lachlan groundwater province. A review of the Groundwater Dependent Ecosystem (GDE) Atlas (Bureau of Meteorology, 2018) did not identify any terrestrial GDEs in the study area or within a 10 km radius of the study area. Woodland and derived grassland vegetation within the study area is considered 'Low potential GDE – from regional studies'. The headwater of Cookopie Creek lies approximately 5 km north of the study area and is identified on the GDE Atlas as 'Moderate potential GDE – from national assessment'. The study area is not part of the Cookopie Creek catchment and the proposal is therefore unlikely to directly or indirectly impact any GDE associated with Cookopie Creek.

7.6.7 MAPPING

Ecological features of the study were mapped by Biosis and are provided in **Figure 11 – Figure 13**.

Figure 11: Ecological Features of the Study Area (Source: Biosis)

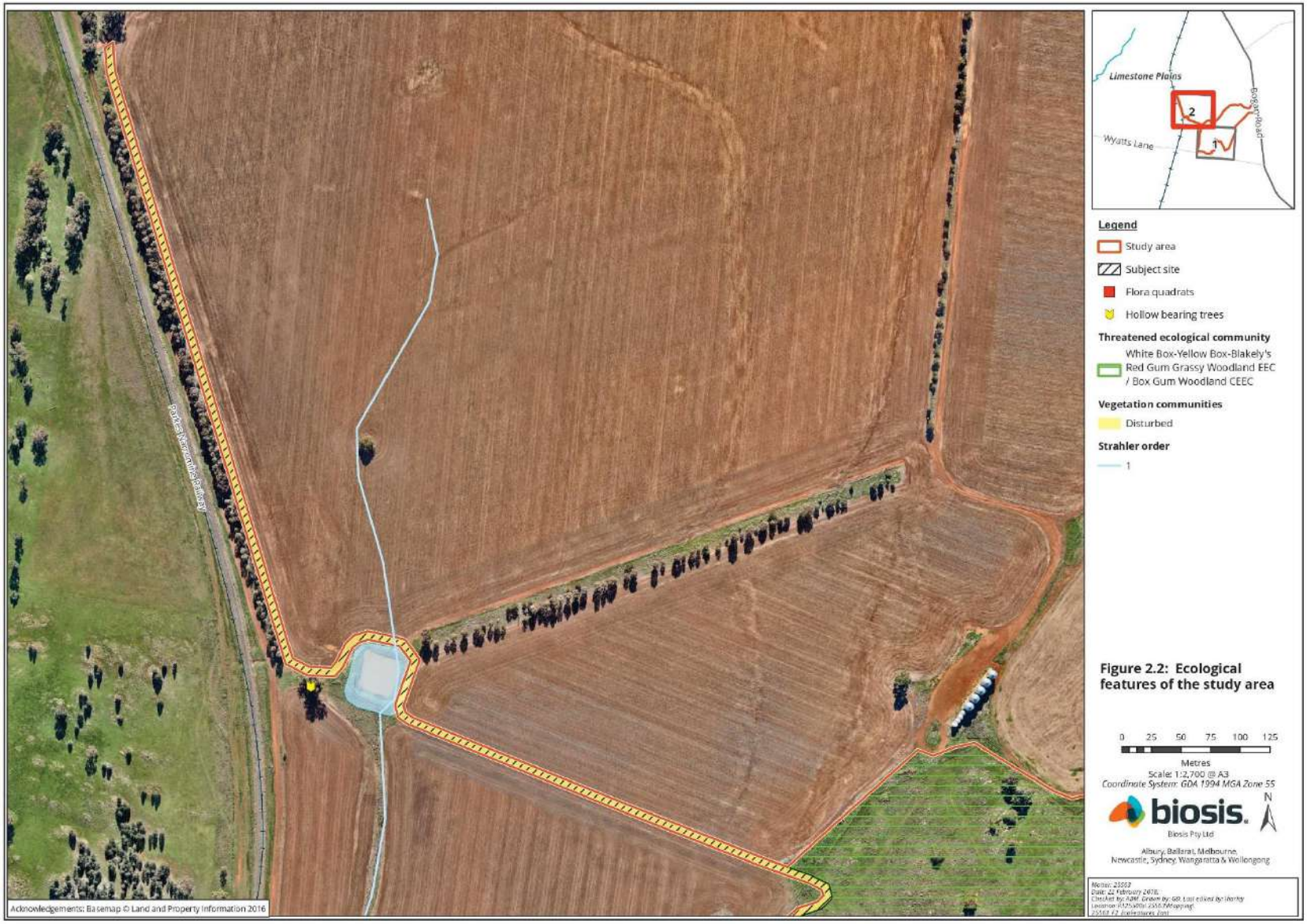

Figure 12: Ecological Features of the Study Area (Source: Biosis)

Figure 13: Extent of Native Vegetation within the Study Area (Source: Biosis)

7.7 ECOLOGICAL IMPACTS

The proposal may result in the following impacts to ecological values:

- Removal of 3.6 hectares of PCT 267 White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland which is consistent with:
  - White box yellow box Blakely's red gum woodland EEC.
  - Box Gum Woodland CEEC.
- Removal of three hollow-bearing trees.
- Removal of three mature White Box and six mature Kurrajong trees that provide foraging habitat for a variety of highly mobile species including some threatened species.
- Increase in deposition of dust on native vegetation and flora and fauna habitat during construction and operation of the quarry expansion.
- Increase in noise and vibration impacts to fauna habitat surrounding the subject site.
- Increased prevalence of weeds or introduction of new weeds to retained native vegetation surrounding the subject site.

The following is noted with respect to cumulative impacts to biodiversity:

- The proposed removal of 3.6 hectares or approximately 5.25% of the existing EEC / CEEC patch will contribute to the ongoing incremental decline of both listed communities in NSW and nationally. However, the EEC / CEEC within the subject site is already substantially modified and the proposal is not expected to further fragment the local EEC / CEEC extent nor is it likely to exacerbate indirect impacts such as dust, erosion and sedimentation or weed invasion. The proposal is therefore unlikely to substantially exacerbate the decline of White box yellow Box Blakely's red gum woodland EEC or Box Gum Woodland CEEC in the local area or more broadly across the range of either community.
- The removal of 3 hollow-bearing trees and 3.6 hectares of foraging resources will contribute to the incremental reduction of habitat for threatened hollow-dependent fauna and highly mobile species in the local landscape. The foraging, roosting and nesting resources directly impacted by the proposal are all well represented beyond the subject site and as such, the loss is not expected to significantly impact any dependent threatened species.
- The expansion of the quarry and addition of a siding access road may, overtime, lead to an increase in traffic, dust and noise and vibration generation in the locality which may in turn impact ecological values surrounding the subject site.

7.8 ASSESSMENT AGAINST KEY BIODIVERSITY LEGISLATION

7.8.1 ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

An assessment of the impacts of the proposal on Matters of NES, against heads of consideration outlined in Commonwealth of Australia (2013) was prepared to determine whether referral of the proposal to the Commonwealth Minister for the Environment is required. Matters of NES relevant to the proposal are summarised in **Table 7.3**.

Table 7.3 – Assessment against the EPBC Act

Matter of NES	Proposal Specifics	Assessment against Commonwealth of Australia (2013)
Threatened species (flora and fauna)	Six flora species and 16 fauna species have been recorded or are predicted to occur in the locality. An assessment of the likelihood of these species occurring in the study area is provided in Table A.2 of Appendix 1 (flora) and Table A.4 of Appendix 2 (fauna). Most of these species are not likely to occur within the study area and development is unlikely to constitute a significant impact.	Not applicable
Threatened ecological communities	The EPBC Act listed TEC Box Gum woodland CEEC is mapped within the subject site. The proposal will result in the permanent removal of 3.6 ha of this CEEC.	Assessments against the Significant Impact Criteria (CoA 2013) have been prepared for this TEC (Appendix 3) concluded that a significant impact was not likely to result from the proposal.
Migratory species	Nine migratory species have been previously recorded or are predicted to occur in the locality	While some of these species would be expected to use the subject site on occasions, some may do so regularly and others may be resident, the subject site does not provide important habitat for an ecologically significant proportion of any of these species.

On the basis of criteria outlined in Commonwealth of Australia (2013) it is considered unlikely that a significant impact on a Matter of NES would result from the proposal.

7.8.2 ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979

An assessment of the proposal against the relevant sections of the EP&A Act was completed by Biosis.

Assessments of Significance were completed for one ecological community; White Box, Yellow Box Blakeley's Red Gum Woodland EEC, considered a medium or greater likelihood of occurrence within the study area. The assessment indicate that a significant effect is not likely to result from the proposal. A Species Impact Statement (SIS) is therefore not required.

Assessment of significance were completed for Little Pied-bat, Grey Crowned Babbler, Superb Parrot and Swift Parrot which were considered to have a medium likelihood of occurrence within the subject site. These assessments indicate that a significant effect is not likely to result on these species. A Species Impact Statement (SIS) is therefore not required.

7.8.3 THREATENED SPECIES CONSERVATION ACT 1995

An assessment of the likelihood of threatened biota occurring within the study area is provided in **Appendix A** (flora) and **B** (fauna) of the assessment (refer **Appendix C**) along with an assessment of whether the proposal has potential to result in a significant effect. These assessments determined that one ecological community and four fauna species have a medium or greater likelihood of occurring within the study area. AoS have been prepared for the threatened biota that are deemed likely to be subject to negative impacts and are provided in Appendix 4 of the assessment (refer **Appendix C**).

AoS indicate that a significant effect is not likely to result from the proposal. A Species Impact Statement is therefore not required.

As the proposal is unlikely to result in a significant effect to threatened biota, consideration of the BioBanking Scheme is not warranted.

7.8.4 BIOSECURITY ACT 2015

No priority weeds for the Central West Region, which includes the Parkes Shire LGA, have been recorded in the study area.

7.8.5 FISHERIES MANAGEMENT ACT 1994

Based on the ecological assessment herein, no threatened species, populations or ecological communities listed under the FM Act are considered likely to occur within the study area. The first order streams and farm dam within the study area are not considered key fish habitat.

7.9 MITIGATION MEASURES

The principal means of reducing impacts to ecological values within the subject site and broader study area will be to minimise removal of native vegetation through siting of the development on already disturbed land.

The design of the proposal has been revised in response to the results of the ecological assessment in order to reduce direct impacts to native vegetation consistent with the White box yellow box Blakely's red gum woodland EEC and Box Gum Woodland CEEC. Specifically, early design options for the siding access road were revised so that the entire length of the proposed road follows existing disturbed tracks; avoiding potential direct and indirect impacts to the EEC / CEEC. The route was also modified to avoid impacts to hollow-bearing trees located adjacent to an earlier road alignment option immediately west of the existing quarry disturbance area.

A suite of management measures will be incorporated in to the construction and operational phases of the proposal to mitigate impacts to ecological values. A construction and operational Environmental Management Plan (EMP) will guide construction of the quarry expansion and include measures to mitigate dust, erosion and sedimentation and to ensure protection of EEC / CEEC vegetation and associated habitats beyond the subject site. The EMP will include on-site fauna management measures that will guide vegetation clearing activities and minimise the risk of injury or death to native fauna, in particular hollow-dependent species during tree removal. As far as practicable, the removal of hollow-bearing trees and other native vegetation will be undertaken at a time and in a manner that will cause least impact to fauna species with potential to occur within the subject site.

The EMP will be developed to also guide on-going management of the quarry activities during operation. The effective management of weeds, dust, noise and vibration so as not to impact surrounding ecological values will be key objectives of the EMP.

Impacts to White box yellow box Blakely's red gum woodland EEC and Box Gum Woodland CEEC will be mitigated, in part, by compensatory planting of 3.6 ha of locally native plants in the retained EEC / CEEC vegetation along the hill and ridge beyond the subject site. The plantings will aim to enhance the floristic and structural characteristics of the EEC / CEEC beyond the subject site and increase resilience of those areas.

A summary of measures to minimise and mitigate impacts are detailed in **Table 4** and **6** of the assessment in **Appendix C** and summarised below. The following measures will be implemented and incorporated into an EMP.

Avoidance:

- Opportunities to avoid impacts within the proposed quarry expansion area are minimal due to constraints imposed by the existing quarry operation and landscape setting of the geological resource.
- The proposal avoids direct impacts to remnant bushland within the Wyatts Lane road reserve by utilising the existing quarry access road for access and by siting the siding access road along existing tracks.

- The proposed siding access road will be designed so as to avoid the need to remove or otherwise directly impact (e.g. lopping of limbs) hollow-bearing trees along the proposed siding access road route.
- Retained trees are to be protected in accordance with Australian Standard *AS4970 – 2009 Protection of trees on development sites* (Standards Australia 2009).
- Direct impacts to waterways are avoided by utilising the existing quarry access road for access and by siting the siding access road along existing tracks.

Minimise and Mitigate:

- Identify the locations of retained EEC / CEEC vegetation as 'No Go' zones in an EMP and on-site using appropriate exclusion fencing and signage.
- Provide site fencing and signage to delineate limits to prevent access to off-site areas, and address in the EMP.
- Communicate the EEC /CEEC 'No Go' zones during the inductions for all site construction and operations personnel. This should include discussion of regulatory implications of non-approved impacts on the EEC / CEEC.
- Minimise soil transportation within, into or out of the study area to reduce the spread of weeds.
- Identify procedures for storage and re-use of topsoil in the EMP.
- Clearing and stripping will be undertaken such that only the minimum area necessary is cleared/stripped to conduct operations. All stripped soils are to be separated (topsoil and subsoils) and stockpiled in the proposed bunding area for future rehabilitation works.
- Compensatory planting of 3.6 ha locally native plants will be undertaken by the proponent within retained EEC / CEEC vegetation west and north of the expanded quarry operations. Species consistent with Box Gum Woodland will be selected and local provenance seed used to enhance the composition, structure and long-term resilience of remnant EEC / CEEC in the study area.
- Ideally, vegetation clearing should be undertaken when hollows are not being used for nesting by birds or breeding by microbats (September to November).
- Pre-clearance surveys should be undertaken within 1 week before the removal of hollow-bearing trees.
- If fauna are suspected to be utilising the hollow, the entrance should be blocked by the arborist and the hollow section carefully lowered to the ground for inspection by an ecologist so that fauna may be re-located. If bats are found to be roosting in the hollow, the ecologist will be required to safely release bats at sunset.
- Any wildlife rescued during vegetation clearing is to be relocated to the closest available area of habitat if uninjured. If wildlife is injured during vegetation clearing they must be taken to the nearest available wildlife carer or veterinarian immediately.
- Blasting will be limited to approximately 6 blasts per year between 0900 and 1700 hours.
- Revegetation of post-construction landforms within the subject site will be undertaken using local native plant species consistent with White Box, Yellow Box Blakely's Red Gum EEC / Box Gum Woodland EEC.
- Undertake stormwater management and sediment/erosion control measures described within the SWMP, and include within the EMP.
- Implement weed hygiene protocols and weed management measures, and include within a Pest and Weed Management Plan that will form part of the EMP.
- Implement dust management measures, including water sprays on crushing equipment and cessation of work during high wind conditions, and include within the EMP.
- Implement noise and vibration mitigation measures, and include within the EMP.

- Ensure that the EMP provides the following:
  - Site personnel induction requirements.
  - Schedule of monitoring and maintenance.
  - Information on ecological features to be included in site inductions and pre-start meetings.
  - Requirements and methods for preclearance fauna surveys by qualified person.
  - Procedures for unexpected threatened species finds and fauna handling.
  - Biodiversity specific component of site induction and toolbox talks.
  - Tree protection measures for retained habitat trees proximal to the subject site.
  - Fauna-sensitive tree-felling protocols for removal of all habitat trees.

Heritage

8.1 INTRODUCTION

Biosis prepared an Aboriginal and non-Aboriginal Cultural Heritage Due Diligence Assessment for the proposal.

A full copy of this assessment is provided in **Appendix D**. The following sections summarise the results of the assessment.

8.2 ASSESSMENT SCOPE

The following is a summary of the major objectives of the assessment:

- Conduct background research in order to recognise any identifiable trends in site distribution and location, including a search of the Aboriginal Heritage Information Management System (AHIMS).
- Undertake archaeological survey as per Requirement 5 of the Code, with particular focus on landforms with high potential for heritage places within the study area, as identified through background research.
- Record and assess sites identified during the survey in compliance with the guidelines endorsed by the OEH.
- Determine levels of archaeological and cultural significance of the study area.
- Make recommendations to mitigate and manage any cultural heritage values identified within the study area.

8.3 STUDY AREA

The study area assessed by Biosis included the existing quarry and the proposed quarry expansion (including the associated bunding and access roads), located within the southern portion of Lot 32 DP816454, and the proposed siding access road following the southern and western boundaries of Lot 32 DP816454.

The study area is depicted in **Figure 14**.

Figure 14: Study Area (Source: Biosis)

8.4 NON-INDIGENOUS HERITAGE

Historical research was undertaken to identify the land use history of the study area, to isolate key phases in its history and to identify the location of any archaeological resources within the study area. The historical research places the history of the study area into the broader context of the Parkes area.

Historical background research included a review of the NSW State Heritage Register (SHR), NSW Heritage Database, Commonwealth Heritage List, Register of National Estate, National Trust Heritage Register, and Schedule 5 of the Parkes LEP. No known items of state or local significance are located within the study area or in the vicinity surrounding the study area.

8.5 ABORIGINAL HERITAGE

8.5.1 ABORIGINAL CONSULTATION

NSW OEH in their response to SEARs, require that consultation in accordance with the Aboriginal community consultation requirements for proponents is required where impacts to Aboriginal objects may occur. As such, the Peak Hill LALC were contacted prior to the archaeological survey to invite a representative to attend. A LALC representative accompanied the Biosis archaeologist for the entirety of the field survey, although no feedback or cultural information regarding the study area was provided.

8.5.2 ASSESSMENT

An assessment in accordance with the due diligence code has been undertaken for the study area in order to inform responsibilities with regards to Aboriginal cultural heritage in the area. In addition to the basic tasks required for a due diligence assessment, an extended background review, as well as an archaeological survey in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010) (the Code) was conducted to adequately map areas of high, moderate and low archaeological sensitivity.

8.5.3 BACKGROUND RESEARCH

Background research identified 72 Aboriginal sites registered with Aboriginal Heritage Information Management System (AHIMS) within a 10 km search area; however, none are located within the study area. Biosis also completed background research to determine the Aboriginal context of the region, including ethnohistory and contact history.

8.5.4 ARCHAEOLOGICAL SURVEY

An archaeological survey of the study area was undertaken on 22 January 2018 by the Biosis archaeologist and a LALC representative. The survey was conducted in two stages. Stage 1 of the survey consisted of a single meandering transect north of the present quarry located within the study area where future extractive activities have been proposed. Stage 2 of the survey effort consisted of five transects that targeted the proposed path of an access road to a future rail siding running west to north of the present quarry.

Survey stages are depicted in **Figure 15** – **Figure 16**.

Figure 15: Survey Stage 1 and 2 (Source: Biosis)

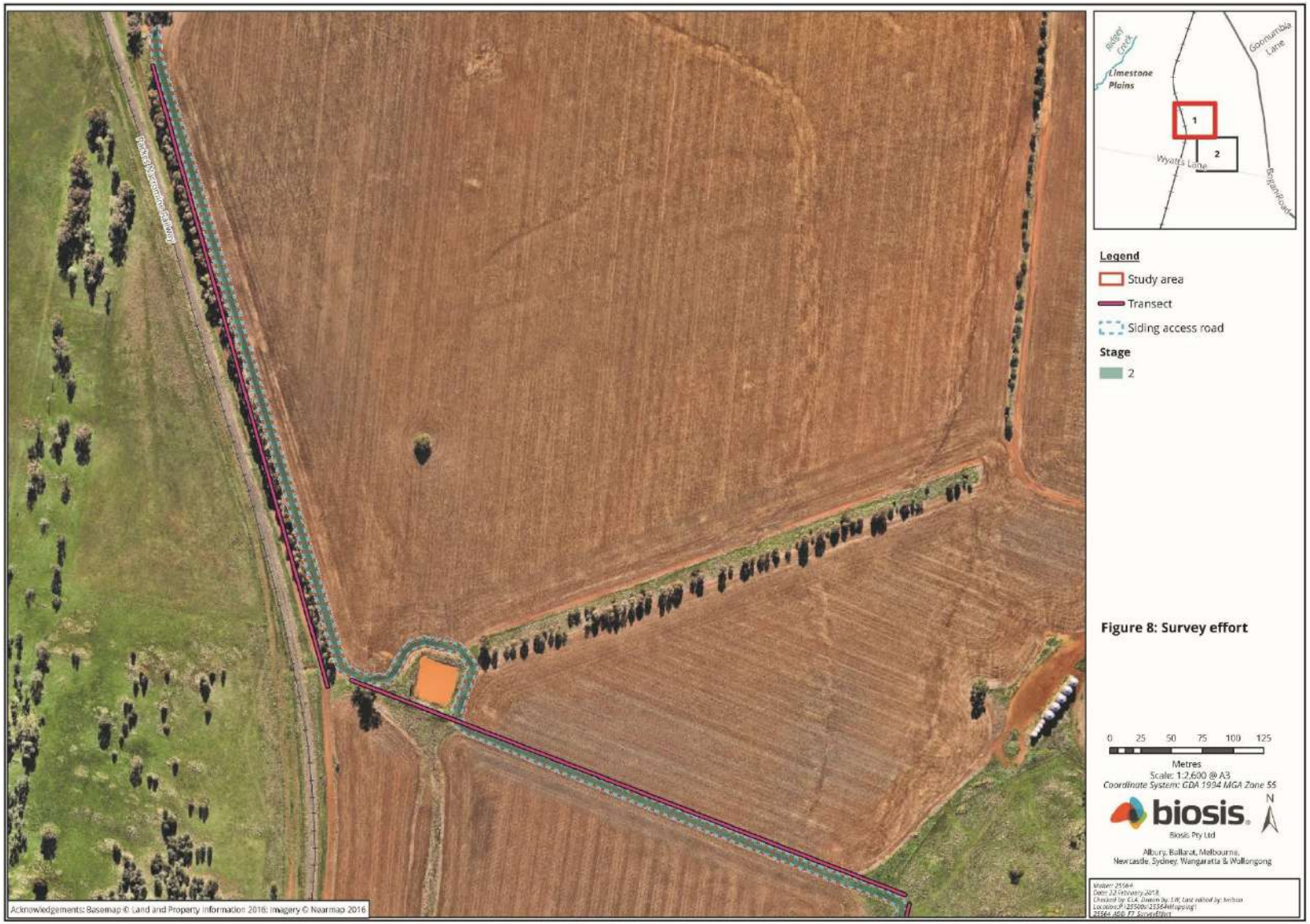

Figure 16: Survey Stage 2 (Source: Biosis)

The survey sampling strategy, methodology and a discussion of results are provided below and

8.5.4.1 Survey Methods

The survey was conducted on foot. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform elements, distinguishable areas of land approximately 40 m across or with a 20 m radius (CSIRO 2009).
- Photographs of the site indicating landform.
- Ground surface visibility (GSV) and areas of exposure.
- Observable past or present disturbances to the landscape from human or animal activities.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, the identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility and the recording of soil information for each survey unit were possible. The location of points marking the boundary of the landform elements were recorded using a hand-held GPS and the Map Grid of Australia (94) coordinate system.

8.5.4.2 Survey Results

No Aboriginal or historical objects or sites were identified during Stage 1 of the survey.

Stage 2 of the survey effort assessed the proposed route for the access road that will run west to north from the present quarry. A total of five transects were walked in order to assess the archaeological potential of the proposed route. Majority of the area has been heavily cleared of remnant vegetation or disturbed by agricultural practices such a ploughing, or vehicle access. No previously unrecorded Aboriginal or Historical sites or objects were recorded during Stage 2 of the survey effort.

Overall, the study area possesses low archaeological potential due to the absence of well drained undisturbed landforms in close proximity to permanent water sources that are associated with the identification of Aboriginal sites (see **Figure 9**). The level of disturbance within the study area, as a result of human agents, also affects the archaeological potential of the area to contain intact deposits. Vehicle disturbance and ploughing within the lower plains, and clearing methods employed for farming purposes on the crest and slopes of the study area have potentially displaced any surface deposits that might have been present.

8.6 CONCLUSION

The assessment has determined that the study area possesses low archaeological potential. A desktop assessment of the study area concluded that no previously recorded Aboriginal or historical sites or objects exist within the vicinity of the study area, exempting them from harm. A review of local and regional patterns between site distribution and landforms also suggests that the study area possesses low archaeological potential, as it is not located within close proximity to permanent sources of water, and is highly disturbed by human activity within the area.

No previously unidentified Aboriginal or historical sites or areas of cultural sensitivity were identified during survey efforts carried out on the 22 January 2018. Biosis has therefore provided mitigation measures (in **Section 8.7**) as per the guidelines outlined within the Due Diligence Flow Chart.

Biosis concluded that no further archaeological work is required in the study area due to the entire study area assessed as having low archaeological potential.

8.7 MITIGATION MEASURES

The following mitigation measures provided by Biosis relate to the discovery of unanticipated Aboriginal objectives, ancestral Aboriginal remains and unexpected finds. These mitigation measures will be implemented and incorporated into an EMP.

- **Discovery of unanticipated Aboriginal objects:**
  - All Aboriginal objects and Places are protected under the *National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the NSW OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works will cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist.
  - If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These will include notifying the OEH and Aboriginal stakeholders.
- **Discovery of Aboriginal ancestral remains:**
  - Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

    1) Immediately cease all work at that location and not further move or disturb the remains.

    2) Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.

    3) Not recommence work at that location unless authorised in writing by OEH.
- **Unexpected finds protocol:**
  - In the event that unanticipated non-Aboriginal heritage items are encountered, the archaeological remains should be assessed by an archaeologist to determine whether the suspected find constitutes a relic under the *NSW Heritage Act 1977* and whether NSW Heritage Council should be notified.

Noise & Vibration

9.1 INTRODUCTION

A Noise and Vibration Impact Assessment has been undertaken to assess the potential impacts of the noise study has been undertaken to assess the potential operational impacts of the proposed extension on nearby sensitive receptors in accordance with the following NSW policies and guidelines:

- *NSW Environmental Protection Authority NSW Noise Policy for Industry (NPfI) (EPA, 2017).*
- *NSW Assessing Vibration: a technical guideline* (DEC, 2006);
- *NSW Road Noise Policy* (DECCW, 2011); and
- *Interim Construction Noise Guideline* (DECCW, 2009)

In accordance with the requirements of the above guidelines, computational modelling and first principle calculations have been undertaken to support the assessment of the potential for adverse amenity impacts as a result of the development.

A full copy of this study is provided in **Appendix E**. Provided below is a summary of the methodology, results and conclusions of the noise and vibration impact assessment.

9.2 SENSITIVE RECEPTORS

The nearest off-site residential receptors to the proposed extension of the quarry include six (6) existing dwellings located within 2 km of the quarry (refer **Table 9.1**). **Figure 17** provides the subject site location in the context of the surrounding uses and receptors.

Table 9.1 – Sensitive Receptors

Receptor ID	Description	Distance to proposal
R1	Existing Dwelling	520 m
R2	Existing Dwelling (Unoccupied)	865 m
R3	Existing Dwelling	960 m
R4	Existing Dwelling	1,160 m
R5	Existing Dwelling	1,910 m
R6	Existing Dwelling	1,710 m

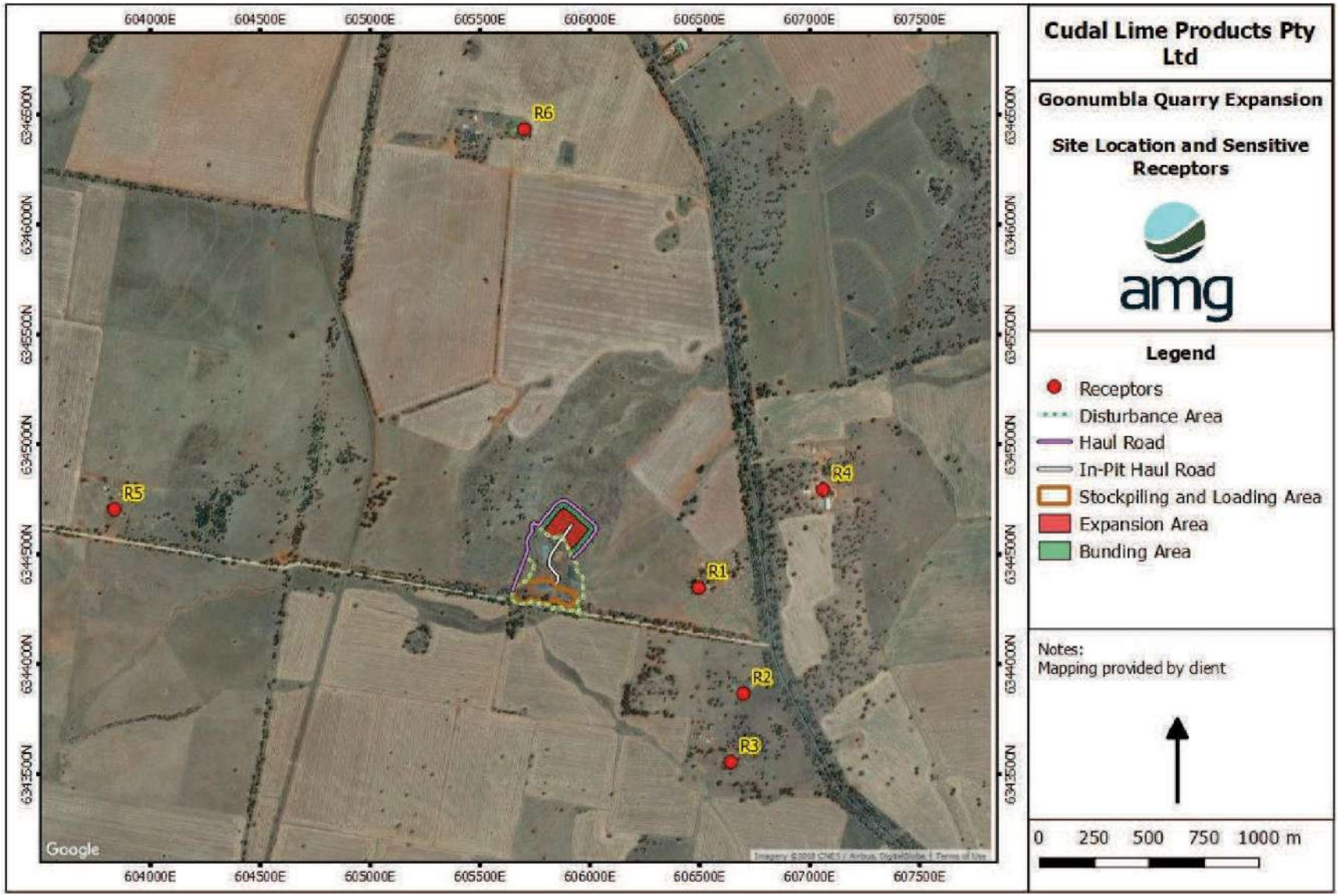

Figure 17: Site Location and Sensitive Receptors (Source: AMG)

9.3 ASSESSMENT PHASES

Typically, site clearing activities are included as part of the construction phase of a new quarry. However, as the site is an existing quarry, site clearance is undertaken when the quarry progresses onto a new bench. As such for the purposes of this assessment, clearing activities will be considered part of the operational activities.

Three operational phases were assessed:

- Surface stripping activities.
- Initial quarrying phase near the surface of the expanded pit.
- Subsurface quarrying 20 m below the natural surface of the expanded pit. Maximum extraction is 35 m below surface, however, when rock extraction is occurring at a depth of 20 m, there is no predicted exceedance of the project trigger levels and therefore the assessment is based on quarrying to a depth of 20 m.

9.4 OPERATIONAL PHASE NOISE ASSESSMENT

9.4.1 OPERATIONAL NOISE CRITERIA

9.4.1.1 Overview

The acoustic assessment has been completed in accordance with the procedure identified in the NSW NPfI. The NPfI establishes two separate noise criteria to meet environmental noise objectives: one to account for intrusive noise and the other to protect the amenity of particular land uses. These two criteria are then used to determine project triggers levels against which the proposal will be assessed. The project noise trigger level is a level that, if exceeded, would indicate a potential noise impact on the community, and so 'trigger' a management response.

The derivation of the two sets of criteria are presented below. For residential dwellings, the noise criteria are assessed at the most-affected point (i.e. highest noise level) on or within the property boundary. Where the property boundary is more than 30 m from the house, then the criteria applies at the most-affected point within 30 m of the house. For industrial receptors, compliance with the noise criteria is assessed at the reasonably most-affected point on or within the property boundary.

9.4.1.2 Intrusiveness Criteria

The project intrusiveness noise level is intended to protect against significant changes in noise levels as a result of industrial development. To achieve this, the NPfI describes intrusive noise as noise that exceeds background noise levels (as defined by the Rating Background Level or RBL) by more than 5 dB.

For the purposes of the assessment, baseline noise levels have been assumed to be equivalent to the minimum background noise levels provided in the NPfI. At some receptors, where there is likely to be an influence during day periods from existing industrial activity in the area, this is considered to represent a conservative assumption. Therefore, **Table 9.2** presents the derivation of the intrusiveness criteria based on the minimum background noise level established by the NPfI.

Table 9.2 – Derived Intrusiveness Noise Criteria

Receptor	Intrusiveness $L_{Aeq,15\text{-}minute}$ Criteria		
	Day	Evening	Night
All nearby residential receptors [a)]	40 [b)]	35 [b)]	35 [b)]

a) Receptor noise limit applies at a location 30 m from the dwelling façade.
b) Minimum background noise level established by the NPfI 2017

9.4.1.3 Amenity Criteria

The project amenity noise level seeks to protect against cumulative noise impacts from industry and maintain amenity for particular land uses. Review of the surrounding area has identified that the proposed quarry represents an isolated activity in an otherwise rural environment.

Therefore, in accordance with the NPfI, the project amenity noise criteria are derived in **Table 9.3** below for the residential uses in the area.

Table 9.3 – NPfI Acceptable Noise Levels for Residential Receivers

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended L_{Aeq} Noise Level (dB(A))	
			Total Industrial Noise	Project Specific[a)]
Residence	Rural	Day	50	50
		Evening	45	45
		Night	40	40

a) Taken to be equivalent to the recommended amenity noise levels given the absence of existing or future industrial development in the area.

9.4.1.4 Project Trigger Levels

The project trigger level is the lower value of the project intrusiveness noise level and the project amenity level, after the conversion to $L_{Aeq,15min}$ dB(A) equivalent level. **Table 8.6** presents the standardised intrusiveness noise level and the project amenity level as derived by adding 3 dB to each period of the day.

Table 9.4 – Determining Project Trigger Levels

Type of Receiver	Time of Day	Standardised L_{Aeq}, 15 min Noise Level (dB)		
		Intrusiveness Criteria	Project Specific ANL	Project Trigger Level
Residential	Day	40	50 + 3 = 53	40
	Evening	35	45 + 3 = 48	35
	Night	35	40 + 3 = 43	35

It is noted that the existing licence under which the facility operates (EPL 20288) has daytime noise limit of 35 dB(A). As described above however, derivation of the day-time noise limits in accordance with the recently published NPfI has resulted in a higher day-time noise limit of 40 dB(A).

Were the proponent to make an application for a quarry development at the site in the absence of the existing facility, this higher (40 dB(A)) noise limit would apply. Given this, adopting a lower noise limit consistent with the existing EPL for this assessment (and the regulation of noise emissions from the expanded quarry) would fail to deliver natural justice for ARQ. Therefore, for the purposes of this assessment, the noise limits derived in accordance with the NPfI have been adopted. Further, it is recommended that where the application is approved, the noise limits established for the expanded operation are consistent with the adopted noise limits.

9.4.1.5 Sleep Disturbance

NSW EPA have identified a screening assessment for sleep disturbance based on the night-time noise levels at a residential location. Where noise levels at a residential location exceed:

- $L_{Aeq,\ 15\ min}$ 40 dB(A) or the prevailing RBL plus 5 dB, whichever is greater; and/or
- L_{AFmax} 52 dB(A) or the prevailing RBL plus 15 whichever is the greater,

A detailed maximum noise level event assessment should be undertaken.

The proposed quarry does not operate at night time, therefore sleep disturbance as a result of this proposal is not an issue.

9.4.2 NOISE SOURCES

Table 9.5 and **Table 9.6** presents a summary of the source noise levels considered in the assessment. The sound power levels for the plant and equipment presented in the table below are as provided by the manufacturer or taken from information held in the AMG library.

Table 9.5 – Source Noise Levels (Existing Equipment)

Source	Quantity	Location	Sound Power Level (dB(A))
Drilling	1	Pit	116
Dozer with heavy ripper	1	Overburden stripping	115
Excavator	2	Pit	103
Front end loader	2	Quarry	107
Mobile jaw crusher	2	Pit	118[a)]
Cone / Screen mobile plant	2	Pit	115[a)]
Haulage trucks	1	Quarry	108
Conveyors (per metre)	9	Pit	89
Conveyor motors	1	Pit	100
Truck-dog trailers (32 tonne)	60/day	Loading area	110
Light Vehicle	14/day	Access road	92

a) Based on previous experience with similar sources there is potential for tonal influences associated with this source. Therefore, in accordance with the NPFI, a +5 dB penalty has been applied to this source.

Table 9.6 – Source Noise Levels (New Equipment)

Source	Quantity	Location	Sound Power Level (dB(A))
Cone Crusher	1	Aggregate Plant	115[a)]
Feeder (1) and screens (2)	3	Aggregate Plant	118[a)]
Conveyors (per metre)	9	Aggregate Plant	89
Conveyor motors	1	Aggregate Plant	100

a) Based on previous experience with similar sources there is potential for tonal influences associated with this source. Therefore, in accordance with the NPFI, a +5 dB penalty has been applied to this source.

9.4.3 NOISE MODELLING METHODOLOGY

For the purposes of predicting impacts associated with noise emissions from the proposal on nearby sensitive receptors, noise modelling of the sources was completed using the proprietary software Cadna. Cadna incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. All predictions have been undertaken in accordance with ISO Standard 9613 (1996) *Acoustics - Attenuation of sound during propagation outdoors*.

The model is utilised to assess the potential noise emissions from the site under a range of operating scenarios and meteorological conditions. The noise modelling also allows investigation of possible noise management solutions, in the event that non-compliance with the assessment criterion is predicted.

9.4.4 METEOROLOGY

The NPfI presents guidelines for the consideration of meteorological effects on noise propagation. Specifically, temperature inversions and/or gradient winds should be modelled if each factor is a feature of the local environment. The following conditions for modelling temperature inversions or gradients winds are provided:

- Temperature inversions:
  - Use default parameters for temperature inversions and drainage-flow wind speed where inversions are present for at least 30 percent of the total night time during winter as specified; or
  - Use parameters determined by direct measurement. Wind data should be collected at a 10 m height.
- Gradient winds:
  - Where there is 30 percent or more occurrence of wind speeds below 3 m/s (source-to-receiver component), then the highest wind speed (below 3 m/s) is used instead of the default.
  - Where there is less than 30 percent occurrence of wind speeds of up to 3 m/s (source-to-receiver component), wind is not included in the noise prediction calculation.

Given the location of the site, the presence of temperature inversions is considered possible for night-periods. Therefore, in accordance with the requirements of the NPfI, the following scenarios have been considered:

- Day Periods - Source to receptor wind at 3 m/s representing a worst-case assessment of potential impacts for day-periods; and
- Night Periods - Moderate temperature inversion with light source to receptor winds representing a worst-case assessment of potential impacts for night periods.

9.4.5 PREDICTED NOISE LEVELS

There are two phases to the expansion of the quarry; the initial phase of overburden stripping and quarrying relatively near the surface and subsurface quarrying as the quarry progresses.

The initial phase of the quarrying has been considered as a worst-case scenario during the expansion of the quarry as the operations are closest to the surface and therefore are not benefiting from the noise mitigation provided by the pit walls. **Table 9.7** below presents predicted receptor noise levels during the initial phase of the expanded operational phase of the quarry.

Table 9.7 – Predicted Daytime Receptor Noise Levels – Expanded Operational Phase, dB(A)

Receptor	Predicted Operational Noise Levels, $L_{Aeq, 15min}$			Day Trigger Level Criteria	Comply (Y/N)
	Stripping Phase	Initial Phase	Subsurface Phase		
R1	42	40	36	40	N / Y / Y
R2	36	41	39	40	Y / N / Y
R3	31	38	35	40	Y / Y/ Y
R4	31	29	24	40	Y / Y/ Y
R5	<20	<20	<20	40	Y / Y/ Y
R6	<20	<20	<20	40	Y / Y/ Y

The modelling results have identified exceedances at sensitive receptors R1 and R2 are possible as a result of noise emissions from stripping activities, the new aggregate plant and drilling activities. It is noted that the results of the modelling indicate that the highest noise levels will occur at R1, with an exceedance of up to 2 dB(A) during the stripping phase. However, these activities are short-term in nature. As the depth

of the pit increases, the predicted noise levels at the receptors will also decrease. Subsequently, when rock extraction is occurring at a depth of 20 m, there is no predicted exceedance of the project trigger level at R1.

9.4.6 MITIGATION OF POTENTIAL IMPACTS

In order to mitigate potential noise impacts at sensitive receptors R1 and R2 the assessment considered a range of mitigation options for the long-term operation of the quarry. Specifically, the modelling has considered implementation of the following mitigation measures:

- Initial phase:
  - Using a silenced rock drill as part of all drill and blast activities;
- Both phases:
  - Installation of a 5 m high, 12 m long noise barrier to the east of the aggregate plant; and
  - Lining the aggregate plant hopper feed bin with material to minimise the impact noise.

Table 9.8 presents the mitigated predicted L_{Aeq} noise levels for the initial and subsurface phases.

Review of the predicted noise levels with mitigation confirms that compliance with the noise limits could be achieved with the recommended mitigation.

Table 9.8 – Predicted Daytime Receptor Noise Levels – Expanded Operational Phase with Mitigation Measures, dB(A)

Receptor	Predicted Operational Noise Levels, $L_{Aeq, 15min}$		Day Trigger Level Criteria	Comply (Y/N)
	Initial Phase	Subsurface Phase		
R1	36	34	40	Y / Y
R2	38	37	40	Y / Y
R3	35	34	40	Y / Y
R4	25	23	40	Y / Y
R5	<20	<20	40	Y / Y
R6	<20	<20	40	Y / Y

9.5 ROAD TRAFFIC NOISE ASSESSMENT

9.5.1 INTRODUCTION

Noise impacts associated with vehicle movements during the operational phase of the proposal are not expected to increase compared to the existing operations. The maximum number of heavy vehicles accessing the site in a single day would not exceed 30 (i.e. generating a total of 60 heavy vehicle movements in a day).

Throughout the quarry expansion, it is anticipated that up to seven (7) employee (light) vehicles will travel to and from the site daily. The staff vehicles will arrive prior to 7 am hours and leave the site after 6 pm hours.

The assessment has considered the potential impacts associated with noise emissions from the maximum expected 14 light and 60 heavy vehicle movements from the site entry along the local access road (Wyatts Lane) via Bogans Road as summarised in **Table 9.9** below.

Table 9.9 – Summary of Road Traffic Data

Road	Vehicle Type	Vehicle Speed	Number of Movements	
			Day (7.00 am – 10 pm)	Night (Peak 1 hour)
Wyatts Lane	Light	60 km/hr	7	7
	Heavy	40 km/hr	60	0
Bogan Road	Light	100 km/hr	7	7
	Heavy	80 km/hr	60	0

9.5.2 ASSESSMENT CRITERIA

Based on the NSW *Road Noise Policy* (RNP) and road type, **Table 9.10** presents the applicable road traffic noise criteria for existing residences affected by traffic on existing roadways generated by land use developments.

Table 9.10 – Applicable Road Traffic Noise Criteria

Road Category	Type of Project & Land Use	Assessment Criteria
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	Day: $L_{Aeq,1\ hour}$ 55 dB(A) Night: $L_{Aeq,1\ hour}$ 50 dB(A)

9.5.3 NOISE MODELLING METHODOLOGY

For the purposes of predicting impacts associated with road traffic noise emissions was completed using the proprietary software CadnaA (version 2018 build 161.4800) developed by DataKustik. The model incorporates the influence of terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. All predictions have been undertaken in accordance with Calculation of Road Traffic Noise (CRTN) methodology developed by the UK Department of Transport. In accordance with the requirements of the RNP, the predictive noise modelling incorporated the following assumptions:

- L_{Aeq} values were calculated from the L_{A10} values predicted by the CRTN methodology using the approximation $L_{Aeq,1\ hour} = L_{A10,1\ hour} – 3$.
- Noise source heights were set at 0.5 m above road level for cars, 1.5 m for heavy vehicle engines and 3.6 m for heavily vehicle exhausts.
- Noise from heavy vehicle exhausts is 8 dB lower than the steady continuous engine noise.
- Corrections established for Australian conditions applied through a negative correction to the CRTN predations of -1.7 dB for façade-corrected levels (Samuels and Sauders, 1982).

9.5.4 RESULTS

Table 9.11 below presents predicted noise levels for the nearest residential receptor to Bogan Road which is setback at a distance of 160 m from the Bogan Road. This is considered to be representative of all dwellings in the area.

Table 9.11 – Predicted Noise Levels – Road Traffic Noise

Receptor	Setback from Roadway	Period	Parameter	Criteria	Predicted Noise Level	Comply (Y/N)
Closest dwelling to Bogan Road	160 m	Day Night	L_{Aeq}, 1 hour L_{Aeq}, 1 hour	55 d B(A) 50 dB(A)	41 31	Y

Predicted noise levels confirms that compliance with the RNP is predicted and adverse amenity impacts due to peak traffic levels generated by the proposal is considered unlikely.

9.6 VIBRATION ASSESSMENT

9.6.1 INTRODUCTION

A review of the proposal indicates there is potential for impacts as a result of vibration generated by plant and equipment during the operational phases. Given this, an assessment of the potential for vibration impacts has been undertaken. In particular, the assessment has considered the potential for impacts on both human comfort and structural damage for the nearest residence to the quarry expansion.

9.6.2 ASSESSMENT CRITERIA

The vibration criteria presented in the *Environmental Noise Management – Assessing Vibration: A Technical Guide* (2006) published by the NSW Department of Environment Climate Change and Water (DECCW) have been adopted for the assessment. The technical guide provides vibration criteria associated with amenity impacts (human annoyance) for the three categories of vibration:

- Continuous vibration (e.g. road traffic, continuous construction activity).
- Impulsive vibration includes less than 3 distinct vibration events in an assessment period (e.g. occasional dropping of heavy equipment).
- Intermittent vibration includes interrupted periods of continuous vibration (e.g. drilling), repeated periods of impulsive vibration (e.g. crushers) or continuous vibration that varies significantly in amplitude.

Table 9.12 and **Table 9.13** present the criteria for continuous and impulsive vibration and intermittent vibration, respectively.

Table 9.12 – Continuous and Impulsive Vibration Criteria for Residences – Peak Velocity

Location	Vibration Type	Preferred Limit (mm/s)	Maximum Limit (mm/s)
Residences	Continuous	0.28	0.56

Table 9.13 – Intermittent Criteria for Residences

Location	Assessment Period	Preferred Value ($m/s^{1.75}$)	Maximum Value ($m/s^{1.75}$)
Residences	Day-time	0.20	0.40

The above criteria are suitable for assessing human annoyance in response to vibration levels. In order to assess potential damage to buildings, reference has been made to British Standard BS 7385-2: 1993 *Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from ground borne vibration*. **Table 9.14** presents vibration criteria for assessing the potential for building damage.

Table 9.14 – Transient Vibration Guide Values for Cosmetic Damage

Type of Building	Peak Particle Velocity (mm/s)	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light framed structures – residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

For blasting, in addition to the criteria provided in the DEC technical guideline, reference has also been made to the Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground

vibration (ANZECC 1990). **Table 9.15** provides a summary of the criteria applied in the assessment of potential blasting vibration and airblast overpressure levels.

Table 9.15 – Blasting Vibration Criteria

Criteria	Values
Airblast Overpressure	The recommended maximum level for airblast overpressure is 115 dB(Lin Peak). The level of 115 dB may be exceeded on up to 5% of the total number of blasts over a period of 12 months. However, the level should not exceed 120 dB (Lin Peak) at any time.
Peak Particle Velocity	The recommended maximum level for ground vibration is 5 mm/sec (peak particle velocity (ppv)). The ppv level of 5 mm/sec may be exceeded on up to 5% of the total number of blasts over a period of 12 months. The level should not exceed 10 mm/sec at any time. However, it is recommended that a level of 2 mm/sec (ppv) be considered as the long term regulatory goal for the control of ground vibration.

9.6.3 ASSESSMENT OF IMPACTS – OPERATIONS (EXCLUDING BLASTING)

9.6.3.1 Potential Vibration Sources

Table 9.16 identifies the vibration source levels for the equipment and likely to be used for the expansion of the quarry. It should be noted there are no vibration source levels for processing plant.

Table 9.16 – Vibration Source Levels – Peak Particle Velocity

Equipment Item	PPV at 10 metres (mm/s)	Source
Loaded trucks (rough surface)	5	USA DT a)
Loaded trucks (smooth surface)	1 – 2	USA DT a)
Excavator	2.5 – 4	DECCW
a) Transit Noise and Vibration Impact Assessment, US Department of Transportation, May 2006.		

9.6.3.2 Assessment of Potential Impacts

Table 9.17 presents PPV predictions for the various construction equipment.

Table 9.17 – Predicted PPV at Sensitive Receptors (mm/s)

Distance from Source (m)	Excavator	Loaded Trucks (rough surfaces)	Loaded Trucks (smooth surfaces)
10	4.00	5.00	1 – 2
20	1.41	1.77	0.35 – 0.71
30	0.77	0.96	0.19 – 0.38
40	0.50	0.63	0.13 – 0.25
50	0.36	0.45	0.09 – 0.18
60	0.27	0.34	0.07 – 0.14
70	0.22	0.27	0.06 – 0.11
80	0.18	0.22	0.05 – 0.09
90	0.15	0.19	0.04 – 0.07
100	0.13	0.16	0.03 – 0.06
150	0.07	0.09	0.02 – 0.03

Table 9.17 – Predicted PPV at Sensitive Receptors (mm/s)

Distance from Source (m)	Excavator	Loaded Trucks (rough surfaces)	Loaded Trucks (smooth surfaces)
Type	Continuous	Intermittent	Intermittent
Nuisance Criteria	Residential 0.28 (preferred) / 0.56 (max) School 0.56 (preferred) / 1.1 (max)	Residential 8.6 (preferred) / 17 (max)	
Building Criteria	Residential 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz 20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above		

The predicted vibration levels presented in **Table 19** indicate compliance with the continuous preferred vibration nuisance criteria for locations at a separation distance of 50-60 metres.

Compliance with the building damage criteria is predicted at 10 metres from operations for each source.

For intermittent vibration associated with haul vehicles, it is difficult to provide an appropriate comparison with the relevant criteria (which is presented as a Vibration Dose Value (VDV) in $m/s^{1.75}$). The calculation of a VDV requires both the overall weighted RMS (root mean square) acceleration (m/s^2) typically obtained from on-site measurements and the estimated time period for vibration events.

It is noted, however, that haul truck movements (on rough surfaces) at distances of >80 m is predicted to be within the maximum continuous criteria of 0.56 mm/s. This comparison with the continuous criteria (as a conservative approach) indicates that vibration levels associated with operation of the quarry are not considered to be significant (which is expected given the significant separation distances).

9.6.4 ASSESSMENT OF IMPACTS – BLASTING

9.6.4.1 Airblast Overpressure

Applying a site constant (K_a) of 10 for receptor R1, a maximum instantaneous charge (MIC) of 100 kg results in predicted compliance with the criteria of 115 dB (Lin Peak) at all nearby receptors.

9.6.4.2 Ground Vibration

Applying the maximum instantaneous charge as determined from the air blast overpressure calculation of 100 kg, the ground vibration level predicted to occur at receptor R1 is 2 mm/s, which complies with the criteria of 5 mm/sec and the long term regulatory goal of 2 mm/s.

It should be noted however that the impacts of blasting are dependent on site specific factors including the blast management techniques, ground conditions and geological strata types and locations. Given this, it is recommended that the maximum instantaneous charge be determined by the blast contractor using site specific data as part of the blast management plan for the quarry expansion.

9.7 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

Initial phase:

- Using a rock drill with a shroud to minimise noise.

Both phases:

- Lining the aggregate plant hopper feed bin with material to minimise the impact noise.
- Clearing and stripping will be undertaken such that only the minimum area necessary is cleared/stripped to conduct operations. All stripped soils are to be separated (topsoil and subsoils)

and stockpiled in the proposed bunding area for future rehabilitation works. To assist in the mitigation of potential off-site noise impacts, stockpiled material is to be formed into earth bunds along with edges of the disturbance area.

- The maximum instantaneous charge is to be determined by the blast contractor using site specific data as part of the blast management plan for the quarry expansion such that the peak particle velocity and airblast overpressure criteria can be achieved.
- Installation of a 5 m high, 12 m long noise barrier to the east of the aggregate plant. To achieve the acoustic objectives, all acoustic barriers should be constructed in a manner that meets the following requirements:
  - Reflective type noise fence panels must have a minimum surface density at air dry moisture content (excluding structural components) of 12 kg/m².
  - The barrier must be complete and free from gaps along its length and at ground level.
  - Acoustic sealing is required between posts.
  - The acoustic barrier could also comprise either two stacked shipping containers, or an earth berm (or a combination of earth berm and noise barrier) providing the final height of 5 m is achieved.
- Using broad-band reversing alarms on all mobile plant and equipment.
- Select quieter items of plant and equipment where feasible and reasonable.
- Operating plant in a quiet and efficient manner.
- Reduce throttle setting and turn off equipment when not being used.
- Regularly inspect and maintain equipment to ensure it is in good working order. Also check the condition of mufflers.

Air Quality

10.1 INTRODUCTION

An Air Quality Assessment has been undertaken to assess the potential operational impacts of the proposed quarry expansion on nearby sensitive receptors in accordance with *Approved Methods for Modelling and Assessment of Air Pollutants in NSW* (EPA, 2016).

In accordance with the requirements of the above guidelines, computational modelling and first principle calculations have been undertaken to support the assessment of the potential for adverse amenity impacts as a result of the development.

A full copy of this study is provided in **Appendix F**. Provided below is a summary of the methodology, results and conclusions of the air quality assessment.

10.2 SENSITIVE RECEPTORS

The nearest off-site residential receptors to the proposed extension of the quarry include six (6) existing dwellings located within two (2) km of the quarry, as identified in **Section 9.2**.

10.3 ASSESSMENT PHASES

Typically, site clearing activities are included as part of the construction phase of a new quarry. However, as the site is an existing quarry, site clearance is undertaken when the quarry progresses onto a new bench. As such for the purposes of this assessment, clearing activities will be considered part of the operational activities.

10.4 ASSESSMENT CRITERIA

Assessment criteria relevant to this assessment are presented in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (2016), published by the NSW EPA. For the purposes of the assessment, **Table 10.1** provides a summary of the criteria provided in the approved methods for those relevant to the operation of the expanded quarry.

Table 10.1 – Approved Methods Emissions Standards

Pollutants	Averaging Period	Concentration	
		pphm	µg/m^3
PM_{10}	24-hours	-	50
	Annual	-	25
$PM_{2.5}$	24-hours	-	25
	Annual	-	8
TSP	Annual	-	90
Deposited Dust	Month	-	2 g/ m^2/month maximum increase
		-	4 g/m^2/month total dust level

10.5 METHODOLOGY

10.5.1 OVERVIEW

Atmospheric dispersion modelling involves the mathematical simulation of the dispersion of air contaminants in the environment. The modelling utilises a range of information to estimate the dispersion of pollutants released from a source including:

- Meteorological data for surface and upper air winds, temperature and pressure profiles, as well as humidity, rainfall, cloud cover and ceiling height information;
- Emissions parameters including source location and height, source dimensions and physical parameters (e.g. Exit velocity and temperature) along with pollutant mass emission rates;
- Terrain elevations and land use both at the source and throughout the surrounding region; and
- The location, height and width of any obstructions (such as buildings or other structures) that could significantly impact on the dispersion of the plume.

For the purpose of the assessment, meteorological modelling has been undertaken using TAPM (The Air Pollution Model) and CALMET to predict localised meteorological conditions. The meteorological data derived from these models have been used as an input for the CALPUFF dispersion modelling.

Further details of the methodology adopted for this assessment is provided in Section 4 of the assessment provided in **Appendix F**.

10.6 AIR DISPERSION MODELLING

10.6.1 BACKGROUND CONCENTRATIONS

To assess cumulative impacts, daily background air quality data has been obtained from the NSW OEH website for 2016.

The nearest and most representative monitoring stations have been used for this assessment. Due to the remote location of the proposal, the nearest monitoring station is located in Bathurst, however this station only records PM_{10} and $PM_{2.5}$.

Table 10.2 details the background monitoring data used in the contemporaneous modelling. It should be noted that where data gaps were identified, the 70th percentile of the daily data was applied. It is noted that no exceedances of PM_{10} or $PM_{2.5}$ were recorded at Bathurst for the year of assessment (according to the OEH (2017) information provided in the *Annual Air Quality Statement 2016*).

Table 10.2 – Background Concentrations

Compound	Missing Data (%)	24-Hour Concentration (µg/m^3)				OEH Station
		Maximum	90th Percentile	70th Percentile	Average	
PM_{10}[a]	7%	34.1	23.5	15.9	13.4	Bathurst
$PM_{2.5}$[a]	37%	15.0	9.4	7.7	6.6	

Review of the hourly monitoring data determines that the existing air quality concentrations comply with the criteria listed in **Table 10.1**.

Ambient monitoring of TSP is undertaken at Parkes as part of the Regional Air Monitoring Network, however data is not readily available. In lieu of this, research indicates that in rural areas, PM_{10} typically represents 49% of total TSP, therefore, TSP concentrations have been estimated based on the application of this ratio (Air Noise Environment Pty Ltd [1999] '*Fine dust and the implications for the coal industry'*, ACARP Project C7009).

Dust deposition is not measured in NSW; therefore, a background concentration has not been considered in this assessment. It is noted that the dust deposition criteria provided in the approved methods is based on an increment of 2 g/m^2/month and as such, the inclusion of existing background deposition rates is considered unnecessary.

10.6.2 SOURCE OF EMISSIONS

Emissions to atmosphere from the proposal can be categorised into the following activities:

- Drilling and blasting
- Bulldozing
- Material Transfers
- Screening and crushing
- Vehicle Movements
- Wind Erosion (stockpiles and exposed areas)

Table 10.3 presents a summary of the equipment for each modelling scenario and their location within the quarry.

Table 10.3 – Equipment Details

Source	Quantity	Location	Scenario	
			Existing	Future
Dozer with heavy ripper	1	Overburden stripping	✓	✓
Excavator	2	Pit	✓	✓
Front end loader	2	Quarry	✓	✓
Mobile jaw crusher	2	Pit	✓	✓
Haulage trucks	1	Quarry	✓	✓
Cone / Screen mobile plant	1	Pit	✓	✓
Conveyors	9	Pit	✓	✓
Conveyor motors	1	Pit	✓	✓
Truck-dog trailers (32 tonne)	See scenarios	Loading area	✓ (30/day)	✓ (60/day)
Light vehicle	See scenarios	Access road	✓ (6/day)	✓ (14/day)
Cone crusher	1	Aggregate plant		✓
Feeder (1) and screens (2)	3	Aggregate plant		✓
Conveyors	9	Aggregate plant		✓
Conveyor motors	1	Aggregate plant		✓

A summary of emission rates for the maximum throughput (for the existing and future operations) modelled for all operational hours are presented in **Table 10.4**.

Table 10.4 – Summary of Emission Rates

Activity	Units	Existing Operations			Future Operations		
		TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
Drilling	t/yr	8.0	4.2	0.2	8.0	4.2	0.2
Blasting	t/yr	1.1	0.6	<0.1	1.1	0.6	<0.1
Bulldozing	t/yr	7.9	5.9	0.8	7.9	5.9	0.8

Table 10.4 – Summary of Emission Rates

Activity	Units	Existing Operations			Future Operations		
		TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
Material Transfers	t/yr	31.9	15.1	2.3	44.0	20.8	3.2
Screening	t/yr	32.9	11.3	0.8	59.1	20.3	1.4
Crushing	t/yr	14.2	6.3	0.1	17.7	7.9	0.1
Vehicle Movements	t/yr	62.7	19.1	1.8	98.0	29.8	2.9
Wind Erosion	t/yr	0.017	0.009	0.001	0.017	0.009	0.001
Total		158.6	62.4	6.1	235.9	89.5	8.6

10.7 PREDICTED GROUND LEVEL CONCENTRATIONS

10.7.1 ASSESSMENT BOUNDARY

The assessment used the boundary between the proposal (i.e. the disturbance area of the proposal) to determine the maximum concentrations from the proposal.

10.7.2 EXISTING OPERATIONS – MAXIMUM HOURLY THROUGHPUT

Predicted ground level concentrations for the existing operations are provided in Section 6.2 of the assessment in **Appendix F**.

10.7.3 FUTURE OPERATIONS – MAXIMUM HOURLY THROUGHPUT

10.7.3.1 Particulate Matter PM_{10}

Table 10.5 presents the maximum predicted 24-hour average cumulative (source plus background) PM_{10} receptor concentrations at each of the identified sensitive receptors and the maximum beyond the boundary of the disturbance area.

Review of the maximum predicted concentration contours confirms that compliance with the 50 µg/m^3 criterion is predicted to be achieved for all sensitive receptors.

Table 10.5 – Future Operations – Maximum Predicted 24-Hour Average Cumulative PM_{10} Concentrations (µg/m^3)

Maximum Predicted Cumulative (Source plus Background) Receptor Concentrations				
Receptor	**Date**	**Source Contribution (A)**	**Existing Background (B)**	**Cumulative (A + B)**
R1	16/04/2016	3.9	34.1	38.0
R2	16/04/2016	1.3	34.1	35.3
R3	16/04/2016	0.6	34.1	34.6
R4	16/04/2016	0.6	34.1	34.6
R5	16/04/2016	0.6	34.1	34.6
R6	16/04/2016	0.6	34.1	34.6
Maximum [a)]	16/04/2016	144.4	34.1	178.4
Air Quality Objective				50

a) Maximum at the disturbance area boundary of the existing quarry

Table 10.6 presents the predicted annual average cumulative PM_{10} concentrations across the modelling domain. The results of the modelling presented confirm that the predicted concentrations are significantly below the 25 µg/m^3 criteria at all sensitive receptors.

Table 10.6 – Future Operations – Predicted Annual Average Cumulative PM_{10} Concentrations (µg/m^3)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R1	2.0	13.4	15.4
R2	0.9	13.4	14.3
R3	0.7	13.4	14.2
R4	1.0	13.4	14.4
R5	0.4	13.4	13.8
R6	0.5	13.4	13.9
Maximum [a)]	22.0	13.4	35.5
Air Quality Objective			25

a) Maximum at the disturbance area boundary of the existing quarry

Table 10.7 presents maximum predicted source contribution PM_{10} receptor concentrations at each of the identified sensitive receptors and the maximum at the quarry disturbance boundary. Also presented in this table is the coincident background concentration and predicted cumulative receptor concentration.

The results of the modelling confirm that emissions from the expanded quarry operation are predicted to result in maximum off-site PM_{10} concentrations of less than 70% of the relative criterion specified in the Approved Methods.

Table 10.7 – Future Operations – Maximum Predicted 24-Hour Average Source Contribution PM_{10} Concentrations (µg/m^3)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R1	28.2	5.4	33.5
R2	12.5	12.1	24.6
R3	7.5	7.1	14.6
R4	12.8	4.2	17.0
R5	2.7	11.1	13.8
R6	8.2	13.3	21.5
Maximum [a)]	350.1	5.4	355.5
Air Quality Objective			50

a) Maximum at the disturbance area boundary of the existing quarry

10.7.3.2 Particulate Matter $PM_{2.5}$

Table 10.8 presents the maximum predicted 24-hour average cumulative (source plus background) $PM_{2.5}$ receptor concentrations at each of the identified sensitive receptors and the maximum at the boundary of the disturbance area. Review of the maximum predicted concentration contours confirms that compliance with the 25 µg/m^3 criterion is predicted to be achieved for the all receptors.

Table 10.8 – Future Operations – Maximum Predicted 24-Hour Average Cumulative $PM_{2.5}$ Concentrations (µg/m³)

Maximum Predicted Cumulative (Source plus Background) Receptor Concentrations				
Receptor	**Date**	**Source Contribution (A)**	**Existing Background (B)**	**Cumulative (A + B)**
R1	21/5/16	0.8	15.0	15.8
R2	21/5/16	0.8	15.0	15.8
R3	21/5/16	0.8	15.0	15.8
R4	21/5/16	0.8	15.0	15.8
R5	21/5/16	0.8	15.0	15.8
R6	21/5/16	0.8	15.0	15.8
Maximum [a)]	21/5/16	6.4	15.0	21.4
Air Quality Objective				25

a) Maximum at the disturbance area boundary of the existing quarry

Table 10.9 presents the predicted annual average cumulative $PM_{2.5}$ concentrations across the modelling domain. The results of the modelling presented confirm that the predicted concentrations are below the 8 µg/m³ criteria for the off-site sensitive receptors.

Table 10.9 – Future Operations – Maximum Predicted Cumulative Annual Average $PM_{2.5}$ Concentrations (µg/m³)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R1	0.6	6.5	7.2
R2	0.5	6.5	7.1
R3	0.5	6.5	7.1
R4	0.6	6.5	7.1
R5	0.5	6.5	7.1
R6	0.5	6.5	7.1
Maximum [a)]	2.5	6.5	9.1
Air Quality Objective			8

a) Maximum at the disturbance area boundary of the existing quarry

Table 10.10 presents maximum predicted source contribution $PM_{2.5}$ receptor concentrations at each of the identified sensitive receptors and the maximum at the quarry disturbance boundary. Also presented in this table is the coincident background concentration and predicted cumulative receptor concentration.

The results of the modelling confirm that emissions from the expanded quarry operations are predicted to result in maximum concentrations of $PM_{2.5}$ concentrations at sensitive receptors of less than 40% of the relative criterion specified in the Approved Methods.

Table 10.10 – Future Operations – Maximum Predicted 24-Hour Average Source Contribution $PM_{2.5}$ Concentrations (µg/m³)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R1	2.6	2.3	4.9
R2	1.1	7.5	8.7
R3	0.7	3.6	4.3

Table 10.10 – Future Operations – Maximum Predicted 24-Hour Average Source Contribution $PM_{2.5}$ Concentrations (µg/m³)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R4	1.2	4.6	5.8
R5	0.2	8.6	8.8
R6	0.7	7.7	8.4
Maximum [a)]	15.9	2.3	18.2
Air Quality Objective			25

a) Maximum at the disturbance area boundary of the existing quarry

10.7.3.3 Total Suspended Particles

Table 10.11 presents maximum predicted source contribution TSP concentrations at each of the identified sensitive receptors and the maximum at the quarry disturbance boundary. Also presented in this table is the coincident background concentration and predicted cumulative receptor concentration.

The results of the modelling confirm that emissions from the emissions from the expanded quarry operations are predicted to result in maximum concentrations of TSP concentrations at sensitive receptors of less than 35% of the relative criterion specified in the Approved Methods.

Table 10.11 – Future Operations – Predicted Cumulative Annual Average TSP Concentrations (µg/m³)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R1	1.3	27.4	28.7
R2	0.4	27.4	27.8
R3	0.3	27.4	27.7
R4	0.4	27.4	27.8
R5	<0.1	27.4	27.4
R6	0.1	27.4	27.5
Maximum [a)]	104.4	27.4	131.8
Air Quality Objective			90

a) Maximum at the disturbance area boundary of the existing quarry

10.7.3.4 Dust Deposition

Table 10.12 presents maximum predicted source contribution dust deposition concentrations at each of the identified sensitive receptors and the maximum at the quarry disturbance boundary. No background values for dust deposition have been applied as discussed in Section 5.2 of the assessment (refer **Appendix F**).

The results of the modelling confirm that emissions from the expanded facility are predicted to result in maximum dust deposition at sensitive receptors of <2% of the relative criterion specified in the Approved Methods.

Table 10.12 – Future Operations – Predicted Cumulative Annual Dust Deposition (g/m²/month)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R1	0.04	-	0.04
R2	0.01	-	0.01
R3	0.01	-	0.01

Table 10.12 – Future Operations – Predicted Cumulative Annual Dust Deposition (g/m^2/month)

Receptor	Source Contribution (A)	Existing Background (B)	Cumulative (A + B)
R4	0.01	-	0.01
R5	<0.01	-	<0.01
R6	<0.01	-	<0.01
Maximum [a)]	5.6	-	5.6
Air Quality Objective			2

a) Maximum at the disturbance area boundary of the existing quarry

10.8 CONCLUSION

The results of the air modelling indicate compliance with the all air quality objectives is predicted to be achieved for all relevant averaging periods at the nearest sensitive receptors to the quarry expansion. Review of the results indicate that the predicted concentrations are driven by the background concentrations with only minor changes (above those resulting from existing quarry operations) expected.

Overall, based on the results of the predictive dispersion modelling, the risk of adverse impacts of the proposed expansion of the quarry is considered to be low.

10.9 MITIGATION MEASURES

No mitigation measures were proposed by AMG in the Air Quality Assessment. However, the assessment is based on the following assumptions:

- The proposal will be undertaken in accordance with **Section 3** of this EIS.
- Clearing and stripping will only be undertaken within the proposal footprint.
- The maximum height of the bunding around the pit expansion is 3 m.
- That site clearing activities are undertaken progressively as the quarry progresses onto a new bench.

In addition to the above, the following mitigations measures will be implemented and incorporated into an EMP:

- The haulage trucks will be fitted with roll-over tarpaulins and as such all loads leaving the quarry site will be covered.
- Strategic watering as required, utilised reclaimed surface water runoff from the sediment basin.
- Speed limiting on the internal access road.
- Temporary suspension of vehicle movements in excessively dry or windy conditions.
- Finish surface of access roads and internal roads with compacted gravel to minimise dust emissions.
- Maintenance of plant and machinery in accordance with the manufacturer's specifications and the *Protection of the Environment Operations (Clean Air) Regulation 2010*.

Greenhouse Gas Assessment

11.1.1 INTRODUCTION

The estimation of greenhouse gas (GHG) emissions for the proposal is based on the following:

- DoEE *National Greenhouse and Energy Reporting Scheme Measurement Technical Guidelines for the estimation of emissions by facilities in Australia* (DoEE, 2017a) which applies to estimation of emissions in the 2017-18 reporting year.
- The Department of the Environment and Energy (DoEE) *National Greenhouse Accounts Factors 2017* (DoE, 2017b).
- The World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) *Greenhouse Gas Protocol The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard Revised Edition* (GHG Protocol) (WRI/WBCSD, 2004).

11.1.2 EMISSION SCOPES

Three 'Scopes' of emissions (Scope 1, Scope 2 and Scope 3) are defined for GHG accounting and reporting purposes, as described below. This terminology has been adopted in Australian GHG reporting and measurement methods and has been employed in this assessment. The 'Scope' of an emission is relative to the reporting entity (i.e. the quarry is a reporting entity). Indirect Scope 2 and Scope 3 emissions will be reportable as direct Scope 1 emissions from another facility.

Scope 1 – Direct GHG emissions

Direct GHG emissions are defined as those emissions that occur from sources that are owned or controlled by the reporting entity. Direct GHG emissions are those emissions that are principally the result of the following types of activities undertaken by an entity:

- Generation of electricity, heat or steam:
  - These emissions result from combustion of fuels in stationary sources.
- Physical or chemical processing:
  - Most of these emissions result from manufacture or processing of chemicals and materials (e.g. the manufacture of cement, aluminium, etc.).
- Transportation of materials, products, waste and employees:
  - These emissions result from the combustion of fuels in entity owned/controlled mobile combustion sources (e.g. trucks, trains, ships, aeroplanes, buses and cars).
- Fugitive emissions:
  - These emissions result from intentional or unintentional releases (e.g. equipment leaks from joints, seals, packing and gaskets.
  - Methane (CH_4) emissions from coal mines and venting).
  - Hydrofluorocarbon (HFC) emissions during the use of refrigeration and air conditioning equipment.
  - CH_4 leakages from gas transport.

Scope 2 – Energy product use indirect GHG emissions

Scope 2 emissions are a category of indirect emissions that account for GHG emissions from the generation of purchased energy products (principally, electricity, steam/heat and reduction materials used for smelting) by the entity.

Scope 2 typically covers purchased electricity, defined as electricity that is purchased or otherwise brought into the organisational boundary of the entity.

Scope 3 – Other indirect GHG emissions

Scope 3 emissions are defined as those emissions that are a consequence of the activities of an entity, but which arise from sources not owned or controlled by that entity. Some examples of scope 3 activities provided in the GHG Protocol are extraction and production of purchased materials, transportation of purchased fuels, and use of sold products and services.

11.1.3 ESTIMATED EMISSIONS

11.1.3.1 Relevant Emission Scopes

Emissions of carbon dioxide (CO_2) would be the most significant GHGs for the proposal. These gases are formed and released during the combustion of fuels used at the subject site and via transport of products.

Inventories of GHG emissions can be calculated using published emission factors. Different gases have different greenhouse warming effects (referred to as global warming potentials) and emission factors take into account the global warming potentials of the gases created during combustion. The estimated emissions are referred to in terms of carbon dioxide equivalent ($CO_{2\text{-}e}$) emissions by applying the relevant global warming potential. The GHG assessment has been conducted using the DoEE (2017b) NGA Factors.

Proposal-related GHG sources included in the assessment are as follows:

- Scope 1:
  - Fuel consumption (diesel) during quarrying operations.
- Scope 2:
  - Electricity usage for on-site compound and processing plant.
- Scope 3:
  - Indirect emissions associated with the production and transport of fuels (diesel).
  - Emissions from transportation (diesel).

11.1.3.2 Calculations

Diesel Combustion – Stationary

GHG emissions from diesel from stationary combustion were estimated using the following approach from DoEE (2017b).

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijstexec}}{1\,000}$$

where:

E_{ij} is the emissions of gas type (j), (carbon dioxide, methane or nitrous oxide, from fuel type (i) (CO_2-e tonnes).

Q_i is the quantity of fuel type (i) (kilolitres) combusted for stationary energy purposes

EC_i is the energy content factor of fuel type (i) (gigajoules per kilolitre) for stationary energy purposes, according to Table 3.

If Q_i is measured in gigajoules, then EC_i is 1.

$EF_{ijstexec}$ is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO_2-e per gigajoule) according to Table

Table 3: Fuel combustion emission factors - liquid fuels and certain petroleum based products for stationary energy purposes

Fuel combusted	Energy content factor (GJ/kL unless otherwise indicated)	Emission factor kg CO_2-e/GJ (relevant oxidation factors incorporated)		
		CO_2	CH_4	N_2O
Diesel oil	38.6	69.9	0.1	0.2

Electricity Emissions

GHG emissions from consumption or purchased electricity were estimated using the following approach from DoEE (2017b).

$$Y = Q \times \frac{EF}{1\,000}$$

where:

Y is the scope 2 emissions measured in CO_2-e tonnes.

Q is the quantity of electricity purchased (kilowatt hours).

For a company operating an electricity transmission network or distribution network, ***Q*** is the quantity of electricity losses for that transmission network or distribution network during the year.

For ***Q***, if the electricity purchased is measured in gigajoules, the quantity of kilowatt hours must be calculated by dividing the amount of gigajoules by 0.0036.

EF is the scope 2 emission factor, for the State, Territory or electricity grid in which the consumption occurs (kg CO_2-e per kilowatt hour). If the electricity is not sourced from a listed electricity grid the emission factor can be either provided by the supplier of the electricity or, if that factor is not available, the emission factor for the Northern Territory may be used.

Table 5 : Indirect (scope 2) emission factors for consumption of purchased electricity or loss of electricity from the grid

State or Territory	Emission factor kg CO_2-e/kWh
New South Wales and Australian Capital Territory	0.83

Diesel Combustion – Transport

GHG emissions from diesel from stationary combustion were estimated using the following approach from DoEE (2017b).

$$E_{ij} = \frac{Q_i \times EC_i \times EF_{ijoxec}}{1\,000}$$

where:

E_{ij} is the emissions of gas type (j), carbon dioxide, methane or nitrous oxide, from fuel type (i) (CO_2-e tonnes).

Q_i is the quantity of fuel type (i) (kilolitres or gigajoules) combusted for transport energy purposes

EC_i is the energy content factor of fuel type (i) (gigajoules per kilolitre or per cubic metre) used for transport energy purposes — see Table 4.

If Q_i is measured in gigajoules, then EC_i is 1.

EF_{ijoxec} is the emission factor for each gas type (j) (which includes the effect of an oxidation factor) for fuel type (i) (kilograms CO_2-e per gigajoule) used for transport energy purposes — see Table 4.

Table 4: Fuel combustion emission factors - fuels used for transport energy purposes

Transport equipment type	Fuel combusted	Energy content factor (GJ/kL unless otherwise indicated)	Emission factor kg CO_2-e/GJ (relevant oxidation factors incorporated)		
			CO_2	CH_4	N_2O
General transport					
	Diesel oil	38.6	69.9	0.1	0.5

11.1.3.3 Results

Diesel Combustion – Stationary (Scope 1)

The annual quantity of diesel consumed for stationary combustion is based on the quantity of diesel consumed by site plant and equipment, provided by the proponent. The annual quantity is 130,000 L (130 kL).

Electricity Emissions (Scope 2)

The proposal does not require any additional electricity consumption. Based on previous electricity consumption advised by ARQ, it is expected that electricity consumption will remain at approximately 760 kWh per day, equating to 4,560 kWh per week (based on 6 day week) and 237,120 kWh annually.

Diesel Combustion – Transport (Scope 3)

The annual quantity of diesel consumed by combustion for transport of product is based on the maximum tonnage transported off-site (150,000 tonnes per year), including:

- A maximum of 9,360 truck movements annually, travelling an average distance of 50 kilometres per movement, equating to a maximum of 468,000 kilometres per year.
- An estimate of diesel consumption from product transportation has been made based on the NSW average fuel consumption rate for articulated trucks of 56.3 L/ 100 km (ABS, 2017).
- Based on travelling 468,000 kilometres per year and the consumption rate (56.3 L / 100km), the maximum total consumption of diesel from transport combustion is 263,484 L (263.5 kL).

It is noted that this assessment does not account for the use of the access road to a future rail siding site. This would be dealt with by a revised assessment as part of a DA modification.

Total Emissions

The estimated annual GHG emissions are presented in **Table 11.1**.

It is noted that annual emissions are not projected as the extraction rate is proposed to remain the same each year.

Table 11.1 – Annual GHG Emissions

Type	Annual Consumption	Emissions ($t CO_{2-e}$)
Diesel Stationary Combustion (Scope 1)	130 kL	350.76
Diesel Combustion Transport (Scope 3)	263.5 kL	710.96
Subtotal	393.5 kL	1,061.72
Electricity Consumption (Scope 2)	237,120 kWh	196.81
TOTAL		1,258.53

11.1.4 CONCLUSION

Assessment of the GHG emissions associated with proposal indicates that annual GHG emissions would represent a minor portion of Australian's GHG targets – approximately 0.0002% of Australia's 2020 target (551 Mt CO_{2-e}) and approximately 0.0002% of Australian's 2030 target (570 Mt CO_{2-e}) (DoEE, 2017c).

Visual Amenity

12.1 VISUAL SETTING

The surrounding area is characterised by broad acre farming enterprises, including cropping and grazing, with on-going machinery use. The subject site is entirely surrounded by land in use for primary production purposes.

The existing quarry is located on the side of a crest of a ridgeline that extends to the north-east.

12.2 SENSITIVE RECEPTORS

The location of nearby receptors is depicted in **Figure 18**.

Road corridor vegetation limits views towards the quarry for receptors R2, R3 and R4. Patches of native vegetation between the quarry expansion and receptor R5 are likely to limit views towards the quarry. As the quarry is located on the south-eastern side of the north-east trending ridgeline, receptor R6 does not have direct views to the existing quarry. Receptor R1 has direct views towards the quarry.

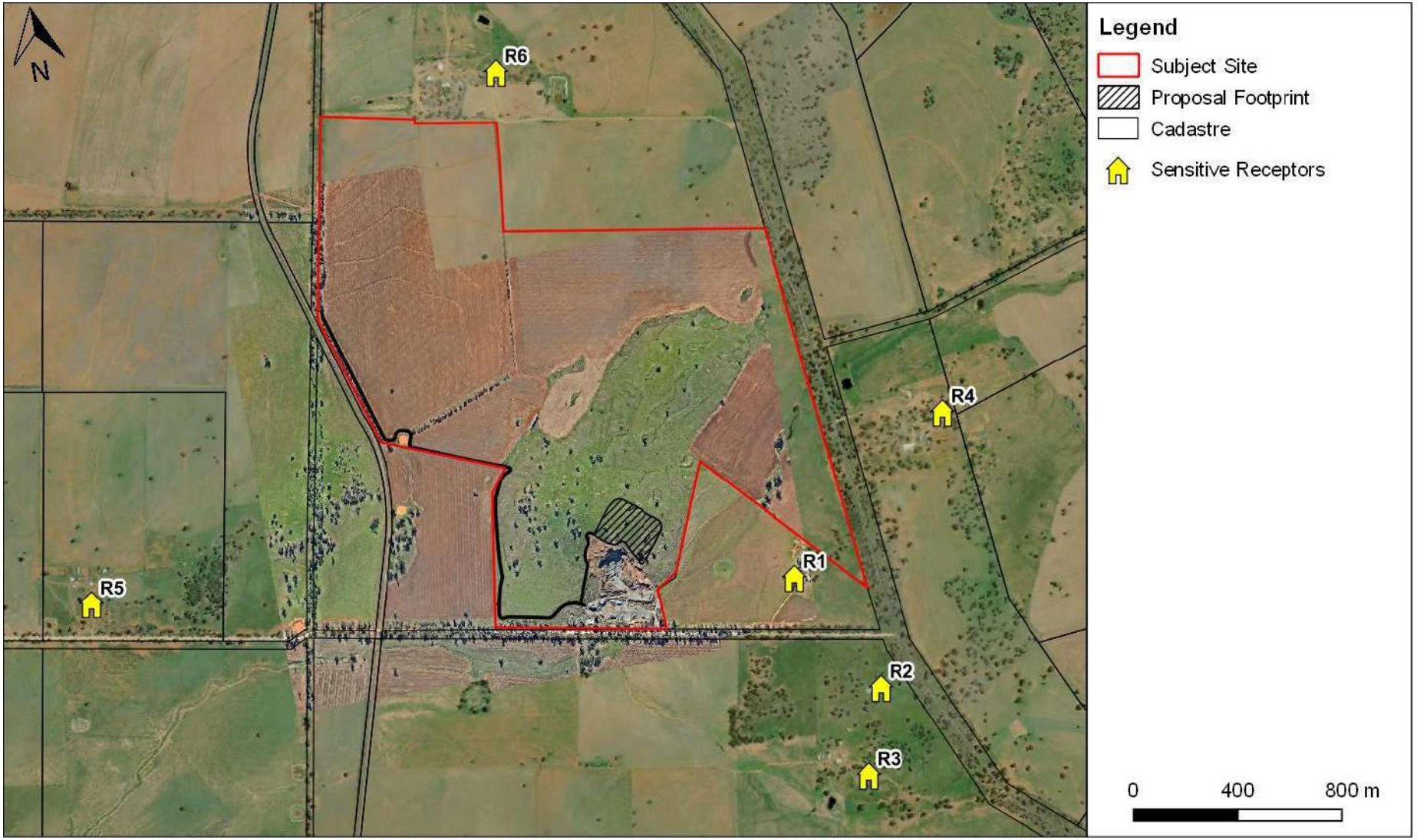

Figure 18: Neighbouring Receptors

12.3 POTENTIAL IMPACTS

The area of proposed quarry expansion continues into the ridgeline. The quarry will remain directly visible to receptor R1 as there is no intervening vegetation or topography. Views from other receptors are likely to be limited due to intervening vegetation and topography. Images in **Figure 20** – **Figure 24** have been extracted from a three-dimensional model showing the proposal in the context of the surrounding landscape and sensitive receptors. The model was created with a Quantum GIS (QGIS) plugin '*Qgis2threejs'* using a 5 m Digital Elevation Model (DEM) data from Geoscience Australia's Elevation Information System (ELVIS). It is noted that the model does not account for obstructing features in the landscape such as vegetation.

The proposed access road to a future rail siding is located along existing farm tracks that cross paddocks used for cropping/grazing. As this road utilises existing tracks, the visual impact is considered to be negligible.

No night-time operations are proposed and therefore lighting would not impact surrounding receptors.

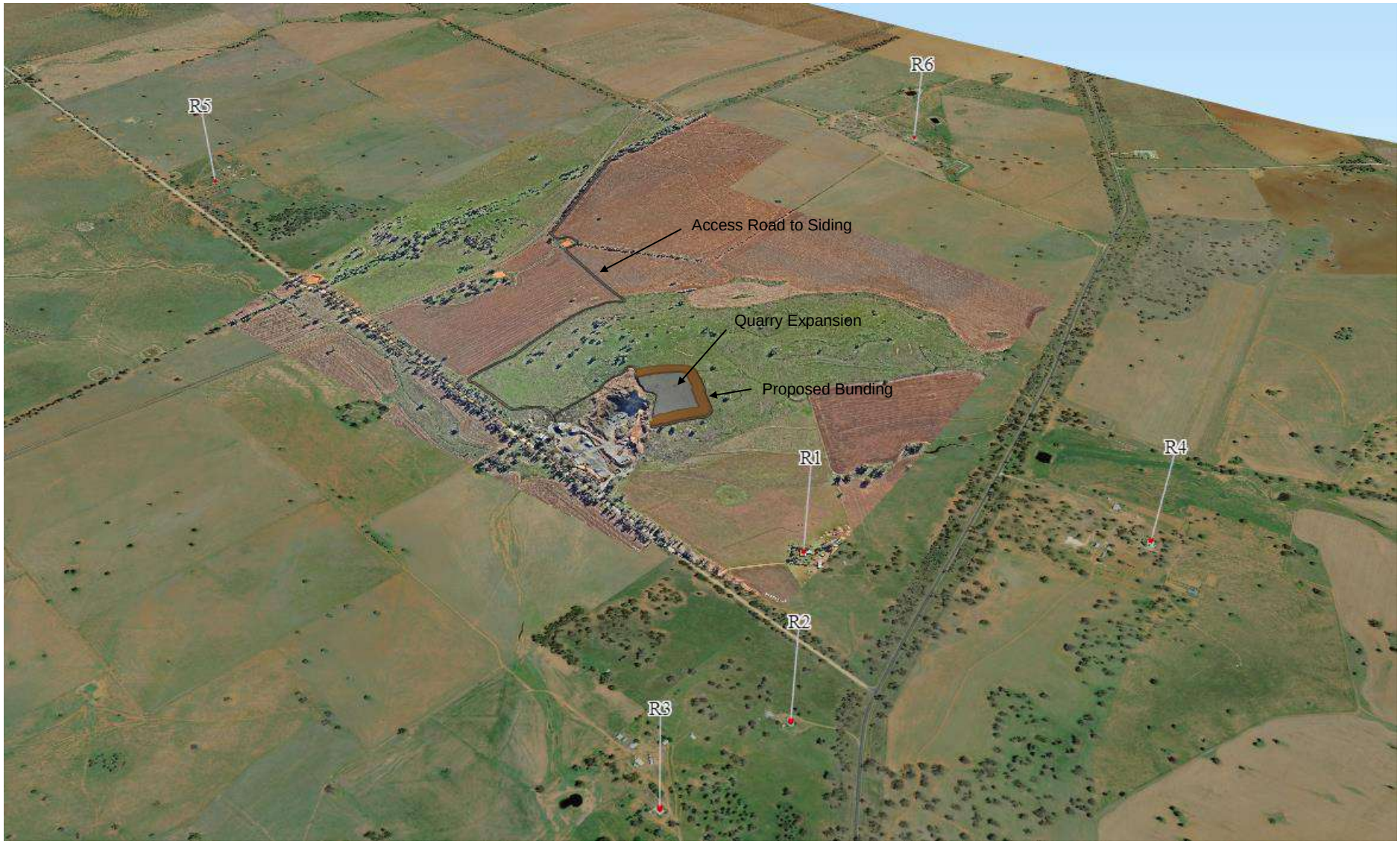

Figure 19: Overhead View of Proposal – View towards the North-West

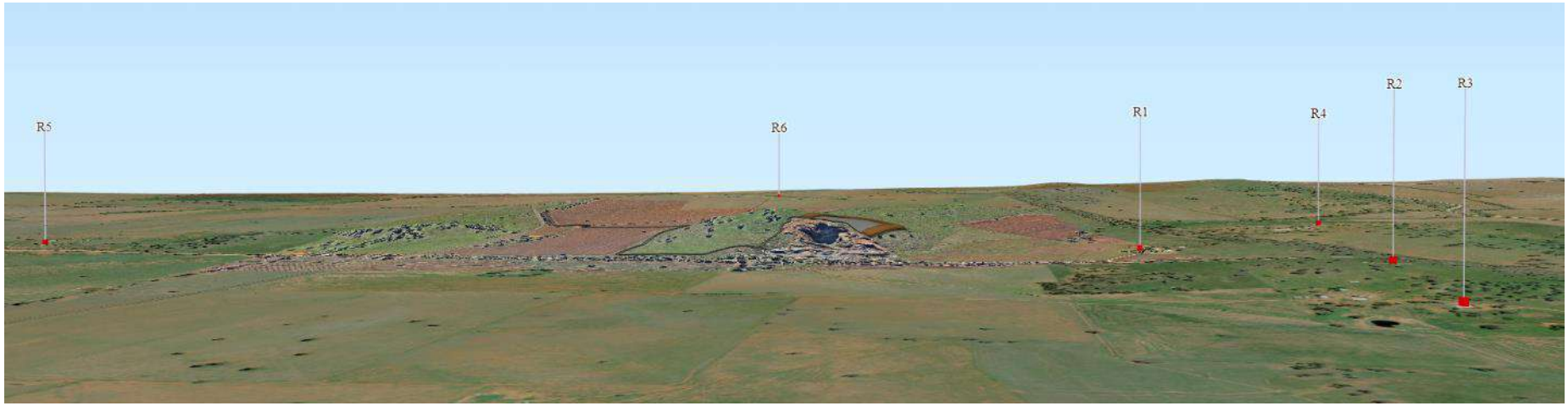

Figure 20: 3D Model Extract – View from the South towards the Quarry

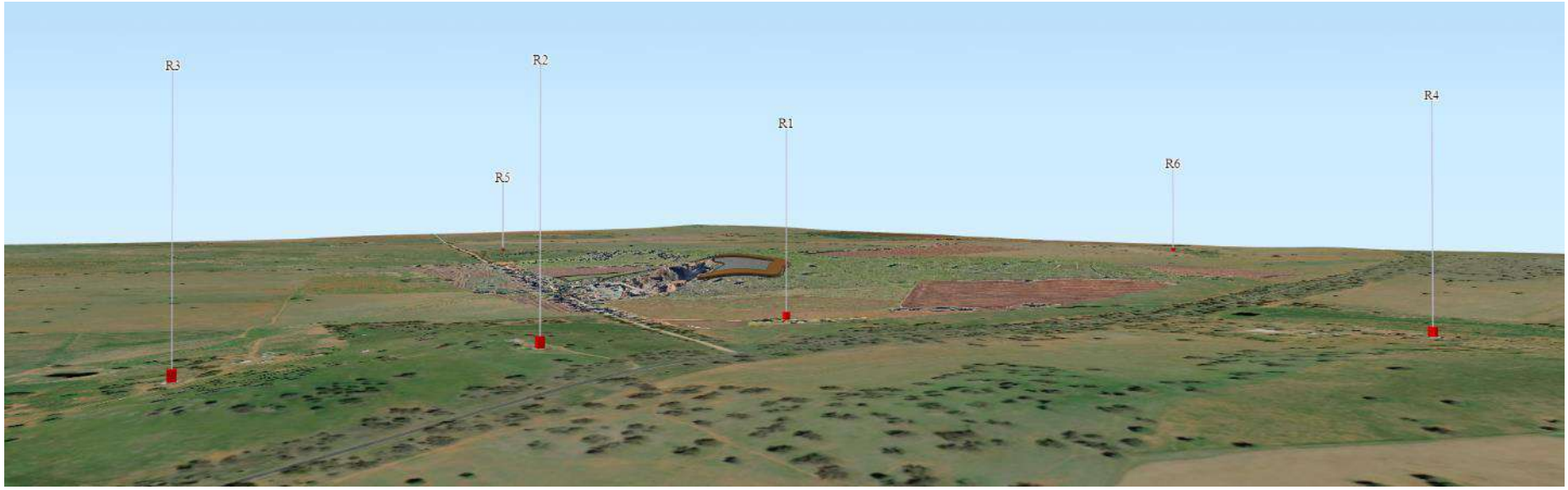

Figure 21: 3D Model Extract – View from the South-East towards the Quarry

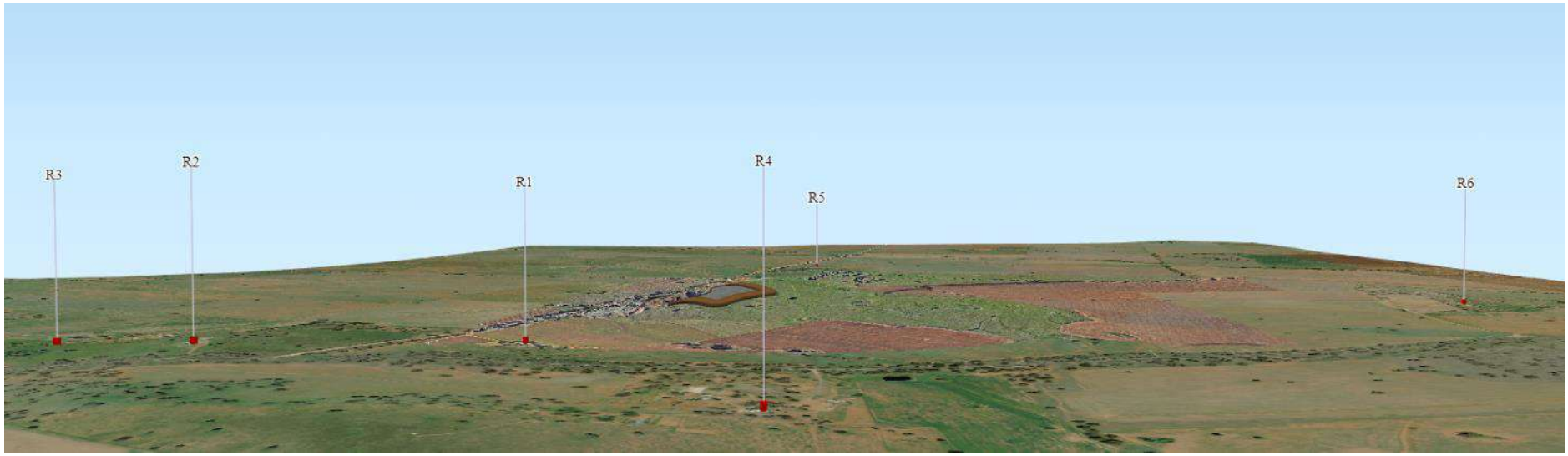

Figure 22: 3D Model Extract – View from the East towards the Quarry

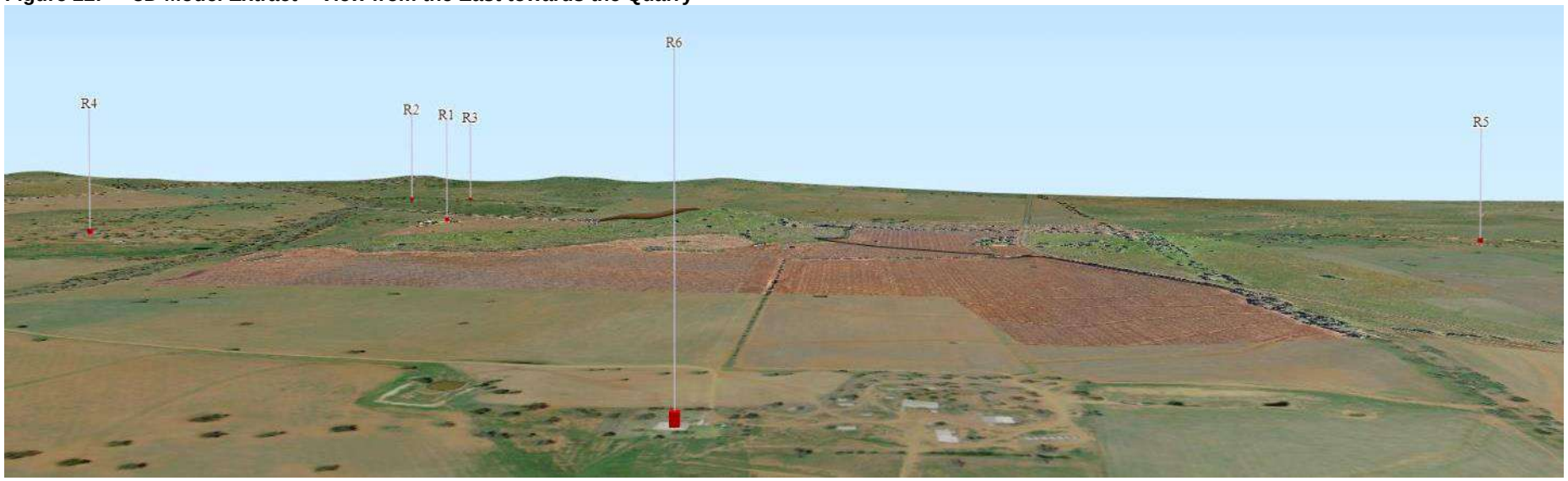

Figure 23: 3D Model Extract – View from the North towards the Quarry

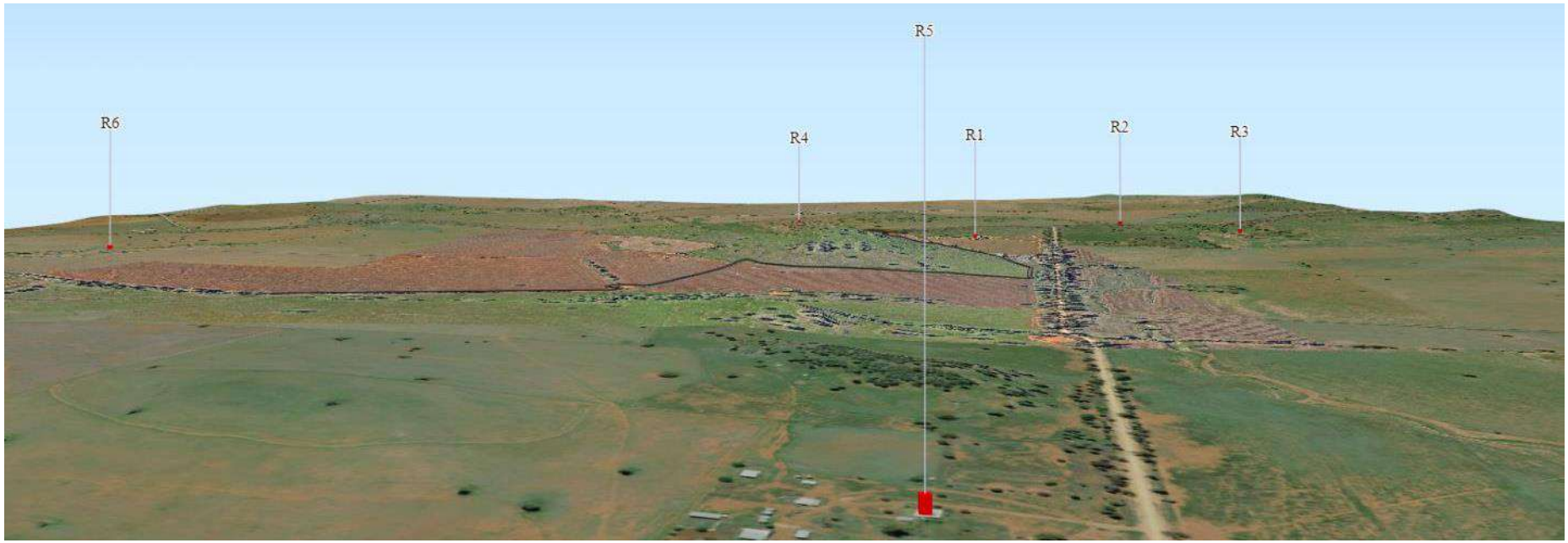

Figure 24: 3D Model Extract – View from the West towards the Quarry

12.4 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- Undertake the quarry expansion in accordance with the quarry design plans in the **Drawing Schedule**.
- Clearing and stripping will only be undertaken within the proposal footprint.
- Ensure the maximum height of the bunding around the pit expansion is 3 m.
- Undertake 3.6 ha of compensatory planting.
- Undertake rehabilitation in accordance with a Rehabilitation Plan.

Water

13.1 EXISTING ENVIRONMENT

13.1.1 SURFACE WATER

One unnamed non-perennial stream (Strahler Order 1) traverses the proposed siding access road in the north-west section of the subject site. This stream channel is undefined upstream of the subject site and remains poorly defined downstream. The stream is highly modified owing to its location within a routinely cropped and grazed agricultural landscape. Surface water features at the subject site are depicted in **Figure 25**; both existing topographic mapping and modified drainage are depicted.

Site topography and drainage has been modified by quarry activity. The quarry area has been excavated and work platforms have been created through filling for stockpiling and processing areas. Constructed drains are used to control water movement through and around the site.

Historic drainage changes include the diversion of an ephemeral drainage line that crosses the south-east corner of the site. This drainage line has a catchment of approximately 1,580 ha to the north-east of the site. Upstream of where this drainage line crosses the site boundary, it is typically a wide shallow depression with no clearly defined channel.

Topographic mapping shows that this ephemeral drainage line previously discharged to a farm dam on the site before continuing in a south-west direction, crossing Wyatts Lane and continuing to another farm dam. The farm dam on the quarry site has been filled and part of the processing area platform extends across the shallow drainage depression. The platform diverts the drainage line to the south and around the toe of the work platform. The quarry access road crosses the diverted drainage line. Once past the work platform area, the drainage line generally follows its previous path crossing Wyatts Lane. Some minor works are evident on the land to the south of Wyatts Lane which directs water to an existing farm dam.

During consultation, a neighbouring landowner to the south raised existing concerns about water crossing over Wyatts Lane flowing down the road (towards the west), blocking and washing away a driveway on the southern side of Wyatts Lane (approximately 320 m west of the quarry access point).

Flow patterns were reviewed on site in consultation with Council in early 2017. This review identified that earth windrows along Wyatts Lane contributed to flow being conveyed along the roadway to the west. Other contributing factors included limited flow capacity in the drainage line to the south of Wyatts Lane and possible flow restrictions caused by the dam embankment to the south. All of these factors are external to the existing quarry operations.

While the existing quarry footprint has diverted the drainage line on the northern side of Wyatts Lane, the existing operations have not increased flows in the drainage line or contributed to the drainage issues that were experienced on Wyatts Lane to the west.

The quarry surface water management system separates the disturbed quarry area from surrounding surface water runoff and forms a controlled drainage area. The catchment area covered by the quarry would previously have added to local surface water runoff. The system is now enclosed and surface runoff is captured and reused which would slightly reduce the total catchment runoff.

During consultation, another neighbouring landowner (directly east of the site) raised a concern about their western fence line (adjacent to the quarry site) potentially washing away in a flood event. As mentioned above, the quarry surface water management system forms a controlled drainage area and does not increase total catchment runoff. Mitigation measures are provided in the SWMP (refer **Section 13.3** and **Appendix H**) to ensure surface water diversion around the quarry does not impact neighbouring land.

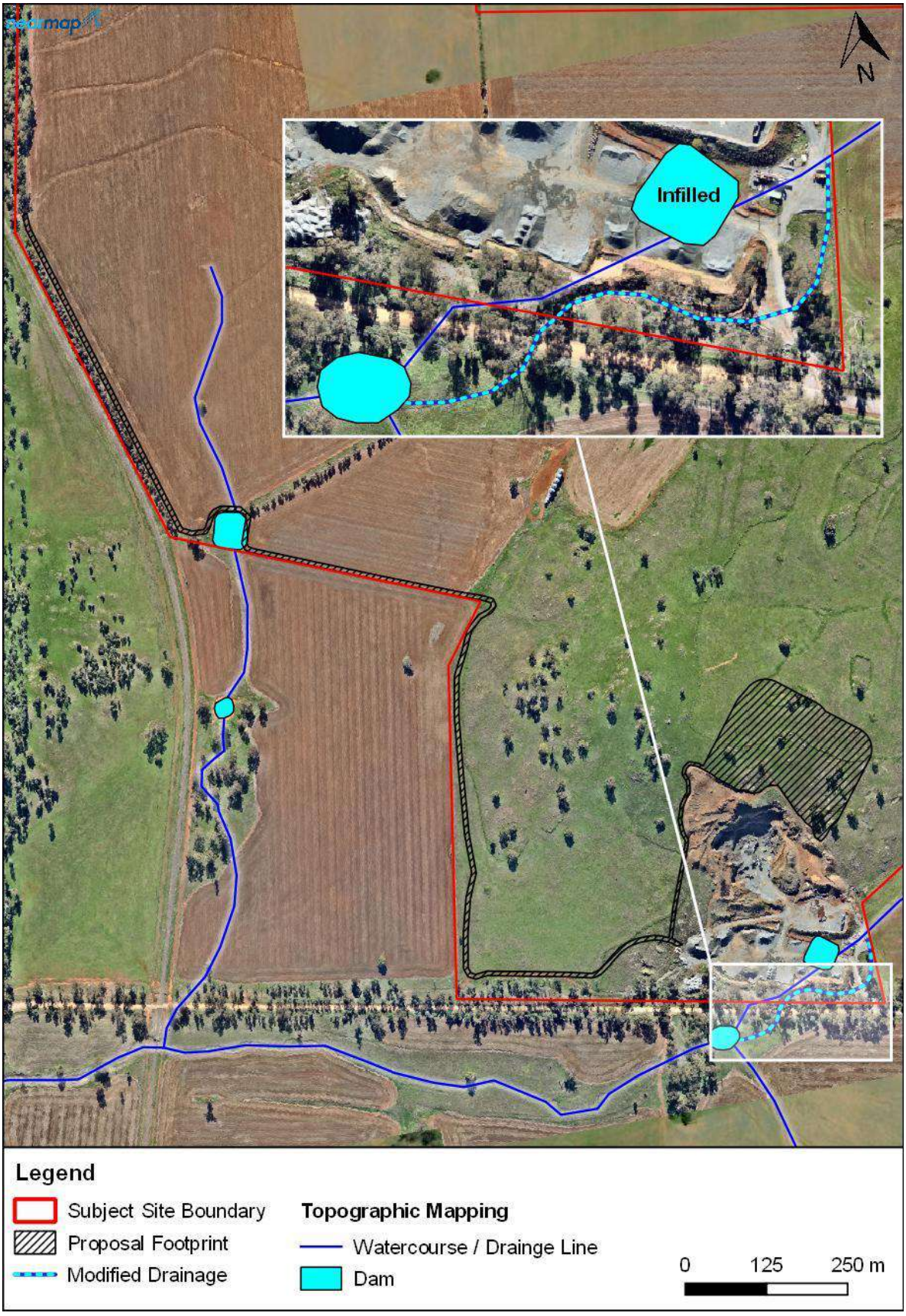

Figure 25: Subject Site Surface Water Features

13.1.2 GROUNDWATER

A review of the NSW Office of Water online *All Groundwater Map* did not identify any groundwater bores at the site of the proposed mine footprint. Available data for registered bores within a 5 km radius of the subject site is provided in **Table 13.1**. The location of these bores is shown on **Figure 26**.

Table 13.1 – Groundwater Bore Data within 5km

Bore ID	Purpose	Drilled Depth	WBZ Upper Limit (m)	Relevant Log Comments
Within 1 km of Subject Site				
GW703577	Stock/Domestic	27	17	WBZ in basalt
Within 1-2 km of Subject Site				
GW054694	Stock	64	No data	No data
GW700137	Stock/Domestic	80	73	WBZ in andesite
GW050126	Stock	61	51.8	WBZ in basalt
GW051462	Stock	36.6	No data	No data
Within 2-5 km of Subject Site				
GW027640	Stock	19.8	No data	No WBZ recorded
GW013201	Stock	36	No data	No data
GW020102	Stock/Domestic	39.6	32.9	WBZ in rock
GW034264	Stock	21.3	No data	No data
GW002754	Stock	44.8	No data	WBZ in rock
GW002706	Not known	36	34.7	WBZ in rock
GW701398	Stock/Domestic	30	16	WBZ in andesite
GW023551	Stock	47.9	No data	No data
GW024318	Stock/Domestic	57.9	37.5	WBZ in rock
GW019698	Stock/Irrigation/Domestic	80.5	25.6	WBZ between mudstone/clay/gravel
GW025779	Stock	57.9	48.8	WBZ in limestone
GW002305	Not known	43.7	41.8	WBZ in rock
GW034610	Stock/Domestic	24.3	24.3	No data
GW703568	Stock/Domestic	45	No data	No data
GW023552	Stock	24.4	No data	No WBZ recorded
GW019623	Stock/Domestic	76.2	No data	No WBZ recorded
GW034609	Stock/Domestic	21.9	21.9	No data
GW002368	Not known	76.2	47.2	WBZ in slate
GW064387	Domestic	68.6	No data	No WBZ recorded
GW034611	Stock	29.3	No data	No data
GW006923	Stock	36.6	23.8	WBZ in quartz
GW027619	Stock	39.6	No data	No WBZ recorded
GW027641	Stock	33.5	No data	No WBZ recorded
GW027633	Stock	19.8	No data	No WBZ recorded
GW703563	Stock/Domestic	30	No data	No data

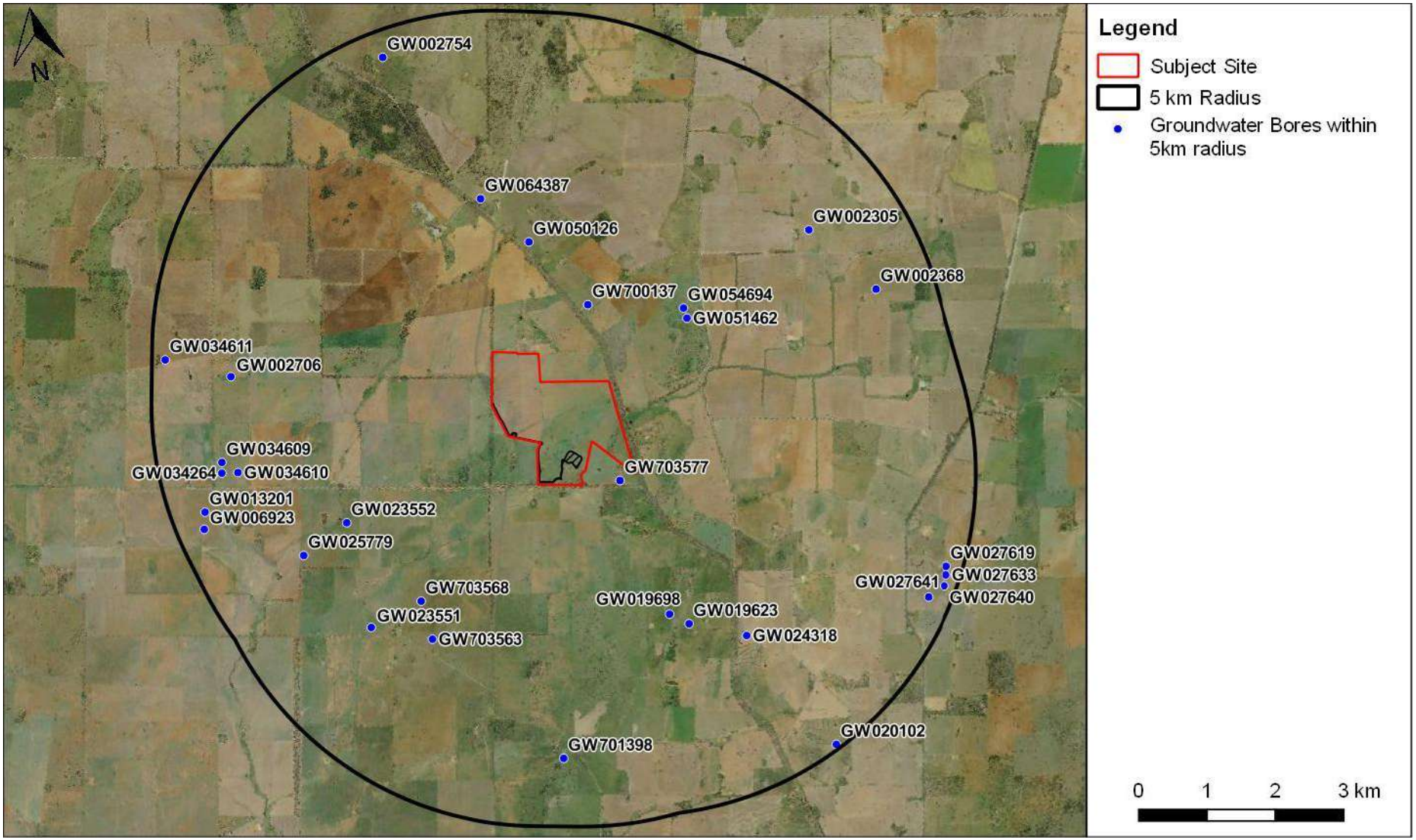

Figure 26: Groundwater Bores within 5 km

Available groundwater data indicates that the water bearing zones (WBZ) within a 5 km radius of the subject site range from 16 – 73 m below surface and on average, are 35.5 m below surface. The closest registered bore (GW703577) has a WBZ at a depth 17 m with a standing water level (SWL) of 16 m; this bore log identifies basalt from 12 m to the depth of the hole (27 m). This bore is located at a lower elevation (327 mAHD at ground level) than the proposed quarry expansion (335 - 352 mAHD at ground level).

There is one unregistered groundwater bore within the subject site located next to the site compound. ARQ confirmed that the bore was present before they commenced operations at the quarry and that it is located proximal to a surface drainage feature and historically infilled dam. The depth to the standing water level (SWL) in this bore is estimated at 1.8 m below the surface (as measured by ARQ). However, the total depth and depth to the WBZ have not been determined. This bore is also located at a lower elevation (315 mAHD at ground level) than the proposed quarry expansion (335 - 352 mAHD at ground level).

The current open-cut pit extends to a depth of approximately 33 m below surface and has not intersected groundwater.

13.2 POTENTIAL IMPACTS

13.2.1 WATER SUPPLY

As identified in **Section 3.1.10**, a site water balance has determined there is no requirement for additional water supply as an expanded sediment basin will contain enough water for quarry operations Therefore, the proposal is unlikely to impact on groundwater or surface water supply, other than to expand the catchment area for surface water (dirty) collection from the quarry. With the expansion (quarry, bunding and pit access road = 5.2 ha), the total quarry catchment will impact 11.3 ha. The SWMP identifies management measures to minimise surface water, erosion and sedimentation impacts.

As part of the rehabilitation strategy, the final void will act as a water storage area after closure of the quarry (refer **Section 3.2**). Only water falling within the void from rainfall will be captured in this storage. All other water will be directed around the bunding that will be retained around the final void.

13.2.2 INTERCEPT GROUNDWATER

Based on findings discussed in **Section 13.1.2**, it is considered unlikely that groundwater will be intersected. The existing quarry, at a current depth of 33 m below surface, has not intersected groundwater and groundwater levels in the region are on average 35.5 m below surface (noting that the elevation of the majority of registered groundwater bores within a 5 km radius of the site is lower than the location of the proposed quarry expansion. Groundwater intercepted by the single bore on-site is considered to be associated with localised surface water drainage features and not representative of underlying aquifer conditions.

The proposed quarry expansion would have a maximum depth of 25 m below surface for Stage 1 and a maximum depth of 35 m below surface for Stage 2, and any groundwater intercepted is considered to be associated with perched and discontinuous low-yield features. Implementation of mitigation measures, outlined in **Section 13.3**, would however minimise the risk of impact to the groundwater resource.

In accordance with the *NSW Aquifer Interference Policy* (NSW Office of Water, 2012), the impacts of the proposed quarry are to be assessed against the 'minimal impact considerations' of the policy. Based on the desktop groundwater assessment and observations from the existing quarry area, any aquifer intercepted by the proposed quarry is considered to be a 'less productive groundwater source' in porous or fractured rock, as defined by the *NSW Aquifer Interference Policy* (NSW Office of Water, 2012). Impacts resulting from the proposal are anticipated to comply with the minimal impact considerations for such a water source. Specifically:

- Less than 10% cumulative variation in the water table at a 40 m buffer from any GDE or high priority culturally significant site listed in applicable Water Sharing Plans.
- Less than 2 m cumulative pressure head decline at any water supply work.
- No change in groundwater quality that would lower the beneficial use category beyond 40 m from the activity.

Water Sharing Plans for the 'Lachlan Unregulated and Alluvial Water Sources' (2012) and the 'NSW Murray Darling Basin Fractured Rock Groundwater Sources' (2011), have not identified the presence of any 'high priority' groundwater dependent ecosystems (GDEs) in the vicinity of the proposal (refer to **Section 7.6.6**).

No analysis of caves or aquifers for subterranean GDEs has been undertaken in the vicinity of the site. The *Risk Assessment Guidelines for Groundwater Dependent Ecosystems* (NSW DPI – Office of Water, 2012) identifies that potential for stygofauna (groundwater dwelling invertebrates) to be present in NSW aquifers is greatest in "*alluvial, fractured rock, including limestone karst units*", which are not considered to be present within the proposal footprint.

13.2.3 CONTAMINATION

There is potential for spills/leaks of oils/fuels from vehicles and machinery to contaminate surface water and groundwater. Appropriate mitigation measures are provided in **Section 13.3** to minimise risk of surface water or groundwater contamination.

13.3 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- Implementation of the SWMP (**Appendix H**) to manage erosion and sedimentation impacts and surface water, specifically:
  - The entire quarry footprint including stockpile and processing areas would be surrounded by surface water drains and diversion bunds that would:
    1. Divert clean surface water runoff away from disturbed areas; and
    2. Collect runoff from disturbed areas and direct it to the sediment basin.
  - Rock check dams would be used to control flow velocity. Discharge points for the clean water diversion drains would include level spreaders to convert channel flow to sheet flow.
  - Permanent drains would be constructed and rehabilitated to provide stable surface water conveyance.
  - Temporary drains would be constructed and relocated as required as quarry operations progress.
  - Initial staging of the quarry would be designed to ensure water from the pit discharges as surface flow to the sediment basin. Once the pit cannot drain via gravity (i.e. when the pit floor goes below outside surface levels during Stage 2 of extraction – a 10 m cut to the quarry floor) all runoff would be contained in the pit and then pumped to the sediment basin as required or used directly for dust suppression.
  - Enlarge the existing sediment basin in accordance with the SWMP design.
  - Manage sediment basin discharge in accordance with the SWMP.

  - Use temporary erosion and sediment controls during the construction stage, as outlined in the SWMP.
  - Incorporate erosion and sediment control design principles into the haul road detailed design.
- If quarrying intersects groundwater of greater volume than short-term seepage, immediately cease quarrying and engage a suitably qualified professional to assess the groundwater resource, identify potential impacts and provide mitigation measures or areas of quarrying to avoid (i.e. restrict depth of excavation).
- Activities with the potential for spills would not be undertaken within 50 m of any of the farm dams or drainage lines.
- A suitable spill response and containment kit will be available on site.
- Storage, handling and use of any potentially hazardous materials (e.g. fuel) would be in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of Practise.*
- Undertake all required monitoring in accordance with EPL 20288.
- Contingent on securing consent, ARQ would either:
  - Seek to licence the unregistered groundwater bore with DPI Water / Water NSW to provide a contingency supply option; or
  - Decommission the unregistered groundwater bore in accordance with industry standard practice detailed in National Water Commission, National Uniform Drillers Licensing Committee, *Minimum Construction Requirements for Water Bores in Australia, Edition 3, February 2012.*
- Undertake rehabilitation in accordance with a Rehabilitation Plan to ensure the final landform is safe and stable.

Geological Resource

14.1.1 EXISTING ENVIRONMENT

14.1.1.1 Regional Geology

Review of the *Parkes 1:100 000 Geological Map* identifies that the quarry is located within the Ordovician Goonumbla Volcanics formation of the Goonumbla Northparkes Volcanic Group. The Goonumbla Volcanics form part of the Junee-Narromine Volcanic Belt of the Lachlan Orogen.

The Australian Stratigraphic Units Database provides the following description of the Northparkes Volcanic Group:

> *Andesitic to basaltic and trachytic lavas and volcanic breccias, monzonitic intrusives, volcaniclastic sandstone and conglomerate, limestone, mudstone; commonly altered and sheared in Parkes Fault Zone.*

14.1.1.2 Local Geology

The quarry expansion is within a mapped unit of the Goonumbla Volcanics which has a north-east trend at the locality. The Australian Stratigraphic Units Database provides the following description of the Goonumbla Volcanics:

> *Basal, medium- to coarse-grained volcanic sandstone with local masses of allochthonous limestone; coarsens upwards into pebbly volcanic sandstone and thick conglomerate beds; basaltic andesite.*

The existing quarry has only intersected basalt/basaltic andesite (hereafter referred to as basalt) and fresh rock extends to the base of the current pit. Surface testing over the expansion area has also identified that basalt is continuous throughout the expansion area. The Goonumbla Volcanics are known to be 2,500 – 4000 m thick (Porter GeoConsultancy, 2015).

14.1.1.3 Resource Estimation

A formal resource estimate has not been undertaken. Prior drilling programs completed by the blast contractor have determined the depth to fresh rock in the locality. All drill holes completed have reached fresh rock. This drilling program determined that the depth to fresh rock is on average 4-5 m below surface. Based on site survey and depth to fresh rock, there is approximately 88,400 m^3 of overburden material overlying fresh rock.

Pit design has considered the depth to fresh rock and has assumed continuity of the deposit at the current pit depth for Stage 1 extraction. The resource available for Stage 1 is 545,000 m^3.

Stage 2 involves a 10 m cut to the final pit floor. The resource available for Stage 2 is 179,700 m^3.

14.1.1.4 Resource Characteristics / Quality

A petrographic report on a ballast sample from the quarry was prepared by Geochempet Services in 2013 and is provided in **Appendix G**. The sample is described as:

- Basalt or basaltic andesite (a basic volcanic igneous rock).
- Finely crystalline, hard and strong.
- Essentially unweathered but showing minor specks of oxidation attributable to a surficial degree of weathering.
- Heavily altered. The presence of common apatite microphenocrysts suggests that these basaltic lavas have shoshonitic affinities, and the alteration reflections the regional sub-greenschist facies burial metamorphic degradation.

- Secondary mineral content about 36% (of which 16% consists of robust minerals – epidote and prehnite).
- Soft, weak minerals amount to about 20% consisting of chlorite-smectite, sericite and calcite.

The basalt intersected at the quarry has minimal oxidation at the top of fresh rock and does not extend to significant depths. The depth to fresh rock is favourably shallow. No extensive fault zones (that may affect resource quality) are mapped in the locality and no wide fault zones have been intersected during quarrying. It is noted that the site is within the broad (~12 km wide) Parkes Fault Zone (as mapped on the *Parkes 1:100 000 Geological Map*) that consists of some major fault lines with a north-east orientation. None of the major fault lines mapped within this zone cross the existing or expanded quarry area.

14.1.1.5 Resource Suitability

Basalt from the quarry has been extracted, processed and used predominantly for the following purposes for which it is suitable:

- Gravel road base
- Railway ballast
- Aggregate for concrete plants

The resource will continue to be extracted for the above-listed purposes.

ARQ has tendered for a contract for the supply of ballast material to a future temporary rail siding site to be used by ARTC when the Inland Rail project commences construction in the region. A significant portion of annual extraction would be supplied for this project.

Petrographic analysis completed by Geochempet Services (2013) on a ballast sample from the quarry was undertaken to determine if the quarry material is suitable for use as ballast and marine armour rock. The report concluded:

- That the basaltic aggregate sampled is predicted to be suitable for use as ballast.
- That the rock equivalent to the supplied sample is adequate for use as a source of marine armour rock because of the 20% of soft, weak minerals may allow slow penetration by seawater, provided that a quarry assessment is made to check if blocks of sufficient size are free of weaknesses such as fractures/veining and jointing.

14.1.1.6 Mineral Resource

A review of the MinView online database confirms that there are several base/precious metal occurrences in the region, with the closest current resource located approximately 12.5 km north-west of the subject site at the Northparkes Mine. The mineralisation at Northparkes Mine occurs within the Goonumbla Volcanics but is in proximity to sub-vertical porphyritic intrusions.

Petrographic analysis completed by Geochempet Services (2013) did not identify any base/precious metals or other valuable mineral resources within the quarry sample. Primary and secondary mineral components are outlined below:

- Primary components:
  - 45% plagioclase feldspar
  - 14% clinopyroxene
  - 5% opaque oxides (magnetite and/or ilmenite)
  - <1% apatite
- Secondary minerals:
  - 16% chlorite and chlorite-smectite
  - 15% epidote

- 3% sericite
- 1% calcite
- 1% prehnite
- Trace quartz

In addition to the absence of valuable mineral resources contained within the quarry sample, results from a surface assay (available via MinView) taken from the drainage line passing through the existing quarry site confirms there are no high-grade base or precious metal deposits at that location.

14.1.2 POTENTIAL IMPACTS

The proposed quarry expansion would result in the extraction of 724,700 m^3 (1,956,690 tonnes) of basalt. At the maximum extraction rate (300,000 tonnes/year) the quarry life would be 6-7 years. By comparison to the nearby Northparkes Mine, milling a total of 6.1 million tonnes in one year (CMOC – Northparkes Mines, 2016), the proposed expansion would not rapidly deplete the resource. In addition, the Goonumbla Volcanics are relatively common in the locality with 3,234 ha of that unit mapped within a 10 km radius of the subject site. The proposal would affect 1.90 ha (0.06 %) of Goonumbla Volcanics mapped within 10 km of the subject site.

14.1.3 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- With regard to both Stages of quarrying, if unsuitable materials are intercepted, they would be avoided where possible.
- If significant changes in geology (or mineralisation) are observed during quarrying ARQ would engage a suitably qualified professional to identify the rock type and any implications for future quarrying.

Land

15.1 LAND USE ZONING

The subject site and surrounding land within a 5 km radius is zoned RU1 – Primary Production. Under the provisions of the *Parkes Local Environmental Plan 2012* the objectives of this zoning are:

- *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*
- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands.*
- *To minimise conflict between land uses within this zone and land uses within adjoining zones.*
- *To encourage eco-tourism enterprises that minimise any adverse effect on primary industry production.*
- *To permit non-agricultural uses that support the primary production purposes of the zone.*
- *To permit small scale rural tourism uses associated with primary production and environmental conservation with minimal impact on primary production and the scenic amenity of the area.*
- *To encourage the provision of tourist accommodation in association with agricultural activities.*
- *To provide opportunities for employment-generating development that adds value to local agricultural production and integrates with tourism.*

The proposal is not antipathetic to the realisation of any of these land use objectives (refer **Section 5.2**).

15.2 SOIL LANDSCAPE & LAND CAPABILITY

The OEH eSPADE identifies three soil landscapes occurring over the subject site (refer **Figure 27**).

The Brolgan Plain soil landscape is mapped as occurring on the level to gently undulating plains on Quaternary alluvium, with Red Brown Earths occurring in association with this soil landscape at the locality.

The Goonumbla soil landscape occurs on the crests and ridges and undulating side slopes of Ordovician Goonumbla Volcanics, with Non-Calcic Brown Soils occurring in association with this soil landscape at the locality.

The Cook Myalls soils landscape occurs on the undulating plains and rises in the vicinity of Cook Myalls (west of Parkes), on intermediate volcanics, chert, sandstones, siltstones, conglomerates and limestones. Non-Calcic Brown Soils occur in association with this soil landscape at the locality.

Figure 27: Soil Landscape Map

The Land and Soil Capability (LSC) assessment scheme uses the biophysical features of the land and soil including landform position, slope gradient, drainage, climate, soil type and soil characteristics to derive classes for a range of land and soil hazards (OEH, 2012). These hazards include soil acidification, water erosion, soil structure decline, wind erosion, shallow soils/rockiness, salinity, mass movement and waterlogging. The land and soil capability mapping corresponds to each soil landscape and the LSC class is categorised based on the most limiting hazard.

Land in capability classes 1-3 is capable of a wide variety of uses and requires limited management. Land in capability classes 4-5 is also capable of a variety of land uses but requires careful management to prevent long-term degradation. Land in capability class 6 has limited land capability and is restricted to low-impact land uses. Land in capability class 7 has very low capability and can result in severe impacts if limitations are not managed (OEH, 2012).

The soil and land capability for each soil landscape is provided in **Table 15.1**.

Table 15.1 – Land and Soil Capability

		Soil Landscape		
		Brolgan Plain	**Cook Myalls**	**Goonumbla**
Hazard Classification	Soil Acidification	1	3	3
	Water Erosion	1	3	3
	Soil Structure Decline	4	3	4
	Wind Erosion	3	2	2
	Shallow Soils/Rockiness	1	1	4
	Salinity	3	3	1
	Mass movement	1	1	1
	Water-logging	3	3	2
LSC Class		4	3	4
Capability		Moderate	High	Moderate

Source: Land and Soil Capability Mapping for NSW (OEH, 2012)

Based on the above, the proposal is located on lands mapped as having Moderate and High capability.

15.3 ACID SULFATE SOIL

The Australian Soil Resource Information System (ASRIS) on-line database maintained by CSIRO Land and Water indicates there is a 'low' to 'extremely low' probability of occurrence of acid sulfate soils, as shown on **Figure 28** overleaf.

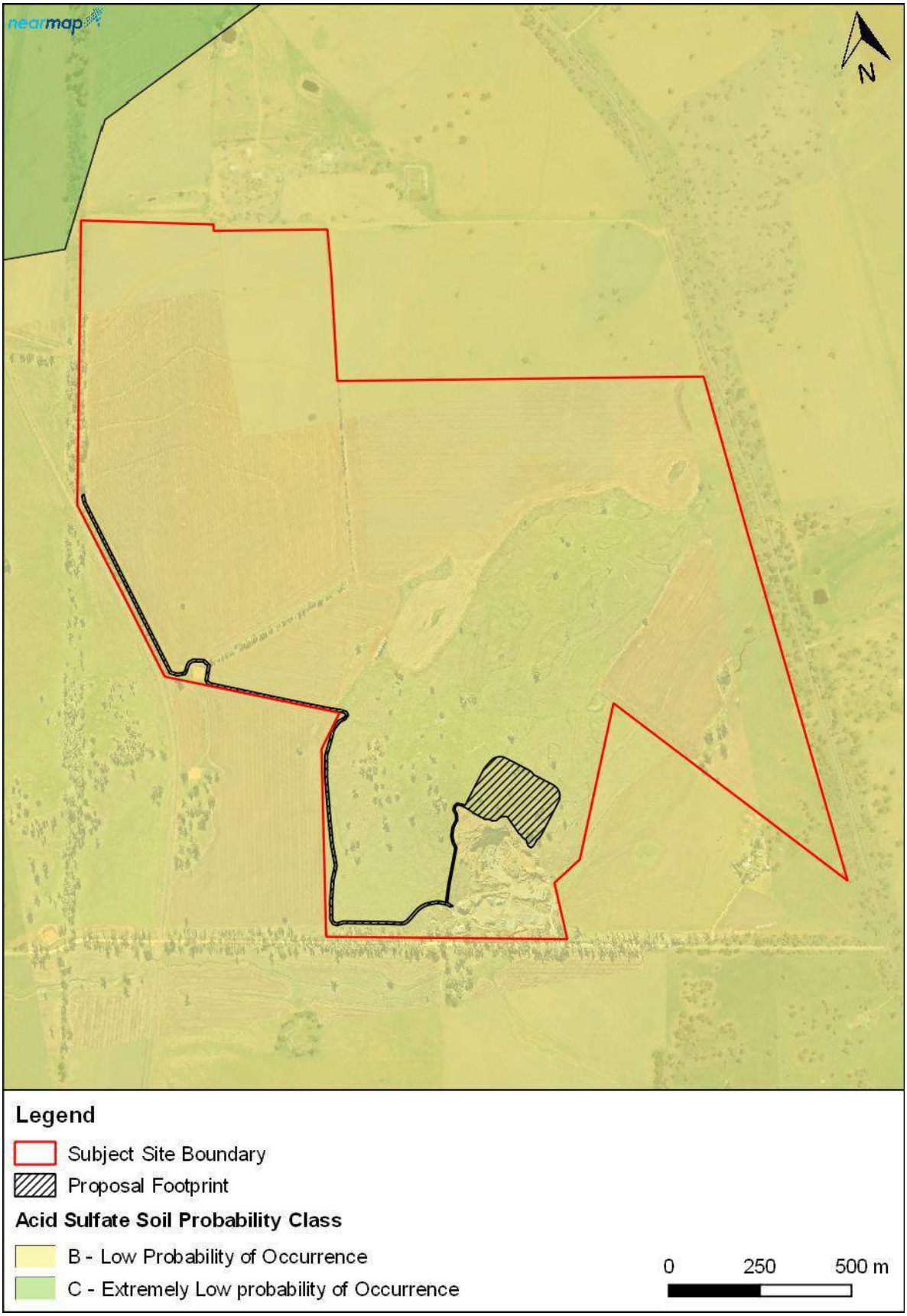

Figure 28: Probability of Acid Sulfate Soil

15.4 AGRICULTURE

There is no mapped Biophysical Strategic Agricultural Land (BSAL) within or near the subject site. The closest BSAL is mapped approximately 37 km east and south-west of the subject site.

15.5 LANDFORM

The existing quarry is located on the side of a crest of an elevated ridgeline that extends to the north-east. The existing open cut pit has a large exposure of the underlying geology and is consistent in rock type and structure. No wide fault zones or fracturing have caused geotechnical instability since the proponent began quarrying in 2013. The area of quarry expansion continues into the ridgeline and has extensive outcropping rock.

The proposed access road to a future rail siding is located along existing farm tracks that cross paddocks used for cropping/grazing that gently slope away from the elevated ridgeline, falling predominantly to the west and south.

15.6 EXPLORATION TITLES AND APPLICATIONS

Modeling Resources Pty Ltd hold a current exploration licence (EL7676) that covers part of the existing quarry but is not within the quarry expansion footprint. This exploration licence expired on 11 January 2018 and renewal has been sought. The status of the renewal application is unknown.

The following companies hold current exploration licences covering a small part of the subject site but are not within the proposal footprint:

- Omya Australia Pty Ltd hold EL8630 and is due to expire 24 July 2020.
- CMOC Mining Pty Ltd hold EL5801 and is due to expire 1 September 2019.

Agricultural Equity Investments Pty Limited applied for a mineral exploration licence (ELA5631) on 19 January 2018. The status of this application is unknown.

The location of current titles and applications relative to the subject site and proposal footprint is provided in **Figure 29** and **Figure 30** overleaf.

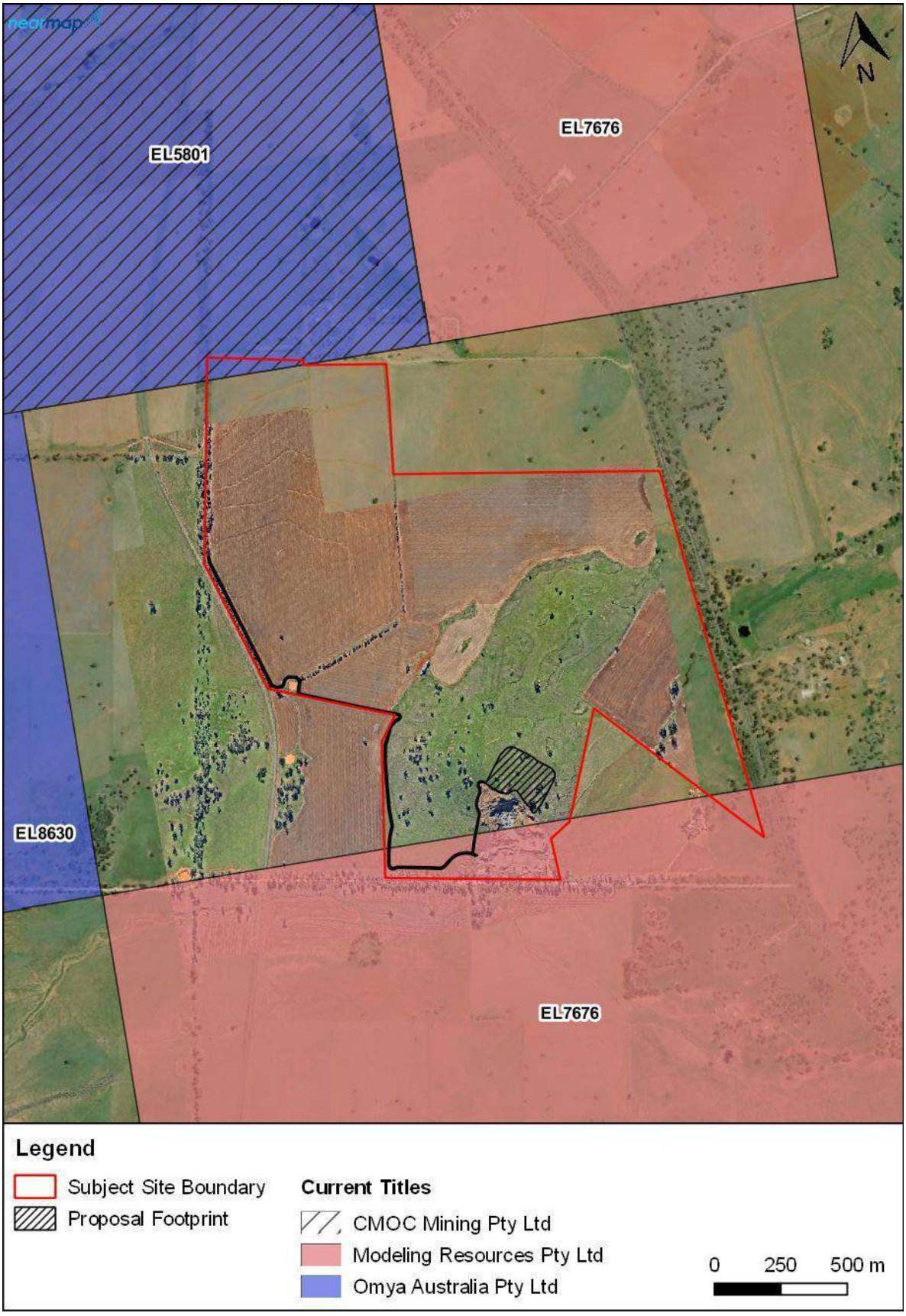

Figure 29: Current Titles

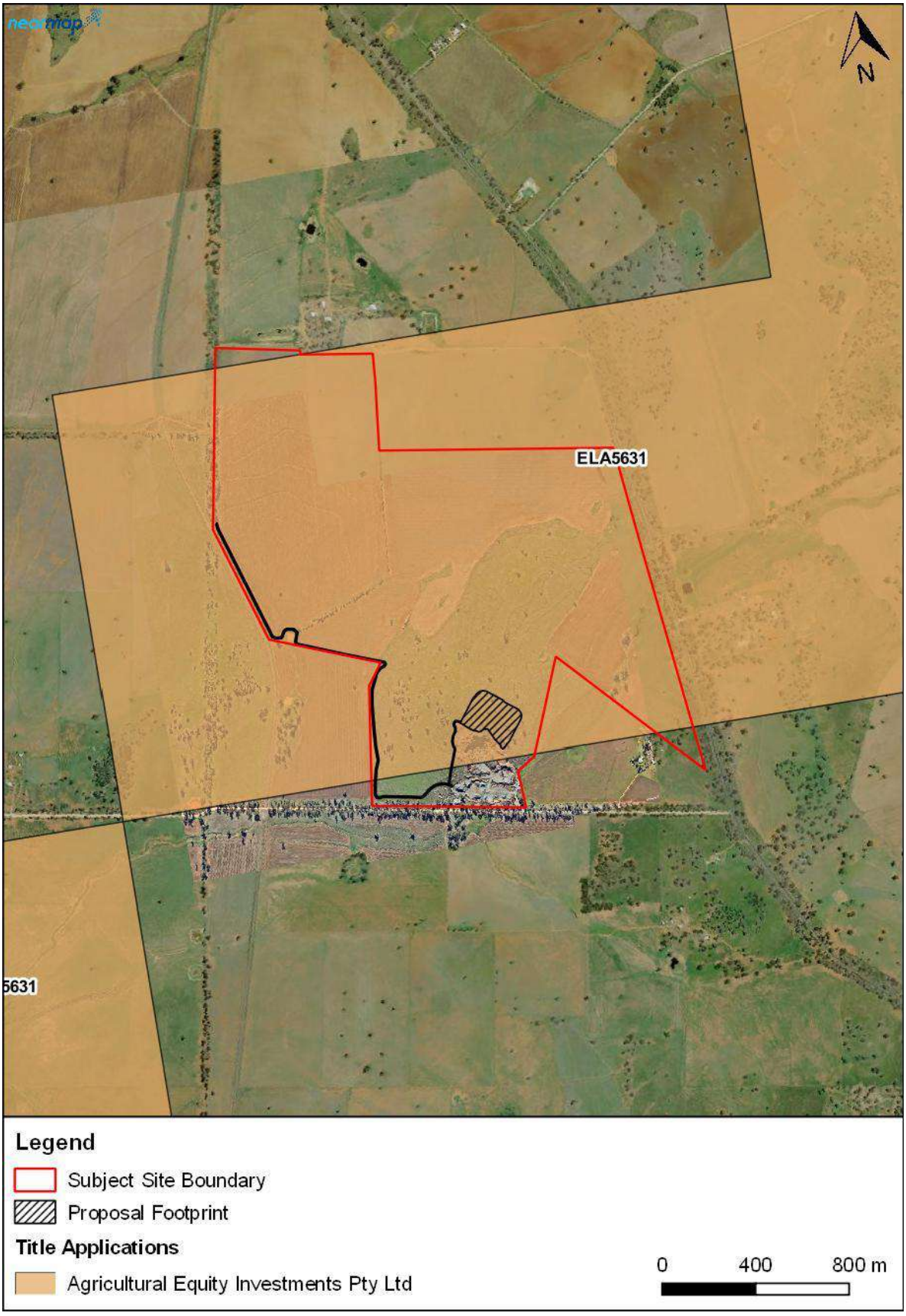

Figure 30: Current Title Application

15.7 CONTAMINATION

A review of the EPA Contaminated Land Record under Section 58 of the *Contaminated Land Management Act 1997* (CLM Act) and the List of NSW contaminated sites notified to EPA under Section 60 of the CLM Act does not identify any registered contaminated sites at or near the subject site.

The Central West Councils Environment and Waterways Alliance developed the Contamination Central Project for the alliance Councils, which includes Parkes Shire Council. The project has resulted in the development of the *Central NSW Regional Contaminated Land Policy Template*. Appendix A of the policy template contains a list of potentially contaminating land uses, and includes the following land uses relevant to the subject site:

- Extensive agriculture: farm shed activities such as chemical storage and handling.
- Mining and extractive industries: including mineral or ore processing or coal washing etc.
- Store and dispense 450 L or more of fuel or oils
- Storage of plant and equipment: generally informal storage of equipment that may lead to land contamination.
- Landfill sites: sites used for the disposal of waste.

There are no farm sheds within the subject site. Silos located within the subject site are outside the proposal footprint.

The existing quarry is an extractive industry but does not involve any chemical processing of minerals or ore. Processing only requires water.

The existing quarry operation provides bunded storage for 450 L of oils and plant/equipment may have caused soil or water contamination due to small leaks of fuel/oils during operation and storage on-site.

The subject site contains a waste dump that was present before quarrying commenced by the proponent in 2013. The source of the material is not known, and the proponent has not used the pit to dispose of any waste.

The waste dump is located within the area of proposed bunding, as shown in **Figure 31** overleaf.

A photograph of the waste dump is provided in **Plate 3**.

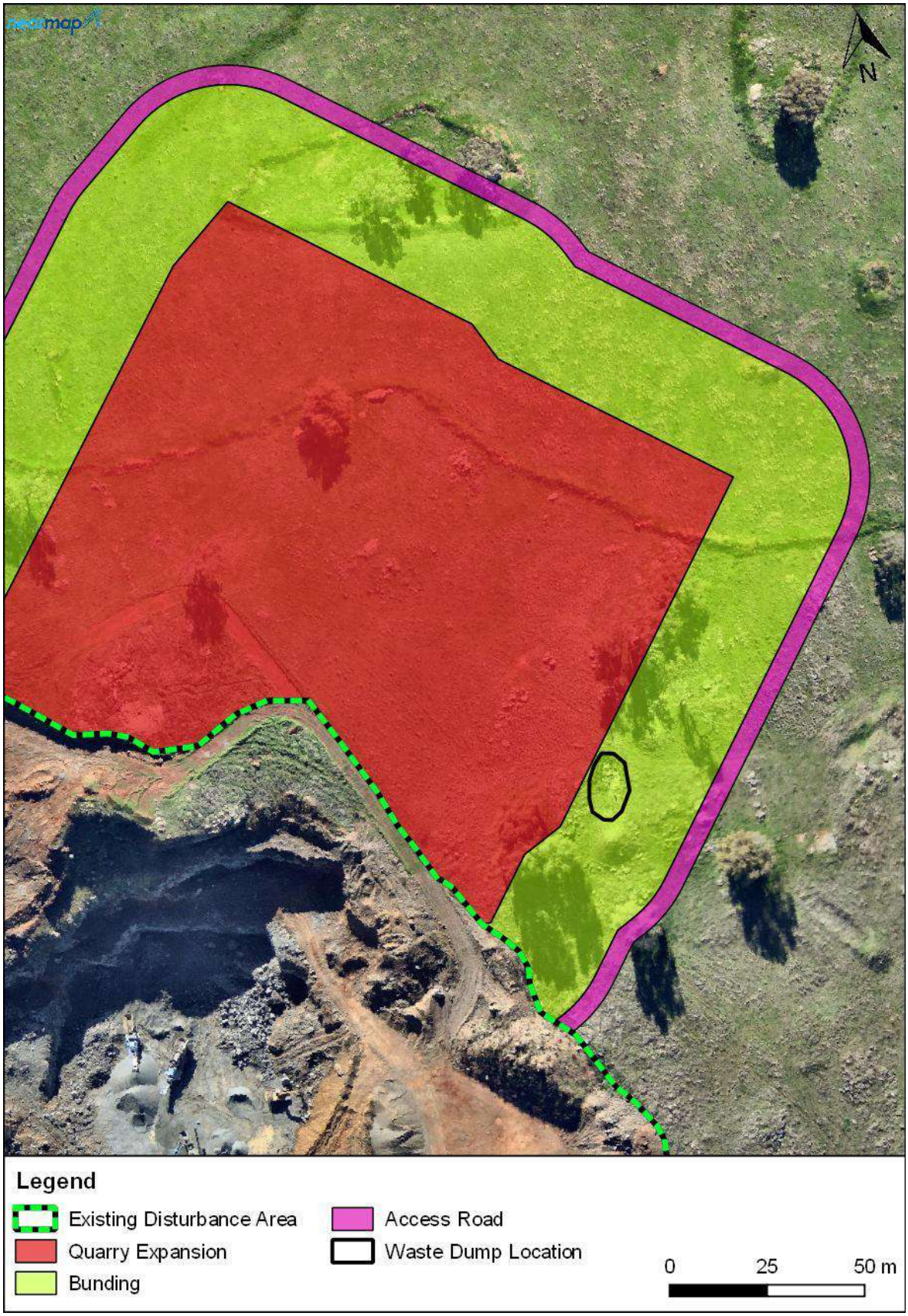

Figure 31: Location of Waste Dump

Plate 3: Waste Dump (view towards north east)

15.8 POTENTIAL IMPACTS

15.8.1 AGRICULTURE

The proposed quarry expansion is an extension of an existing operational quarry and is not a new land use in the locality. The proposed access road to a future rail siding would utilise existing farm tracks and only result in minor impact to land used for grazing/agriculture by road widening in some sections of the road.

The subject site does contain some viable agricultural land but does not contain any BSAL. The proposed quarry expansion impacts an area of relatively low productivity agricultural land due to extensive outcropping and shallow rock preventing cultivation.

The Parkes LGA covers a total area of 598,973 ha. Review of land use zoning data for the LGA identifies that 94.5% (566,208 ha) of the LGA is zoned RU1 – Primary Production. The proposed quarry expansion would permanently impact 1.90 ha of RU1 zoned land, representing 0.000003% of RU1 zoned land in the LGA. The proposal does not compromise or significantly diminish the availability of land for primary production purposes in the Parkes LGA. It does not reduce, nor impact directly or indirectly on any BSAL. It does not compromise the capacity for immediate neighbours to continue existing or proposed primary production land uses at this locality.

15.8.2 LANDFORM

The proposed quarry expansion would result in the removal of 1.90 ha (final void) of the existing rocky ridgeline. The lack of geotechnical instability encountered at the existing quarry and the lack of any known significant fault zones in the quarry expansion area indicates that geotechnical instability is

unlikely to result from the proposed expansion. Benching in accordance with quarry design plans in the **Drawing Schedule** will also minimise the potential for pit wall instability.

15.8.3 SOIL IMPACTS

Potential soil impacts relate to the potential for erosion and off-site sediment movement, and compaction. The proposal would have no long-term impact on soil resources (other than extraction of the resource from the quarried areas) nor would it result in significant changes to any characteristics of the soil landscape. Potential impacts to soils would be minimised by mitigation measures provided in **Section 15.9**.

15.8.4 MINERAL EXPLORATION

The proposal would not prevent exploration licence holders from undertaking exploration activities at the subject site. The quarry expansion does involve the removal of rock that would no longer be available for exploration drilling. However, exploration licence holders would not be restricted in their ability to drill under or around the existing and expanded quarry.

As noted in **Section 14,** the material to be extracted is unlikely to be targeted for exploration as testing did not identify any valuable mineral resources in the basalt.

15.8.5 CONTAMINATION

The waste dump is within the proposal footprint and will therefore be impacted. The waste material will need to be classified appropriately and disposed of lawfully before quarry expansion works commence.

Contamination of soil or water may occur if leakage from oil/fuel storage or plant/equipment occurs.

15.9 MITIGATION MEASURES

The following mitigation measure will be implemented prior to quarry expansion commencing:

- Waste material in the waste dump will be classified appropriately by a suitably qualified professional and wastes will be disposed of lawfully. Where surrounding soil has become impacted by landfilled waste, waste classification of soil material will include laboratory analysis for potential contaminants to determine suitability for disposal.

The following mitigation measures will be implemented and incorporated into an EMP:

- Implementation of the SWMP to manage erosion and sedimentation impacts and surface water.
- Implementation of a Weed Management Plan to prevent the infestation and spread of weeds.
- Undertake the quarry expansion in accordance with the quarry design plans in the **Drawing Schedule**.
- Activities with the potential for spills would not be undertaken within 50 m of any of the farm dams or drainage lines.
- A suitable spill response and containment kit will be available on site.
- Storage, handling and use of any potentially hazardous materials (e.g. fuel) would be in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of Practise.*

Traffic and Access

16.1 EXISTING ENVIRONMENT

16.1.1 WYATTS LANE

Traffic volumes for Wyatts Lane are limited to vehicles associated with the current primary production uses in the area and for access to various dwellings.

16.1.2 BOGAN ROAD

As reported in the Geolyse (2012) *Statement of Environmental Effects – Proposed Quarry*, the Annual Average Daily Traffic (AADT) volume for Bogan Road is approximately 500. Expansion of the Northparkes Mine in 2014 (DPE, n.d. [Northparkes Extension Project]) and modification applications (DPE, n.d. [Mod 1, Mod 2 and Mod 3]) for the Northparkes Mine did not increase traffic generation on Bogan Road. Therefore, it is expected that AADT for Bogan Road is unchanged.

16.1.3 CONDITIONS AFFECTING TRANSPORT

Wyatts Lane is sealed from the quarry access point to Bogan Road and therefore dust is not expected to be generated from transporting the quarry product. Frost and fog during winter months is not considered likely to significantly impact the transport of quarry product. Adverse weather conditions are unlikely to exacerbate risks because in wet weather the pit is not likely to be in operation.

16.2 POTENTIAL IMPACTS

16.2.1 TRAFFIC ROUTE

No change to the existing transport route via Wyatts Lane to Bogan Road is proposed.

The use of the proposed access road to a future rail siding site does not form part of this assessment and would be dealt with via a DA modification if its use is required.

16.2.2 TRAFFIC GENERATION

Daily heavy vehicle movements will vary over the life of the quarry in response to demand and contracts. Notwithstanding, the cap on annual tonnage transported from the quarry by heavy vehicle via public roads, as part of the proposed expansion, is 150,000 tonnes.

Spread evenly throughout the year this equates to an average of 15 heavy vehicles (30 movements) a day, six days a week. In terms of a maximum number of heavy vehicle movements in a day, the opportunities provided through the quarry expansion would see a doubling of these heavy vehicle numbers (i.e. 30 heavy vehicles – 60 movements) with up to 1,000 tonne of product transported from the quarry in a day.

An increase in light vehicles would also result because of the 4 additional employees driving to and from the site each day.

16.2.3 INTERSECTION TREATMENT

The existing intersection treatment at Bogan Road and Wyatts Lane (a CHR[S] and AUL arrangement) was designed and constructed by Parkes Shire Council after the proponent secured development consent to commencing quarrying in 2013 (DA 12097).

The existing intersection treatment remains adequate to accommodate the daily maximum heavy vehicle movements generated as a result of the proposed quarry expansion; capped at 1,000 tonne of product transported from the quarry in any one day (i.e. 30 heavy vehicles – 60 movements).

It is also noted that the ARQ will continue to operate under the same conditions as the existing operation. Specifically:

- Transportation of material off-site will not occur on a Sunday or Public Holidays.
- Transport activities will be restricted to outside school bus times, specifically excluding transport of quarry products between 8:00 – 9:00 am and 3:30 – 4:30 pm on school days.
- Any 'incident' related to the intersection will be required to be reported to the proponent who will, in turn, report this to Parkes Shire Council.

16.3 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- ARQ will maintain a record of heavy vehicle movements on a daily basis to ensure that maximum daily heavy vehicle movements are not exceeded.
- ARQ will ensure that transport activities are not undertaken during school bus times, specifically excluding transport of quarry products between 8:00 – 9:00 am and 3:30 – 4:30 pm on school days.
- ARQ will maintain an Incident Register. Any 'incident' relating to off-site haulage will be reported to Parkes Shire Council.

Hazards and Public Safety

17.1 BUSHFIRE HAZARD

17.1.1 RISK

Review of the NSW Planning Portal confirms that the subject site does not contain any mapped bushfire prone land.

The closest bushfire prone land is mapped approximately 3 km north-east of the proposed quarry expansion. The patch of vegetation mapped as bushfire prone is isolated and not connective with woodland at or near the subject site.

The subject site is predominantly used for agriculture (grazing and cropping). Vegetation surrounding the proposal footprint includes shrub/grass/forb woodland (where outcropping rock has prevented cultivation) as well as cropped land (Biosis, 2018). Woodland also occupies the Wyatts Lane road corridor and a small area along the southern boundary of the site. The quarry operation is separated from this woodland by 3 m high bunding along the southern extent of the existing disturbance area.

Slope around the proposal footprint varies as the quarry is located on a ridgeline, and the access road to a future rail siding site is located on gently sloping ground falling away from the ridgeline to the west and south. From the side of the quarry expansion to the west, it is upslope. Downward slopes around the northern and eastern side of the quarry expansion ranges from approximately 6 – 12 % (3.4 – 6.8 degrees).

On the basis that the subject site is not identified as being bush fire prone, neither Australian Standard 3959-2009 or the Rural Fire Service *Planning for Bushfire Protection 2006* (PBFP) are considered to apply to the proposal. Notwithstanding that the subject site is not mapped as bushfire prone, a general assessment of the development against the objectives of PBFP is provided in **Table 17.1**.

Table 17.1 – General PBFP Principles

Principle	Response
Protection measures are governed by the degree of threat posed to a development	The proposed mitigation measures are considered appropriate for the degree of threat to the site and focus on separating quarry activities from potential bushfire threats (i.e. woodland), ensuring appropriate storage of flammable materials and appropriate measures to respond to a bushfire threat.
A minimum setback from a hazard is always required, i.e. a defendable space	Bunding is provided around the quarry site and is proposed around the quarry expansion. This separates quarry activities from surrounding vegetation.
The greater the setback from the hazard, the lower the subsequent bush fire protection construction standards required	No applicable bush fire protection construction standards apply.
The smaller the interface a development has fronting the bush fire threat, the less the opportunity for bush fire to threaten the development	Noted
Bush fire protection measures (BPMs) are contained within the 'overall' development and not on adjoining lands, other than in exceptional circumstances	This is achieved.
No development in a bush fire prone area can be guaranteed to be entirely safe from bush fires	Noted

17.1.2 POTENTIAL IMPACTS

Impacts associated with bush fire threat to the quarry are considered to be largely negligible due to the managed nature (cropping/grazing) of the surrounding landscape and the mitigation measures provided to minimise bushfire risk. The proposal itself it not likely to pose a significant bushfire threat as all quarry proposed activities would be undertaken within the quarry and on gravel access roads, therefore minimising the potential for vehicles to spark a grass fire.

17.1.3 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- All quarry activities will be undertaken within the quarry and on gravel access roads.
- No explosives would be stored on-site.
- All existing and proposed oil / fuel storage bunds will be maintained in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of Practise.*
- ARQ would ensure that a water cart is available, thereby providing firefighting capabilities if required.
- In the event that the subject site is threatened by a bushfire, site personnel would be evacuated via the Wyatts Lane entry point, or via the siding access road which provides an alternative exit point to Wyatts Lane. Alternatively, if evacuation is not possible or safe, the open-cut pit would provide a cleared area for personnel to shelter.
- The current Pollution Incident Response Management Plan (PIRMP) will be updated to reflect the proposed quarry expansion and potential hazards.
- ARQ will prepare a Bush Fire Management Plan.

17.2 NATURALLY OCCURRING ASBESTOS

17.2.1 RISK

Review of the NSW OEH SEED online database confirms that the subject site contains land mapped as containing a geological unit with low potential for Naturally Occurring Asbestos (NOA). However, the proposal footprint is not located within mapped NOA, as shown on **Figure 32** overleaf. The quarry expansion is located approximately 1 km away from the mapped NOA.

The metadata for the NOA mapped at the subject site identifies the NOA as basal units of the Nelungaloo Volcanics with slight potential mafic component that are buffered due to limited outcrop. The proposed quarry expansion is within the mapped Goonumbla Volcanics.

Petrographic analysis by Geochempet Services (2013) did not identify any NOA minerals (such as chrysotile, actinolite, amosite, anthophyllite, crocidolite or tremolite) within the quarry sample.

17.2.2 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- If ARQ encounters a significant change in geology or suspected NOA minerals, all quarry activities would immediately cease and ARQ would engage a suitably qualified professional to identify the rock type and any potential NOA hazards.
- If required, an Asbestos Management Plan would be prepared.

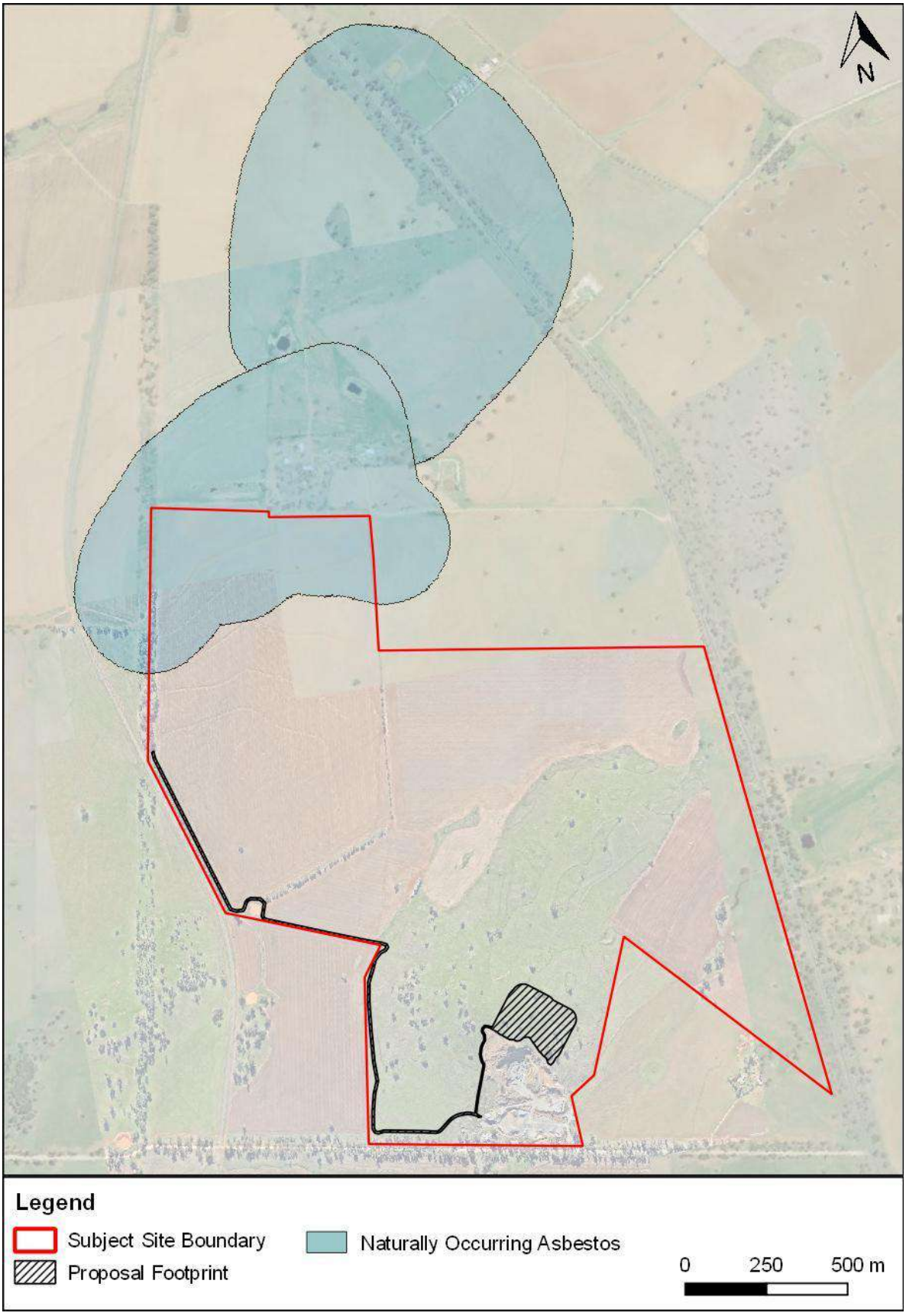

Figure 32: Naturally Occurring Asbestos

17.3 SILICA HAZARD

17.3.1 RISK

Workers can come across crystalline silica during excavation through quartz containing rock. A health hazard is created when the very fine particles of crystalline silica can be inhaled. Respirable crystalline silica (RCS), depending on factors such as how much dust a worker breathes in and for how long, can cause silicosis. Silicosis is a fibrosis (scarring) of the lung resulting in loss of lung function.

Significant levels of airborne dust are most likely to occur when materials or products in the workplace are cut, sanded, drilled or during any other activities which create fine dust.

Petrographic analysis completed by Geochempet Services (2013) estimated the free silica content as a trace amount of quartz. Therefore, it is not anticipated that high levels of silica would be encountered during quarrying.

17.3.2 MITIGATION MEASURES

In accordance with the *Work Health and Safety Regulation 2017* (WHS Regulation) and as outlined by SafeWork NSW (2017), the following mitigation measures will be implemented and incorporated into an EMP:

- Apply water suppression to reduce dust generation.
- Provide suitable personal protective equipment, including a program to correctly fit, instruct on the use and ensure regular maintenance of respiratory protective equipment.
- Use dust removal systems on tools to reduce dust exposure of mobile workers
- Isolate areas of the workplace where dust is generated by other workers.
- Ensure regular housekeeping in dusty work areas to prevent the accumulation of dust.

In addition to the above measures, if ARQ encounters a significant change in geology or significant quartz, ARQ would engage a suitably qualified professional to identify the rock type and any potential hazards.

17.4 BLASTING

17.4.1 RISK

Blast risks include noise, vibration and air quality and these are addressed in **Section 8**.

Additional blast risks include the following:

- Potential for rock to be ejected beyond the blast site, causing injury or property damage.
- Misfire may result in unexploded charges and detonators being left in the face or in the broken rock.
- Quarry operator exposure to blast fumes.

17.4.2 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- ARQ will continue to engage a qualified blast contractor for all blasting activities.
- ARQ will prepare a Blast Management Plan (BMP) that addresses all necessary requirements to ensure that any blasting operations carried out by the mine operator comply with the *Explosives Act 2003* and the *Explosives Regulations 2013*.

- ARQ will notify the Chief Inspector of the DRE of the name of the mine operator and production manager.

17.5 HAZARDOUS / DANGEROUS GOODS

17.5.1 RISK

Fuels and chemicals may pose the following risks:

- Contamination (surface water, groundwater or soil).
- Fire hazard due to flammability.
- Health hazards due to exposure, inhalation or ingestion of hazardous substances.

An existing bunded container capable of holding 1400 L is located next to the site compound. This container stores the following:

- 205 L of engine oil
- 205 L of hydraulic oil
- 40 L of transmission oil

A bunded container for a 30,000 litre diesel fuel tank is proposed as part of the proposal for re-fuelling and maintenance purposes. The bunded container will be located adjacent to the site compound.

17.5.2 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP to minimise risks associated with the use, storage and transport of hazardous / dangerous goods:

- All existing and proposed oil / fuel storage bunds will be maintained in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of Practise.*
- No explosives required for blasting will be stored on site. All blasting materials will be transported to and from the subject site by the qualified blast contractor.
- Diesel will be transported to the subject site by a fuel tanker.
- The diesel tank will be contained in its own bund and no other flammable materials would be stored within the diesel tank bund.

17.6 PUBLIC SAFETY

17.6.1 RISK

Public safety risks of a quarry operation include unsafe access into the quarry, injury by fall or rock fall.

17.6.2 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- Ensure the entrance to the subject site is via locked gates.
- Maintain signage provided at the quarry entrance (**Plate 4**).
- Maintain perimeter bunding to prevent unsafe access into the quarry.
- Inspect and maintain boundary fencing near the quarry.
- Undertake rehabilitation in accordance with a Rehabilitation Plan to ensure the final landform is safe and stable.

Plate 4: Signage at Quarry Entrance

Wastes

18.1 POTENTIAL IMPACTS

18.1.1 WASTE DUMP IMPACT

As noted in **Section 15.7**, an existing waste dump is located within the proposal footprint. Waste material in the waste dump will be classified appropriately by a suitably qualified professional and wastes will be disposed of lawfully. Where surrounding soil has become impacted by landfilled waste, waste classification of soil material will include laboratory analysis for potential contaminants to determine suitability for disposal.

18.1.2 WASTE GENERATION

The quarry does not produce significant waste rock volumes. Overburden and minor waste rock (i.e. rock with high clay content in fault zones) would be utilised for bunding around the quarry expansion.

No significant volumes of general waste would be produced by the proposal. Minor general waste would be collected in skip bins on site and disposed of at a local waste facility. No waste would be disposed of on-site.

18.1.3 ACID GENERATION

The type of rock (basalt) to be extracted is not known to have a chemical composition likely to contribute to potential acid generation. No sulphide minerals were reported in the samples analysed by Geochempet Services (2013). The risk of potential acid generation from excavated rock is considered to be very low.

18.2 MITIGATION MEASURES

The following mitigation measures will be implemented and incorporated into an EMP:

- The waste material in the waste dump will be classified appropriately by a suitably qualified professional and wastes will be disposed of lawfully.
- Waste rock material will be stockpiled around the pit in the bunding area, as described in **Section 3.1.3**.
- Skip bins will be provided for the disposal of minor domestic and industrial waste generated on-site. Wastes will be disposed of at a local waste facility.

Utilities

A *Dial Before You Dig* search confirms that the only infrastructure within the subject site is an Essential Energy overhead powerline that crosses the existing quarry site. The proposal does not require any augmentation to the existing electricity supply.

Socio-Economic Impacts

20.1 POTENTIAL IMPACTS

The proposal has the potential to result in a range of real and perceived socio-economic impacts, both positive and negative, as follows:

Positive:

- Provide local employment for an additional 4 jobs having a positive impact on local communities in the locality.
- Providing a viable resource to meet market requirements for the quarry product.
- Bolster and support the operation of a local company providing the opportunity for flow on effects to the community.

Negative:

- Potential impacts to property valuation in the immediate locality.
- The potential for the perception of health risks associated with the activity (air quality and noise etc.).
- Potential visual impacts associated with the operation.

These negative impacts are minor and manageable via the measures set down in this EIS and are considered negligible when compared to the positive flow on impacts associated with the proposal.

20.1.1 MITIGATION MEASURES

The following mitigation measures would be implemented and incorporated into an EMP. The measures are proposed to off-set any residual perceived socio-economic impacts associated with the proposal.

- Establish, operate and maintain a clear and easily used method for engaging with the general public and potentially affected nearby residential properties.
- Maintain a complaints line providing a direct avenue for complaints to be registered and addressed directly with ARQ rather than Council needing to get involved.
- Maintaining a reporting system that transparently reflects the activities at the site, available for viewing by the general public and regulatory agencies.
- Seek to employ local people rather than those from further afield.
- Seek to use local companies rather than larger regional or interstate firms.
- Ensure the site is appropriately rehabilitated.

On balance, positive socio-economic impacts are considered to outweigh the negative, and the measures proposed would ensure the proposal operates in a responsible and sustainable manner.

Cumulative Impact

Cumulative impacts associated with the proposal are identified to potentially occur in the following scenarios:

- Cumulative noise, air quality and traffic impacts associated with the operation of other industries, mines and agricultural industries in the region.
- The expansion of the quarry and addition of a siding access road may, overtime, lead to an increase in traffic, dust and noise and vibration generation in the locality which may in turn impact ecological values surrounding the subject site.

Cumulative impacts in relation to the above scenarios could include impacts such as:

- individual impacts so close in time that the effects of one are not dissipated before the next (time crowded effects); or
- individual impacts so close in space that the effects overlap (space crowded effects); or
- repetitive, often minor impacts eroding environmental conditions (nibbling effects); or
- different types of disturbances interacting to produce an effect which is greater or different than the sum of the separate effects (synergistic effects).

By virtue of the quantitative assessments of noise, air quality and traffic impacts provided in this EIS, it is demonstrated that the overall impacts of the proposal are unlikely to lead to the above listed cumulative impacts. With respect to cumulative impacts to biodiversity, the Flora and Fauna Assessment concluded that:

- The proposal is unlikely to substantially exacerbate the decline of White box yellow Box Blakely's red gum woodland EEC or Box Gum Woodland CEEC in the local area or more broadly across the range of either community.
- The removal of 3 hollow-bearing trees and 3.6 hectares of foraging resources will contribute to the incremental reduction of habitat for threatened hollow-dependent fauna and highly mobile species in the local landscape. The foraging, roosting and nesting resources directly impacted by the proposal are all well represented beyond the subject site and as such, the loss is not expected to significantly impact any dependent threatened species.

In addition, environmental assessments for future proposals for mining (considered due to current exploration leases/application over the subject site) would be considered in the context of this quarry.

Mitigation Measures

22.1 INTRODUCTION

This section of the EIS provides a consolidated summary of all proposed safeguards and environmental mitigation measures that form part of the proposal. It collates all commitments made in this EIS and includes a description of the measures that would be implemented to monitor and report on the environmental performance of the development.

22.2 ENVIRONMENTAL MANAGEMENT STRATEGY

Potential environmental impacts will be avoided, minimised and managed through adoption of mitigation measures. The strategy for ensuring these commitments are acted upon will be to implement the following management plans:

- Environmental Management Plan (EMP)
- Surface Water Management Plan (SWMP)
- Blast Management Plan (BMP)
- Bushfire Management Plan
- Weed Management Plan
- Rehabilitation Plan
- Driver's Code of Conduct

These management plans will include, but may not be restricted to, inclusion of all relevant safeguards and environmental mitigation measures identified in this EIS (and any associated Conditions of Approval).

The SWMP has been prepared and is provided in **Appendix H**. The EMP, BMP, Rehabilitation Plan, Weed Management Plan, Bushfire Management Plan and Driver's Code of Conduct would be prepared prior to commencing the quarry expansion.

The EMP will include procedures, timing, reporting, and the allocation of responsibilities designed to minimise environmental impacts. Relevant sub-plans would be appended to the EMP.

22.3 SUMMARY OF MITIGATION MEASURES

All mitigation measures identified in **Section 7– 21** are summarised in **Table 22.1.**

Table 22.1 – Summary of Mitigation Measures

Environmental Impact	Mitigation Measures
Biodiversity	The following measures will be implemented and incorporated into an EMP: Avoidance: • Opportunities to avoid impacts within the proposed quarry expansion area are minimal due to constraints imposed by the existing quarry operation and landscape setting of the geological resource. • The proposal avoids direct impacts to remnant bushland within the Wyatts Lane road reserve by utilising the existing quarry access road for access and by siting the siding access road along existing tracks. • The proposed siding access road will be designed so as to avoid the need to remove or otherwise directly impact (e.g. lopping of limbs) hollow-bearing trees along the proposed siding access road route. • Retained trees are to be protected in accordance with Australian Standard *AS4970 – 2009 Protection of trees on development sites* (Standards Australia 2009).

Table 22.1 – Summary of Mitigation Measures

Environmental Impact	Mitigation Measures
	• Direct impacts to waterways are avoided by utilising the existing quarry access road for access and by siting the siding access road along existing tracks. • Minimise and Mitigate: • Identify the locations of retained EEC / CEEC vegetation as 'No Go' zones in an EMP and on-site using appropriate exclusion fencing and signage. • Provide site fencing and signage to delineate limits to prevent access to off-site areas, and address in the EMP. • Communicate the EEC /CEEC 'No Go' zones during the inductions for all site construction and operations personnel. This should include discussion of regulatory implications of non-approved impacts on the EEC / CEEC. • Minimise soil transportation within, into or out of the study area to reduce the spread of weeds. • Identify procedures for storage and re-use of topsoil in the EMP. • Clearing and stripping will be undertaken such that only the minimum area necessary is cleared/stripped to conduct operations. All stripped soils are to be separated (topsoil and subsoils) and stockpiled in the proposed bunding area for future rehabilitation works. • Compensatory planting of 3.6 ha of locally native plants will be undertaken by the proponent within retained EEC / CEEC vegetation west and north of the expanded quarry operations. Species consistent with Box Gum Woodland will be selected and local provenance seed used to enhance the composition, structure and long-term resilience of remnant EEC / CEEC in the study area. • Ideally, vegetation clearing should be undertaken when hollows are not being used for nesting by birds or breeding by microbats (September to November). • Pre-clearance surveys should be undertaken within 1 week before the removal of hollow-bearing trees. • If fauna are suspected to be utilising the hollow, the entrance should be blocked by the arborist and the hollow section carefully lowered to the ground for inspection by an ecologist so that fauna may be re-located. If bats are found to be roosting in the hollow, the ecologist will be required to safely release bats at sunset. • Any wildlife rescued during vegetation clearing is to be relocated to the closest available area of habitat if uninjured. If wildlife is injured during vegetation clearing they must be taken to the nearest available wildlife carer or veterinarian immediately. • Blasting will be limited to approximately 6 blasts per year between 0900 and 1700 hours. • Revegetation of post-construction landforms within the subject site will be undertaken using local native plant species consistent with White Box, Yellow Box Blakely's Red Gum EEC / Box Gum Woodland EEC. • Undertake stormwater management and sediment/erosion control measures described within the SWMP, and include within the EMP. • Implement weed hygiene protocols and weed management measures, and include within a Pest and Weed Management Plan that will form part of the EMP. • Implement dust management measures, including water sprays on crushing equipment and cessation of work during high wind conditions, and include within the EMP. • Implement noise and vibration mitigation measures, and include within the EMP. • Ensure that the EMP provides the following: – Site personnel induction requirements. – Schedule of monitoring and maintenance. – Information on ecological features to be included in site inductions and pre-start meetings. – Requirements and methods for preclearance fauna surveys by qualified person. – Procedures for unexpected threatened species finds and fauna handling. – Biodiversity specific component of site induction and toolbox talks. – Tree protection measures for retained habitat trees proximal to the subject site. – Fauna-sensitive tree-felling protocols for removal of all habitat trees.
Heritage	The following measures will be implemented and incorporated into an EMP: • Discovery of unanticipated Aboriginal objects: – All Aboriginal objects and Places are protected under the *National Parks and Wildlife Act 1974*. It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the NSW OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works will cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist.

Table 22.1 – Summary of Mitigation Measures

Environmental Impact	Mitigation Measures
Noise and Vibration	– If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These will include notifying the OEH and Aboriginal stakeholders. – • Discovery of Aboriginal ancestral remains: – Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must: 1) Immediately cease all work at that location and not further move or disturb the remains. 2) Notify the NSW Police and OEH's Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location. 3) Not recommence work at that location unless authorised in writing by OEH. • Unexpected finds protocol: – In the event that unanticipated non-Aboriginal heritage items are encountered, the archaeological remains should be assessed by an archaeologist to determine whether the suspected find constitutes a relic under the *NSW Heritage Act 1977* and whether NSW Heritage Council should be notified. The following measures will be implemented and incorporated into an EMP: Initial phase: • Using a rock drill with a shroud to minimise noise. • Both phases: • Lining the aggregate plant hopper feed bin with material to minimise the impact noise. • Clearing and stripping will be undertaken such that only the minimum area necessary is cleared/stripped to conduct operations. All stripped soils are to be separated (topsoil and subsoils) and stockpiled in the proposed bunding area for future rehabilitation works. To assist in the mitigation of potential off-site noise impacts, stockpiled material is to be formed into earth bunds along with edges of the disturbance area. • The maximum instantaneous charge is to be determined by the blast contractor using site specific data as part of the blast management plan for the quarry expansion such that the peak particle velocity and airblast overpressure criteria can be achieved. • Installation of a 5 m high, 12 m long noise barrier to the east of the aggregate plant. To achieve the acoustic objectives, all acoustic barriers should be constructed in a manner that meets the following requirements: – Reflective type noise fence panels must have a minimum surface density at air dry moisture content (excluding structural components) of 12 kg/m². – The barrier must be complete and free from gaps along its length and at ground level. – Acoustic sealing is required between posts. – The acoustic barrier could also comprise either two stacked shipping containers, or an earth berm (or a combination of earth berm and noise barrier) providing the final height of 5 m is achieved. • Using broad-band reversing alarms on all mobile plant and equipment. • Select quieter items of plant and equipment where feasible and reasonable. • Operating plant in a quiet and efficient manner; • Reduce throttle setting and turn off equipment when not being used; and • Regularly inspect and maintain equipment to ensure it is in good working order. Also check the condition of mufflers.
Air Quality	The following measures will be implemented and incorporated into an EMP: • The proposal will be undertaken in accordance with **Section 3** of this EIS. • Clearing and stripping will only be undertaken within the proposal footprint. • The maximum height of the bunding around the pit expansion is 3 m. • That site clearing activities are undertaken progressively as the quarry progresses onto a new bench. • In addition to the above, the following mitigations measures will be implemented and incorporated into an EMP: • The haulage trucks will be fitted with roll-over tarpaulins and as such all loads leaving the quarry site will be covered. • Strategic watering as required, utilised reclaimed surface water runoff from the sediment basin. • Speed limiting on the internal access road.

Table 22.1 – Summary of Mitigation Measures

Environmental Impact	Mitigation Measures
	• Temporary suspension of vehicle movements in excessively dry or windy conditions. • Finish surface of access roads and internal roads with compacted gravel to minimise dust emissions. • Maintenance of plant and machinery in accordance with the manufacturer's specifications and the *Protection of the Environment Operations (Clean Air) Regulation 2010*.
Visual Amenity	The following measures will be implemented and incorporated into an EMP: • Undertake the quarry expansion in accordance with the quarry design plans in the **Drawing Schedule**. • Clearing and stripping will only be undertaken within the proposal footprint. • Ensure the maximum height of the bunding around the pit expansion is 3 m. • Undertake 3.6 ha of compensatory planting. • Undertake rehabilitation in accordance with a Rehabilitation Plan.
Water	The following mitigation measures will be implemented and incorporated into an EMP: • Implementation of the SWMP (**Appendix H**) to manage erosion and sedimentation impacts and surface water, specifically: – The entire quarry footprint including stockpile and processing areas would be surrounded by surface water drains and diversion bunds that would: 1. Divert clean surface water runoff away from disturbed areas; and 2. Collect runoff from disturbed areas and direct it to the sediment basin. – Rock check dams would be used to control flow velocity. Discharge points for the clean water diversion drains would include level spreaders to convert channel flow to sheet flow. – Permanent drains would be constructed and rehabilitated to provide stable surface water conveyance. – Temporary drains would be constructed and relocated as required as quarry operations progress. – Initial staging of the quarry would be designed to ensure water from the pit discharges as surface flow to the sediment basin. Once the pit cannot drain via gravity (i.e. when the pit floor goes below outside surface levels during Stage 2 of extraction – a 10 m cut to the quarry floor) all runoff would be contained in the pit and then pumped to the sediment basin as required or used directly for dust suppression. – Enlarge the existing sediment basin in accordance with the SWMP design. – Manage sediment basin discharge in accordance with the SWMP. – Use temporary erosion and sediment controls during the construction stage, as outlined in the SWMP. – Incorporate erosion and sediment control design principles into the haul road detailed design. • If quarrying intersects groundwater of greater volume than short-term seepage, immediately cease quarrying and engage a suitably qualified professional to assess the groundwater resource, identify potential impacts and provide mitigation measures or areas of quarrying to avoid (i.e. restrict depth of excavation). • Activities with the potential for spills would not be undertaken within 50 m of any of the farm dams or drainage lines. • A suitable spill response and containment kit will be available on site. • Storage, handling and use of any potentially hazardous materials (e.g. fuel) would be in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of P*ractise. • Undertake all required monitoring in accordance with EPL 20288. • Contingent on securing consent, ARQ would either: – Seek to licence the unregistered groundwater bore with DPI Water / Water NSW to provide a contingency supply option; or – Decommission the unregistered groundwater bore in accordance with industry standard practice detailed in National Water Commission, National Uniform Drillers Licensing Committee, *Minimum Construction Requirements for Water Bores in Australia, Edition 3, February 2012*. • Undertake rehabilitation in accordance with a Rehabilitation Plan to ensure the final landform is safe and stable.
Geological Resource	The following measures will be implemented and incorporated into an EMP: • With regard to both Stages of quarrying, if unsuitable materials are intercepted, they would be avoided where possible.

Table 22.1 – Summary of Mitigation Measures

Environmental Impact	Mitigation Measures
	• If significant changes in geology (or mineralisation) are observed during quarrying ARQ would engage a suitably qualified professional to identify the rock type and any implications for future quarrying.
Land	The following mitigation measure will be implemented prior to quarry expansion commencing: • Waste material in the waste dump will be classified appropriately by a suitably qualified professional and wastes will be disposed of lawfully. Where surrounding soil has become impacted by landfilled waste, waste classification of soil material will include laboratory analysis for potential contaminants to determine suitability for disposal. The following mitigation measures will be implemented and incorporated into an EMP: • Implementation of the SWMP to manage erosion and sedimentation impacts and surface water. • Implementation of a Weed Management Plan to prevent the infestation and spread of weeds. • Undertake the quarry expansion in accordance with the quarry design plans in the **Drawing Schedule**. • Activities with the potential for spills would not be undertaken within 50 m of any of the farm dams or drainage lines. • A suitable spill response and containment kit will be available on site. • Storage, handling and use of any potentially hazardous materials (e.g. fuel) would be in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of Practise.*
Traffic and Access	The following measures will be implemented and incorporated into an EMP: • ARQ will maintain a record of heavy vehicle movements on a daily basis to ensure that maximum heavy vehicle movements are not exceeded. • ARQ will ensure that transport activities are not undertaken during school bus times, specifically excluding transport of quarry products between 8:00 – 9:00 am and 3:30 – 4:30 pm on school days. • ARQ will maintain an Incident Register. Any 'incident' relating to off-site haulage will be reported to Parkes Shire Council.
Hazards and Public Safety	The following measures will be implemented and incorporated into an EMP: Bushfire Hazard: • All quarry activities will be undertaken within the quarry and on gravel access roads. • No explosives would be stored on-site. • All existing and proposed oil / fuel storage bunds will be maintained in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of Practise.* • ARQ would ensure that a water cart is available, thereby providing firefighting capabilities if required. • In the event that the subject site is threatened by a bushfire, site personnel would be evacuated via the Wyatts Lane entry point, or via the siding access road which provides an alternative exit point to Wyatts Lane. Alternatively, if evacuation is not possible or safe, the open-cut pit would provide a cleared area for personnel to shelter. • The current Pollution Incident Response Management Plan (PIRMP) will be updated to reflect the proposed quarry expansion and potential hazards. • ARQ will prepare a Bush Fire Management Plan. • Naturally Occurring Asbestos: • If ARQ encounters a significant change in geology or suspected NOA minerals, all quarry activities would immediately cease and ARQ would engage a suitably qualified professional to identify the rock type and any potential NOA hazards. • If required, an Asbestos Management Plan would be prepared. Silica Hazard: In accordance with the *Work Health and Safety Regulation 2017* (WHS Regulation) and as outlined by SafeWork NSW (2017), the following mitigation measure will be implemented and incorporated into an EMP: • Apply water suppression to reduce dust generation.

Table 22.1 – Summary of Mitigation Measures

Environmental Impact	Mitigation Measures
	• Provide suitable personal protective equipment, including a program to correctly fit, instruct on the use and ensure regular maintenance of respiratory protective equipment. • Use dust removal systems on tools to reduce dust exposure of mobile workers • Isolate areas of the workplace where dust is generated by other workers. • Ensure regular housekeeping in dusty work areas to prevent the accumulation of dust. In addition to the above measures, if ARQ encounters a significant change in geology or significant quartz, ARQ would engage a suitably qualified professional to identify the rock type and any potential hazards. **Blasting:** The following mitigation measure will be implemented and incorporated into an EMP: • ARQ will continue to engage a qualified blast contractor for all blasting activities. • ARQ will prepare a Blast Management Plan (BMP) that addresses all necessary requirements to ensure that any blasting operations carried out by the mine operator comply with the *Explosives Act 2003* and the *Explosives Regulations 2013*. • ARQ will notify the Chief Inspector of the DRE of the name of the mine operator and production manager. • Hazardous / Dangerous Goods The following mitigation measures will be implemented and incorporated into an EMP to minimise risks associated with the use, storage and transport of hazardous / dangerous goods: • All existing and proposed oil / fuel storage bunds will be maintained in accordance with the Safe Work Australia (2017) *National Standard for the Storage and Handling of Workplace Dangerous Goods* and WorkCover NSW (2005) *Storage and Handling of Dangerous Goods Code of Practise.* • No explosives required for blasting will be stored on site. All blasting materials will be transported to and from the subject site by the qualified blast contractor. • Diesel will be transported to the subject site by a fuel tanker. • The diesel tank will be contained in its own bund and no other flammable materials would be stored within the diesel tank bund. • Public Safety The following mitigation measures will be implemented and incorporated into an EMP: • Ensure the entrance to the subject site is via locked gates. • Maintain signage provided at the quarry entrance (**Plate 4**). • Maintain perimeter bunding to prevent unsafe access into the quarry. • Inspect and maintain boundary fencing near the quarry. • Undertake rehabilitation in accordance with a Rehabilitation Plan to ensure the final landform is safe and stable.
Wastes	The following mitigation measures will be implemented and incorporated into an EMP: • The waste material in the waste dump will be classified appropriately by a suitably qualified professional and wastes will be disposed of lawfully. • Waste rock material will be stockpiled around the pit in the bunding area, as described in **Section 3.1.3**. • Skip bins will be provided for the disposal of minor domestic and industrial waste generated on-site. Wastes will be disposed of at a local waste facility.
Socio-economic Impacts	The following mitigation measures would be implemented and incorporated into an EMP. The measures are proposed to off-set any residual perceived socio-economic impacts associated with the proposal. • Establish, operate and maintain a clear and easily used method for engaging with the general public and potentially affected nearby residential properties. • Maintain a complaints line providing a direct avenue for complaints to be registered and addressed directly with ARQ rather than Council needing to get involved. • Maintaining a reporting system that transparently reflects the activities at the site, available for viewing by the general public and regulatory agencies. • Seek to employ local people rather than those from further afield. • Seek to use local companies rather than larger regional or interstate firms. • Ensure the site is appropriately rehabilitated so that it can be used in the future in a similar or improved manner.

Justification and Conclusion

23.1 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

23.1.1 INTRODUCTION

The *National Strategy for Ecological Sustainable Development* (NSESD) (Department of Environment and Heritage 1992) defines Ecologically Sustainable Development (ESD) as:

> *using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased (refer website)*

The concept of ESD gives formal recognition to environmental and social considerations in decision-making to ensure the current and future generations can enjoy an environment that functions as well as or better than the environment they inherit.

The core objectives of the NSESD are:

- To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- To provide for equity within and between generations; and
- To protect biological diversity and maintain essential ecological processes and life-support systems.

As outlined in Schedule 2 of the EP&A Reg, the four principles of ESC are listed below and discussed in the following sections:

- Precautionary principle
- Intergenerational equity
- Conservation of biological diversity and ecological integrity
- Improved valuation and pricing of environmental resources

23.1.2 PRECAUTIONARY PRINCIPLE

The precautionary principle states where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a justification for not implementing mitigation measures or strategies to avoid potential impact.

Lack of full scientific uncertainty has not been used to justify not implementing mitigation measures to avoid potential impact.

23.1.3 INTERGENERATIONAL EQUITY

The second principle of ESD is intergenerational equity, such that the present generation should ensure the health, diversity and productivity of the environment are equal to or better for future generations.

All work would be carried out in accordance with the environmental safeguards in **Section 22** to mitigate potential impacts and ensure that rehabilitation provides a suitable and safe environment for future generations.

23.1.4 CONSERVATION OF BIOLOGICAL DIVERSITY AND ECOLOGICAL INTEGRITY

The third principle of ESD is conservation of biological diversity and ecological integrity such that ecosystems, species and genetic diversity within species are maintained.

The Biosis (2018) Flora and Fauna Assessment concluded that a significant impact on a Matter of NES is unlikely to result from the proposal, and that the AoS indicate a significant effect is not likely to result on species assessed and therefore a SIS is not required. It is considered that the mitigating measures (including 3.6 ha of compensatory planting) provided in **Section 7** would ensure that biological diversity and ecological integrity is conserved.

23.1.5 IMPROVED VALUATION, PRICING AND INCENTIVE MECHANISMS

The final principle of ESD is improved valuation and pricing of environmental resources which establishes the need to determine economic values for services provided by the natural environment such as the atmosphere's ability to receive gaseous emissions, cultural values and visual amenity. The principle is designed to improve methods of carrying out valuation of environmental costs and benefits and use this information when making decisions.

Environmental factors have been considered in the proposal design and where possible, areas of environmental value have been avoided. Compensatory planting is also proposed to offset impacts to ecological values associated with the quarry expansion. It is also considered that the opportunity to supply ballast to a future rail siding site minimises potential environmental costs associated with off-site transport of quarry product. Internal transport of quarry product to ARTC will result in less truck movements on public roads for the duration of the contract and overall, the distance of truck movements would be less, thereby reducing emissions.

23.2 JUSTIFICATION

23.2.1 NEED FOR THE PROPOSAL

The proposal would maximise the economic and productive use of land containing a viable geological resource.

The proposed quarry expansion would allow continued extraction from the quarry and generate higher volumes of quarry product to meet the increasing local market demand for aggregate, road base and ballast. Supply of aggregate is required by the local construction industry in Parkes (i.e. concrete plants). Supply of road base is required by local earthmoving and construction companies, as well as local roads and farms. Supply of ballast material is required by both ARTC and John Holland.

The expansion of the quarry and higher extraction/processing rate would put ARQ in a favourable position to supply ballast material to ARTC for the Inland Rail project (if they are successful in tendering for the contract). ARQ communication with ARTC has confirmed that the quarry is well situated for supply ballast for both the Parkes – Narromine line and the Narromine – Narrabri line. If successful in tendering, it is anticipated that the Inland Rail project would require approximately 80% of annual extraction for a duration of 2 years.

The proposal would also generate employment (4 new staff) and therefore contribute to economic activity in the local area through positive flow on effects from wages, construction activities and equipment purchase.

23.2.2 JUSTIFICATION

In assessing whether the proposal is justified, consideration has been given to both biophysical and socio-economic factors, including the potential for residual effects on the environment and the potential benefits of the proposal. Based on the assessment undertaken and mitigation measures proposed, the potential impacts of the proposed are considered acceptable, as outlined in the following subsections.

23.2.3 BIOPHYSICAL

The proposal has been conceived to:

- Minimise the footprint of physical disturbance (such as vegetation clearance or soil and water disturbance) through the refinement of the proposal footprint.
- Minimises impacts to the local soil and water environment through provision of a detailed SWMP.
- Minimises the clearing of native vegetation, including minor amendments to the proposal footprint to ensure tree loss was avoided where possible.
- Ensure that the quarry is rehabilitated to provide a safe and stable landform.

There remains some potential for residual impacts to the environment. A summary of potential impacts is provided in the following sections.

23.2.3.1 Biodiversity

The proposal may result in the following impacts to ecological values:

- Removal of 3.6 hectares of PCT 267 White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland which is consistent with:
  - White box yellow box Blakely's red gum woodland EEC
  - Box Gum Woodland CEEC.
- Removal of three hollow-bearing trees.
- Removal of three mature White Box and six mature Kurrajong trees that provide foraging habitat for a variety of highly mobile species including some threatened species.
- Increase in deposition of dust on native vegetation and flora and fauna habitat during construction and operation of the quarry expansion.
- Increase in noise and vibration impacts to fauna habitat surrounding the subject site.
- Increased prevalence of weeds or introduction of new weeds to retained native vegetation surrounding the subject site.

Mitigation measures are provided to avoid and minimise impacts. These measures will be incorporated into an EMP.

23.2.3.2 Heritage

The Aboriginal and non-Aboriginal Cultural Heritage Due Diligence Assessment has determined that the study area possesses low archaeological potential. A desktop assessment of the study area concluded that no previously recorded Aboriginal or historical sites or objects exist within the vicinity of the study area, exempting them from harm. No previously unidentified Aboriginal or historical sites or areas of cultural sensitivity were identified during survey efforts carried out on the 22 January 2018.

The assessment concluded that no further archaeological work is required in the study area due to the entire study area assessed as having low archaeological potential.

Recommendations are provided and relate to the discovery of unanticipated Aboriginal objectives, ancestral Aboriginal remains and unexpected finds. These measures will be incorporated into an EMP.

23.2.3.3 Noise & Vibration

A Noise and Vibration Impact Assessment has been undertaken to assess the potential impacts of the noise study has been undertaken to assess the potential operational impacts.

Noise modelling for surrounding receptors identified exceedances at sensitive receptors R1 and R2 are possible as a result of noise emissions from stripping activities, the new aggregate plant and drilling activities. However, when noise mitigation measures were incorporated into the modelling, results

confirm that compliance with the noise limits could be achieved. The assessment also notes that as the depth of the pit increases, the predicted noise levels at the receptors will also decrease.

Predicted noise levels confirms that compliance with the NSW *Road Noise Policy* is predicted and adverse amenity impacts due to peak traffic levels generated by the proposal is considered unlikely.

Predicted vibration levels (excluding blasting) indicate compliance with the continuous preferred vibration nuisance criteria for locations at a separation distance of 50-60 metres, and compliance with the building damage criteria is predicted at 10 metres from operations for each source.

With a maximum instantaneous charge (MIC) of 100 kg, results predict compliance with the criteria of 115 dB(Lin Peak) at all nearby receptors. Applying the MIC as determined from the air blast overpressure calculation of 100 kg, the ground vibration level predicted to occur at receptor R1 is 2 mm/s, which complies with the criteria of 5 mm/sec and the long term regulatory goal of 2 mm/s.

Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.4 Air Quality

An Air Quality Assessment has been undertaken to assess the potential operational impacts of the proposed quarry expansion. The results of the air modelling indicate compliance with the all air quality objectives is predicted to be achieved for all relevant averaging periods at the nearest sensitive receptors to the quarry expansion. Overall, based on the results of the predictive dispersion modelling, the risk of adverse impacts of the proposed expansion of the quarry is considered to be low.

A Greenhouse Gas Assessment has also been performed for the proposal. The assessment indicates that annual GHG emissions would represent a minor portion of Australian's GHG targets – approximately 0.0002% of Australia's 2020 target (551 Mt $CO_{2\text{-}e}$) and approximately 0.0002% of Australian's 2030 target (570 Mt $CO_{2\text{-}e}$).

Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.5 Visual Amenity

The quarry and expansion will remain visible to surrounding receptors due to its elevated position on a ridgeline. Views from some receptors are likely to be limited by intervening vegetation and topography. No night-time operation is proposed and therefore lighting will not impact receptors at night. Bunding will be extended around the pit expansion. Vegetation of the bunding, in accordance with a Rehabilitation Plan, will assist with the long-term visual integration into the surrounding landscape.

The proposal is not anticipated to result in a significant adverse impacts to the visual environment. Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.6 Water

A desktop assessment of the surface water and groundwater environment as well as consideration of water supply has been completed. A SWMP has been prepared to manage erosion and sedimentation impacts. The SWMP includes a site water balance that has determined that an expanded sediment basin will provide enough water supply for the expanded quarry operation.

The proposal is not anticipated to result in a significant risk to surface water or groundwater. Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.7 Geological Resource

A desktop assessment of the geological resource has been completed. The assessment did not identify any significant adverse impacts to the geological resource as the development does not proposed a rapid depletion of the resource, and the resource itself is not uncommon in the region. Potential changes in geology or quality or the occurrence of mineralisation are identified as risks and mitigation measures are provided to address these risks. These measures will be incorporated into an EMP.

23.2.3.8 Land

A desktop assessment of land use and capability, soils and associated risks, agricultural land use, landform and geotechnical risks, exploration activities and contamination has been completed. The proposal represents a logical extension of an existing quarry operation that does not impact high value agricultural land (due to shallow and outcropping rock). Despite the presence of exploration activity in the region, the proposal would not prevent licence holders from undertaking exploration activities around and under the quarry operation. In addition, the quarry is not known to contain any valuable mineral resources. The presence of a waste dump within the proposal footprint does not pose a significant risk as waste will be classified and disposed of appropriately.

The proposal is not anticipated to result in a significant risk to the land or its associated uses. Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.9 Traffic and Access

A desktop assessment of traffic and access impacts has been completed. No changes to the existing transport route are proposed. The opportunities provided via quarry expansion would result in a maximum of 60 heavy vehicle movements (30 loads) per day (6 days per week) which is double the existing approved maximum heavy vehicle movements. Notwithstanding, the cap on annual tonnage transported from the quarry by heavy vehicle via public roads, as part of the proposed expansion, is 150,000 tonnes. Therefore, on average throughout the year, the heavy vehicle movements would remain within the existing maximum daily movements of 15 loads (30 movements). The current intersection treatment at Bogan Road – Wyatts Lane remains adequate to accommodate the daily maximum heavy vehicle movements generated as a result of the proposed quarry expansion

An increase in light vehicles would also result because of the 4 additional employees driving to and from the site each day.

The proposal is not anticipated to result in a significant risk to the local traffic environment. Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.10 Hazards and Public Safety

A desktop assessment of potential on-site hazards and risks to public safety has been completed. The assessment considered bushfire risk, naturally occurring asbestos, silica hazards, blasting hazards, hazardous and dangerous goods and risks to public safety such as unsafe access into the quarry.

The proposal is not anticipated to result in a significant exposure to hazards or risk to public safety where mitigation measures are effectively implemented. Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.11 Wastes

Potential impacts associated with waste have been considered and are minor. No significant risks associated with waste are anticipated. Mitigation measures are provided to minimise impacts and will be incorporated into an EMP.

23.2.3.12 Utilities

A *Dial Before You Dig* search confirms that the only infrastructure within the subject site is an Essential Energy overhead powerline that crosses the existing quarry site. The proposal does not require any augmentation to the existing electricity supply.

23.2.3.13 Socio-Economic Impacts

An assessment of both positive and negative socio-economic impacts has been undertaken. Mitigation measures are provided to off-set residual perceived negative impacts, and would be incorporated into an EMP.

23.2.3.14 Cumulative Impact

By virtue of the detailed assessments undertaken for biodiversity, noise, air quality and traffic impacts provided in this EIS, it is demonstrated that the overall impacts of the proposal are unlikely to lead to the above listed cumulative impacts. In addition, environmental assessments for future proposals for mining (considered due to current exploration leases/application over the subject site) would be considered in the context of this quarry.

23.2.4 SOCIO-ECONOMIC

An assessment of both positive and negative socio-economic impacts has been undertaken. Mitigation measures are provided to off-set residual perceived negative impacts, and would be incorporated into an EMP.

23.2.4.1 Benefits

The proposal would:

- Provide local employment for an additional 4 jobs having a positive impact on local communities in the locality.
- Providing a viable resource to meet market requirements for the quarry product.
- Bolster and support the operation of a local company providing the opportunity for flow on effects to the community.

The proposal is justified as it provides for the provision of a reliable source of basalt suitable for use in a range of local in-demand activities. The existing quarry operation is also well located to serve the local market and potentially the Inland Rail project.

In summary the proposal is considered to be justified on the basis that:

- Is consistent with the zoning of the area and represents an approved use.
- Is designed and sited to minimise impacts to the local receiving environment.
- The subject site is suitable for the proposal.
- Is consistent with the principles of ESD.

23.2.5 PUBLIC BENEFIT

The public interest may be determined by consideration of relevant national, state and local government goals, as well as community priorities, which are expressed through a range of documentation. Relevant strategic documents are considered in **Section 5.13**.

The proposal is considered to be in the public interest on the basis that it:

- Offers an opportunity for productive and sustainable economic activity within the area.
- It would provide continued employment and additional local employment opportunities.
- Has been designed with appropriate consideration to social, environmental and sustainability interests of the community.

23.2.6 ALTERNATIVES

The only alternative considered was to not proceed with the proposal. Other alternatives such as quarrying in another location or at a smaller scale would not meet the needs of the proposal i.e. to meet market demand.

The expansion of the existing quarry is a logical approach to accessing the geological resource and avoids the creation of a separate open-cut pit. The Goonumbla Volcanics are mapped as an isolated formation at the locality extending approximately 1.7 km on a north-easterly orientation. There are other

mapped areas of the Goonumbla Volcanics in the region, however, the subject site is highly suitable for quarrying due to the resource being close to the surface (i.e. outcropping and shallow rock).

The existing quarry operation is also well located to serve the local market in and around Parkes, and potentially the Inland Rail project.

The environmental assessment has demonstrated that potential impacts can be avoided and minimised through implementation of mitigation measures.

23.2.7 CONSEQUENCES OF NOT PROCEEDING

The logical consequences of not proceeding in its current form would be that the opportunities offered via this development would not be realised. Opportunities for the development together with other identified consequences include:

- Economic benefits of the proposal would not be realised, including the employment of up to an additional four staff, the flow benefits of local wages into the community and opportunities for local businesses to benefit from the continued and expanded operation of the quarry.
- The available basalt resource would not be extracted and would therefore not be available to meet ongoing demand for the product or to supply ballast to the Inland Rail project.
- Impacts to the local biophysical environment would not occur.

By reference to the above, it is considered that the anticipated positive impacts of the development outweigh any minor residual impacts identified throughout this EIS.

23.3 CONCLUSION

This EIS has been prepared in accordance with the relevant provisions of Part 4 of the EP&A Act and Schedule 2 of the EP&A Reg. The development represents designated development by reference to clause 19, Part 1, Schedule 3 of the EP&A Reg and this EIS is provided as required to support the DA. This EIS has been prepared in accordance with the SEARs issued on the 27 June 2016.

The proposal provides an opportunity to provide a resource that is in demand in the local area, in a location that has direct access to the resource, and in a favourable position to supply ballast to the Inland Rail project.

An assessment of potential environmental impacts has identified some adverse impacts to the environment that would require the implementation of appropriate controls to ensure compliance in accordance with relevant legislation, standards and guidelines. Measures are proposed to ensure impacts are appropriately managed, and would be included within an EMP that will address the ongoing operation and expansion of the quarry. These measures would ensure compliance with relevant legislation and any conditions of approval.

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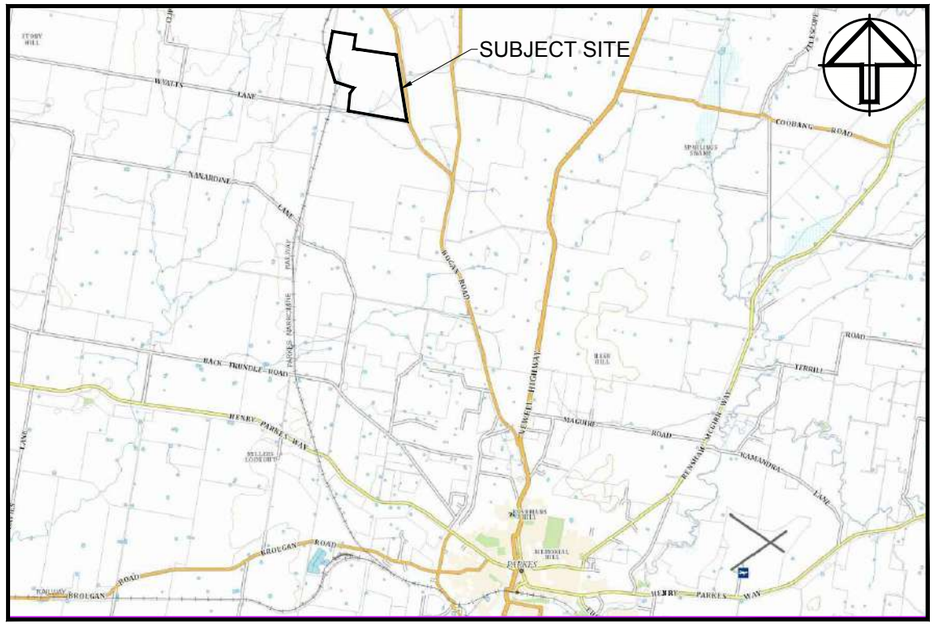
Drawings

GOONUMBLA QUARRY
AUSROCK QUARRIES PTY. LTD.
QUARRY PLANS

SCHEDULE OF DRAWINGS	
DRAWING	TITLE
C001	TITLE SHEET
C002	EXISTING CONTOUR AND DETAIL SURVEY
C003	DEVELOPMENT SITE
C004	STAGE 1 QUARRY LAYOUT
C005	STAGE 1 QUARRY SECTIONS
C006	STAGE 2 QUARRY LAYOUT
C007	STAGE 2 QUARRY SECTIONS
C008	ACCESS ROAD TO RAIL SIDING PLAN



SITE LOCALITY
NOT TO SCALE

REV.	DATE	DFTD.	APPD.	DETAILS
A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

	FILE	INITIALS	DATE
SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

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APPROVAL AUTHORITY: PARKES SHIRE COUNCIL & WESTERN JOINT REGIONAL PLANNING COUNCIL

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DRAWING: TITLE SHEET

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C001 OF C008

NOTES:

1. THIS PLAN IS PREPARED FROM A FIELD SURVEY FOR THE PURPOSE OF DESIGNING NEW CONSTRUCTIONS ON THE LAND AND SHOULD NOT BE USED FOR ANY OTHER PURPOSE.
2. VISIBLE SERVICES HAVE BEEN LOCATED ONLY. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE, THE RELEVANT AUTHORITIES SHOULD BE CONTACTED FOR LOCATION OF FURTHER UNDERGROUND SERVICES AND DETAILED LOCATIONS OF ALL SERVICES.
3. CONTOUR INTERVAL 0.25m.
4. THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN.
5. SURVEY DATE : 10 MAY 2016

LEGEND:

——— / ——— EXISTING FENCE

– – – – – – – EXISTING BOTTOM OF BANK

— — — — EXISTING TOP OF BANK

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REV.	DATE	DFTD.	APPD.	DETAILS
A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

	FILE	INITIALS	DATE
SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

SCALE 1:1000 (A1)

0 20 40 60 80 100

0 20 40 60 80 100

SCALE 1:2000 (A3)

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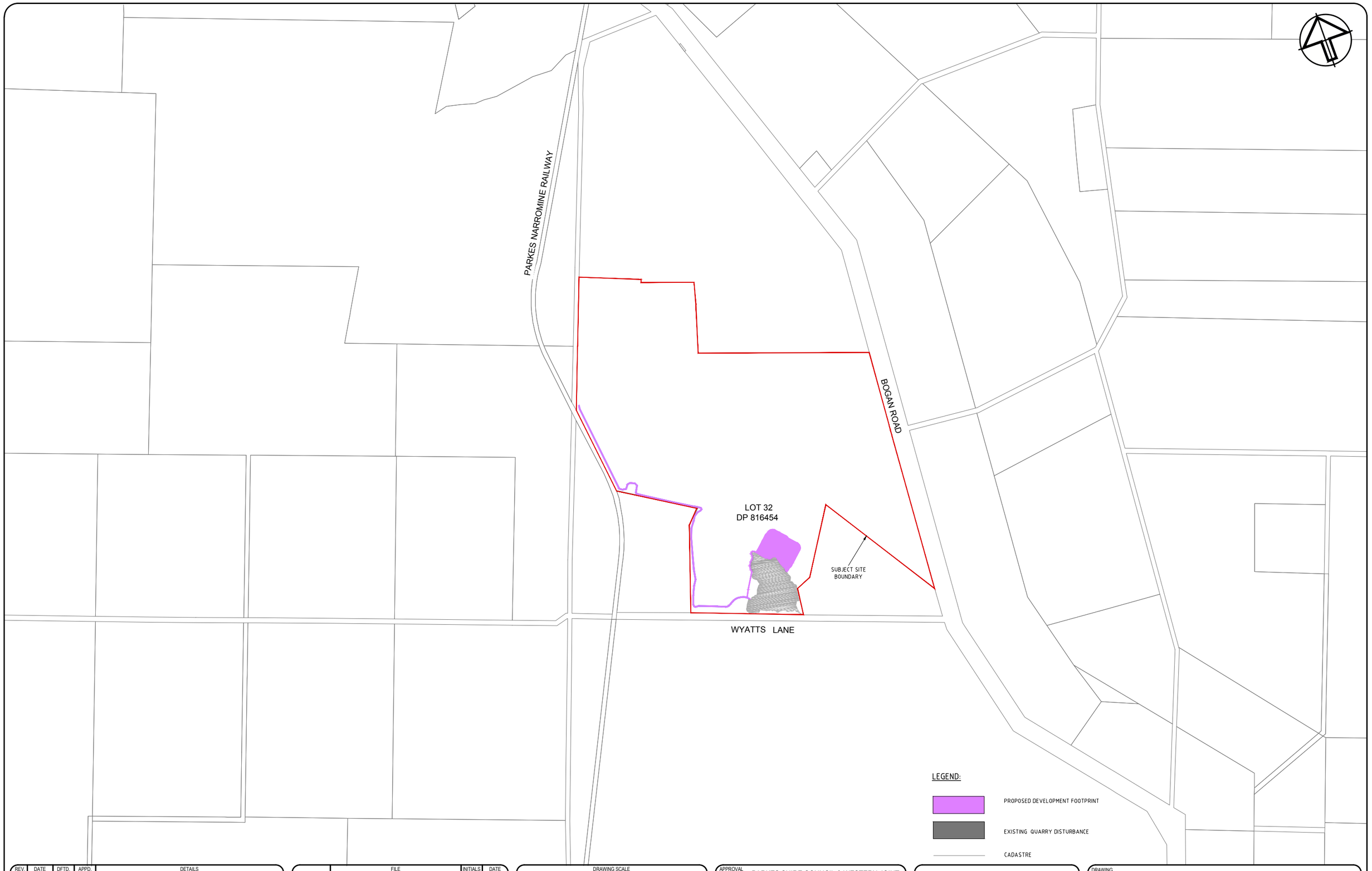
DRAWING: EXISTING QUARRY CONTOUR & DETAIL SURVEY

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C002 OF C008



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A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

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SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

SCALE 1:15000 (A1)

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SCALE 1:30000 (A3)

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DRAWING: DEVELOPMENT SITE

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C003 OF C008

NOTES:

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3. CONTOUR INTERVAL 0.25m.
4. THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN.
5. SURVEY DATE : 10 MAY 2016

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REV.	DATE	DFTD.	APPD.	DETAILS
A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

	FILE	INITIALS	DATE
SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

SCALE 1:1000 (A1)

0 20 40 60 80 100

SCALE 1:2000 (A3)

0 20 40 60 80 100

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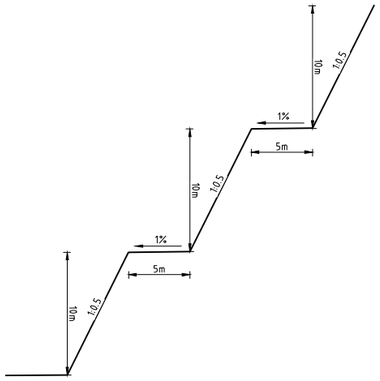
DRAWING: STAGE 1 QUARRY LAYOUT

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C004 OF C008



QUARRY BENCHING TYPICAL SECTION
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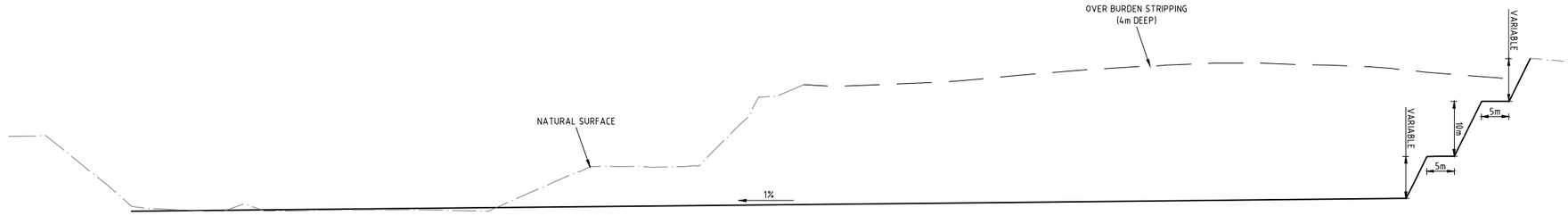

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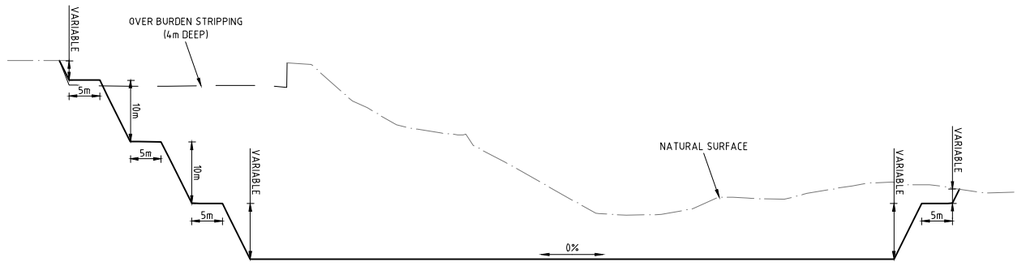

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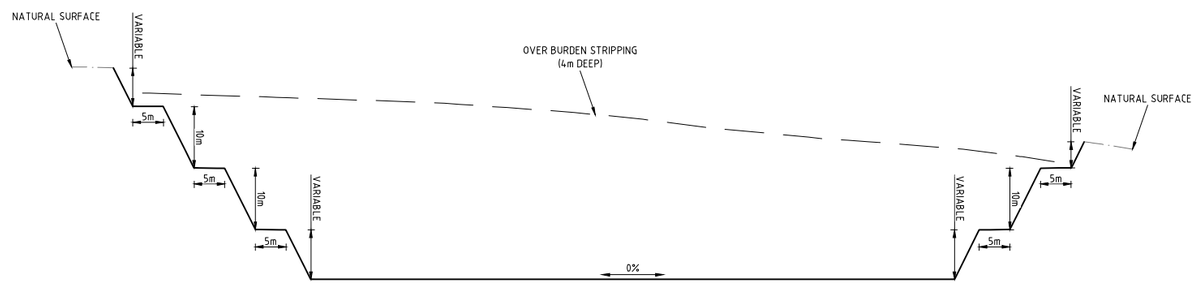

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REV.	DATE	DFTD.	APPD.	DETAILS
A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

	FILE	INITIALS	DATE
SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

REFER TO INDIVIDUAL DRAWING/SECTION SCALES

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DRAWING: STAGE 1 QUARRY SECTIONS

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C005 OF C008

NOTES:

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3. CONTOUR INTERVAL 0.25m.
4. THESE NOTES ARE AN INTEGRAL PART OF THIS PLAN.
5. SURVEY DATE : 10 MAY 2016

LEGEND:

- BUNDING 30M WIDE, 3M HIGH. APPROX. 1.43ha)
- AGGREGATE PLANT LOCATION
- ACCESS ROAD (5M WIDE, 0.41 ha)
- SEDIMENT BASIN
- ROAD TO SIDING (7M WIDE, 1.45 ha)
- EXISTING FENCE
- EXISTING BOTTOM OF BANK
- EXISTING TOP OF BANK
- EXISTING DISTURBANCE AREA

32
DP 816454

SEE SHEET C007 FOR DETAILS

ACCESS ROAD TO POTENTIAL FUTURE RAIL SIDING

PROPOSED QUARRY STAGE 2
HARD ROCK EXCAVATION VOLUME 179700m³

INDICATIVE ACCESS RAMP TO QUARRY FLOOR

R.L. 309.250

170m QUARRY FLOOR

91.8m QUARRY FLOOR

85m QUARRY FLOOR

37.5m QUARRY FLOOR

189.75m QUARRY FLOOR

1% 10% 1%

LOADING/STOCKPILE AREA

EXPANDED SEDIMENT BASIN

SITE COMPOUND

TRACK DIRT GRAVEL ACCESS ROAD

WYATTS LANE

31
DP 816454

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REV.	DATE	DFTD.	APPD.	DETAILS
A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

	FILE	INITIALS	DATE
SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

SCALE 1:1000 (A1)

0 20 40 60 80 100

0 20 40 60 80 100

SCALE 1:2000 (A3)

DO NOT SCALE FROM THESE DRAWINGS. ALL MEASUREMENTS SHALL BE CONFIRMED ON SITE AND WITH GEOLYSE PTY. LTD. PRIOR TO CONSTRUCTION

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CLIENT: AUSROCK QUARRIES PTY. LTD.

PROJECT: GOONUMBLA HARD ROCK QUARRY

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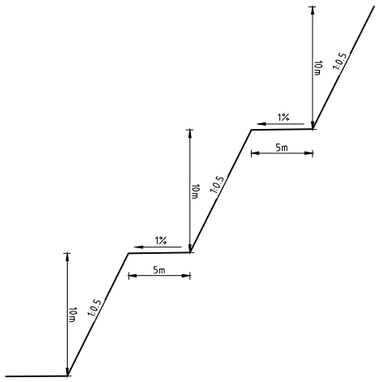
DRAWING: STAGE 2 QUARRY LAYOUT

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

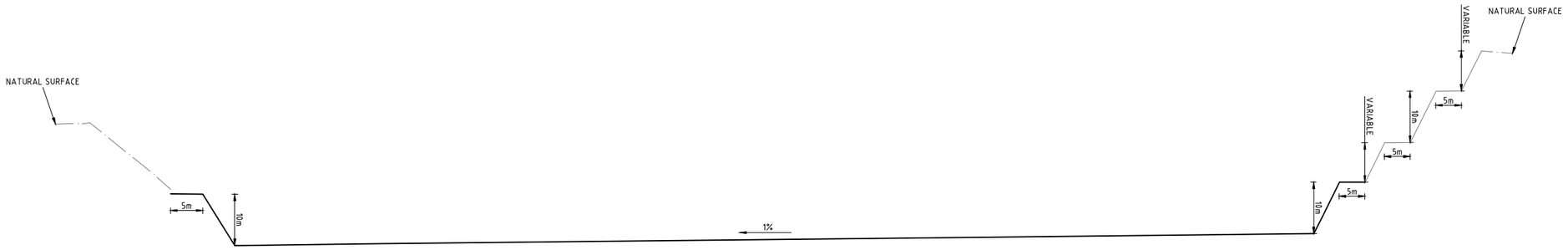
SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C006 OF C008



QUARRY BENCHING TYPICAL SECTION
SCALE 1:250 (A1)
SCALE 1:500 (A3)



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C006
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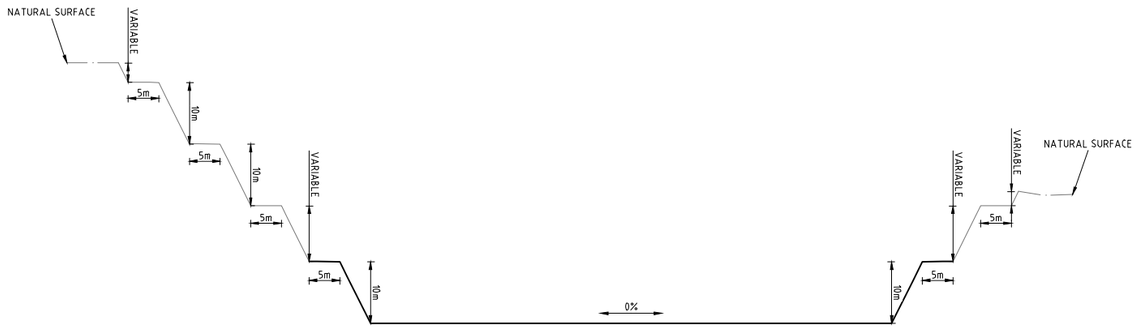

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C006
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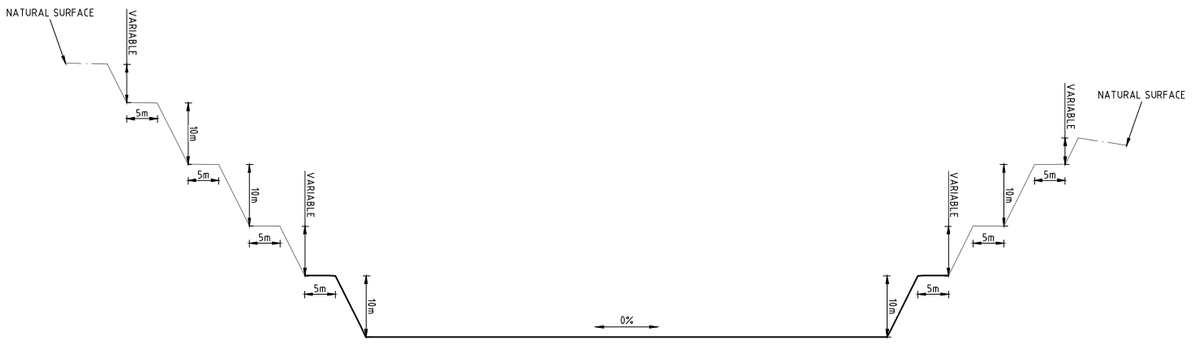

TYPICAL SECTION 3
C006
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REV.	DATE	DFTD.	APPD.	DETAILS
A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

	FILE	INITIALS	DATE
SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

REFER TO INDIVIDUAL DRAWING/SECTION SCALES

DO NOT SCALE FROM THESE DRAWINGS. ALL MEASUREMENTS SHALL BE CONFIRMED ON SITE AND WITH GEOLYSE PTY. LTD. PRIOR TO CONSTRUCTION

APPROVAL AUTHORITY: PARKES SHIRE COUNCIL & WESTERN JOINT REGIONAL PLANNING COUNCIL

CLIENT: AUSROCK QUARRIES PTY. LTD.

PROJECT: GOONUMBLA HARD ROCK QUARRY

GEOLYSE
ORANGE
orange@geolyse.com
www.geolyse.com
154 PEISLEY STREET
P.O. BOX 1963
ORANGE, NSW 2800
Ph. (02) 6393 5000
Fx. (02) 6393 5050

DRAWING: STAGE 2 QUARRY SECTIONS

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C007 OF C008

LEGEND:

- SUBJECT SITE BOUNDARY
- ACCESS ROAD (5M WIDE, 0.41 ha)
- ROAD TO SIDING (7M WIDE, 1.45 ha)
- EXISTING QUARRY DISTURBANCE
- PROPOSED WORKS
- BUNDING

REV.	DATE	DFTD.	APPD.	DETAILS
A	17/05/16	AJD	MDH	CONCEPTUAL QUARRY DESIGN
B	15/02/18	GT	MDH	FOR REVIEW
C	13/03/18	GT	CB	FOR REVIEW

	FILE	INITIALS	DATE
SURVEY	215453 merged.mjo	SB	10/05/16
DESIGN	215453_02A_QUARRY_DESIGN.project	AJD	17/05/16
DRAINS/ HEC-RAS MODELLING	-	-	-
ENGINEERING/ SURVEYING APPROVAL		-	-

DRAWING SCALE

SCALE 1:2500 (A1)

0 50 100 150 200

0 50 100 150 200

SCALE 1:5000 (A3)

DO NOT SCALE FROM THESE DRAWINGS. ALL MEASUREMENTS SHALL BE CONFIRMED ON SITE AND WITH GEOLYSE PTY. LTD. PRIOR TO CONSTRUCTION

APPROVAL AUTHORITY: PARKES SHIRE COUNCIL & WESTERN JOINT REGIONAL PLANNING COUNCIL

CLIENT: AUSROCK QUARRIES PTY. LTD.

PROJECT: GOONUMBLA HARD ROCK QUARRY

GEOLYSE
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ORANGE, NSW 2800
Ph. (02) 6393 5000
Fx. (02) 6393 5050

DRAWING: ACCESS ROAD TO RAIL SIDING PLAN

PROJECT NUMBER 215453 | DRAWING FILE 215453_02C_C001-C008.dwg | SIZE A1

SURVEY MARK | R.L. | DATUM A.H.D. | SET 02

IMAGE SOURCE

STATUS FOR REVIEW | SHEET C008 OF C008

Appendix A

SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS (SEARS)

NSW GOVERNMENT Planning & Environment

[redacted]

Ms Chloe Bigg
Geolyse
[redacted]

Dear Ms Bigg

Bogan Road Quarry Extension (EAR 1052)
Secretary's Environmental Assessment Requirements

I refer to your request for the Secretary's Environmental Assessment Requirements (EARs) for the above development, which is designated local development under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

I have attached a copy of the EARs for the Environmental Impact Statement (EIS) for the development. These requirements have been prepared in consultation with relevant government agencies and are based on the information your company has provided to date. I have also attached the agencies' input into the EARs, which you are also advised to consider closely when preparing the EIS.

In your request for EARs, you have indicated that the proposal is classified as integrated development under section 91 of the EP&A Act. You are encouraged to consult with the Environment Protection Authority with respect to licence requirements. If further integrated approvals are required, you must undertake your own consultation with the relevant public authorities, and address their requirements in the EIS.

When you lodge your DA with the consent authority, you must provide:
- one hard and one electronic copy of the EIS to the Department;
- one hard and one electronic copy of the EIS to any identified integrated approval authority; and
- a cheque for $320 to each identified integrated approval authority, to offset costs involved in the review of the DA and EIS. No cheque is required for the Department as it is not an approval authority.

If your proposal contains any actions that could have a significant impact on matters of National Environmental Significance, then it will also require approval under the Commonwealth's *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. If you have any questions about the application of the EPBC Act to your proposal, you should contact the Department of the Environment in Canberra (6274 1111 or www.environment.gov.au).

You should contact the local Mine Safety Operations Branch of the NSW Department of Industry, Division of Resources and Energy in regard to this and other matters relating to compliance with the *Work Health and Safety (Mines and Petroleum Sites) Act 2013.*

If you have any enquiries about these requirements, please contact Lauren Evans on 9228 6311.

Yours sincerely

[redacted]

Howard Reed
Director
Resource Assessments
As nominee of the Secretary

27.6.16

Secretary's Environmental Assessment Requirements

Section 78A(8) of the *Environmental Planning and Assessment Act 1979* and Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.*

Designated Development

EAR Number	1052
Proposal	Extension of an existing hard rock quarry to extract and process a maximum of 250,000 tonnes of basalt in any year over a 5 to 7 year period (or up to 15-20 years based on a slower extraction rate).
Location	1105 Bogan Road, Goonumbla (Lot 32 DP 816454)
Applicant	Cudal Lime Products Pty Ltd
Date of Issue	27 June 2016
Date of Expiry	27 June 2018
General Requirements	The Environmental Impact Statement (EIS) for the development must comply with the requirements in Clauses 6 and 7 of Schedule 2 of the *Environmental Planning and Assessment Regulation 2000.* In particular, the EIS must include: • an executive summary; • a comprehensive description of the development, including: - a detailed site description and history of any previous quarrying on the site, including a current survey plan; - identification of the resource, including the amount, type and composition, as well as details regarding the timing and intensity of extractive operations, having regard to DRE's requirements (Attachment 2); - the layout of the proposed works and components (including any existing infrastructure that would be used for the development); - an assessment of the potential impacts of the development, as well as any cumulative impacts, including the measures that would be used to minimise, manage or offset these impacts; - a summary of all proposed environmental management and monitoring measures for the development; - a detailed rehabilitation plan for the site; - any likely interactions between the development and any existing/approved developments and land uses in the area; - a list of any other approvals that must be obtained before the development may commence; - the permissibility of the development, including identification of the land use zoning of the site; - identification of sensitive receivers likely to be affected by the development using clear maps/plans, including key landform areas, such as conservation areas and waterways; and • the reasons why the development should be approved, having regard to the economic, social and environmental aspects of the development and taking into consideration the objects of the *Environmental Planning & Assessment Act 1979*; and • a signed declaration from the author of the EIS, certifying that the information contained within the document is neither false nor misleading.
Key Issues	The EIS must assess the potential impacts of the proposal at all stages of the development, including the establishment, operation and decommissioning of the development. The EIS must address the following specific issues: • **Water** – including: - an annual site water balance for representative years over the life of the development and demonstration that sufficient water supplies would be available to meet operational requirements; - identification of any licensing requirements or other approvals required under the *Water Act 1912* and/or *Water Management Act 2000*; - a description of the measures proposed to ensure the development can operate in accordance with the requirements of any relevant Water Sharing Plan or water source embargo;

- an assessment of activities that could cause erosion or sedimentation issues, and the proposed measures to prevent or control these impacts;
- an assessment of the likely impacts of the development on the quality and quantity of surface and groundwater resources, having regard to EPA and DPI Water requirements (Attachment 2);
- a detailed description of the proposed water management system, water monitoring program and other measures to mitigate surface and groundwater impacts;
- an assessment of potential downstream impacts from surface water runoff;

- **Air** – including an assessment of the likely air quality impacts of the development in accordance with the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*, having regard to EPA's requirements (Attachment 2). The assessment is to give particular attention to potential dust impacts on any nearby private receivers due to construction activities, the operation of the quarry and/or road haulage;
- **Noise and Blasting** – including:
  - an assessment of the likely construction and operational noise and vibration impacts of the development in accordance with the *NSW Industrial Noise Policy* and the *Interim Construction Noise Guideline*, having regard to EPA and Council requirements (Attachment 2);
  - an assessment of the likely road noise impacts (traffic and haulage) of the development under the *NSW Road Noise Policy*; and
  - an assessment of the likely blasting and vibration impacts of the development, having regard to the relevant ANZEC guidelines and paying particular attention to impacts on people, livestock, heritage items and infrastructure;
- **Biodiversity** – including:
  - accurate predictions of any vegetation clearing on site;
  - a detailed assessment of the potential biodiversity impacts of the development, paying particular attention to threatened species and/or populations (or their habitats), endangered ecological communities and groundwater dependent ecosystems, and having regard to OEH, DRE and Council requirements (Attachment 2);
  - a detailed description of the proposed measures to maintain or improve the biodiversity values of the site in the medium to long term, as relevant; and
  - an assessment of whether a Species Impact Statement is required;
- **Heritage** – including:
  - an assessment of the potential impacts on Aboriginal heritage (cultural and archaeological), including evidence of appropriate consultation with relevant Aboriginal communities/parties and documentation of the views of these stakeholders regarding the likely impact of the development on their cultural heritage, having regard to OEH requirements (Attachment 2); and
  - identification of Historic heritage in the vicinity of the development and an assessment of the likelihood and significance of impacts on heritage items, having regard to the requirements of relevant policies and guidelines listed in Attachment 1;
- **Transport** – including:
  - an assessment of potential traffic impacts on the capacity, condition, safety and efficiency of the local and State road networks, detailing the nature of the traffic generated, transport routes, traffic volumes and potential impacts on local and regional roads, having regard to RMS and Council requirements (Attachment 2);
  - a description of the measures that would be implemented to maintain and/or improve the capacity, efficiency and safety of the road network (particularly the proposed transport routes) over the life of the development;
  - evidence of any consultation with relevant roads authorities, regarding the establishment of agreed contributions towards road upgrades or maintenance; and
  - a description of access roads, specifically in relation to nearby Crown roads and fire trails;
- **Land** – including:
  - an assessment of potential impacts on the quality and quantity of the soils and land capability of the site, including any likely disturbance of contaminated soils, and the proposed mitigation, management and remedial measures (as appropriate), having regard to EPA requirements (Attachment 2);
  - an assessment of the likely impacts on landforms and topography, including the long-term geotechnical stability of any new landforms; and
  - an assessment of the compatibility of the development with other land uses in the vicinity of the development, in accordance with the requirements of Clause 12 of *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, having regard to the requirements of DPI Agriculture (Attachment 2);
- **Waste** – including estimates of the quantity and nature of the waste streams that would be generated or received by the development and any measures that would be implemented to minimise, manage or dispose of these waste streams, having regard to EPA requirements (Attachment 2);
- **Public Safety** – including an assessment of the likely risks to public safety, paying particular attention to the transport, storage, handling and use of any hazardous or dangerous goods, and having regard to RFS requirements (Attachment 2);

	• **Visual** – including an assessment of the likely visual impacts of the development on any surrounding private landowners and key vantage points in the public domain, paying particular attention to impacts on any nearby private residences and road users; • **Social & Economic** – an assessment of the likely social and economic impacts of the development, including consideration of both the significance of the resource and the costs and benefits of the project; and • **Rehabilitation** – including: - a detailed description of the proposed rehabilitation measures that would be undertaken throughout the development and during quarry closure, having regard to the requirements of DRE, EPA and DPI Water (Attachment 2); - a detailed rehabilitation strategy, including justification for the proposed final landform and consideration of the objectives of any relevant strategic land use plans or policies; and - the measures that would be undertaken to ensure sufficient financial resources are available to implement the proposed rehabilitation strategy.
Environmental Planning Instruments	The EIS must take into account all relevant State Government environmental planning instruments, guidelines, policies, and plans. While not exhaustive, Attachment 1 contains a list of some of the environmental planning instruments, guidelines, policies and plans that may be relevant to the environmental assessment of this development. During the preparation of the EIS you must also consult the Department's EIS Guideline – Extractive Industries – Quarries. This guideline is available from the Department of Planning and Environment's Information Centre, 23-33 Bridge Street, Sydney or by calling 1300 305 695. In addition, the EIS must assess the development against the Parkes Local Environmental Plan 2012 and any relevant development control plans/strategies.
Consultation	In preparing the EIS for the development, you should consult with relevant local, State or Commonwealth Government authorities, infrastructure and service providers and any surrounding landowners that may be impacted by the development. The EIS must describe the consultation that was carried out, identify the issues raised during this consultation, and explain how these issues have been addressed in the EIS.

ATTACHMENT 1

The following guidelines may assist in the preparation of the Environmental Impact Statement. This list is not exhaustive and not all of these guidelines may be relevant to your proposal.

Many of these documents can be found on the following websites:
http://www.planning.nsw.gov.au
http://www.bookshop.nsw.gov.au
http://www.publications.gov.au

Environmental Planning Instruments, Policies, Guidelines & Plans

Environmental Planning Instruments - General	
	State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007
	State Environmental Planning Policy (State and Regional Development) 2011
	State Environmental Planning Policy (Infrastructure) 2007
	Parkes Local Environmental Plan 2012
Risk Assessment	
	AS/NZS 4360:2004 Risk Management (Standards Australia)
	HB 203: 203:2006 Environmental Risk Management – Principles & Process (Standards Australia)
Land	
	State Environmental Planning Policy No. 55 – Remediation of Land
	Agricultural Land Classification (DPI)
	Rural Land Capability Mapping (OEH)
	Soil and Landscape Issues in Environmental Impact Assessment (NOW)
	Australian and New Zealand Guidelines for the Assessment and Management of Contaminated Sites (ANZECC)
	Guidelines for Consultants Reporting on Contaminated Sites (EPA)
	Agricultural Issues for Extractive Industry Development (DPI)
Water	
Groundwater	NSW Aquifer Interference Policy 2012 (NOW)
	NSW State Groundwater Policy Framework Document (NOW)
	NSW State Groundwater Quality Protection Policy (NOW)
	NSW State Groundwater Quantity Management Policy (NOW)
	Australian Groundwater Modelling Guidelines 2012 (Commonwealth)
	National Water Quality Management Strategy Guidelines for Groundwater Protection in Australia (ARMCANZ/ANZECC)
	Guidelines for the Assessment & Management of Groundwater Contamination (EPA)
Surface Water	NSW State Rivers and Estuary Policy (NOW)
	NSW Government Water Quality and River Flow Objectives (EPA)
	Using the ANZECC Guideline and Water Quality Objectives in NSW (EPA)
	National Water Quality Management Strategy: Australian Guidelines for Fresh and Marine Water Quality (ANZECC/ARMCANZ)
	National Water Quality Management Strategy: Australian Guidelines for Water Quality Monitoring and Reporting (ANZECC/ARMCANZ)
	Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (EPA)
	Managing Urban Stormwater: Soils & Construction (Landcom) and associated Volume 2E: Mines and Quarries (DECC)
	Managing Urban Stormwater: Treatment Techniques (EPA)
	Managing Urban Stormwater: Source Control (EPA)
	Technical Guidelines: Bunding & Spill Management (EPA)
	A Rehabilitation Manual for Australian Streams (LWRRDC and CRCCH)
	NSW Guidelines for Controlled Activities (NOW)
Flooding	Floodplain Development Manual (OEH)
	Floodplain Risk Management Guideline (OEH)

Biodiversity	
	Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (DECC) 2004
	The Threatened Species Assessment Guideline – The Assessment of Significance (DECC) 2007
	NSW State Groundwater Dependent Ecosystem Policy (NOW)
	Risk Assessment Guidelines for Groundwater Dependent Ecosystems (NOW)
	State Environmental Planning Policy No. 44 – Koala Habitat Protection
	Policy & Guidelines – Aquatic Habitat Management and Fish Conservation (NSW Fisheries)
	Aquatic Ecology in EIA – EIS Guideline series (DP&E)
Heritage	
	The Burra Charter (The Australia ICOMOS charter for places of cultural significance)
	Guide to investigation, assessing and reporting on Aboriginal cultural heritage in NSW (OEH) 2011
	Draft Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation (DP&E)
	Aboriginal Cultural Heritage Consultation Requirements for Proponents (OEH)
	Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (OEH)
	Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (OEH)
	NSW Heritage Manual (OEH)
	Statements of Heritage Impact (OEH)
Noise & Blasting	
	NSW Industrial Noise Policy (EPA)
	Interim Construction Noise Guideline (EPA)
	NSW Road Noise Policy (EPA)
	Technical basis for guidelines to minimise annoyance due to blasting overpressure and ground vibration (ANZEC)
Air	
	Protection of the Environment Operations (Clean Air) Regulation 2010
	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (EPA)
	Assessment and Management of Odour from Stationary Sources in NSW (DEC)
	National Greenhouse Accounts Factors (Commonwealth)
Transport	
	Guide to Traffic Generating Development (RTA)
	Road Design Guide (RMS) & relevant Austroads Standards
Public Safety	
	State Environmental Planning Policy No. 33 – Hazardous and Offensive Development
	Hazardous and Offensive Development Application Guidelines – Applying SEPP 33
	Hazardous Industry Planning Advisory Paper No. 6 – Guidelines for Hazard Analysis
Resource	
	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 (JORC)
Waste	
	Waste Classification Guidelines (DECC)
	Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes 1999 (EPA)
Rehabilitation	
	Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth)
	Mine Closure and Completion – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth)
	Strategic Framework for Mine Closure (ANZMEC-MCA)

ATTACHMENT 2

AGENCIES' CORRESPONDENCE

Contact Person: Michael Carter

20 June 2016

Lauren Evans
Planning Officer
Resource Assessment, Planning Services
Department of Planning and Environment
[redacted]

Dear Ms Evans

RE: GRAVEL QUARRY AT LOT 32 DP816454, 1105 BOGAN STREET, GOONUMBLA (EAR ID NO. 1052)

Further to your request for Council's requirements for an environmental assessment of the above project (**Cudal Project**), Council provides the following:

- **Current Approvals** - Development Consent No. DA12097 granted by Parkes Shire Council for a Gravel Quarry on 16 July 2013 applies to the site. A review of the consent indicates that the Cudal Project will increase on-site extraction from 30,000 tonnes per year to 250,000 tonnes per year and extend operational hours. Council requests that Development Consent No. DA12097 (attached) be surrendered to prevent any inconsistence between consents.

- **Air quality -** Air quality impacts, particularly dust, must be addressed in the environmental assessment and appropriate practices proposed to minimise the generation of dust from the operations and the potential impacts on surrounding properties.

  Access and traffic generation - The Cudal project report indicates that the Cudal Project will utilise existing public road infrastructure for transportation of product to customers and non-production waste disposal to the Parkes Waste Landfill. The assessment of the proposal must include a comprehensive investigation of the haulage route(s) to be used by the quarry operator, as well as other customers of the quarry. The haulage route(s) must be assessed to confirm they are constructed to a standard suitable for their intended purpose and rectified where deficient.

  Note: The draft Parkes Shire Section 94 Contributions Plan provides the framework for traffic investigations.

- **Contributions towards public infrastructure** - Parkes Shire Council currently has on public exhibition a Section 94 Contributions Plan which requires consideration of contributions for traffic generating development impacts on local roads. It is envisaged the draft Parkes Shire Section 94 Contributions Plan will be finalised and adopted by Council in the very near future. Council requests that the environmental assessment

address the provisions of the impending Parkes Shire Section 94 Contributions Plan, in order for the Consent Authority to be satisfied that the development will require the necessary provision for road upgrades and annual maintenance associated with road haulage.

- **Noise and vibration** - Sensitive receptors within proximity of the Cudal Project may be impacted by extended operational hours. Noise and blasting operations must be addressed in the environmental assessment with appropriate practices proposed to minimise the potential impacts on surrounding properties.

- **Flora and fauna** - The Cudal project report identifies that vegetation will be removed for the construction of stockpiles, loading and bunding areas. The proposed areas of vegetation clearing were not approved in previous Development Consent No.DA12097. The environmental assessment must include a comprehensive investigation of the proposed areas of vegetation disturbance and include detailed measures proposed to avoid, minimise, mitigate and/or offset biodiversity impacts of the development.

If you would like to discuss any aspect of this submission in more detail, please contact Council's Manager Planning Services, Michael Carter on (02) 6861 2373.

Yours faithfully

per: [redacted]

Kent Boyd
GENERAL MANAGER

Steven Campbell
DIRECTOR OF PLANNING & ENVIRONMENT

COPY

NOTICE OF DETERMINATION OF A MODIFICATION APPLICATION

issued under the Environmental Planning and Assessment Act, 1979
Section 81 (1) (a)

Issued to:

Applicants Name:	Cudal Lime
Applicants Address:	C/- Geolyse Pty Ltd PO Box 1963 ORANGE NSW 2800

Development Consent No:	DA12097
Description of Development:	Gravel Quarry
Subject Land:	Lot 32 DP 816454 'Limestone' 1105 Bogan Street, Goonumbla
Consent to Operate from:	16 April 2013
Consent to Lapse on:	16 April 2018

Determination: The development application has been determined by granting of consent pursuant to Section 80 of the Environmental Planning and Assessment Act, 1979 on 16 April 2013 and now modified pursuant to Section 96 of the said Act, subject to the conditions specified in this notice. These conditions replace the original conditions specified in Development Consent No DA12097.

Conditions:

Approved Plans and Documentation

1. Development shall take place in accordance with the Parkes Shire Council stamped plan(s) and supporting documentation lodged in respect of Development Application No: DA12097 except where varied by the following conditions.

2. The General Terms of Approval issued by the Environment Protection Authority on the 28 March 2013 as outlined in Notice No. 1511683 and included herein, must be adhered to.

Road-Works

3. The property access from Wyatt's Lane shall meet the requirements of Figure 7.4 of the Austroads *Guide to Road Design-Part 4: Intersections and Crossings-General* as an entry for articulated vehicles off a high speed rural road. The access shall be sealed at least 15m from the edge of carriageway on Wyatt's Lane. Full engineering details of the roadworks and the exact location of the access shall be submitted for approval by Parkes Council's Director Engineering Services prior to the issue of a Construction Certificate.

4. Traffic operations associated with this consent will be limited to four vehicle movements per day between 8:30am and 3:45pm on weekdays, and between 8:30 and 3:00pm Saturdays, for a duration no longer than three months from commencement of operations under an approved traffic control regime. Traffic operations will continue up to a maximum of 30 vehicle movements per day, between 8:30am and 3:45pm on weekdays and between 8:30am and 3:00pm Saturdays, upon Wyatts Lane being upgraded to cater for the additional vehicular load generated by the development. This will be done at no cost to Council. The roadway will be expanded to two 3.5m lanes (7m carriageway) with a 3.7m wide central seal designed and constructed in accordance with AUS-SPEC#1/Parkes Shire Council. A detailed design for the road will be submitted to council for approval prior to the issue of a Construction Certificate.

5. Traffic operations associated with this consent will be limited to four vehicle movements per day between 8:30am and 3:45pm on weekdays, and between 8:30 and 3:00pm Saturdays, for a duration no longer than three months from commencement of operations under an approved traffic control regime. Traffic operations will continue up to a maximum of 30 vehicle movements per day, between 8:30am and 3:45pm on weekdays and between 8:30am and 3:00pm Saturdays, upon the upgrade of the intersection of Bogan Road and Wyatts Lane with CHR(S) and AUL treatments in accordance with Austroads Guide to Road Design Part 4A: Unsignalised and Signalised Intersections. This requirement is due to the existing Safe Intersection Sight Distance deficiency on Bogan Road and additional traffic generated by the development. The treatment will include all required pavement widening and markings designed and constructed in accordance with AUS-SPEC#1/Parkes Shire Council. A detailed design for the road will be submitted to council for approval prior to the issue of a Construction Certificate.

6. Introduce and effectively maintain measures to suppress and control dust at all times during the construction. Details of the proposed dust control measures, including procedures for the implementation of such measures, shall be submitted to Council for approval prior to commencement of construction works.

7. All road-works, including drainage infrastructure, must be constructed and completed in accordance with AUS-SPEC#1/Parkes Shire Council. The road works must be inspected by Council or an Accredited Certifying Authority at the times specified below:

   (a) **Earthworks:** Prior to any road works and when all sediment controls have been placed in position.
   (b) **Road Drainage:** When all drainage work and structures are installed and prior to backfilling.
   (c) **Road Pavement:** When the road-base is properly formed and compacted and prior to sealing.
   (d) **Completion:** When all roadworks are completed, including sealing, directional signage, street lighting and street furniture.

8. Signage will be installed on Wyatts Lane, in accordance with AS1742.2, in the form of W5-22 signs indicating trucks entering the road. This will be done at no expense to Council.

9. All trucks leaving the quarry will be covered to prevent dust and to stop material from falling upon the road.

10. On haulage days, dust levels are to be monitored on Wyatts Lane and the internal access road. If these levels become such that the driver's sight distance is inhibited then dust suppression is to be conducted.

11. As per conditional B-Double access approval on Wyatt's Lane, B-Double trucks are not permitted to travel 8:00-9:00am and 3:30-4:30pm on school days. The speed of all haulage vehicles from the quarry is to be restricted to 80 km/hr. The supervisor of haulage operations will be responsible for informing the drivers of this restriction to provide a safer environment for the general public using the road.

12. The Applicant will be responsible for both the maintenance of Wyatt's Lane and the intersection of Bogan Road and Wyatts Lane to Council's satisfaction. Wyatts Lane will be subject to a 2 year inspection interval and be maintained to a "Local Access" level of service as defined in Council's Transport Asset Management Plan. All maintenance work shall comply with Council Aus-Spec standards and all work will be completed at no cost to Council.

    Note: Within Council's nominated inspection interval Wyatts Lane will be assessed according to the criteria stipulated for level of service "Local Access". Should the condition assessment at inspection nominate a deficiency identified within the roadway, the applicant shall be contacted by Council with instructions to repair or maintain the road back to "Local Access" standard.

Driver Code of Conduct

13. The Applicant shall introduce and implement a Driver's Code of Conduct which will be required to be abided by all operators to and from the site. The Code shall include clauses requiring the driver to obey all Australian and NSW road rules and licensing requirements. It shall also stipulate the maximum speed to be travelled on Wyatt's Lane and Bogan Road being 100km/h and restrictions on B-Double vehicles to travel at a maximum of 80km/h and not between 8:00-9:00am and 3:30-4:30pm on school days.

    Note: The intent of this condition is to create a form of enforcement if a driver is operating dangerously on a public roadway endangering themselves or other road users.

Septic

14. The applicant must obtain approval to operate a system of sewage management on the site from Parkes Shire Council under Section 68 of the Local Government Act 1993.

Rehabilitation

15. Prior to works commencing on site, a final plan identifying the proposed end use and landform of the land once rehabilitated, shall be lodged with and approved by Council.

General Terms of Approval - Environment Protection Authority

Administrative conditions

A1. Information supplied to the EPA

A1.1 Except as expressly provided by these general terms of approval, works and activities must be carried out in accordance with the proposal contained in:

- Development application DA12097 submitted to the EPA on 9 January 2013;

- Statement of Environmental Effects, Proposed Quarry, prepared by Geolyse for Cudal Lime products, dated December 2012;
- All additional documents supplied to the EPA on 14 March 2013 in relation to the development, including:
  - Additional Information Report
  - Revised drawing set
  - Acoustic Assessment, dated 7 March 2013

A2. Fit and Proper Person

A2.1 The applicant must, in the opinion of the EPA, be a fit and proper person to hold a licence under the Protection of the Environment Operations Act 1997, having regard to the matters in s.83 of that Act.

Discharges to Air and Water and Applications to Land

P1.1 The following points referred to in the table are identified in this licence for the purpose of the monitoring and/or the setting of limits for discharges of pollutants to waters from the point.

Water and land

EPA identification no.	Types of Monitoring Point	Type of Discharge Point	Location Description
Sediment Basin Overflow (location TBA)	Surface quality monitoring	Surface water discharge	TBC

Note: The monitoring requirements may be modified by the EPA subject to ongoing review of licence conditions and monitoring results.

Note: A licence application will need to define the sediment basin on the premises.

Note: Discharge of pollutants to waters from the sediment basin is only permitted when the discharge occurs solely as a result of rainfall that exceeds the minimum design criteria for sediment control measures in *Managing Urban Stormwater: Soils and Construction - Volume 2E Mines and Quarries.*

Limit conditions

L1. Pollution of waters

L.1.1 Except as may be expressly provided by a licence under the Protection of the Environment Operations Act 1997 in relation of the development, section 120 of the Protection of the Environment Operations Act 1997 must be complied with in and in connection with the carrying out of the development.

L3. Concentration limits

L3.1 For each discharge point or utilisation area specified in the table/s below, the concentration of a pollutant discharged at that point, or applied to that area, must not exceed the concentrations limits specified for that pollutant in the table.

L3.2 Where a pH quality limit is specified in the Table, the specified percentage of samples must be within the specified ranges.

L3.3 To avoid any doubt, this condition does not authorise the discharge or emission of any other pollutants.

Water and Land

Monitoring Point 1 - Sediment Basin Overflow

Pollutant	Units of measure	50% concentration limit	90% concentration limit	3DGM concentration limit	100% concentration limit
Total Suspended Solids	mg/L			-	50

Note: Discharge of pollutants to waters from the sediment basin is only permitted when the discharge occurs solely as a result of rainfall that exceeds the minimum design criteria for sediment control measures in *Managing Urban Stormwater: Soils and Construction - Volume 2E Mines and Quarries*.

L4. Hours of operation

L4.1 All loading activities at the premises must only be conducted between:

- 0700 - 1800 - Monday to Friday
- 0700 - 1500 - Saturdays
- Never on Sundays or Public Holidays

L4.2 All extraction and processing work at the premises must only be carried on between:

- 0900 - 1700 - Monday to Friday
- Never on Saturdays, Sundays or Public Holidays

L4.3 This condition does not apply to the delivery of material outside the hours of operation permitted by condition L4.1 or L4.2, if that delivery is required by police or other authorities for safety reasons; and/or the operation or personnel or equipment are endangered. In such circumstances, prior notification is provided to the EPA and affected residents as soon as possible, or within a reasonable period in the case of emergency.

L4.4 The hours of operation specified in conditions L4.1 and L4.2 may be varied with written consent if the EPA is satisfied that the amenity of the residents in the locality will not be adversely affected.

L5. Waste

L5.1 The licensee must not cause, permit or allow any waste generated outside the premises to be received at the premises for storage, treatment, processing, reprocessing or disposal or any waste generated at the premises to be disposed of at the premises, except as expressly permitted by a licence under the Protection of the Environment Operations Act 1997.

L5.2 This condition only applies to the storage, treatment, processing, reprocessing or disposal of waste at the premises if it requires an environment protection licence under the Protection of the Environment Operations Act 1997.

L6. Noise limits

L6.1 Noise generated at the premises must not exceed the noise limits in the table below.

Location	Day Noise Limits – LAeq (15 minute)
Any residential receiver	35 dB(A)

Note:

L6.2 For the purpose of condition L6.1 and L6.5;

- Day is defined as the period from 7am to 6pm Monday to Saturday and 8am to 6pm Sunday and Public Holidays.
- LAeq(15minute) is defined as the equivalent continuous 'A' weighted sound pressure level- the energy average of the noise measured over a 15 minute period, and LA1 (1 minute) is defined as the sound pressure level exceeded for one percent of a 1 minute measurement period.

L6.3 The noise limits set out in condition L6.1 apply under all meteorological conditions except for the following:

a) Wind speeds greater than 3 metres/second at 10 metres above ground level.
b) Stability category F temperature inversion conditions and wind speeds greater than 2 metres/second at 10 metres above ground level; or
c) Stability category G temperature inversion conditions.

L6.4 For the purposes of condition L6.3:

a) Data recorded by a meteorological station installed on site must be used to determine meteorological conditions; and
b) Temperature inversion conditions (stability category) are to be determined by the sigma-theta method referred to in Part E4 of Appendix E to the NSW Industrial Noise Policy.

L6.5 To determine compliance:

a) with the Leq(15 minute) noise limits in condition L6.1, the noise measurement equipment must be located:

   - approximately on the property boundary, where any dwelling is situated 30 metres or less from the property boundary closest to the premises; or
   - within 30 metres of a dwelling façade, but not closer than 3m, where any dwelling on the property is situated more than 30 metres from the property boundary closest to the premises; or, where applicable
   - within approximately 50 metres of the boundary of a National Park or a Nature Reserve.

b) with the LA1(1 minute) noise limits in condition L6.1, the noise measurement equipment must be located within 1 metre of a dwelling façade.

c) with the noise limits in condition L6.1, the noise measurement equipment must be located:

   - at the most affected point at a location where there is no dwelling at the location; or
   - at the most affected point within an area at a location prescribed by conditions L6.5(a) or L6.5(b).

L6.6 A non-compliance of condition L6.1 will still occur where noise generated from the premises in excess of the appropriate limit is measured:

- at a location other than an area prescribed by conditions L6.5(a) and L6.5(b); and/or
- at a point other than the most affected point at a location.

L6.7 For the purposes of determining the noise generated at the premises the modification factors in Section 4 of the NSW Industrial Noise Policy must be applied, as appropriate, to the noise levels measured by the noise monitoring equipment.

Additions to Definition of Terms of the licence

- NSW Industrial Noise Policy - the document entitled "New South Wales Industrial Noise Policy published by the Environment Protection Authority in January 2000."

- Noise - sound pressure levels' for the purposes of conditions L6.1 to L6.7.

L7. Blasting

L7 Blasting Limits

L7.1 The airblast overpressure level from blasting operations at the premises must not exceed 115dB (Lin Peak) at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.2 The airblast overpressure level from blasting operations at the premises must not exceed 120dB (Lin Peak) at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.3 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 5mm/sec at any noise sensitive locations for more than five per cent of the total number of blasts over each reporting period. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.4 Ground vibration peak particle velocity from the blasting operations at the premises must not exceed 10mm/sec at any time at any noise sensitive locations. Error margins associated with any monitoring equipment used to measure this are not to be taken into account in determining whether or not the limit has been exceeded.

L7.5 Blasting at the premises may only take place between 9:00am-5:00pm Monday to Friday. Blasting is not permitted on weekends or public holidays.

L7.6 Blasting outside of the hours specified in L7.5 can only take place with the written approval of the Environment Protection Authority (EPA).

NOTE: A breach of the licence will still occur where airblast overpressure or ground vibration levels from the blasting operations at the premises exceeds the limit specified in conditions L7.1 to L7.4 at any "noise sensitive locations" other than the locations identified in the above condition.

Operating conditions

O1. Odour

O1.1 The licensee must not cause or permit the emission of offensive odour beyond the boundary of the premises.

Note: Section 129 of the Protection of the Environment Operations Act 1997, provides that the licensee must not cause or permit the emission of any offensive odour from the premises but provides a defence if the emission is identified in the relevant environment protection licence as a potentially offensive odour and the odour was emitted in accordance with the conditions of the license directed at minimising odour.

No condition of this licence identifies a potentially offensive odour for the purpose of Section 129 of the Protection of the Environment Operations Act 1997

O2. Dust

O2.1 Activities occurring at the premises must be carried out in a manner that will minimise emissions of dust from the premises.

O2.2 Trucks entering and leaving the premises that are carrying loads must be covered at all times, except during loading and unloading.

O2.3 All dust control equipment must be operable at all times with the exception of shutdowns required for maintenance.

O3. Stormwater/sediment control - Construction Phase

O3.1 An Erosion and Sediment Control Plan (ESCP) must be prepared and implemented. The plan must describe the measures that will be employed to minimise soil erosion and the discharge of sediment and other pollutants to lands and/or waters during construction activities. The ESCP should be prepared in accordance with the requirements for such plans outlined in *Managing Urban Stormwater: Soils and Construction* (available from the Department of Housing).

O4. Stormwater/sediment control - Operation Phase

O4.1 A Stormwater Management Scheme must be prepared for the development and must be implemented. Implementation of the Scheme must mitigate the impacts of stormwater run-off from and within the premises following the completion of construction activities. The Scheme should be consistent with the Stormwater Management Plan for the catchment. Where a Stormwater Management Plan has not yet been prepared the Scheme should be consistent with the guidance contained in *Managing Urban Stormwater: Council Handbook* (available from the EPA).

O7. Blast management protocol

O7.1 A Blasting/Vibration Management Protocol must be prepared in relation to the development and implemented. The protocol must include, but need not be limited to, the following matters:

- compliance standards;
- mitigation measures;
- remedial action;
- monitoring methods and program;
- monitoring program for flyrock distribution*;

- measures to protect underground utilities (eg: rising mains, subsurface telecommunication and electric cables) and livestock nearby;

notification of procedures for neighbours prior to detonation of each blast;

- measures to ensure no damage by flyrock to people, property, livestock and powerlines.*

O8. Noise Barrier

O8.1 The noise barrier referred to below Table 5 of the Acousitc Assessment prepared by Blackett Acoustics, dated 7 March 2013, must be of solid construction, without gaps and extend to ground level in order to be effective.

Monitoring and recording conditions

M1 Monitoring records

M1.1 The results of any monitoring required to be conducted by the EPA's general terms of approval, or a licence under the Protection of the Environment Operations Act 1997, in relation to the development or in order to comply with the load calculation protocol must be recorded and retained as set out in conditions M1.2 and M1.3.

M1.2 All records required to be kept by the licence must be:

in a legible form, or in a form that can readily be reduced to a legible form;

kept for at least 4 years after the monitoring or event to which they relate took place; and

produced in a legible form to any authorised officer of the EPA who asks to see them.

M1.3 The following records must be kept in respect of any samples required to be collected: the date(s) on which the sample was taken;

- the time(s) at which the sample was collected;
- the point at which the sample was taken; and
- the name of the person who collected the sample.

M2. Requirement to monitor concentration of pollutants discharged

M2.1 For each monitoring/ discharge point or utilisation area specified below (by a point number), the applicant must monitor (by sampling and obtaining results by analysis) the concentration of each pollutant specified in Column 1. The applicant must use the sampling method, units of measure, and sample at the frequency, specified opposite in the other columns:

Point 1 - Sediment Basin Overflow Water and Land

Pollutant	Units of measure	Frequency	**Sampling Method**
Total Suspended Solids	mg/L	during any discharge	Grab Sample

Reporting conditions

R1.1 The applicant must provide an annual return to the EPA in relation to the development as required by any licence under the Protection of the Environment Operations Act 1997 in relation to the development. In the return the applicant must report on the annual monitoring undertaken (where the activity results in pollutant discharges), provide a summary of complaints relating to the development, report on compliance with licence conditions and provide a calculation of licence

fees (administrative fees and, where relevant, load based fees) that are payable. If load based fees apply to the activity the applicant will be required to submit load-based fee calculation worksheets with the return.

Pollution Studies and Reduction Programs

Soil Erosion and Sediment Control Plan

U1.1 The Proponent must prepare and implement a Soil Erosion and Sediment Control Plan. This Plan must:

(a) ensure that soil erosion and sediment pollution will be managed consistent with the guidelines, principles and minimum design standards Volume 1 of *Managing Urban Stormwater: Soils and Construction (Landcom 2004)* (the Blue Book);

(b) ensure that the sediment basin will be designed and managed consistent with the guidelines, principles and minimum design standards in *Managing Urban Stormwater: Soils and Construction - Volume 2E Mines and Quarries (DECC 2008);*

(c) ensure that the haul roads and access roads will be managed consistent with the guidelines, principles and minimum design standards in *Managing Urban Stormwater: Soils and Construction - Volume 2C Unsealed Roads (DECC 2008)*;

(d) provide plan drawings showing the locations for best management practices for the site during development of the extraction area;

(e) include written text detailing the installation, monitoring and maintenance requirements for each of the recommended BMPs for erosion and sediment control; and

(f) include detailed drawings of any engineering structures such as sediment and evaporation ponds and the clear water diversion structures, including design standards and management regimes to return the erosion and sediment control system to design capacity following rainfall events.

Particulate Matter Control Best Practice

U2.1 The proponent must conduct a site specific Best Management Practice (BMP) determination to identify the most practicable means to reduce particle emissions.

U2.2 The proponent must prepare a report which includes, but is not necessarily limited to, the following:

- identification, quantification and justification of best practice measures that could be used to minimise particle emissions;
- evaluation of the practicability of implementing these best practice measures; and
- a proposed timeframe for implementing all practicable best practice measures.

In preparing the report, the proponent must utilise the document entitled *Coal Mine Particulate Matter Control Best Practice – Site Specific Determination Guideline – November 2011 (http://www.environment.nsw.gov.au/resources/air/20110813coalmineparticulate.pdf)*.

It is noted the site specific Best Management Practice (BMP) determination findings could alternatively be documented in the Air Quality Management Plan (refer below).

U2.3 The report required by condition U2.2 must be submitted by the proponent to the Environment Protection Authority's Head of Operations Dubbo, at PO Box 2111 Dubbo NSW 2830 prior to an application for an environment protection licence for the project.

Air Quality Management Plan

U2.4 Based on the information contained in the site specific BMP (refer to condition U2.2 above) and the project EA, the proponent must develop and implement an air quality management plan for the project in consultation with the EPA. As a minimum the air quality management plan must include the following information for each emission source:

- *Key performance indicator(s);*
- *Monitoring method;*
- *Location, frequency and duration of monitoring;*
- *Record keeping;*
- *Response mechanisms; and*
- *Compliance reporting.*

If consent is granted by Parkes Shire Council the EPA will be unable to issue a Scheduled Development or Scheduled Activity Licence until the documentation referred to above is prepared and approved.

Reasons for Conditions:

Development Application No: DA12097 was assessed using current procedures developed by the Parkes Shire Council and other resource information. This includes:

- the requirements of Section 79C(1) of the *Environmental Planning and Assessment Act 1979* which states:

  Section 79C(1) Matters for consideration – general

  In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:

  (a) the provisions of:
  - *(i) any environmental planning instrument, and*
  - *(ii) any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority, and*
  - *(iii) any development control plan, and*
  - *(iv) any matters prescribed by the regulations that apply to the land to which the development application relates*

  (b) the likely impacts of that development, including environmental impacts on both the natural and built environments and social and economic impacts in the locality,

  (c) the suitability of the site for the development,

  (d) any submissions made in accordance with this Act or the regulations,

  (e) the public interest.

- the requirements of the Parkes Local Environmental Plan 2012.

- the requirements of the following Development Control Plans and Council Policies:
  - (i) Carparking Code, Development Control Plan 1998
  - (ii) Rural Development, Development Control Plan 1998

- field inspection and liaison between officers of the Parkes Shire Council as well as the following government authorities:
  - (i) Environment Protection Authority
  - (ii) Roads and Maritime Services

Other Approvals:	
Local Government Act, 1993 approvals granted under Section 78A (5):	
General Terms of Other Approvals Integrated as Part of the Consent:	Environmental Protection Authority - Notice No. 1511683
Right of Review:	Section 82A of the Environmental Planning and Assessment Act, 1979 confers the right for an applicant to request the Council to review its determination within twelve months after the date of determination. Any requests for a review are required to be accompanied by a fee as set by the Environmental Planning and Assessment Regulation, 1994.
Right of Appeal:	Section 97 of Environmental Planning and Assessment Act, 1979 confers the right for an applicant who is dissatisfied with Council's determination to appeal to the Land and Environment Court within 12 months after the date on which you receive this notice.
Signed:	On behalf of the consent authority:
Signature:	[redacted]
Name:	Steven Campbell **DIRECTOR PLANNING AND ENVIRONMENT**
Date:	16 July 2013

NSW GOVERNMENT | Department of Primary Industries

OUT16/23067

15 June 2016

Lauren Evans
Planning Officer
Resource Assessments
Department of Planning & Environment
[redacted]

Email: [redacted]

Dear Lauren

SEAR's Request _EAR ID No 1052 Proposed Quarry at 1105 Bogan Road Goonumbla

Thank you for the opportunity to provide Environmental Assessment Requirements for the above proposal as per your email dated 6 June 2016.

DPI Agriculture, a division of Department of Primary Industries (DPI), is concerned with the protection and growth of agricultural industries and the resources upon which these industries depend. The subject land is located on and within the vicinity of diverse agricultural industry lands used both for grazing and cropping. The assessment of the land and soil capability of the existing and new quarry area will indicate on site land type and its capability for various agricultural uses. There is a need to consider how the proposed quarry operations (and existing ones) will impact on the use of adjacent lands particularly those used for agriculture.

The Environmental Impact Statement for the proposal should consider surrounding agricultural industries and resources as potential receptors of any identified impacts. Of particular importance, is consideration of any potential impacts on drainage patterns as a result of proposed subsurface extraction and the final void impact. Specific issues for this proposal are identified in Attachment 1.

The *Agriculture issues for Extractive Industry Development Factsheet* provides information on other potential agricultural impacts that may need consideration for these types of development. This is available at this link:
http://www.dpi.nsw.gov.au/agriculture/resources/lup/development-assessment/extractive-industries

Should you require clarification on any of the information contained in this response, please contact me on (02) 68811250 or mobile 0427949987.

Yours Sincerely

Mary Kovac
Resource Management Officer
Central and Far West Regions

Summary of Major Issues for SEARS for the proposed Quarry at 1105 Bogan Road Goonumbla

Issue	Detail and Recommendation
Impact on Agricultural Land	Review the farming operations in the area. Determine the amount of land being removed from agriculture in the identified proposal area. Undertake a soils and land capability assessment to determine: • Existing land value to plant and animal land uses both on the proposal site and adjacent lands to the proposed activity.
Dust	Undertake an inventory of potential impacts on adjacent farm residencies and farming operations. Outline mitigating actions to minimize dust impact on adjacent farming enterprises.
Weed containment and management	Update/develop a Weed Management Plan (particularly for any soil stockpiles to be used for future rehabilitation) and adjacent roadsides (to avoid spreading weeds off site).
Pest Management	Update/develop a Pest Management Plan.
Soil erosion and sedimentation	Update/develop Erosion and Sediment Control Plan and a Stormwater Management Plan.
Access and noise (Traffic)	Identify access routes and associated noise and traffic impacts on farm residences and farming operations in the vicinity and mitigation measures for these impacts.
Visual and lighting	Identify visual and lighting impacts on nearby farm residences and farming operations identified and describe mitigation measures.
Bushfire management	Update/complete a bush fire risk assessment and develop a Bush Fire Management Plan
Rehabilitation planning	Determine the impact of surrounding land uses by documenting end land uses and final landforms for the whole quarry operation.
Consultation	Show any consultation commitments regarding adjacent landholders and rural community regarding the operations and access details of the proposal. Identify any past issues that have arisen and been resolved that may impact on the operation of this quarry proposal.

Department of Primary Industries
Water

Contact Rachel Daly
Phone 02 6841 7429
Fax 02 6884 0096
Email Rachel.daly@dpi.nsw.gov.au

Our ref: ERM 2016/0457/ 9056068
Your ref: EAR ID No 1052

Lauren Evans
Department of Planning and Environment
[redacted]

20 June 2016

Dear Lauren

Request for Secretary's Environmental Assessment Requirements for proposed Bogan Road Gravel Quarry, 1105 Bogan Road, Goonumbla (Lot 32 DP 816454) EAR ID No 1052

The DPI Water has reviewed the supporting documentation accompanying the request for Secretary's Environmental Assessment Requirements (SEARs) and provides the following comments below, and further detail in **Attachment A**.

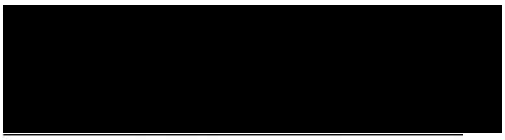
It is recommended that the EIS be required to include:

- Assessment of any volumetric water licensing requirements (including those for ongoing water take following completion of the project) – addressing whether any licences or approvals may be required under the *Water Management Act 2000* and *Water Act 1912.*
- The identification of an adequate and secure water supply for the life of the project. Confirmation that water can be sourced from an appropriately authorised and reliable supply. This is to include an assessment of the current market depth where water entitlement is required to be purchased.
- Annual volumes of surface water and groundwater proposed to be taken by the activity (including through inflow and seepage) from each surface and groundwater source as defined by the relevant water sharing plan.
- A current assessment of immediate and cumulative impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts. This should include proposed surface and groundwater monitoring activities and methodologies.
- Details of proposed management systems for dirty and clean water including stormwater runoff and erosion and sediment control measures.
- A detailed and consolidated site water balance.
- A detailed assessment against the NSW Aquifer Interference Policy (2012) using DPI Water's assessment framework. Also refer to NSW Aquifer Interference Policy Fact Sheet 7 available at http://www.water.nsw.gov.au/water-management/law-and-policy/key-policies/aquifer-interference

- Full technical details and data of all surface and groundwater modelling, and an independent peer review.
- Details of the final landform of the site, including final void management (where relevant) and rehabilitation measures.
- Details of works within 40 metres of a watercourse and measures put in place to protect the watercourse. Works may require a Controlled Activity Approval under the *Water Management Act 2000* and the works are to be in accordance with the Guidelines for Controlled Activities on Waterfront Land.
- Consideration of relevant policies and guidelines.
- A statement of where each element of the SEARs is addressed in the EIS (i.e. in the form of a table).

A generic set of assessment requirements are provided in Attachment A. Should you have any further queries in relation to this submission please do not hesitate to contact Rachel Daly on (02) 6841 7429.

Yours sincerely



Tim Baker
Senior Water Regulation Officer
Water Regulatory Operations, Water Regulatory Operations North
NSW Department of Primary Industries - Water

ATTACHMENT A

DPI Water Comments on Secretary's Environmental Assessment Requirements – Bogan Road Gravel Quarry

The following detailed assessment requirements are provided to assist in adequately addressing the assessment requirements for this proposal.

For further information visit the DPI Water website, www.water.nsw.gov.au

Key Relevant Legislative Instruments
This section provides a basic summary to aid proponents in the development of an Environmental Impact Statement (EIS), and should not be considered a complete list or comprehensive summary of relevant legislative instruments that may apply to the regulation of water resources for a project.

The EIS should take into account the objects and regulatory requirements of the *Water Act 1912* (WA 1912) and *Water Management Act 2000* (WMA 2000), and associated regulations and instruments, as applicable.

Water Management Act 2000 (WMA 2000)

Key points:

- Volumetric licensing in areas covered by water sharing plans
- Works within 40m of waterfront land
- SSD & SSI projects are exempt from requiring water supply work approvals and controlled activity approvals as a result of the *Environmental Planning & Assessment Act 1979 (EP&A Act)*.
- No exemptions for volumetric licensing apply as a result of the *EP&A Act*.
- Basic landholder rights, including harvestable rights dams
- Flood management works
- Aquifer interference activity approval provisions have not yet commenced and are regulated by the *Water Act 1912*
- Maximum penalties of $2.2 million plus $264,000 for each day an offence continues apply under the *WMA 2000*

Water Act 1912 (WA 1912)

Key points:

- Volumetric licensing in areas where no water sharing plan applies
- Monitoring bores
- Aquifer interference activities that are not regulated as a water supply work under the *WMA 2000*.
- No exemptions apply to licences or permits under the *WA 1912* as a result of the *EP&A Act*.
- Regulation of water bore driller licensing.

Water Management (General) Regulation 2011

Key points:

- Provides various exemptions for volumetric licensing and activity approvals
- Provides further detail on requirements for dealings and applications.

Water Sharing Plans – these are considered regulations under the *WMA 2000*

Access Licence Dealing Principles Order 2004

Harvestable Rights Orders

Water Sharing Plans

The proposal is located within the area covered by the Water Sharing Plan for the NSW Murray Darling Basin Fractured Rock Groundwater Sources 2011 and the Water Sharing Plan for the Lachlan Unregulated and Alluvial Water Sources 2012. The EIS is required to:

- Demonstrate how the proposal is consistent with the relevant rules of the Water Sharing Plan including rules for access licences, distance restrictions for water supply works and rules for the management of local impacts in respect of surface water and groundwater sources, ecosystem protection (including groundwater dependent ecosystems), water quality and surface-groundwater connectivity.
- Provide a description of any site water use (amount of water to be taken from each water source) and management including all sediment dams, clear water diversion structures with detail on the location, design specifications and storage capacities for all the existing and proposed water management structures.
- Provide an analysis of the proposed water supply arrangements against the rules for access licences and other applicable requirements of any relevant WSP, including:
    - Sufficient market depth to acquire the necessary entitlements for each water source.
    - Ability to carry out a "dealing" to transfer the water to relevant location under the rules of the WSP.
    - Daily and long-term access rules.
    - Account management and carryover provisions.
- Provide a detailed and consolidated site water balance.
- Further detail on licensing requirements is provided below.

Relevant Policies and Guidelines

The EIS should take into account the following policies (as applicable):

- NSW Guidelines for Controlled Activities on Waterfront Land (DPI Water, 2012)
- NSW Aquifer Interference Policy (DPI Water, 2012)
- Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI Water, 2012)
- Australian Groundwater Modelling Guidelines (NWC, 2012)
- NSW State Rivers and Estuary Policy (1993)
- NSW State Groundwater Policy Framework Document (1997)
- NSW State Groundwater Quality Protection Policy (1998)
- NSW State Groundwater Dependent Ecosystems Policy (2002)
- NSW Water Extraction Monitoring Policy (2007)

DPI Water policies can be accessed at the following links:
http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/default.aspx
http://www.water.nsw.gov.au/Water-licensing/Approvals/Controlled-activities/default.aspx

An assessment framework for the NSW Aquifer Interference Policy can be found online at: http://www.water.nsw.gov.au/Water-management/Law-and-policy/Key-policies/Aquifer-interference.

Licensing Considerations

The EIS is required to provide:

- Identification of water requirements for the life of the project in terms of both volume and timing (including predictions of potential ongoing groundwater take following the cessation of operations at the site.
- Details of the water supply source(s) for the proposal including any proposed surface water and groundwater extraction from each water source as defined in the relevant Water Sharing Plan/s and all water supply works to take water.
- Explanation of how the required water entitlements will be obtained (i.e. through a new or existing licence/s, trading on the water market, controlled allocations etc.).
- Information on the purpose, location, construction and expected annual extraction volumes including details on all existing and proposed water supply works which take surface water, (pumps, dams, diversions, etc).
- Details on all bores and excavations for the purpose of investigation, extraction, dewatering, testing and monitoring. All predicted groundwater take must be accounted for through adequate licensing.
- Details on existing dams/storages (including the date of construction, location, purpose, size and capacity) and any proposal to change the purpose of existing dams/storages
- Details on the location, purpose, size and capacity of any new proposed dams/storages.
- Applicability of any exemptions under the *Water Management (General) Regulation 2011* to the project.

Water allocation account management rules, total daily extraction limits and rules governing environmental protection and access licence dealings also need to be considered.

The Harvestable Right gives landholders the right to capture and use for any purpose 10% of the average annual runoff from their property. The Harvestable Right has been defined in terms of an equivalent dam capacity called the Maximum Harvestable Right Dam Capacity (MHRDC). The MHRDC is determined by the area of the property (in hectares) and a site-specific run-off factor. The MHRDC includes the capacity of all existing dams on the property that do not have a current water licence. Storages capturing up to the harvestable right capacity are not required to be licensed but any capacity of the total of all storages/dams on the property greater than the MHRDC may require a licence.

For more information on Harvestable Right dams, including a calculator, visit:
http://www.water.nsw.gov.au/Water-licensing/Basic-water-rights/Harvesting-runoff/Harvesting-runoff

Dam Safety

Where new or modified dams are proposed, or where new development will occur below an existing dam, the NSW Dams Safety Committee should be consulted in relation to any safety issues that may arise. Conditions of approval may be recommended to ensure safety in relation to any new or existing dams.

See www.damsafety.nsw.gov.au for further information.

Surface Water Assessment

The predictive assessment of the impact of the proposed project on surface water sources should include the following:

- Identification of all surface water features including watercourses, wetlands and floodplains transected by or adjacent to the proposed project.
- Identification of all surface water sources as described by the relevant water sharing plan.
- Detailed description of dependent ecosystems and existing surface water users within the area, including basic landholder rights to water and adjacent/downstream licensed water users.
- Description of all works and surface infrastructure that will intercept, store, convey, or otherwise interact with surface water resources.
- Assessment of predicted impacts on the following:
    - flow of surface water, sediment movement, channel stability, and hydraulic regime,
    - water quality,
    - flood regime,
    - dependent ecosystems,
    - existing surface water users, and
    - planned environmental water and water sharing arrangements prescribed in the relevant water sharing plans.

Groundwater Assessment

To ensure the sustainable and integrated management of groundwater sources, the EIS needs to include adequate details to assess the impact of the project on all groundwater sources including:

- Works likely to intercept, connect with or infiltrate the groundwater sources.
- Any proposed groundwater extraction, including purpose, location and construction details of all proposed bores and expected annual extraction volumes.
- Bore construction information is to be supplied to the DPI Water by submitting a “Form A” template. The DPI Water will supply “GW” registration numbers (and licence/approval numbers if required) which must be used as consistent and unique bore identifiers for all future reporting.
- A description of the watertable and groundwater pressure configuration, flow directions and rates and physical and chemical characteristics of the groundwater source (including connectivity with other groundwater and surface water sources).
- Sufficient baseline monitoring for groundwater quantity and quality for all aquifers and GDEs to establish a baseline incorporating typical temporal and spatial variations.
- The predicted impacts of any final landform on the groundwater regime.
- The existing groundwater users within the area (including the environment), any potential impacts on these users and safeguard measures to mitigate impacts.
- An assessment of groundwater quality, its beneficial use classification and prediction of any impacts on groundwater quality.
- An assessment of the potential for groundwater contamination (considering both the impacts of the proposal on groundwater contamination and the impacts of contamination on the proposal).

- Measures proposed to protect groundwater quality, both in the short and long term.
- Measures for preventing groundwater pollution so that remediation is not required.
- Protective measures for any groundwater dependent ecosystems (GDEs).
- Proposed methods of the disposal of waste water and approval from the relevant authority.
- The results of any models or predictive tools used.

Where potential impact/s are identified the assessment will need to identify limits to the level of impact and contingency measures that would remediate, reduce or manage potential impacts to the existing groundwater resource and any dependent groundwater environment or water users, including information on:

- Any proposed monitoring programs, including water levels and quality data.
- Reporting procedures for any monitoring program including mechanism for transfer of information.
- An assessment of any groundwater source/aquifer that may be sterilised from future use as a water supply as a consequence of the proposal.
- Identification of any nominal thresholds as to the level of impact beyond which remedial measures or contingency plans would be initiated (this may entail water level triggers or a beneficial use category).
- Description of the remedial measures or contingency plans proposed.
- Any funding assurances covering the anticipated post development maintenance cost, for example on-going groundwater monitoring for the nominated period.

Groundwater Dependent Ecosystems

The EIS must consider the potential impacts on any Groundwater Dependent Ecosystems (GDEs) at the site and in the vicinity of the site and:

- Identify any potential impacts on GDEs as a result of the proposal including:
  - the effect of the proposal on the recharge to groundwater systems;
  - the potential to adversely affect the water quality of the underlying groundwater system and adjoining groundwater systems in hydraulic connections; and
  - the effect on the function of GDEs (habitat, groundwater levels, connectivity).
- Provide safeguard measures for any GDEs.

Watercourses, Wetlands and Riparian Land

The EIS should address the potential impacts of the project on all watercourses likely to be affected by the project, existing riparian vegetation and the rehabilitation of riparian land. It is recommended the EIS provides details on all watercourses potentially affected by the proposal, including:

- Scaled plans showing the location of:
  - wetlands/swamps, watercourses and top of bank;
  - riparian corridor widths to be established along the creeks;
  - existing riparian vegetation surrounding the watercourses (identify any areas to be protected and any riparian vegetation proposed to be removed);
  - the site boundary, the footprint of the proposal in relation to the watercourses and riparian areas; and

  - proposed location of any asset protection zones.
- Photographs of the watercourses/wetlands and a map showing the point from which the photos were taken.
- A detailed description of all potential impacts on the watercourses/riparian land.
- A detailed description of all potential impacts on the wetlands, including potential impacts to the wetlands hydrologic regime; groundwater recharge; habitat and any species that depend on the wetlands.
- A description of the design features and measures to be incorporated to mitigate potential impacts.
- Geomorphic and hydrological assessment of water courses including details of stream order (Strahler System), river style and energy regimes both in channel and on adjacent floodplains.

Access Road Construction

- Any construction activity within 40m of a watercourse, should be designed by a suitably qualified person, consistent with the NSW *Guidelines for Controlled Activities on Waterfront Land* (July 2012).

Landform rehabilitation (including final void management)

The Environmental Impact Statement report should include:

- Justification of the proposed final landform with regard to its impact on local and regional surface and groundwater systems;
- A detailed description of how the site would be progressively rehabilitated and integrated into the surrounding landscape;
- Outline of proposed construction and restoration of topography and surface drainage features if affected by the project;
- Detailed modelling of potential groundwater volume, flow and quality impacts of the presence of an inundated final void (where relevant) on identified receptors specifically considering those environmental systems that are likely to be groundwater dependent;
- An outline of the measures to be put in place to ensure that sufficient resources are available to implement the proposed rehabilitation; and
- The measures that would be established for the long-term protection of local and regional aquifer systems and for the ongoing management of the site following the cessation of the project.

End Attachment A

Department of Industry
Resources & Energy

16 June 2016

Lauren Evans
Planning Officer
Department of Planning & Environment
[redacted]

Emailed
Your Reference: EAR ID No.1052
Our Reference: OUT16/23364

Dear Ms Evans,

Re: Request for Secretary's Environmental Assessment Requirements Proposal – Bogan Road Gravel Quarry

Thank you for the opportunity to provide advice on the subject proposal.

This is a response from NSW Department of Industry – Division of Resources & Energy (DRE), incorporating advice from the Agriculture and Fisheries Branches. Specific Fisheries or Forests issues arising may be provided in separate correspondence.

The building and construction industries in NSW require ongoing replacement of supplies as sources are exhausted. The expansion of existing quarries, subject to environmental assessment, helps to ensure a continued supply of material for a range of building and construction uses in NSW. The resource in the subject area represents a locally and regionally important source of gravel and hard rock aggregate for the greater Parkes area.

Mineral Resources Issues
Gravel and hard rock aggregate are not prescribed minerals under the *Mining Act 1992*. Therefore, DRE has no statutory role in authorising or regulating the extraction of this commodity, apart from its role under the *Work Health & Safety Act 2011* and associated regulations and the *Mine Health and Safety Act 2004* and associated regulations, for ensuring the safe operation of mines and quarries.

All environmental reports (EISs or similar) accompanying Development Applications for extractive industry lodged under the *Environmental Planning & Assessment Act 1979* should include a resource assessment **(as detailed in Attachment A)** which:

- **Documents the size and quality of the resource and demonstrates that both have been adequately assessed; and**
- **Documents the methods used to assess the resource and its suitability for the intended applications.**

Applications to modify, expand, extend or intensify an existing consent that has already been adequately reported using the above protocol in publicly available documents, may

restrict detailed documentation to the additional resources to be used, if accompanied by a summary of past resource assessments and of past production.

DRE collects data on the quantity and value of construction materials produced annually throughout the State. Forms are sent to all operating quarries at the end of each financial year for this purpose. The statistical data thus collected is of great value to Government and industry in planning and resource management, particularly as a basis for analysing trends in production and for estimating future demand for particular commodities or in particular regions. In order to assist in the collection of construction material production data, the proponent should be required to provide annual production data for the subject site to DRE as a condition of any new or amended development consent.

Queries regarding the above information, and future requests for advice in relation to this matter, should be directed to the DRE – Geological Survey of New South Wales Land Use team at landuse.minerals@industry.nsw.gov.au

Agricultural Issues for Extractive Industries (Quarries)

The relevant agricultural issues to consider when preparing and also when assessing extractive industry proposals are set out in the Departments' Guideline: *Agricultural issues for Extractive Industries* available on our website; http://www.dpi.nsw.gov.au/agriculture/resources/lup/development-assessment. The guideline also documents recommended project design and mitigatory responses.

The guideline is part of a series designed to help consent authorities identify potential agricultural impacts, and assess whether such proposals can avoid conflict with existing agricultural developments; and protect valuable food and fibre production resources. The guidelines can similarly help consultants and proponents and are available from the Department of Primary Industries land use planning web portal: http://www.dpi.nsw.gov.au/agriculture/resources/lup/development-assessment .

Fisheries Issues

General issues are summarised in **Attachment B**.

Yours sincerely

[redacted]

Cressida Gilmore
Manager - Land Use

Encl. Attachments "A to B"

ATTACHMENT A

NSW Department of Industry
RESOURCES & ENERGY DIVISION

ENVIRONMENTAL and WORK HEALTH & SAFETY ASSESSMENT REQUIREMENTS FOR CONSTRUCTION MATERIAL QUARRY PROPOSALS

It is in the best interests of both the proponent and the community to fully assess the resources which are to be extracted. This means that a thorough geological assessment should be undertaken to determine the nature, quality and extent of the resource. Failure to undertake such an assessment could lead to operational problems and possibly even failure of the proposal.

The following issues need to be addressed when preparing an environmental assessment (EA) or environmental impact statement (EIS) for a proposed construction materials (extractive materials) quarry:

Resource Assessment

1. A summary of the regional and local geology including information on the stratigraphic unit or units within which the resource is located.

2. The amount of material to be extracted and the method or methods used to determine the size of the resource (e.g. drilling, trenching, geophysical methods). Plans and cross-sections summarising this data, at a standard scale, showing location of drillholes and/or trenches, and the area proposed for extraction, should be included in the EA or EIS. Relevant supporting documentation such as drill logs should be included or appended. Major resource proposals should be subject to extensive drilling programs to identify the nature and extent of the resource.

3. Characteristics of the material or materials to be produced:
   a) For structural clay/shale extraction proposals, ceramic properties such as plasticity, drying characteristics (e.g. dry green strength, linear drying shrinkage), and firing characteristics (e.g. shrinkage, water absorption, fired colour) should be described.
   b) For sand extraction proposals, properties such as composition, grainsize, grading, clay content and contaminants should be indicated. The inclusion of indicative grading curves for all anticipated products as well as the overall deposit is recommended.
   c) For hard rock aggregate proposals, information should be provided on properties such as grainsize and mineralogy, nature and extent of weathering or alteration, and amount and type of deleterious minerals, if any.

d) For other proposals, properties relevant to the range of intended uses for the particular material should be indicated.

Details of tests carried out to determine the characteristics of the material should be included or appended. Such tests should be undertaken by NATA registered testing laboratories.

4. An assessment of the quality of the material and its suitability for the anticipated range of applications should be given.

5. The amount of material anticipated to be produced annually should be indicated. If the proposal includes a staged extraction sequence, details of the staging sequence needs to be provided. The intended life of the operation should be indicated.

6. If the proposal is an extension to an existing operation, details of history and past production should be provided.

7. An assessment of alternative sources to the proposal and the availability of these sources. The impact of not proceeding with the proposal should be addressed.

8. Justification for the proposal in terms of the local and, if appropriate, the regional context.

9. Information on the location and size of markets to be supplied from the site.

10. Route(s) used to transport quarry products to market.

11. Disposal of waste products and the location and size of stockpiles.

12. Assessment of noise, vibration, dust and visual impacts, and proposed measures to minimise these impacts.

13. Proposed rehabilitation procedures during, and after completion of, extraction operations, and proposed final use of site.

14. Assessment of the ecological sustainability of the proposal.

Health and Safety Issues

In relation to the health & safety of mining and quarrying operations, the following issues should be addressed:

1. All operations are to comply with the following Acts & Regulations
   a. *Work Health & Safety Act 2011*
   b. *Work Health & Safety Regulations 2011*
   c. *Mine Health & Safety Act 2004*
   d. *Mine Health & Safety Regulations 2007*

2. The mine holder must nominate the mine operator in writing on the prescribed form to the Chief Inspector as required by the *Mine Health & Safety Act 2004* Section 22 prior to the commencement of extraction.

3. The operator of the mine must appoint a production manager as required by the *Mine Health & Safety Regulation 2007* Clause 16 and the operator must notify the Chief Inspector of the appointment in writing as required by the *Mine Health & Safety Regulation 2007* Clause 18 prior to the commencement of extraction.

4. Any blasting operations carried out by the mine operator must comply with the *Explosives Act 2003* and the *Explosives Regulations 2005*.

Mineral Ownership

The *Mining Act 1992* applies to those commodities prescribed by the regulations of the Act (Schedule 2, *Mining Regulation 2003*). Most construction materials are not prescribed minerals under the *Mining Act 1992*. In general terms, this means these materials are owned by the Crown where they occur on Crown land and by the landowner in the case of freehold land. A Mining Title is not required for their extraction although a Crown Lands licence is required where they occur on Crown land.

Construction materials such as *sand (other than marine aggregate), loam, river gravel, and coarse aggregate materials such as basalt, sandstone, and granite* are not prescribed minerals under the *Mining Act 1992*. Therefore, NSW Department of Industry has no statutory responsibility for authorising or regulating the extraction of these commodities, apart from its role under the *Mine Health and Safety Act 2004* with respect to the safe operation of mines and quarries. However, the Department is the principal government authority responsible for assessing the State's resources of construction materials and for advising State and local government on their planning and management.

Some commodities, notably *structural clay (ie clay for brick, tile and pipe manufacture), dimension stone (except for sandstone), quartzite, kaolin, limestone and marine aggregate* are prescribed minerals under the *Mining Act 1992*. Minerals which are prescribed as minerals under the terms of the Mining Act may, in some cases belong either to the Crown or to the landowner, depending on a number of factors including the date on which the mineral was proclaimed and the date of alienation of the land. The proponent needs to determine whether the material is privately owned or Crown mineral (publicly owned). If it is privately owned, then either a notification under Section 8 of the *Mining Act 1992* or, alternatively, a mining lease or mineral claim would be required. If it is a Crown mineral, an application for a mining lease or mineral claim will have to be lodged.

If you are unsure whether a mining title is required for your proposal you should contact NSW Department of Industry, Resources & Energy Division.

Department of Industry
Resources & Energy

ATTACHMENT B

Primary Industries Division - Aquatic Habitat Protection Requirements

Matters to be Addressed

Definitions

The definitions given below are relevant to these requirements:

Fish means any part of marine, estuarine or freshwater fish or other aquatic animal life at any stage of their life history (whether alive or dead). This includes aquatic molluscs, crustaceans, echinoderms, worms, aquatic insect larvae and other macroinvertebrates .

Marine vegetation means any species of plant that at any time in its life must inhabit water (other than fresh water).

Waters refers to all waters including tidal waters as well as flowing streams, irregularly flowing streams, gullies, rivers, lakes, coastal lagoons, wetlands and other forms of natural or man made water bodies on both private and public land.

1. General Requirements

- Area which may be affected either directly or indirectly by the development or activity should be identified and shown on an appropriately scaled map (1:25000) and aerial photographs.
- All waterbodies and waterways within the proposed area of development are to be identified.
- Description and maps of aquatic vegetation, snags, gravel beds and any other protected, threatened or dominant habitats should be presented. Description should include area, density and species composition.
- A survey of fish species should be carried out and results included. Existing data should be used only if collected less than 5 years previously.
- Identification of recognised recreational and commercial fishing grounds, aquaculture farms and/or other waterways users.
- Details of the location of all component parts of the proposal, including any auxiliary infrastructure, timetable for construction of the proposal with details of various phases of construction
- Aspects of the management of the proposal, both during construction and after completion, which relate to impact minimisation and site rehabilitation eg Environment Management Plans, Rehabilitation Plans, Compensatory offsets
- For each freshwater body identified on the plan, the plan should include, either by annotation or by an accompanying table, hydrological and stream morphology information such as: flow characteristics, including any seasonal variations, bed substrate, and bed width
- For each marine or estuarine area identified on the plan, the plan should include, either by annotation or by an accompanying table, hydrological and stream morphology information such as: tidal characteristics, bed substrate, and depth contours

DREDGING AND RECLAMATION ACTIVITIES

- Purpose of works
- Type(s) and distribution of marine vegetation in the vicinity of the proposed works
- Method of dredging to be used

- Timing and Duration of works
- Dimension of area of works including levels and volume of material to be extracted or placed as fill
- Nature of sediment to be dredged, including Acid Sulphate Soil, contaminated soils etc
- Method of marking area subject to works
- Environmental safeguards to be used during and after works
- Measures for minimising harm to fish habitat under the proposal
- Spoil type and source location for reclamation activities
- Method of disposal of dredge material
- Location and duration of spoil stockpiling, if planned

ACTIVITIES THAT DAMAGE MARINE VEGETATION

- Type of marine vegetation to be harmed
- Map and density distribution of marine vegetation
- Reasons for harming marine vegetation
- Methods of harming marine vegetation
- Construction details
- Duration of works/activities
- Measures for minimising harm to marine vegetation under the proposal and details of compensatory habitat development to replace lost vegetation.
- Method and location of transplanting activities or disposal of marine vegetation

ACTIVITIES THAT BLOCK FISH PASSAGE

- Type of activity eg works in a stream that change flow or morphological characteristics of the stream, including culvert and causeway construction, sediment and erosion control measures, stormwater diversion structures.
- Length of time fish passage is to be restricted, whether permanent or temporary
- Timing of proposed restriction. Should be timed to avoid interfering with migratory movements of fish.
- Remediation or compensatory works to offset any impacts

THREATENED SPECIES

- Threatened aquatic species assessment (Section 5c, EP&A Act 1979). This must be addressed even if there are no Threatened Species present on the site.
- Seven Part Test

FISHING AND AQUACULTURE

- Outline and document commercial, recreational and indigenous fishing activities that may be affected by the activity, including regular commercial fishing grounds, popular recreational fishing sites, recognised indigenous harvesting sites.
- Will the activity interfere with or cause an impact on the continuing operation and viability of nearby aquaculture or mariculture ventures.

2. Initial Assessment

A list of threatened species, endangered populations and endangered ecological communities must be provided. In determining these species, consideration must be given to the habitat types present within the study area, recent records of threatened species in the locality and the known distributions of these species.

In describing the locality in the vicinity of the proposal, discussion must be provided in regard to the previous land and water uses and the effect of these on the proposed site. Relevant historical events may include land clearing, agricultural activities, water

abstraction/diversion, dredging, de-snagging, reclamation, siltation, commercial and recreational activities.

A description of habitat including such components as stream morphology, in-stream and riparian vegetation, water quality and flow characteristics, bed morphology, vegetation (both aquatic and adjacent terrestrial), water quality and tide/flow characteristics must be given. The condition of the habitat within the area must be described and discussed, including the presence and prevalence of introduced species. A description of the habitat requirements of threatened species likely to occur in the study area must be provided.

In defining the proposal area, discussion must be provided in regard to possible indirect effects of the proposal on species/habitats in the area surrounding the subject site: for example, through altered hydrological regimes, soil erosion or pollution. The study area must extend downstream and/or upstream as far as is necessary to take all potential impacts into account.

Please Note: Persons undertaking aquatic surveys may be required to hold or obtain appropriate permits or licences under relevant legislation. For example:

Fisheries Management Act 1994
- Permit to take fish or marine vegetation for research or other authorised purposes (Section 37)
- Licence to harm threatened (aquatic) species, and/or damage the habitat of a threatened species (Section 220ZW).

Animal Research Act 1985:
- Animal Research Authority to undertake fauna surveys.

It is recommend that, prior to any field survey activities taking place, those persons proposing to undertake those activities give consideration to their obligation to obtain appropriate permits or licences which may be required in the specific context of the proposed survey activities.

3. Assessment of Likely Impacts

The EIS must:
- describe and discuss significant habitat areas within the study area;
- outline the habitat requirements of threatened species likely to occur in the study area;
- indicate the location, nature and extent of habitat removal or modification which may result from the proposed action;
- discuss the potential impact of the modification or removal of habitat;
- identify and discuss any potential for the proposal to introduce barriers to the movement of fish species; and
- describe and discuss any other potential impacts of the proposal on fish species or their habitat.

For all species likely to have their lifecycle patterns disrupted by the proposal to the extent that individuals will cease to occupy any location within the subject site, the EIS must describe and discuss other locally occurring populations of such species. The relative significance of this location for these species in the general locality must be discussed in terms of the extent, security and viability of remaining habitat in the locality.

4. Ameliorative Measures

The EIS must consider how the proposal has been or may be modified and managed to conserve fisheries habitat on the subject site and in the study area.

In discussing alternatives to the proposal, and the measures proposed to mitigate any effects of the proposal, consideration must be given to developing long term management strategies to protect areas within the study area which are of particular importance for fish species. This may include proposals to restore or improve habitat.

Any proposed pre-construction monitoring plans or on-going monitoring of the effectiveness of the mitigation measures must be outlined in detail, including the objectives of the monitoring program, method of monitoring, reporting framework, duration and frequency.

In the event of a request for concurrence or consultation of the Secretary of NSW Department of Industry, one (1) copy of the EIS should be provided to NSW Department of Industry in order for the request to be processed.

It should be noted that NSW Department of Industry has no regulatory or statutory role to review draft EISs unless they are accompanied by or are requested as part of a licence application under Part 7A of the FM Act. However, NSW Department of Industry is available to provide advice to consent and determining authorities regarding Fisheries' opinion as to whether the requirements have been met if requested, pending the availability of resources and other statutory priorities.

Useful Information

To help you in the preparation of an EIS, the publication "*Guidelines for the Assessment of Aquatic Ecology in EIA"* (Draft 1998) produced by the Department for Urban Affairs and Planning may prove useful in outlining appropriate procedures and methodologies for conducting aquatic surveys.

Should you require any further information on these requirements please contact the Aquatic Habitat Protection Office at Port Stephens on 4916 3931.

Cudal Lime Production Pty Ltd
PO BOX 54
CUDAL NSW 2864

Attention: Mr Simon Shanon

Notice Number	1541433
File Number	EF13/8261
Date	17-Jun-2016

RE: "Proposal extension to the existing quarry for Cudal Lime Productions Pty Ltd "

I refer to your request for the Environment Protection Authority's (EPA) requirements for the environmental assessment (EA) in regard to the above proposal received by EPA on 6 June 2016.

The EPA has considered the details of the proposal as provided by Cudal Lime Products Pty Ltd and has identified the information it requires to issue its general terms of approval in Attachment A. In summary, the EPA's key information requirements for the proposal include an adequate assessment of:

1. Air: assessment of impacts during both construction and operation, including mitigation strategies and management of dust;
2. Water: assessment of impacts of surface and groundwater, including proposed monitoring and mitigation measures to protect water. This must include water demand and management requirements.
3. Noise and vibration: assessment of impacts during both construction and operation from noise and blasting related activities, including traffic noise. The assessment should address the impacts on nearby receptors and noise amenity in accordance with the NSW industrial Noise Policy, and identify strategies to mitigate potential noise impacts;
4. Land: assessment of impacts to land including management of contaminated soil, sediment and erosion control and proposed management and mitigation measures. This must account for any naturally occurring elements that may cause pollution of land and/or water;
5. Waste: the impacts of potential acid generation from waste rock, including proposed methods of encapsulation.

In carrying out the assessment, the proponent should refer to the relevant guidelines as listed in Attachment B and any relevant industry codes of practice and best practice management guidelines.

Please note that this response does not cover biodiversity or Aboriginal cultural heritage issues, which are the responsibility of the Office of Environment and Heritage.

The Proponent should be made aware that any commitments made in the EA may be formalised as approval conditions and may also be placed as formal licence conditions.

The Proponent should be made aware that, consistent with provisions under Part 9.4 of the *Protection of the Environment Operations Act 1997* ("the Act") the EPA may require the provision of a financial assurance and/or assurances. The amount and form of the assurance(s) would be determined by the EPA and required as a condition of an Environment Protection Licence ("EPL").

In addition, as a requirement of an EPL, the EPA will require the Proponent to prepare, test and implement a Pollution Incident Response Management Plan and/or Plans in accordance with Section 153A of the Act.

Yours sincerely

[redacted]

Bradley Tanswell

Acting Unit Head Far West Operations

Environment Protection Authority

(by Delegation)

Encl: Attachment A - EIS Requirements

Attachment B - Guidance material

ATTACHMENT A: EIS REQUIREMENTS FOR

Proposal extension to the existing quarry for Cudal Lime Productions Pty Ltd

How to use these requirements

The EPA requirements have been structured in accordance with the DIPNR EIS Guidelines, as follows. It is suggested that the EIS follow the same structure:

A. Executive summary

B. The proposal

C. The location

D. Identification and prioritisation of issues

E. The environmental issues

F. List of approvals and licences

G. Compilation of mitigation measures

H. Justification for the proposal

A Executive summary

The executive summary should include a brief discussion of the extent to which the proposal achieves identified environmental outcomes.

B The proposal

1. Objectives of the proposal

- The objectives of the proposal should be clearly stated and refer to:
  a) the size and type of the operation, the nature of the processes and the products, by-products and wastes produced
  b) a life cycle approach to the production, use or disposal of products
  c) the anticipated level of performance in meeting required environmental standards and cleaner production principles
  d) the staging and timing of the proposal and any plans for future expansion
  e) the proposal's relationship to any other industry or facility.

2. Description of the proposal

General

- Outline the production process including:
  a) the environmental "mass balance" for the process – quantify in-flow and out-flow of materials, any points of discharge to the environment and their respective destinations (sewer, stormwater, atmosphere, recycling, landfill etc)
  b) any life-cycle strategies for the products.
- Outline cleaner production actions, including:
  a) measures to minimise waste (typically through addressing source reduction)
  b) proposals for use or recycling of by-products
  c) proposed disposal methods for solid and liquid waste
  d) air management systems including all potential sources of air emissions, proposals to re-use or treat emissions, emission levels relative to relevant standards in regulations, discharge points
  e) water management system including all potential sources of water pollution, proposals for re-use, treatment etc, emission levels of any wastewater discharged, discharge points, summary of options explored to avoid a discharge, reduce its frequency or reduce its impacts, and rationale for selection of option to discharge.
  f) soil contamination treatment and prevention systems.
- Outline construction works including:
  a) actions to address any existing soil contamination
  b) any earthworks or site clearing; re-use and disposal of cleared material (including use of spoil on-site)

c) construction timetable and staging; hours of construction; proposed construction methods

d) environment protection measures, including noise mitigation measures, dust control measures and erosion and sediment control measures.

Air

- Identify all sources of air emissions from the development.
  Note: emissions can be classed as either:
  - *point (eg emissions from stack or vent) or*
  - *fugitive (from wind erosion, leakages or spillages, associated with loading or unloading, conveyors, storage facilities, plant and yard operation, vehicle movements (dust from road, exhausts, loss from load), land clearing and construction works).*
- Provide details of the project that are essential for predicting and assessing air impacts including:
  a) the quantities and physio-chemical parameters (eg concentration, moisture content, bulk density, particle sizes etc) of materials to be used, transported, produced or stored
  b) an outline of procedures for handling, transport, production and storage
  c) the management of solid, liquid and gaseous waste streams with potential for significant air impacts.

Noise and vibration

- Identify all noise sources from the development (including both construction and operation phases). Detail all potentially noisy activities including ancillary activities such as transport of goods and raw materials.
- Specify the times of operation for all phases of the development and for all noise producing activities.
- For projects with a significant potential traffic noise impact provide details of road alignment (include gradients, road surface, topography, bridges, culverts etc), and land use along the proposed road and measurement locations – diagrams should be to a scale sufficient to delineate individual residential blocks.

Water

- Provide details of the project that are essential for predicting and assessing impacts to waters:
  a) including the quantity and physio-chemical properties of all potential water pollutants and the risks they pose to the environment and human health, including the risks they pose to Water Quality Objectives in the ambient waters (as defined on http://www.environment.nsw.gov.au/ieo/index.htm, using technical criteria derived from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC 2000)
  b) the management of discharges with potential for water impacts
  c) drainage works and associated infrastructure; land-forming and excavations; working capacity of structures; and water resource requirements of the proposal.
- Outline site layout, demonstrating efforts to avoid proximity to water resources (especially for activities with significant potential impacts eg effluent ponds) and showing potential areas of modification of contours, drainage etc.

- Outline how total water cycle considerations are to be addressed showing total water balances for the development (with the objective of minimising demands and impacts on water resources). Include water requirements (quantity, quality and source(s)) and proposed storm and wastewater disposal, including type, volumes, proposed treatment and management methods and re-use options.

Waste and chemicals

- Provide details of the quantity and type of both liquid waste and non-liquid waste generated, handled, processed or disposed of at the premises. Waste must be classified according to the *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-liquid Wastes* (NSW EPA, 1999).
- Provide details of liquid waste and non-liquid waste management at the facility, including:
  a) the transportation, assessment and handling of waste arriving at or generated at the site
  b) any stockpiling of wastes or recovered materials at the site
  c) any waste processing related to the facility, including reuse, recycling, reprocessing (including composting) or treatment both on- and off-site
  d) the method for disposing of all wastes or recovered materials at the facility
  e) the emissions arising from the handling, storage, processing and reprocessing of waste at the facility
  f) the proposed controls for managing the environmental impacts of these activities.
- Provide details of spoil disposal with particular attention to:
  a) the quantity of spoil material likely to be generated
  b) proposed strategies for the handling, stockpiling, reuse/recycling and disposal of spoil
  c) the need to maximise reuse of spoil material in the construction industry
  d) identification of the history of spoil material and whether there is any likelihood of contaminated material, and if so, measures for the management of any contaminated material
  e) designation of transportation routes for transport of spoil.
- Provide details of procedures for the assessment, handling, storage, transport and disposal of all hazardous and dangerous materials used, stored, processed or disposed of at the site, in addition to the requirements for liquid and non-liquid wastes.
- Provide details of the type and quantity of any chemical substances to be used or stored and describe arrangements for their safe use and storage.
- Reference should be made to the guidelines: *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (NSW EPA, 1999).

ESD

- Demonstrate that the planning process and any subsequent development incorporates objectives and mechanisms for achieving ESD, including:

an assessment of a range of options available for use of the resource, including the benefits of each option to future generations

proper valuation and pricing of environmental resources

  f) identification of who will bear the environmental costs of the proposal.

3. Rehabilitation

- Outline considerations of site maintenance, and proposed plans for the final condition of the site (ensuring its suitability for future uses).

4. Consideration of alternatives and justification for the proposal

- Consider the environmental consequences of adopting alternatives, including alternative:
  a) sites and site layouts
  b) access modes and routes
  c) materials handling and production processes
  d) waste and water management
  e) impact mitigation measures
  f) energy sources
- Selection of the preferred option should be justified in terms of:
  a) ability to satisfy the objectives of the proposal
  b) relative environmental and other costs of each alternative
  c) acceptability of environmental impacts and contribution to identified environmental objectives
  d) acceptability of any environmental risks or uncertainties
  e) reliability of proposed environmental impact mitigation measures
  f) efficient use (including maximising re-use) of land, raw materials, energy and other resources.

C The location

1. General

- Provide an overview of the affected environment to place the proposal in its local and regional environmental context including:
  a) meteorological data (eg rainfall, temperature and evaporation, wind speed and direction)
  b) topography (landform element, slope type, gradient and length)
  c) surrounding land uses (potential synergies and conflicts)
  d) geomorphology (rates of landform change and current erosion and deposition processes)
  e) soil types and properties (including erodibility; engineering and structural properties; dispersibility; permeability; presence of acid sulfate soils and potential acid sulfate soils)
  f) ecological information (water system habitat, vegetation, fauna)
  g) availability of services and the accessibility of the site for passenger and freight transport.

2. Air

- Describe the topography and surrounding land uses. Provide details of the exact locations of dwellings, schools and hospitals. Where appropriate provide a perspective view of the study area such as the terrain file used in dispersion models.
- Describe surrounding buildings that may effect plume dispersion.
- Provide and analyse site representative data on following meteorological parameters:
  a) temperature and humidity
  b) rainfall, evaporation and cloud cover
  c) wind speed and direction
  d) atmospheric stability class
  e) mixing height (the height that emissions will be ultimately mixed in the atmosphere)
  f) katabatic air drainage
  g) air re-circulation.

3. Noise and vibration

- Identify any noise sensitive locations likely to be affected by activities at the site, such as residential properties, schools, churches, and hospitals. Typically the location of any noise sensitive locations in relation to the site should be included on a map of the locality.
- Identify the land use zoning of the site and the immediate vicinity and the potentially affected areas.

4. Water

- Describe the catchment including proximity of the development to any waterways and provide an assessment of their sensitivity/significance from a public health, ecological and/or economic perspective. The Water Quality and River Flow Objectives on the website: http://www.environment.nsw.gov.au/ieo/index.htm should be used to identify the agreed environmental values and human uses for any affected waterways. This will help with the description of the local and regional area.

5. Soil Contamination Issues

- Provide details of site history – if earthworks are proposed, this needs to be considered with regard to possible soil contamination, for example if the site was previously a landfill site or if irrigation of effluent has occurred.

D Identification and prioritisation of issues / scoping of impact assessment

- Provide an overview of the methodology used to identify and prioritise issues. The methodology should take into account:
  a) relevant NSW government guidelines
  b) industry guidelines
  c) EISs for similar projects
  d) relevant research and reference material
  e) relevant preliminary studies or reports for the proposal
  f) consultation with stakeholders.
- Provide a summary of the outcomes of the process including:
  a) all issues identified including local, regional and global impacts (eg increased/ decreased greenhouse emissions)
  b) key issues which will require a full analysis (including comprehensive baseline assessment)
  c) issues not needing full analysis though they may be addressed in the mitigation strategy
  d) justification for the level of analysis proposed (the capacity of the proposal to give rise to high concentrations of pollution compared with the ambient environment or environmental outcomes is an important factor in setting the level of assessment).

E The environmental issues

1. General

- The potential impacts identified in the scoping study need to be assessed to determine their significance, particularly in terms of achieving environmental outcomes, and minimising environmental pollution.
- Identify gaps in information and data relevant to significant impacts of the proposal and any actions proposed to fill those information gaps so as to enable development of appropriate management and mitigation measures. This is in accordance with ESD requirements.

Note: The level of detail should match the level of importance of the issue in decision making which is dependent on the environmental risk.

Describe baseline conditions

- Provide a description of existing environmental conditions for any potential impacts.

Assess impacts

- For any potential impacts relevant for the assessment of the proposal provide a detailed analysis of the impacts of the proposal on the environment including the cumulative impact of the proposal on the receiving environment especially where there are sensitive receivers.
- Describe the methodology used and assumptions made in undertaking this analysis (including any modelling or monitoring undertaken) and indicate the level of confidence in the predicted outcomes and the resilience of the environment to cope with the predicted impacts.
- The analysis should also make linkages between different areas of assessment where necessary to enable a full assessment of environmental impacts eg assessment of impacts on air quality will often need to draw on the analysis of traffic, health, social, soil and/or ecological systems impacts; etc.
- The assessment needs to consider impacts at all phases of the project cycle including: exploration (if relevant or significant), construction, routine operation, start-up operations, upset operations and decommissioning if relevant.
- The level of assessment should be commensurate with the risk to the environment.

Describe management and mitigation measures

- Describe any mitigation measures and management options proposed to prevent, control, abate or mitigate identified environmental impacts associated with the proposal and to reduce risks to human health and prevent the degradation of the environment. This should include an assessment of the effectiveness and reliability of the measures and any residual impacts after these measures are implemented.
- Proponents are expected to implement a 'reasonable level of performance' to minimise environmental impacts. The proponent must indicate how the proposal meets reasonable levels of performance. For example, reference technology based criteria if available, or identify good practice for this type of activity or development. A 'reasonable level of performance' involves adopting and implementing technology and management practices to achieve certain pollutant emissions levels in economically viable operations. Technology-based criteria evolve gradually over time as technologies and practices change.

- Use environmental impacts as key criteria in selecting between alternative sites, designs and technologies, and to avoid options having the highest environmental impacts.
- Outline any proposed approach (such as an Environmental Management Plan) that will demonstrate how commitments made in the EIS will be implemented. Areas that should be described include:

  a) operational procedures to manage environmental impacts

  b) monitoring procedures

  c) training programs

  d) community consultation

  e) complaint mechanisms including site contacts

  f) strategies to use monitoring information to improve performance

  g) strategies to achieve acceptable environmental impacts and to respond in event of exceedences.

4. Air

Describe baseline conditions

- Provide a description of existing air quality and meteorology, using existing information and site representative ambient monitoring data.

Assess impacts

- Identify all pollutants of concern and estimate emissions by quantity (and size for particles), source and discharge point.
- Estimate the resulting ground level concentrations of all pollutants. Where necessary (eg potentially significant impacts and complex terrain effects), use an appropriate dispersion model to estimate ambient pollutant concentrations. Discuss choice of model and parameters with the DECCW.
- Describe the effects and significance of pollutant concentration on the environment, human health, amenity and regional ambient air quality standards or goals.
- Describe the contribution that the development will make to regional and global pollution, particularly in sensitive locations.
- For potentially odorous emissions provide the emission rates in terms of odour units (determined by techniques compatible with EPA / DECCW procedures). Use sampling and analysis techniques for individual or complex odours and for point or diffuse sources, as appropriate.

  Note: With dust and odour, it may be possible to use data from existing similar activities to generate emission rates.

- Reference should be made to *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW* (DEC, 2001); *Approved Methods for the Sampling and Analysis of Air Pollutants in NSW* (DEC, 2007); *Assessment and Management of Odour from Stationary Sources in NSW* (DEC, 2006); *Technical Notes: Assessment and Management of Odour from Stationary Sources in NSW (DEC, 2006); Load Calculation Protocol for use by holders of NSW Environment Protection Licences when calculating Assessable Pollutant Loads* (DECC, 2009).

Describe management and mitigation measures

- Outline specifications of pollution control equipment (including manufacturer's performance guarantees where available) and management protocols for both point and fugitive emissions. Where possible, this should include cleaner production processes.

5. Noise and vibration

Describe baseline conditions

- Determine the existing background (LA90) and ambient (LAeq) noise levels in accordance with the *NSW Industrial Noise Policy.*
- Determine the existing road traffic noise levels in accordance with the *NSW Environmental Criteria for Road Traffic Noise*, where road traffic noise impacts may occur.
- The noise impact assessment report should provide details of all monitoring of existing ambient noise levels including:
  a) details of equipment used for the measurements
  b) a brief description of where the equipment was positioned
  c) a statement justifying the choice of monitoring site, including the procedure used to choose the site, having regards to the definition of 'noise sensitive locations(s)' and 'most affected locations(s)' described in Section 3.1.2 of the *NSW Industrial Noise Policy*
  d) details of the exact location of the monitoring site and a description of land uses in surrounding areas
  e) a description of the dominant and background noise sources at the site
  f) day, evening and night assessment background levels for each day of the monitoring period
  g) the final Rating Background Level (RBL) value
  h) graphs of the measured noise levels for each day should be provided
  i) a record of periods of affected data (due to adverse weather and extraneous noise), methods used to exclude invalid data and a statement indicating the need for any re-monitoring under Step 1 in Section B1.3 of the *NSW Industrial Noise Policy*
  j) determination of LAeq noise levels from existing industry.

Assess impacts

- Determine the project specific noise levels for the site. For each identified potentially affected receiver, this should include:
  a) determination of the intrusive criterion for each identified potentially affected receiver
  b) selection and justification of the appropriate amenity category for each identified potentially affected receiver
  c) determination of the amenity criterion for each receiver
  d) determination of the appropriate sleep disturbance limit.

- Maximum noise levels during night-time period (10pm-7am) should be assessed to analyse possible affects on sleep. Where LA1(1min) noise levels from the site are less than 15 dB above the background LA90 noise level, sleep disturbance impacts are unlikely. Where this is not the case, further analysis is required. Additional guidance is provided in Appendix B of the *NSW Environmental Criteria for Road Traffic Noise.*
- Determine expected noise level and noise character (eg tonality, impulsiveness, vibration, etc) likely to be generated from noise sources during:
  a) site establishment
  b) construction
  c) operational phases
  d) transport including traffic noise generated by the proposal
  e) other services.

  Note: The noise impact assessment report should include noise source data for each source in 1/1 or 1/3 octave band frequencies including methods for references used to determine noise source levels. Noise source levels and characteristics can be sourced from direct measurement of similar activities or from literature (if full references are provided).
- Determine the noise levels likely to be received at the most sensitive locations (these may vary for different activities at each phase of the development). Potential impacts should be determined for any identified significant adverse meteorological conditions. Predicted noise levels under calm conditions may also aid in quantifying the extent of impact where this is not the most adverse condition.
- The noise impact assessment report should include:
  a) a plan showing the assumed location of each noise source for each prediction scenario
  b) a list of the number and type of noise sources used in each prediction scenario to simulate all potential significant operating conditions on the site
  c) any assumptions made in the predictions in terms of source heights, directivity effects, shielding from topography, buildings or barriers, etc
  d) methods used to predict noise impacts including identification of any noise models used. Where modelling approaches other than the use of the ENM or SoundPlan computer models are adopted, the approach should be appropriately justified and validated
  e) an assessment of appropriate weather conditions for the noise predictions including reference to any weather data used to justify the assumed conditions
  f) the predicted noise impacts from each noise source as well as the combined noise level for each prediction scenario under any identified significant adverse weather conditions as well as calm conditions where appropriate
  g) for developments where a significant level of noise impact is likely to occur, noise contours for the key prediction scenarios should be derived
  h) an assessment of the need to include modification factors as detailed in Section 4 of the *NSW Industrial Noise Policy.*
- Discuss the findings from the predictive modelling and, where relevant noise criteria have not been met, recommend additional mitigation measures.
- The noise impact assessment report should include details of any mitigation proposed including the attenuation that will be achieved and the revised noise impact predictions following mitigation.

- Where relevant noise/vibration criteria cannot be met after application of all feasible and cost effective mitigation measures the residual level of noise impact needs to be quantified by identifying:
  a) locations where the noise level exceeds the criteria and extent of exceedence
  b) numbers of people (or areas) affected
  c) times when criteria will be exceeded
  d) likely impact on activities (speech, sleep, relaxation, listening, etc)
  e) change on ambient conditions
  f) the result of any community consultation or negotiated agreement.
- For the assessment of existing and future traffic noise, details of data for the road should be included such as assumed traffic volume; percentage heavy vehicles by time of day; and details of the calculation process. These details should be consistent with any traffic study carried out in the EIS.
- Where blasting is intended an assessment in accordance with the *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration* (ANZECC, 1990) should be undertaken. The following details of the blast design should be included in the noise assessment:
  a) bench height, burden spacing, spacing burden ratio
  b) blast hole diameter, inclination and spacing
  c) type of explosive, maximum instantaneous charge, initiation, blast block size, blast frequency.

Describe management and mitigation measures

- Determine the most appropriate noise mitigation measures and expected noise reduction including both noise controls and management of impacts for both construction and operational noise. This will include selecting quiet equipment and construction methods, noise barriers or acoustic screens, location of stockpiles, temporary offices, compounds and vehicle routes, scheduling of activities, etc.
- For traffic noise impacts, provide a description of the ameliorative measures considered (if required), reasons for inclusion or exclusion, and procedures for calculation of noise levels including ameliorative measures. Also include, where necessary, a discussion of any potential problems associated with the proposed ameliorative measures, such as overshadowing effects from barriers. Appropriate ameliorative measures may include:
  a) use of alternative transportation modes, alternative routes, or other methods of avoiding the new road usage
  b) control of traffic (eg: limiting times of access or speed limitations)
  c) resurfacing of the road using a quiet surface
  d) use of (additional) noise barriers or bunds
  e) treatment of the façade to reduce internal noise levels buildings where the night-time criteria is a major concern
  f) more stringent limits for noise emission from vehicles (i.e. using specially designed 'quite' trucks and/or trucks to use air bag suspension
  g) driver education
  h) appropriate truck routes
  i) limit usage of exhaust breaks
  j) use of premium muffles on trucks

k) reducing speed limits for trucks

l) ongoing community liaison and monitoring of complaints

m) phasing in the increased road use.

4. Water

Describe baseline conditions

- Describe existing surface and groundwater quality – an assessment needs to be undertaken for any water resource likely to be affected by the proposal and for all conditions (e.g. a wet weather sampling program is needed if runoff events may cause impacts).

  Note: Methods of sampling and analysis need to conform with an accepted standard (e.g. Approved Methods for the Sampling and Analysis of Water Pollutants in NSW (DEC 2004) *or be approved and analyses undertaken by accredited laboratories).*

- Provide site drainage details and surface runoff yield.
- State the ambient Water Quality and River Flow Objectives for the receiving waters. These refer to the community's agreed environmental values and human uses endorsed by the Government as goals for the ambient waters. These environmental values are published on the website: http://www.environment.nsw.gov.au/ieo/index.htm. The EIS should state the environmental values listed for the catchment and waterway type relevant to your proposal. NB: A consolidated and approved list of environmental values are not available for groundwater resources. Where groundwater may be affected the EIS should identify appropriate groundwater environmental values and justify the choice.
- State the indicators and associated trigger values or criteria for the identified environmental values. This information should be sourced from the ANZECC 2000 *Guidelines for Fresh and Marine Water Quality* (http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html) (Note that, as at 2004, the NSW Water Quality Objectives booklets and website contain technical criteria derived from the 1992 version of the ANZECC Guidelines. The Water Quality Objectives remain as Government Policy, reflecting the community's environmental values and long-term goals, but the technical criteria are replaced by the more recent ANZECC 2000 Guidelines). NB: While specific guidelines for groundwater are not available, the ANCECC 2000 Guidelines endorse the application of the trigger values and decision trees as a tool to assess risk to environmental values in groundwater.
- State any locally specific objectives, criteria or targets, which have been endorsed by the government e.g. the Healthy Rivers Commission Inquiries or the NSW Salinity Strategy (DLWC, 2000) (http://www.environment.nsw.gov.au/salinity/government/nswstrategy.htm).
- Where site specific studies are proposed to revise the trigger values supporting the ambient Water Quality and River Flow Objectives, and the results are to be used for regulatory purposes (e.g. to assess whether a licensed discharge impacts on water quality objectives), then prior agreement from the EPA on the approach and study design must be obtained.
- Describe the state of the receiving waters and relate this to the relevant Water Quality and River Flow Objectives (i.e. are Water Quality and River Flow Objectives being achieved?). Proponents are generally only expected to source available data and information. However, proponents of large or high risk developments may be required to collect some ambient water quality / river flow / groundwater data to enable a suitable level of impact assessment. Issues to include in the description of the receiving waters could include:

  a) lake or estuary flushing characteristics

b) specific human uses (e.g. exact location of drinking water offtake)

c) sensitive ecosystems or species conservation values

d) a description of the condition of the local catchment e.g. erosion levels, soils, vegetation cover, etc

e) an outline of baseline groundwater information, including, but not restricted to, depth to watertable, flow direction and gradient, groundwater quality, reliance on groundwater by surrounding users and by the environment

f) historic river flow data where available for the catchment.

Assess impacts

- No proposal should breach clause 120 of the *Protection of the Environment Operations Act* 1997 (i.e. pollution of waters is prohibited unless undertaken in accordance with relevant regulations).
- Identify and estimate the quantity of all pollutants that may be introduced into the water cycle by source and discharge point including residual discharges after mitigation measures are implemented.
- Include a rationale, along with relevant calculations, supporting the prediction of the discharges.
- Describe the effects and significance of any pollutant loads on the receiving environment. This should include impacts of residual discharges through modelling, monitoring or both, depending on the scale of the proposal. Determine changes to hydrology (including drainage patterns, surface runoff yield, flow regimes, wetland hydrologic regimes and groundwater).
- Describe water quality impacts resulting from changes to hydrologic flow regimes (such as nutrient enrichment or turbidity resulting from changes in frequency and magnitude of stream flow).
- Identify any potential impacts on quality or quantity of groundwater describing their source.
- Identify potential impacts associated with geomorphological activities with potential to increase surface water and sediment runoff or to reduce surface runoff and sediment transport. Also consider possible impacts such as bed lowering, bank lowering, instream siltation, floodplain erosion and floodplain siltation.
- Identify impacts associated with the disturbance of acid sulfate soils and potential acid sulfate soils.
- Containment of spills and leaks shall be in accordance with the technical guidelines section 'Bunding and Spill Management' of the *Authorised Officers Manual* (EPA, 1995) (http://www.epa.nsw.gov.au/mao/bundingspill.htm) and the most recent versions of the Australian Standards referred to in the Guidelines. Containment should be designed for no-discharge.
- The significance of the impacts listed above should be predicted. When doing this it is important to predict the ambient water quality and river flow outcomes associated with the proposal and to demonstrate whether these are acceptable in terms of achieving protection of the Water Quality and River Flow Objectives. In particular the following questions should be answered:

  a) will the proposal protect Water Quality and River Flow Objectives where they are currently achieved in the ambient waters; and

  b) will the proposal contribute towards the achievement of Water Quality and River Flow Objectives over time, where they are not currently achieved in the ambient waters.

- Consult with the EPA as soon as possible if a mixing zone is proposed (a mixing zone could exist where effluent is discharged into a receiving water body, where the quality of the water being discharged does not immediately meet water quality objectives. The mixing zone could result in dilution, assimilation and decay of the effluent to allow water quality objectives to be met further downstream, at the edge of the mixing zone). The EPA will advise the proponent under what conditions a mixing zone will and will not be acceptable, as well as the information and modelling requirements for assessment.

Note: *The assessment of water quality impacts needs to be undertaken in a total catchment management context to provide a wide perspective on development impacts, in particular cumulative impacts.*

- Where a licensed discharge is proposed, provide the rationale as to why it cannot be avoided through application of a reasonable level of performance, using available technology, management practice and industry guidelines.
- Where a licensed discharge is proposed, provide the rationale as to why it represents the best environmental outcome and what measures can be taken to reduce its environmental impact.
- Reference should be made to *Managing Urban Stormwater: Soils and Construction* (DECC, 2008), *Guidelines for Fresh and Marine Water Quality* ANZECC 2000), *Environmental Guidelines: Use of effluent by Irrigation* (DEC, 2004).

Describe management and mitigation measures

- Outline stormwater management to control pollutants at the source and contain them within the site. Also describe measures for maintaining and monitoring any stormwater controls.
- Outline erosion and sediment control measures directed at minimising disturbance of land, minimising water flow through the site and filtering, trapping or detaining sediment. Also include measures to maintain and monitor controls as well as rehabilitation strategies.
- Describe waste water treatment measures that are appropriate to the type and volume of waste water and are based on a hierarchy of avoiding generation of waste water; capturing all contaminated water (including stormwater) on the site; reusing/recycling waste water; and treating any unavoidable discharge from the site to meet specified water quality requirements.
- Outline pollution control measures relating to storage of materials, possibility of accidental spills (eg preparation of contingency plans), appropriate disposal methods, and generation of leachate.
- Describe hydrological impact mitigation measures including:
  a) site selection (avoiding sites prone to flooding and waterlogging, actively eroding or affected by deposition)
  b) minimising runoff
  c) minimising reductions or modifications to flow regimes
  d) avoiding modifications to groundwater.
- Describe groundwater impact mitigation measures including:
  a) site selection
  b) retention of native vegetation and revegetation
  c) artificial recharge
  d) providing surface storages with impervious linings
  e) monitoring program.
- Describe geomorphological impact mitigation measures including:
  a) site selection
  b) erosion and sediment controls
  c) minimising instream works

d) treating existing accelerated erosion and deposition

e) monitoring program.

- Any proposed monitoring should be undertaken in accordance with the *Approved Methods for the Sampling and Analysis of Water Pollutants in NSW* (DEC 2004).

5. Soils and contamination

Describe baseline conditions

- Provide any details (in addition to those provided in the location description - Section C) that are needed to describe the existing situation in terms of soil types and properties and soil contamination.

Assess impacts

- Identify any likely impacts resulting from the construction or operation of the proposal, including the likelihood of:

  a) disturbing any existing contaminated soil

  b) contamination of soil by operation of the activity

  c) subsidence or instability

  d) soil erosion

  e) disturbing acid sulfate or potential acid sulfate soils.

- Reference should be made to *Contaminated Sites – Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011); *Contaminated Sites – Guidelines on Significant Risk of Harm from Contaminated Land and the Duty to Report* (EPA, 2003).

Describe management and mitigation measures

- Describe and assess the effectiveness or adequacy of any soil management and mitigation measures during construction and operation of the proposal including:

  a) erosion and sediment control measures

  b) proposals for site remediation – see *Managing Land Contamination, Planning Guidelines SEPP 55 – Remediation of Land* (Department of Urban Affairs and Planning and Environment Protection Authority, 1998)

  c) proposals for the management of these soils – see *Assessing and Managing Acid Sulfate Soils,* Environment Protection Authority, 1995 (note that this is the only methodology accepted by the EPA).

6. Waste and chemicals

Describe baseline conditions

- Describe any existing waste or chemicals operations related to the proposal.

Assess impacts

- Assess the adequacy of proposed measures to minimise natural resource consumption and minimise impacts from the handling, transporting, storage, processing and reprocessing of waste and/or chemicals.
- Reference should be made to *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes* (EPA, 1999).

Describe management and mitigation measures

- Outline measures to minimise the consumption of natural resources.
- Outline measures to avoid the generation of waste and promote the re-use and recycling and reprocessing of any waste.
- Outline measures to support any approved regional or industry waste plans.

7. Cumulative impacts

- Identify the extent that the receiving environment is already stressed by existing development and background levels of emissions to which this proposal will contribute.
- Assess the impact of the proposal against the long term air, noise and water quality objectives for the area or region.
- Identify infrastructure requirements flowing from the proposal (eg water and sewerage services, transport infrastructure upgrades).
- Assess likely impacts from such additional infrastructure and measures reasonably available to the proponent to contain such requirements or mitigate their impacts (eg travel demand management strategies).

F. List of approvals and licences

- Identify all approvals and licences required under environment protection legislation including details of all scheduled activities, types of ancillary activities and types of discharges (to air, land, water).

G. Compilation of mitigation measures

- Outline how the proposal and its environmental protection measures would be implemented and managed in an integrated manner so as to demonstrate that the proposal is capable of complying with statutory obligations under EPA licences or approvals (eg outline of an environmental management plan).
- The mitigation strategy should include the environmental management and cleaner production principles which would be followed when planning, designing, establishing and operating the proposal. It should include two sections, one setting out the program for managing the proposal and the other outlining the monitoring program with a feedback loop to the management program.

H. Justification for the Proposal

- Reasons should be included which justify undertaking the proposal in the manner proposed, having regard to the potential environmental impacts.

ATTACHMENT B: GUIDANCE MATERIAL

Title	Web address
Relevant Legislation	
Contaminated Land Management Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+140+1997+cd+0+N
Environmentally Hazardous Chemicals Act 1985	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+14+1985+cd+0+N
Environmental Planning and Assessment Act 1979	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+203+1979+cd+0+N
Protection of the Environment Operations Act 1997	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+156+1997+cd+0+N
Water Management Act 2000	http://www.legislation.nsw.gov.au/maintop/view/inforce/act+92+2000+cd+0+N
Licensing	
Guide to Licensing	www.epa.nsw.gov.au/licensing/licenceguide.htm
Air Issues	
Air Quality	
Approved methods for modelling and assessment of air pollutants in NSW (2005)	http://www.epa.nsw.gov.au/resources/air/ammodelling05361.pdf
POEO (Clean Air) Regulation 2010	http://www.legislation.nsw.gov.au/maintop/view/inforce/subordleg+428+2010+cd+0+N
Noise and Vibration	
Interim Construction Noise Guideline (DECC, 2009)	http://www.epa.nsw.gov.au/noise/constructnoise.htm
Assessing Vibration: a technical guideline (DEC, 2006)	http://www.epa.nsw.gov.au/noise/vibrationguide.htm
Industrial Noise Policy Application Notes	http://www.epa.nsw.gov.au/noise/applicnotesindustnoise.htm
Environmental Criteria for Road Traffic Noise (EPA, 1999)	http://www.epa.nsw.gov.au/resources/noise/roadnoise.pdf
Interim Guideline for the Assessment of Noise from Rail Infrastructure Projects (DECC, 2007)	http://www.epa.nsw.gov.au/noise/railinfranoise.htm
Environmental assessment requirements for rail traffic-generating developments	http://www.epa.nsw.gov.au/noise/railnoise.htm

Waste, Chemicals and Hazardous Materials and Radiation	
Waste	
Environmental Guidelines: Solid Waste Landfills (EPA, 1996)	http://www.epa.nsw.gov.au/resources/waste/envguidlns/solidlandfill.pdf
Draft Environmental Guidelines - Industrial Waste Landfilling (April 1998)	http://www.epa.nsw.gov.au/resources/waste/envguidlns/industrialfill.pdf
Waste Classification Guidelines (DECC, 2009)	http://www.epa.nsw.gov.au/waste/envguidlns/index.htm
Resource recovery exemption	http://www.epa.nsw.gov.au/waste/RRecoveryExemptions.htm
Chemicals subject to Chemical Control Orders	
Chemical Control Orders (regulated through the EHC Act)	http://www.epa.nsw.gov.au/pesticides/CCOs.htm
National Protocol - Approval/Licensing of Trials of Technologies for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
National Protocol for Approval/Licensing of Commercial Scale Facilities for the Treatment/Disposal of Schedule X Wastes - July 1994	Available in libraries
Water and Soils	
Acid sulphate soils	
Coastal acid sulfate soils guidance material	http://www.environment.nsw.gov.au/acidsulfatesoil/
Acid Sulfate Soils Planning Maps	http://www.environment.nsw.gov.au/acidsulfatesoil/riskmaps.htm
Contaminated Sites Assessment and Remediation	
Managing land contamination: Planning Guidelines – SEPP 55 Remediation of Land	http://www.planning.nsw.gov.au/assessingdev/pdf/gu_contam.pdf
Guidelines for Consultants Reporting on Contaminated Sites (EPA, 2000)	http://www.epa.nsw.gov.au/resources/clm/20110650consultantsglines.pdf
Guidelines for the NSW Site Auditor Scheme - 2nd edition (DEC, 2006)	http://www.epa.nsw.gov.au/resources/clm/auditorglines06121.pdf
Sampling Design Guidelines (EPA, 1995)	Available by request from EPA's Environment Line

National Environment Protection (Assessment of Site Contamination) Measure 1999 (or update)	http://www.scew.gov.au/nepms/assessment-site-contamination
Soils – general	
Managing land and soil	http://www.environment.nsw.gov.au/soils/landandsoil.htm
Managing urban stormwater for the protection of soils	http://www.environment.nsw.gov.au/stormwater/publications.htm
Landslide risk management guidelines	http://www.australiangeomechanics.org/resources/downloads/
Site Investigations for Urban Salinity (DLWC, 2002)	http://www.environment.nsw.gov.au/resources/salinity/booklet3siteinvestigationsforurbansalinity.pdf
Local Government Salinity Initiative Booklets	http://www.environment.nsw.gov.au/salinity/solutions/urban.htm
Water	
Water Quality Objectives	http://www.environment.nsw.gov.au/ieo/index.htm
ANZECC (2000) Guidelines for Fresh and Marine Water Quality	http://www.environment.gov.au/water/publications/quality/nwqms-guidelines-4-vol1.html
Applying Goals for Ambient Water Quality Guidance for Operations Officers – Mixing Zones	Contact the EPA on 131555
Approved Methods for the Sampling and Analysis of Water Pollutant in NSW (2004)	http://www.environment.nsw.gov.au/resources/legislation/approvedmethods-water.pdf

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EAR ID No. 1052

Ms Lauren Evans
Planning Officer
Department Planning & Environment
[redacted]

Dear Ms Evans

Bogan Road Gravel Quarry

Thank you for your email dated 6 June 2016 seeking the requirements of the Office of Environment and Heritage (OEH) for the preparation of an Environmental Impact Statement (EIS) for the above proposal.

The background information provided indicates that the proponent proposes to establish a new open cut-pit quarry extending from an existing active gravel quarry. The proposed activities include site and infrastructure establishment, haulage, processing and stockpiling, transportation of product, water and waste management and rehabilitation.

OEH Role

OEH has responsibilities under the:

- *National Parks and Wildlife Act 1974* - namely the protection and care of Aboriginal objects and places, the protection and care of native flora and fauna and the protection and management of reserves; and the
- *Threatened Species Conservation Act 1995* which aims to conserve threatened species of flora and fauna, populations and ecological communities to promote their recovery and manage processes that threaten them.
- *Native Vegetation Conservation Act 2003* – ensuring compliance with the requirements of this legislation.

OEH understands from the correspondence that the proposed activity is a Part 4 application pursuant to the *Environmental Planning and Assessment Act 1979* (*EP&A Act)*, and has not been classified as State Significant Development. As such OEH only has a statutory role in assessing such an activity if the consent authority determines that:

a) the activity is likely to significantly affect a threatened species, population, ecological community, or its habitat, as listed under the *Threatened Species Conservation (TSC) Act 1995*; and/or
b) An Aboriginal Heritage Impact Permit is required.

The *Environmental Planning and Assessment Act 1979* (*EP&A Act*) and *Environmental Planning and Assessment Regulation 2000* require that the EIS should fully describe the proposal, the existing

environment and impacts of the proposal. It is the responsibility of the proponent and consent authority to adequately consider the requirements under the *EP&A Act and Regulation.*

OEH can provide advice on the EIS where the EIS deals with natural and cultural heritage conservation issues. OEH may also comment on the legitimacy of the conclusions reached regarding the significance of impacts by the proposed development to these components of the environment.

This letter directs you primarily to our generic guidance material. However please note that it is up to the proponent (and later the consent/determining authority after appropriate consultation) to determine the detail and comprehensiveness of the surveys and level of assessment required to form legally defensible conclusions regarding the impact of the proposal. The scale and intensity of the proposed development should dictate the level of investigation. It is important that all conclusions are supported by adequate data.

OEH Requirements

In summary, the OEH's key information requirements for the proposal include an adequate assessment of:

1. **Impacts on flora, fauna, threatened species, populations, communities and their habitats;**
2. **Impacts to Aboriginal cultural heritage objects.**

This assessment should include consideration of direct and indirect impacts as a result of both construction and operation of the project. Assessment of any cumulative impacts of this and other developments in the area will be essential.

Flora, Fauna and Threatened Species

A copy of our generic Environmental Assessment Guidelines are included in Attachments A and B. These guidelines address requirements under the *EP&A Act* and OEH's areas of responsibility relating to flora, fauna and threatened species, populations and ecological communities and their habitats.

OEH is committed to the protection, appropriate management, and where necessary, rehabilitation of native vegetation. For these reasons, OEH considers that careful planning should precede any development that involves further vegetation clearance or other significant impact within areas of remnant vegetation.

Negative impacts to native vegetation (eg clearing) should be avoided where possible. Where impacts cannot be avoided, the EIS should detail how a "maintain or improve" outcome for biodiversity will be achieved. BioBanking provides a voluntary mechanism through which this can be achieved. The BioBanking Assessment Methodology allows quantification of impacts and assessment of the value of offset areas and associated management regimes for those areas. The BioBanking scheme provides an alternative path for proponents to the current threatened species assessment of significance process. Information about BioBanking is located on OEH's website at http://www.environment.nsw.gov.au/biobanking/ .

Cultural Heritage

The importance of protecting Aboriginal Cultural Heritage is reflected in the provisions under Part 6 of the *National Parks and Wildlife Act 1974 (NP&W Act)*, as amended. That Act clearly establishes that Aboriginal objects and places are protected and may not be harmed, disturbed or desecrated without appropriate authorisation. Importantly, approvals under Parts 4 and 5 of the *EP&A Act 1979* do not absolve the proponent of their obligations under the *NP&W Act 1979*.

Under the *NP&W Act 1974*, it is the responsibility of each individual proposing to conduct ground disturbance works to ensure that they have conducted a due diligence assessment to avoid harming Aboriginal objects by the proposed activity. OEH has produced a generic due diligence process, which is not mandatory to follow, however any alternative process followed must be able to demonstrate their process was reasonable and practicable in attempts to avoid harm to Aboriginal objects.

Consultation must also be in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW 2010) as set by OEH if impact to cultural heritage is unavoidable.

Further advice regarding Aboriginal cultural heritage can be found on the OEH web-site at: http://www.environment.nsw.gov.au/licences/achregulation.htm. and within guidance documents listed in Attachment B.

Should you require further information please contact Michelle Howarth, Conservation Planning Officer on (02) 6883 5339.

Yours sincerely

[redacted]

STEVEN COX
Senior Team Leader Planning North West
Regional Operations Group

22 June 2016

Contact officer: MICHELLE HOWARTH
[redacted]

ATTACHMENT A

Office of Environment and Heritage's EIS Requirements for the Proposed Bogan Road Gravel Quarry

1. Environmental impacts of the project

Impacts related to the following environmental issues need to be assessed, quantified and reported on:

- **Cumulative impact**
- **Aboriginal cultural heritage**
- **Biodiversity**
- **OEH Estate - Land reserved or acquired under the NPW Act**

The Environmental Impact Statement (EIS) should address the specific requirements outlined under each heading below and assess impacts in accordance with the relevant guidelines mentioned. A full list of guidelines is at **Attachment B**.

2. Cumulative Impact

The cumulative impacts from all clearing activities and operations, associated edge effects and other indirect impacts on cultural heritage, biodiversity and OEH Estate need to be comprehensively assessed in accordance with the *Environmental Planning and Assessment Act 1979*.

This should include the cumulative impact of the proponent's existing and proposed development and associated infrastructure (such as access tracks etc) as well as the cumulative impact of other developments located in the vicinity. This assessment should include consideration of both construction and operational impacts.

3. Aboriginal cultural heritage

The EIS report should contain:

a. A description of the Aboriginal objects and declared Aboriginal places located within the area of the proposed development.
b. A description of the cultural heritage values, including the significance of the Aboriginal objects and declared Aboriginal places, that exist across the whole area that will be affected by the proposed development, and the significance of these values for the Aboriginal people who have a cultural association with the land.
c. A description of how the requirements for consultation with Aboriginal people as specified in clause 80C of the *National Parks and Wildlife Regulation 2009* have been met.
d. The views of those Aboriginal people regarding the likely impact of the proposed development on their cultural heritage. If any submissions have been received as a part of the consultation requirements, then the report must include a copy of each submission and your response.
e. A description of the actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified, and the need apply for an Aboriginal Heritage Impact Permit (AHIP).
f. A description of any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places.
g. A description of any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm or, if this is not possible, to manage (minimise) harm.
h. A specific Statement of Commitment that the proponent will complete an Aboriginal Site Impact Recording Form and submit it to the Aboriginal Heritage Information Management System (AHIMS) Registrar, for each AHIMS site that is harmed through the proposed development.

In addressing these requirements, the proponent must refer to the following documents:

- ***Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*** (DECCW, 2010) - http://www.environment.nsw.gov.au/licences/consultation.htm. This document further explains the consultation requirements that are set out in clause 80C of the National Parks and

Wildlife Regulation 2009. The process set out in this document must be followed and documented in the Environmental Assessment Report.

- ***Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales*** (DECCW, 2010) http://www.environment.nsw.gov.au/licences/archinvestigations.htm. The process described in this Code should be followed and documented where the assessment of Aboriginal cultural heritage requires an archaeological investigation to be undertaken.

Notes:

i. An *Aboriginal Site Impact Recording Form* (http://www.environment.nsw.gov.au/licences/DECCAHIMSSiteRecordingForm.htm) must be completed and submitted to the Aboriginal Heritage Information Management System (AHIMS) Registrar, for each AHIMS site that is harmed through archaeological investigations required or permitted through these environmental assessment requirements.

ii. Under section 89A of the *National Parks and Wildlife Act* 1974, it is an offence for a person not to notify OEH of the location of any Aboriginal object the person becomes aware of, not already recorded on the Aboriginal Heritage Information Management System (AHIMS). An AHIMS Site Recording Form should be completed and submitted to the AHIMS Registrar (http://www.environment.nsw.gov.au/contact/AHIMSRegistrar.htm), for each Aboriginal site found during investigations.

4. Biodiversity

Biodiversity impacts can be assessed using **either:**

- The BioBanking Assessment Methodology (scenario 1) **or**
- A detailed biodiversity assessment (scenario 2).

The requirements for each of these approaches are detailed below.

The BioBanking Assessment Methodology can be used either to obtain a BioBanking statement, or to assess impacts of a proposal and to determine required offsets without obtaining a statement. In the latter instances, if the required credits are not available for offsetting, appropriate alternative options may be developed in consultation with OEH officers.

Note:

i. The Shire may be listed in Schedule 1 of ***SEPP No. 44 - Koala Habitat Protection*****.** If so, the requirements of the SEPP regarding Koala habitat protection should also be considered by the proponent.

SCENARIO 1 - Where a proposal is assessed using the BioBanking Assessment Methodology (BBAM)

1. Where a BioBanking Statement is being sought under Part 7A of the *Threatened Species Conservation* Act 1995 (TSC Act), the assessment must be undertaken by an accredited BioBanking assessor (as specified under Section 142B (1) (c) of the TSC Act 1995) and done in accordance with the *BioBanking Assessment Methodology* (OEH, 2014). To qualify for a BioBanking Statement a proposal must meet the 'improve or maintain' standard.

1a. The EIS should include a specific Statement of Commitments that reflects all requirements of the BioBanking Statement including the number of credits required and any DG approved variations to impact on Red Flags.

2. Where the BioBanking Assessment Methodology is being used to assess impacts of a proposal and to determine required offsets, and a BioBanking Statement is not being obtained, the EIS should contain a detailed biodiversity assessment and all components of the assessment must be undertaken in accordance with the *BioBanking Assessment Methodology* (OEH, 2014).

2a. The EIS should include a specific Statement of Commitments which:

- is informed by the outcomes of the proposed BioBanking assessment offset package;

- sets out the ecosystem and species credits required by the BioBanking Assessment Methodology and how these ecosystem and/or species credits will be secured and obtained;
- if the ecosystem or species credits cannot be obtained, provides appropriate alternative options to offset expected impacts, noting that an appropriate alternative option may be developed in consultation with OEH officers and in accordance with OEH policy;
- demonstrates how all options have been explored to avoid red flag areas; and
- includes all relevant 'BioBanking files (e.g. *.xml output files), data sheets, underlying assumptions (particularly in the selection of vegetation types from the vegetation types database), and documentation (including maps, aerial photographs, GIS shape files, other remote sensing imagery etc.) to ensure that the OEH can conduct an appropriate review of the assessment.

3. **Where appropriate**, likely impacts (both **direct** and **indirect**) on any adjoining and/or nearby OEH estate reserved under the *National Parks and Wildlife Act 1974* or any marine and estuarine protected areas under the *Fisheries Management Act 1994* or the *Marine Parks Act 1997* should be considered. Please refer to the *Guidelines for developments adjoining land and water managed by the Department of Environment, Climate Change and Water* (DECCW, 2010).
4. With regard to the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, the assessment should identify and assess any relevant Matters of National Environmental Significance and whether the proposal has been referred to the Commonwealth or already determined to be a controlled action.

SCENARIO 2 - Where a proposal is assessed outside the BioBanking Assessment Methodology

1. The EIS should include a detailed biodiversity assessment, including assessment of impacts on threatened biodiversity, native vegetation and habitat. This assessment should address the matters included in the following sections.
2. A field survey of the site should be conducted and documented in accordance with relevant guidelines, including:

    - the *Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna -Amphibians* (DECCW, 2009);
    - *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft* (DEC, 2004); and
    - Threatened species survey and assessment guideline information on www.environment.nsw.gov.au/threatenedspecies/surveyassessmentgdlns.htm.
    - Commonwealth survey requirements (birds, bats, reptiles, frogs, fish and mammals): http://www.environment.gov.au/topics/environment-protection/environment-assessments. These are relevant when species or communities listed under the *Environment Protection and Biodiversity Conservation Act* are present.

    It is preferable for proponents to use the Interim Vegetation Mapping Standard data form to collect the vegetation plot data for the project site, and any offset site associated with the project. This will provide data that is useful for vegetation mapping as well as in the BioBanking Assessment Methodology. This is available at http://www.environment.nsw.gov.au/research/VISplot.htm.

    If a proposed survey methodology is likely to vary significantly from the above methods, the proponent should discuss the proposed methodology with the OEH prior to undertaking the EIS, to determine whether the OEH considers that it is appropriate.

    Recent (less than five years old) surveys and assessments may be used. However, previous surveys should not be used if they have:

    - been undertaken in seasons, weather conditions or following extensive disturbance events when the subject species are unlikely to be detected or present, or
    - utilised methodologies, survey sampling intensities, timeframes or baits that are not the most appropriate for detecting the target subject species,

unless these differences can be clearly demonstrated to have had an insignificant impact upon the outcomes of the surveys. If a previous survey is used, any additional species listed under the TSC Act since the previous survey took place, must be surveyed for.

Determining the list of potential threatened species for the site must be done in accordance with the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft* (DEC, 2004).

The OEH Threatened Species website http://www.environment.nsw.gov.au/threatenedspecies/ and the *Atlas of NSW Wildlife* database must be the primary information sources for the list of threatened species present.

The Vegetation Types database (available via the OEH website at http://www.environment.nsw.gov.au/biobanking/vegtypedatabase.htm, and other data sources (e.g. PlantNET, Online Zoological Collections of Australian Museums (http://ozcam.org.au/), previous or nearby surveys etc.) may also be used to compile the list.

Other reference literature may be available for the subject locality/region. The proponent should explore this possibility thoroughly.

3. The EIS should contain the following information as a minimum:
   a. Description and geo-referenced mapping of study area (**and associated spatial data files**), e.g. overlays on topographic maps, satellite images and /or aerial photos, including details of map datum, projection and zone, all survey locations, vegetation communities (including classification and methodology used to classify), key habitat features and reported locations of threatened species, populations and ecological communities present in the subject site and study area. Separate spatial files (.shp format) to be provided to the OEH should include, at a minimum, shapefiles of the project site, impact footprint, vegetation mapping and classification for both the impact and any offset site(s);
   b. Description of survey methodologies used, including timing, location and weather conditions, and a comparison of survey effort (in tabular form) with that recommended in the *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities - Working Draft* (DEC, 2004). Where survey effort is not consistent with those guidelines justification must be provided;
   c. Detailed description of vegetation communities (including classification and methodology used to classify) and including all plot data. Plot data should be supplied to the OEH in electronic format (eg MS-Excel) and organised by vegetation community;
   d. Details, including qualifications and experience of all staff undertaking the surveys, mapping and assessment of impacts as part of the EIS;
   e. Identification of national and state listed threatened biota known or likely to occur in the study area and their conservation status;
   f. Description of the likely impacts of the proposal on biodiversity and wildlife corridors, including **direct** and **indirect** and **construction** and **operation** impacts. Wherever possible, quantify these impacts such as the amount of each vegetation community or species habitat to be cleared or impacted, or any fragmentation of a wildlife corridor;
   g. Identification of the **avoidance**, **mitigation** and **management measures** that will be put in place as part of the proposal to avoid or minimise impacts, including details about alternative options considered and how long term management arrangements will be guaranteed;
   h. Description of the residual impacts of the proposal. **If the proposal cannot adequately avoid or mitigate impacts on biodiversity, then a biodiversity offset package is expected** (see the requirements for this at point 6 below); and
   i. Provision of specific Statement of Commitments relating to biodiversity.

4. An assessment of the significance of **direct** and **indirect** impacts of the proposal must be undertaken for threatened biodiversity **known or considered likely to occur** in the study area based on the presence of suitable habitat. The Assessment of Significance is a statutory mechanism which allows decision makers to assess whether a proposed development or activity is likely to have a significant effect on threatened species, populations or ecological communities, or their habitats. This assessment must take into account: