Walcha Council Ordinary Meeting
Wednesday, 28 April 2021

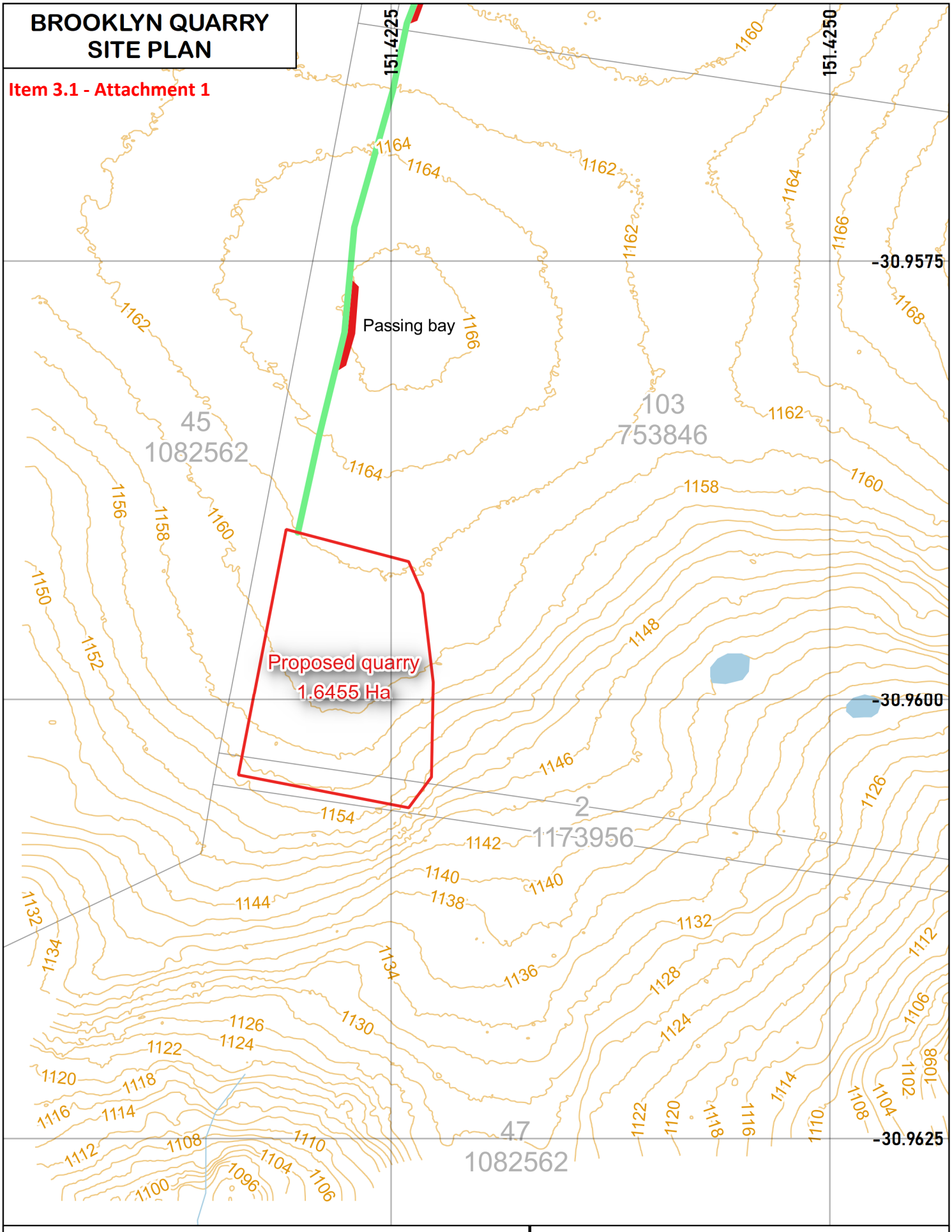
Item 6.1 – Development Application 10.2020.3 – Brooklyn / 1643 Oxley Highway Walcha – Basalt Quarry – Attachments – Part 1

Attachments:

1. Site Plan
2. Statement of Environmental Effects
3. State of Environmental Effects – Appendix I

BROOKLYN QUARRY SITE PLAN

Item 3.1 - Attachment 1



Map grid based on WGS84
Lot data © NSW Dept Finance, Services & Innovation 2020.
Topographic data from drone survey July 2020.
Map drawn by M.Goodwin 2020.

0 50 100 150 200 250 m

Quarry site
Lot boundary
Dam
2m contour (m ASL)

ACCESS TRACK
Quarry - new
Quarry passing

STATEMENT OF ENVIRONMENTAL EFFECTS

Development Application

for Brooklyn quarry

REVISION REGISTER

VERSION	DATE	REVISION REASON	AREAS REVISED
1.0	Feb 2020	Lodged with Council on 21-2-2020 as supporting information for DA.	N/A
1.1	Apr 2020	Information request by NSW RMS on 24-4-2020.	Primarily location, land title & ownership, traffic and hours of operation.
1.2	Aug 2020	Council request for additional information regarding DA submissions & Traffic for NSW letter dated 26-5-2020.	Primarily alternatives, access, highway access design, groundwater, topography, noise, dust, blasting.

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ABBREVIATIONS

~	about
ASL	above sea level
dB(A)	A-weighted decibels, a measure of relative loudness of sounds in air as perceived by the human ear
km	kilometre
L Aeq (15 min)	average noise energy over a 15 minute period
LCM	loose cubic metres
m	metre
MIC	maximum instantaneous charge
NSW EPA	NSW Environment Protection Authority
PM10	all airborne particulate matter smaller than 10 µm (microns) in diameter
SPL	sound pressure level
SWL	sound power level

1 INTRODUCTION

1.1 NAME OF DEVELOPMENT

Brooklyn quarry.

1.2 APPLICANT

Scott Robert Blake & Brian James Blake.

1.3 SUMMARY

This Statement of Environmental Effects (SEE) is part of the supporting documentation for a Development Application for a basalt quarry to that will extract, process, store and sell aggregate and gravel. It provides:

- A description of the proposed development.
- A description of the existing environment.
- Strategies to mitigate potential environmental impacts.
- An analysis of Section 4.15 requirements under the Environmental Planning and Assessment Act 1979.
- A land use conflict risk assessment (Appendix A).
- A threatened species "test of significance" (Appendix B).
- A review of Biodiversity Offsets Scheme Thresholds.
- Highway access design (Appendix H and I).
- Groundwater Impact Assessment (Appendix J)

2 DESCRIPTION OF THE DEVELOPMENT

2.1 LOCATION, LAND TITLE & OWNERSHIP

2.1.1 Location

The development site is located within the "Brooklyn" property, about 16km west of Walcha, as shown Figure 1. The site address 1643 Oxley Highway, Walcha Road 2354.

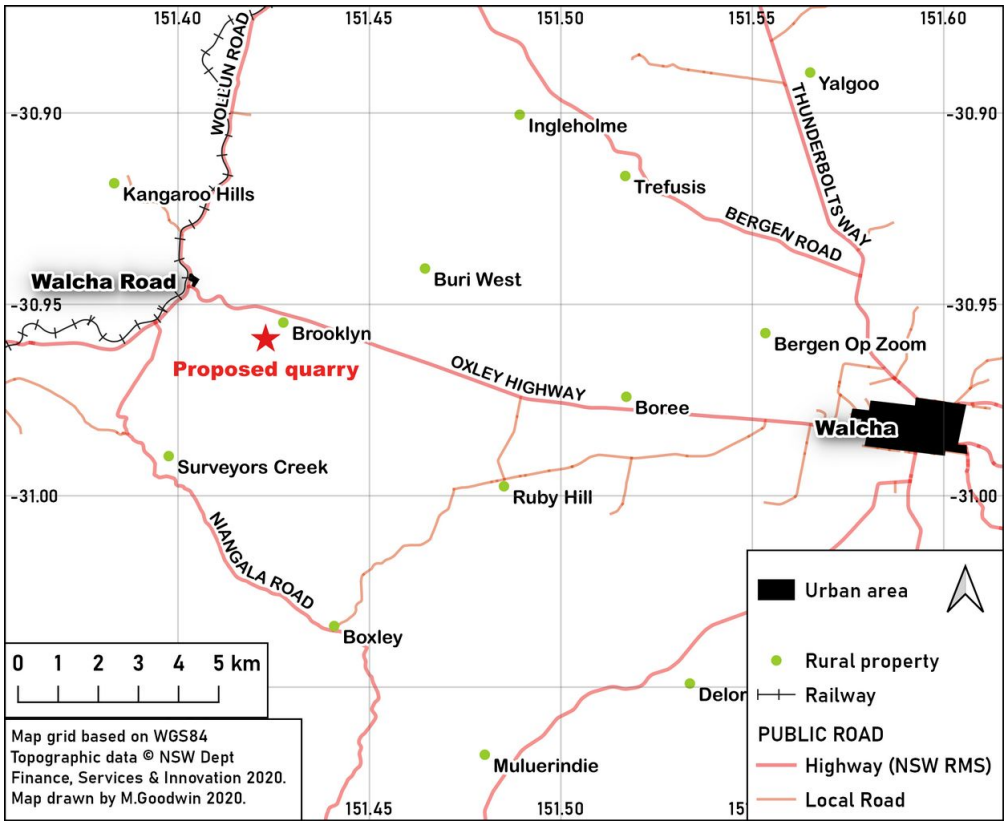


Figure 1 – Proposed quarry location.

2.1.2 Land title & ownership

The development involves four freehold lots which are all part of the "Brooklyn" holding, owned by Brian James Blake, one of the applicants. The location of the lots relative to the quarry site are shown in Figure 2 and 3. Those lots are:

- 103 in deposited plan 753846 (part of quarry site).
- 2 in deposited plan 1173956 (part of quarry site).
- 47 in deposited plan 1082562 (part of quarry site).
- 46 in deposited plan 1082562 (access).

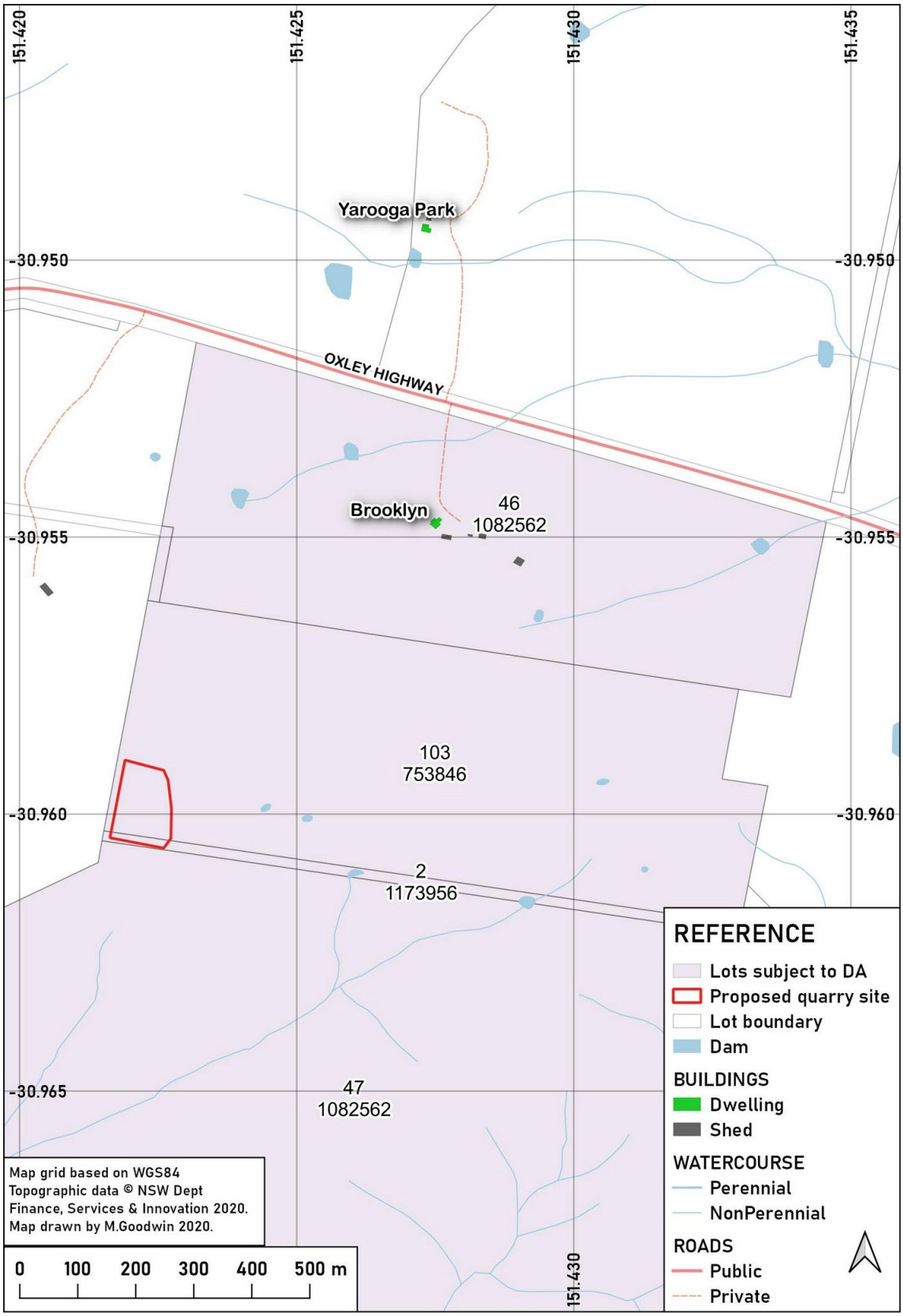


Figure 2 – Lots comprising proposed development (shaded).

Figure 3 – Site boundary & Google Earth aerial image 21-8-2018.

2.2 RESOURCE

It is proposed to establish a new basalt rock quarry to supply aggregate and gravel to local users for concrete production, road sealing, road base and similar purposes. Drilling and costeaning work combined with geological and geophysical observations indicate there is a profile of usable rock of more than 30 metres. Under ideal circumstances there may be up to about 450,000 cubic metres of rock that could be extracted.

Engineering testing of numerous basalt samples from the site has shown the rock is suitable for the various intended uses.

It is planned to market gravel and aggregate within a radius of about 100 kilometres of the quarry. More distant customers are unlikely given significant transport costs and the availability of alternative sources of quarry products.

2.3 DISTURBANCE AREA

Maximum disturbance areas arising from quarry related operations will be 1.9878 hectares, as indicated in Table 1.

Table 1 – Disturbance domains & areas.

DOMAIN	DISTURBANCE	DIMENSIONS	AREA (Ha)
Quarry	Quarry void, stockpiles, crushing equipment, office/amenities	Odd shape shown in Figure 3.	1.6455
Access track	Quarry access track from Brooklyn boundary to edge of quarry site.	Existing 928m. 3.5m wide	0.3248
Access track passing bays	Passing bays at 185m intervals along quarry access track.	50m long & 3.5m wide. Five bays	0.0175
		TOTAL	**1.9878**

2.4 EXTRACTION ACTIVITY

2.4.1 Rate

It is expected that the likely market for gravel and aggregate in the Walcha district is likely to range from about 1,000 up to 29,000 cubic metres per year. Quantities above a few thousand

cubic metres would only be likely to occur in extraordinary circumstances, such as during the construction of major infrastructure projects.

2.4.2 Maximum quarry depth & extent

If there is sufficient demand for quarry product, then the quarry void will reach a maximum:

- Depth of 30 metres.
- Surface extent about 100 metres (east-west) by 160 metres (north-south), with a roughly rectangular shape.

2.4.3 Excavation methods

Excavation of the basalt rock will be undertaken using earth-moving machinery such as an excavator, front-end loader and/or bulldozer, on a sporadic basis in response to customer orders. Basalt is typically comparatively hard, hence it will be necessary to drill and blast all rock prior to excavation.

Figure 4 provides a generalised indicative layout of the quarry site.

2.4.4 Quarry equipment

At peak levels of operation the following equipment, or very similar items, are expected to be used within the quarry site:

- One front end loader.
- One PC400 45t tracked excavator
- One PC400 45t tracked excavator with Hammer
- One air track drill
- One rock crusher
- One truck >20 tonne

2.4.5 Blasting & explosives

Basalt is a relatively strong rock that needs to be fractured with explosives prior to excavation with earth moving equipment. To achieve this, holes will be drilled in a predetermined pattern with particular attention being applied to their angle, depth and spacing. Each hole will then be loaded with explosive which is initiated with the aid of primer explosive and detonators. The detonation of each hole will be delayed in a planned sequence to so that each hole is fired

individually in close succession. The delayed firing technique is a standard practice in quarry operations which improves the efficiency of the blast and also reduces environmental impacts such as noise, dust, ground vibration.

The design of a blast will be varied depending its location within the quarry, geological structures, product requirements and any limiting factors in relation to potentially sensitive locations (including amenities, crushing equipment, etc). Blast design is therefore completed on a blast by blast basis, ensuring that all these factors are considered to achieve blast levels that are within acceptable limits.

The maximum expected frequency of blasting is once per week.

No on site explosives storage is proposed. All explosives will be delivered to the site for immediate, or following day, use. Delivery will be via a dangerous goods licensed, purpose built truck, operated by a commercial explosives supplier.

In NSW current explosives legislation and licensing requires that explosives can only be used in a quarry:

- By a person with an explosives license specifically endorsed for quarry and/or open cut mine work.
- In accordance with Australian Standard 2187.2-2006 Storage & use of explosives - Part 2: Use of Explosives.

2.4.6 Quarry benching

Initially it is proposed to establish quarry benches about 5 metres high by 5 metres wide, although it is expected that bench height will probably be increased over time to 10 metres. Bench heights will only be changed after consideration of all relevant factors, including:

- Geotechnical issues:- Ground stability is determined by a combination of factors including layering (thickness, composition & strength), jointing (natural crack patterns) and faults/fractures.
- Worker safety.
- Productivity.

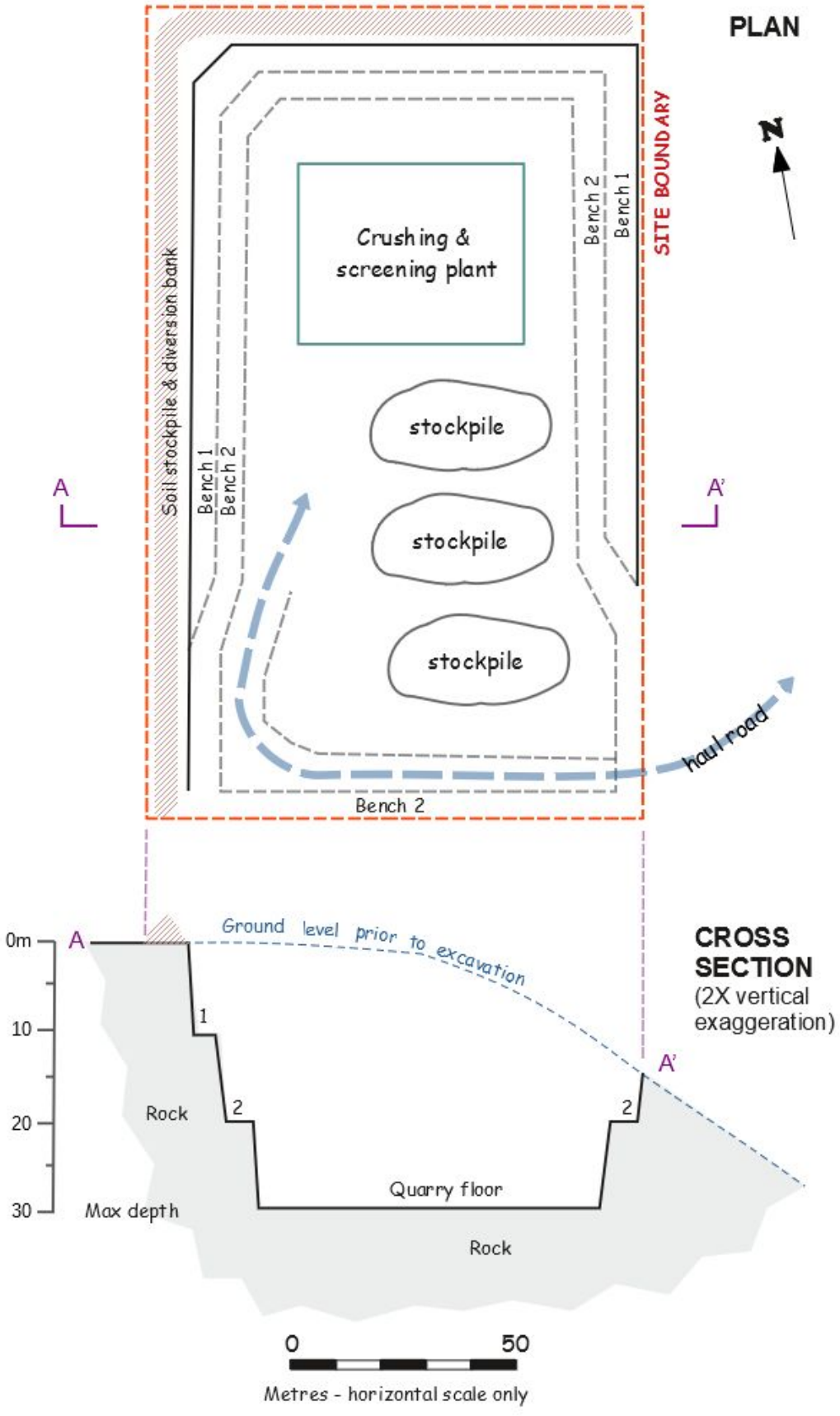


Figure 4 – Generalised quarry layout & profile.

2.4.7 Processing

Most of the basalt excavated will be subject to processing, including one or more of the following:

- Using grizzly bars to separate over size boulders from soil and rock.
- Splitting over size boulders using hydraulic splitters and/or hydraulic hammers.
- Crushing and screening to produce a range of sized aggregates.

2.4.8 Stockpiles

Material that may be stockpiled within the quarry site includes:

- Excavated basalt, gravel, soil and processed aggregate.
- Waste rock that is not suitable for sale. This material may be useful for rehabilitation, such as battering the edges of the quarry.
- Top soil, for future rehabilitation.

2.5 STAFF AMENITIES

Initially staff amenities will consist of a portable toilet and/or ATCO style portable lunch room/amenities building (<25 square metres). If subsequent circumstances warrant, an office area (<25 square metres) may be added (or combined) with the amenities area.

2.6 HIGHWAY ACCESS

2.6.1 Highway traffic

The most recent publicly available and relevant NSW Roads and Maritime traffic volume data for the Oxley Highway is from 2011 at a monitoring site near Woolbrook (station 92702). Key aspects shown in the data include:

- Average of 622 vehicle movements per day in either direction (web site 622, downloaded data 607).
- Average of 105 truck movements per day in either direction (web site).
- Peak movements occur between 8:00AM and 5:00PM typically averaging 40 to 53 vehicles per hour (downloaded data).
- Actual vehicle movements never exceeded 100 per hour (downloaded data).

2.6.2 Quarry traffic

Quarry traffic volume estimates based on various production levels are provided in Table 2 below. More detailed information is provided in Appendix G, including assumptions used to prepare the estimates. Actual traffic volumes will depend on the demand for quarry products, which is expected to fluctuate significantly from year to year and cannot be reliably predicted at this time.

Table 2 – Estimated quarry traffic at various production levels.

		TRUCKS (2 way)	STAFF (2 way)		CONTRCTR (2 way)	TOTAL	VEHICLES /WRK DAY
LCM (m3)	TONNES	year	FTE	year	year	VEHICLES	261/YR
1,000	2,400	130	0.2	100	20	250	1
5,000	12,000	649	1	500	30	1,179	5
10,000	24,000	1,297	2	1,000	50	2,347	9
20,000	48,000	2,595	4	2,000	84	4,679	18
29,000	69,600	3,762	5.8	2,900	118	6,780	26

No allowance has been made for staff car pooling when travelling to the site from Walcha, so the staff vehicle movement figures are likely to be significantly overestimated.

2.6.3 Existing highway access

The existing access driveway from the "Brooklyn" property onto the Highway is shown in Plate 1 and Figure 5. Visibility between this access and the highway is partially obscured by trees and the rising slope will impede trucks entering the highway.

It is proposed that this access will be decommissioned and fenced off.

Plate 1 – Existing "Brooklyn" access road, left side of Oxley Highway 19-1-2020 (looking west).

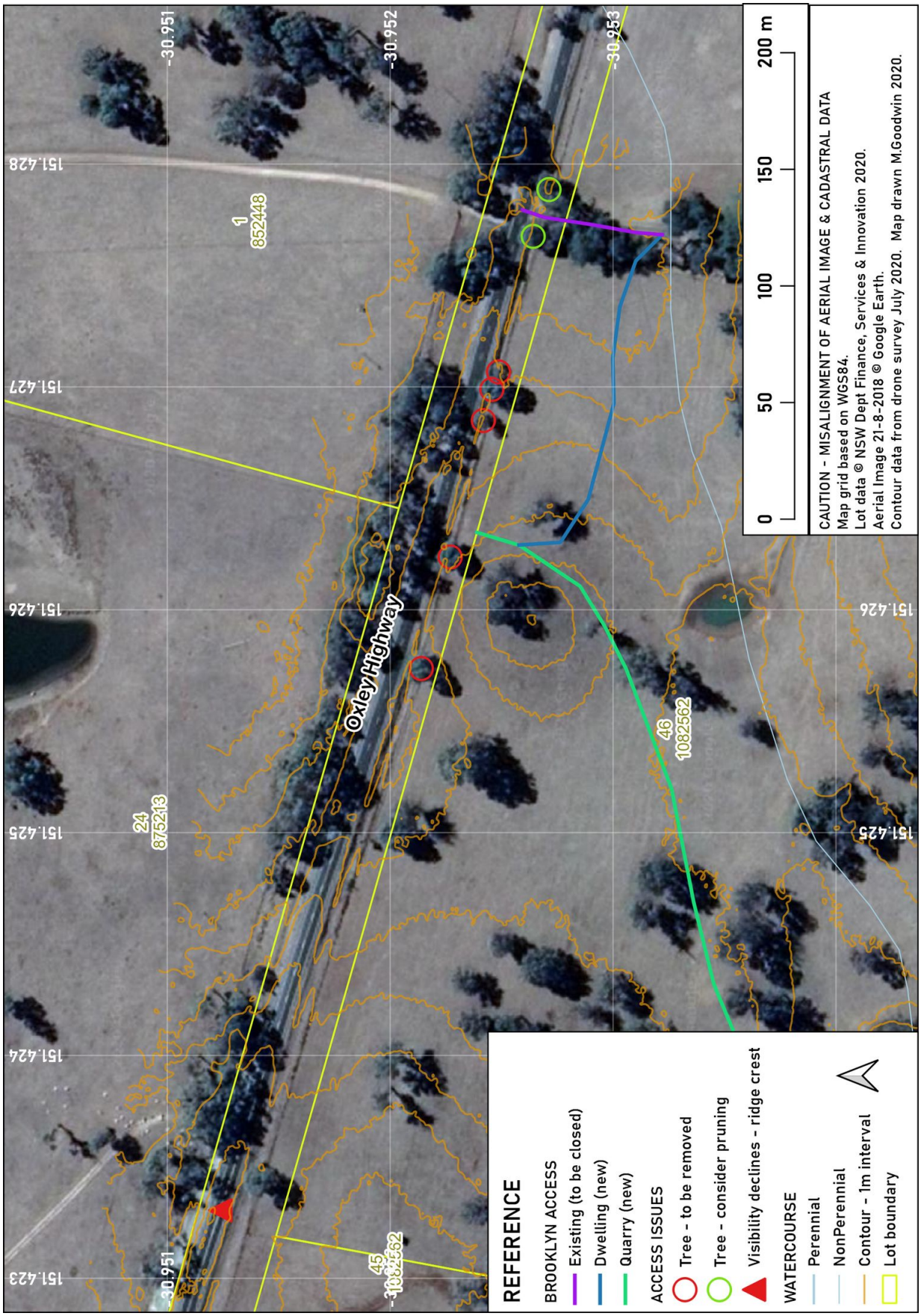


Figure 5 – Existing & proposed highway access.

2.6.4 New highway access - design

The applicants propose to establish a new access driveway from the Oxley Highway into into Brooklyn that will improve vehicle visibility, access and safety. The location of the proposed new access driveway is shown in Figure 5 and Plate 2.

Preliminary turn warrants assessment and a 2D concept drawing for proposed new access has been prepared Planit Consulting dated 24-7-2020 (see Appendix I). The designs have been developed to be consistent with Transport for NSW requirements documented in a letter to Walcha Council dated 26 May 2020 (see Appendix H).

Plate 2 – Proposed new "Brooklyn" access, behind tree right foreground, 19-1-2020 (looking east).

2.6.5 New highway access – establishment threshold

The proponent is committed to establishing the new highway access consistent with Council and Traffic for NSW requirements within 6 months of the quarry achieving 5,000m^3 in commercial sales.

The threshold is proposed on the basis that it would be unreasonable to require compliance with all Traffic for NSW standards prior to significant commercial activity, when:

- The initial impacts of the development on the highway will be relatively minor during the commencement phases of the development.
- Staged compliance will facilitate the viability of the development.

The 5,000m^3 threshold is equivalent to about 12,500 tonnes of quarry product at a density of about 2.5 tonnes per cubic metre. If the product is shipped within a year, this equates to about 337 trucks per year (~37 tonnes each) or 1.3 trucks per working day (~250 work days/year).

2.6.6 New highway access – tree removal

Several trees in the immediate vicinity of the proposed new Oxley Highway access will impair visibility between the access track and Highway. Trees proposed to be removed or considered for pruning are marked in Figure 5.

Clearing of trees for rural infrastructure, such as fences and tracks, is permitted on the "Brooklyn" holding without any other approval under Part 5A and schedule 5A of the Local Land Services Act 2013. Item 31(b) in schedule 5A allows 30m clearing for fence, effectively 15m within "Brooklyn" holding.

2.7 "BROOKLYN" ACCESS TRACK

Quarry access within the "Brooklyn" holding will be via a private track about 0.9 km long and 3.5m wide as shown in Figure 6. About 700 metres of the access is an existing property track[1], while the northernmost 200 metres will be a new construction.

The track will be upgraded using soil and gravel to provide an all weather surface and will have passing bays located about 180 metres apart.

[1] Visible in historical Google Earth imagery dated 2-12-2014. Accessed 8-5-2020.

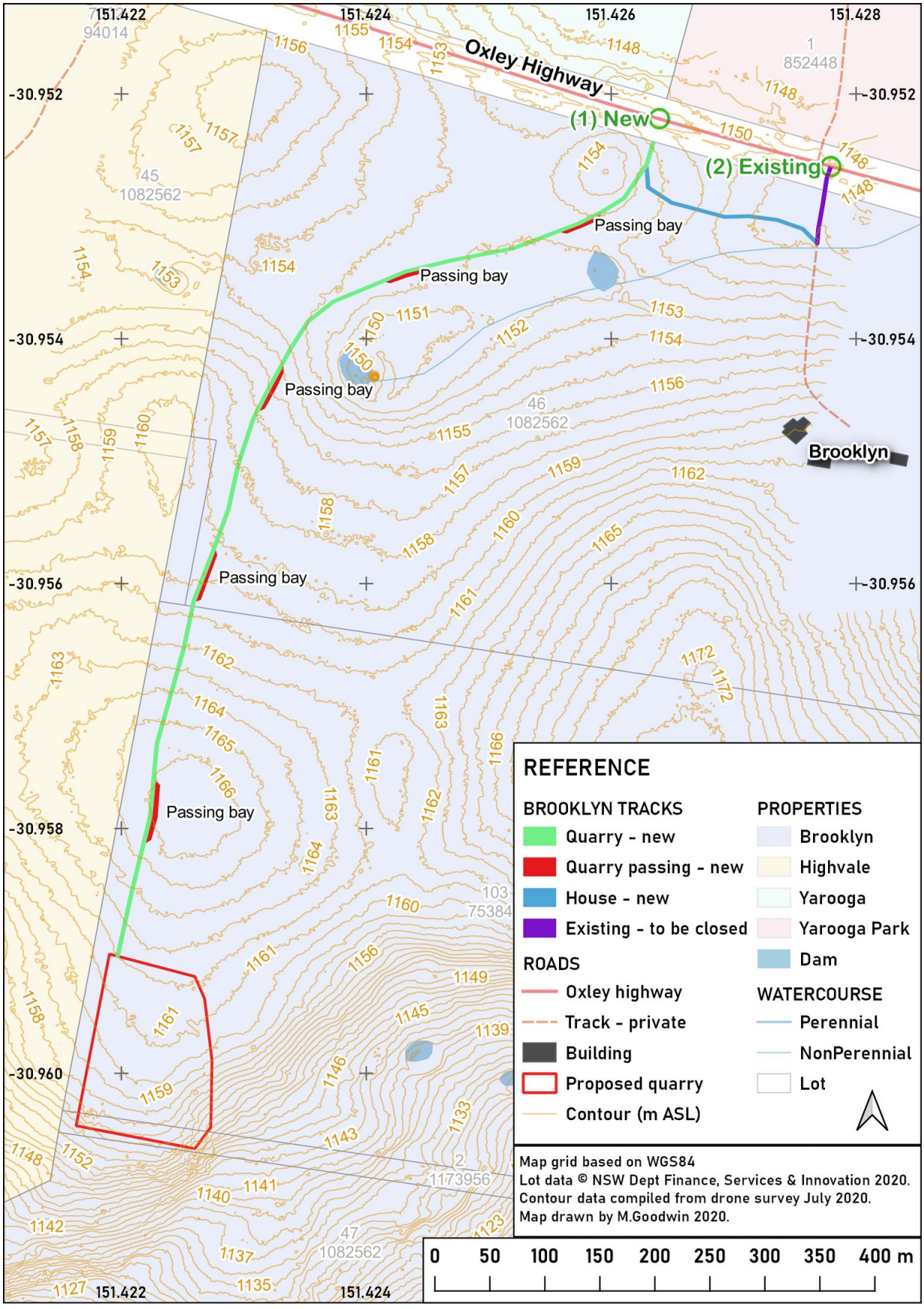


Figure 6 – Quarry access within the Brooklyn" holding.

2.8 HOURS OF OPERATION

The proposed maximum hours of operation are provided in Table 3 below. It is not expected that seasonal conditions or similar factors will require regular cessation of operations.

Initial activities will be undertaken on a sporadic basis in response to orders, hence there may be significant periods of negligible or relatively small scale activities. If a consistent demand for quarry products can be developed, then activities will be maintained in a manner consistent with the maximum hours in Table 3.

Table 3 – Proposed maximum hours of operation.

ACTIVITY	MON TO FRI	SAT & SUN	PUBLIC HOLIDAYS
Blasting	8:00 to 17:00	No activity	No activity
Drilling, extraction & processing	Daylight hours		
Loading trucks & product shipping			
Maintenance	24 hours per day, when required		

2.9 ECONOMIC IMPACTS

The development will have economic impacts proportionate to the scale of the operation. Preliminary expectations are that the development will produce between 1,000 (low) to 29,000 cubic metres (high) per annum. Expected economic impacts are outlined below.

2.9.1 Employment

Initially direct employment levels at the quarry are expected to be in the vicinity of one full time equivalent position, per 5,000 loose cubic metres (LCM) of annual production, as indicated in Table 4.

It is planned to employ local staff in a mixture of full time and part time positions including plant operator/s, driller/shotfirer, quarry manager and clerical support. Actual employee numbers and positions will vary depending on:

- Demand for quarry products, which will vary from year to year.
- Cost and availability of suitable workers, such as shotfirers, drillers and quarry managers.
- Cost effectiveness and availability of of contractors.

Table 4 – Estimated full time equivalent employees (FTE).

ANNUAL PRODUCTION		QUARRY FTE
LCM (m^3)	tonnes	
1,000	2,400	0.2
5,000	12,000	1
10,000	24,000	2
20,000	48,000	4
29,000	69,600	5

2.9.2 Contractors

Contract services required to support quarry operations include:

- Plant and equipment mechanics - About 2 days per 5,000m^3 LCM or every three months, depending on production levels and equipment.
- Explosives transport & blasting - About 3 days per 30,000 tonnes.
- Mobile crushing and screening plant, probably in lower capacity stages only - About 10 days per 10,000m^3 LCM.

The estimated number of contractor working days associated with the quarry operation are provided in Table 5.

Table 5 – Estimated contractor days per annum.

ANNUAL PRODUCTION		PLANT MAINTENANCE	EXPLOSIVES USE & TRANSPORT	CRUSHING & SCREENING	TOTAL
LCM (m^3)	tonnes				
1,000	2,400	4	1	1	**10**
5,000	12,000	8	1.5	5	**15**
10,000	24,000	12	3	10	**25**
20,000	48,000	16	6	20	**42**
29,000	69,600	20	9	30	**59**

2.9.3 Construction costs

Currently all higher quality aggregate and road base used in the Walcha Shire area comes from relatively distant sources, including Guyra (~220 km round trip), Hernani (~308km), Attunga (~200km) and Nabiac (~260km round trip to Nowendoc).

A local quarry will substantially reduce freight costs, hence the overall cost of construction for any project requiring significant amounts of aggregate or road base. For example, transport costs for aggregate used to manufacture concrete at Walcha are expected to be reduced by more than 80%.

2.10 REHABILITATION

Currently the main landuse on the "Brooklyn" property is cattle and sheep grazing. Upon cessation of quarry operations the void will be rehabilitated to create a safe and stable landform consistent with the landowner's requirements. This is expected to involve one or more of the following strategies:

- Pre-stripping and stockpiling top soil from the site. This soil will be used to facilitate re-vegetation of disturbed areas.
- Battering the edges of the quarry void to reduce the slope of walls, either by excavation or by suitable placement of waste rock.
- Ripping and/or applying a veneer of topsoil to any areas of compacted soil associated with the quarry void.

- Using the quarry void to retain water for domestic livestock to drink from. This may require some earthworks to facilitate appropriate access paths and slopes.
- Using appropriate earthworks to ensure surface water flows do not cause significant soil erosion after cessation of operations.

2.11 END DATE

A specific end date for the operation of the quarry has not been proposed because:

- Rural quarries tend to have highly variable and sporadic rates of extraction.
- The actual end date will depend upon the rate of extraction of gravel/aggregate, which will vary from year to year, depending on demand.

2.12 ALTERNATIVES

2.12.1 Other Brooklyn sites

Several alternative sites were considered on the "Brooklyn" property but were rejected for one or more of the following reasons.

- **Resource deficiency** - A significant volume of rock (ie >250,000 cubic metres) with suitable engineering properties is required to enable the establishment of a viable aggregate quarry. Geological and geophysical observations indicate that other parts of the "Brooklyn" property lack sufficient volumes of suitable rock.
- **Higher environmental values** - Parts of the property with relatively intact vegetation communities and higher vegetation density have been avoided as they have more significant environmental values.
- **Topography** - Establishing, operating and rehabilitating a quarry is typically more cost effective on the side of a ridge or hill. Other parts of the "Brooklyn" property were considered and discarded on the basis that they had minimal or excessive slope.

2.12.2 Other locations

Consideration was given to establishing a quarry at various other sites within the Shire, but they were rejected for one or more reasons, including:

- There were unrelated dwellings within 1 kilometre.
- A lack of reasonable proximity to Walcha township.
- No evidence of a significant volume of basalt rock.

- Likely access problems including public roads in poor condition and/or located a significant distance from a public road.
- Higher environmental values with significant stands of native vegetation, rock outcrops or other factors.

2.12.3 Do nothing

A "do nothing" scenario involves the quarry not proceeding which would involve various "opportunity costs", including losing a chance to:

- Increase economic diversity via the establishment of a new extractive industry.
- Reduce construction costs for local roads, buildings and infrastructure by enabling a local source of aggregate supply.
- Diversify local employment opportunities.
- Create new local jobs.
- Enable a relatively isolated extractive industry proposal to proceed within a setting where it is quite unlikely to have any significant adverse impacts on the environment, neighbours, community or public infrastructure.

2.13 LEGAL CONTEXT

Quarries are regulated under various acts in NSW, with the most significant outlined below. There are various regulations made under the respective acts.

2.13.1 Environmental Planning and Assessment Act 1979

Under the Environmental Planning and Assessment Act 1979 and the Walcha Local Environmental Plan 2012, development consent is required from Walcha Shire Council to enable the establishment and operation of an "extractive industry", such as a quarry, on land zoned "RU1 Primary Production". The requirements of the Act are considered in more detail within the section titled "6. Matters for Consideration" below.

2.13.2 Work Health and Safety Act 2011

The Work Health and Safety Act 2011 applies to all workplaces in NSW, including quarries. At quarry sites this act is primarily administered by NSW Resources & Geoscience.

2.13.3 Work Health and Safety (Mines and Petroleum Sites) Act 2013

The Work Health and Safety (Mines and Petroleum Sites) Act 2013 contains provisions for work health and safety issues unique to mine sites, including a quarry. At quarry sites this act is administered by NSW Resources & Geoscience.

2.13.4 Explosives Act 2003

Transport, handling and use of explosives within NSW is regulated by the Explosives Act 2003. This act is administered by Safe Work NSW and NSW Resources & Geoscience.

2.13.5 Protection of the Environment Operations Act 1997

Provisions of the Protection of the Environment Operations Act 1997 enable Council to address adverse environmental impacts such as noise and dust.

3 ENVIRONMENTAL SETTING

3.1 TOPOGRAPHY

The proposed quarry is located at an elevation of about 1150 to 1160 metres above sea level, on the edge of a plateau which forms part of the Great Dividing Range, as depicted in Figure 7 below. A detailed digital terrain model of the quarry site and vicinity is provided in Appendix L.

Surface water drainage from the site flows to the east and south into the Surveyors Creek catchment, then the MacDonald River about 6.5km down slope of the site.

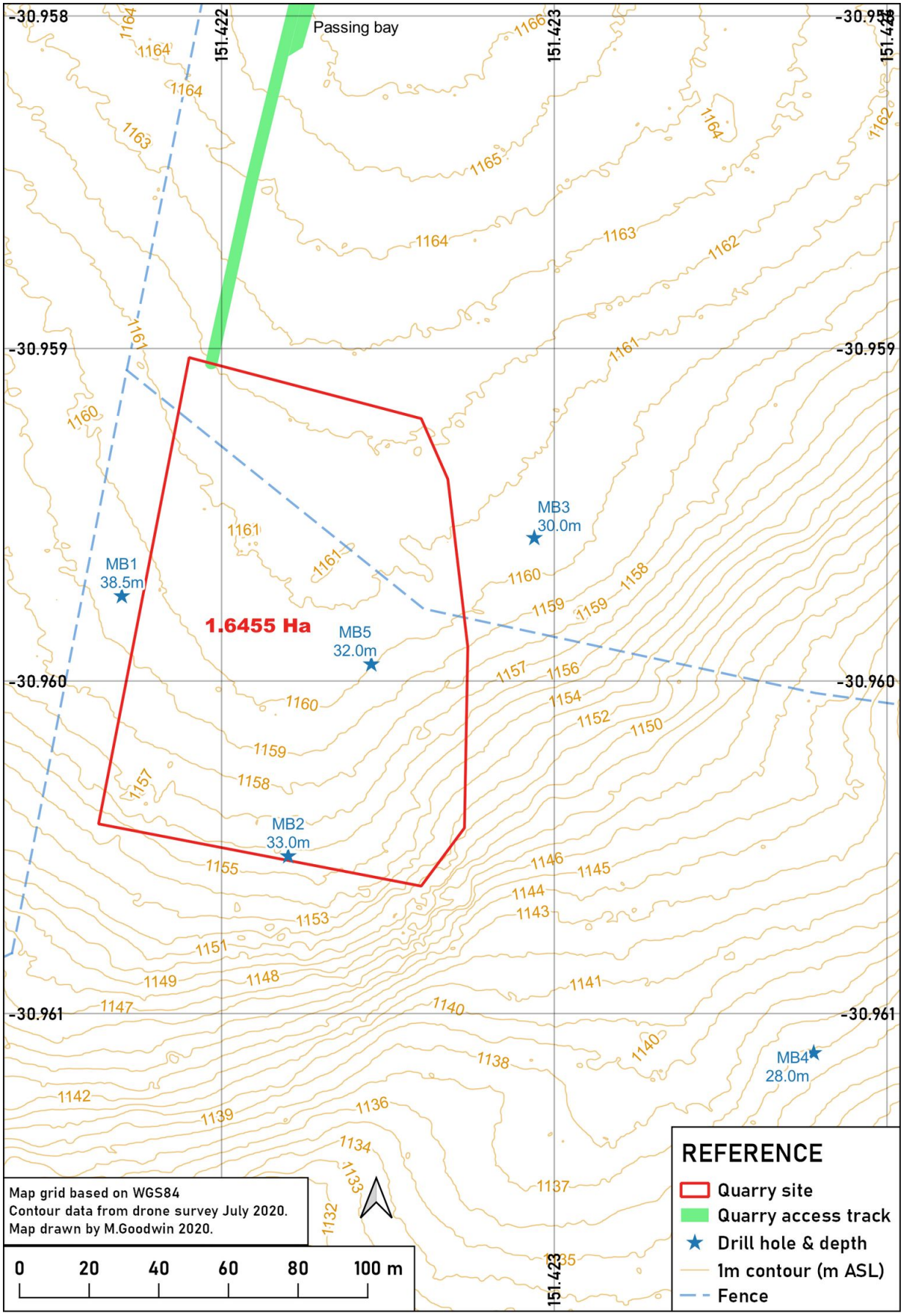


Figure 7 – Quarry site topography.

3.2 GEOLOGY

Trenching and drilling of the quarry site has a generally shallow reddish clay soil immediately overlying relatively fresh (unweathered) Tertiary basalt, as represented in Figure 8 and Plate 3 below. Five drill holes were drilled during July 2020 at the locations shown Figure 7. They showed that the basalt is up to 37.0 metres (hole MB 1) in the immediate vicinity of the quarry site.

All of the basalt is likely to be suitable for commercial use, unless there are significant geological variations. Known variations include some minor proportions of volcaniclastic/pyroclastic rocks (ash and agglomerate) exposed during test trenching and drilling.

Drilling indicates there is a relatively persistent layer of clay underlying the basalt at about 1124m ASL on the quarry site. The clay typically shows a mottled colour and texture similar to highly weathered volcaniclastic rocks observed in excavator costeans. This clay layer is about 7m below the maximum depth of the proposed quarry.

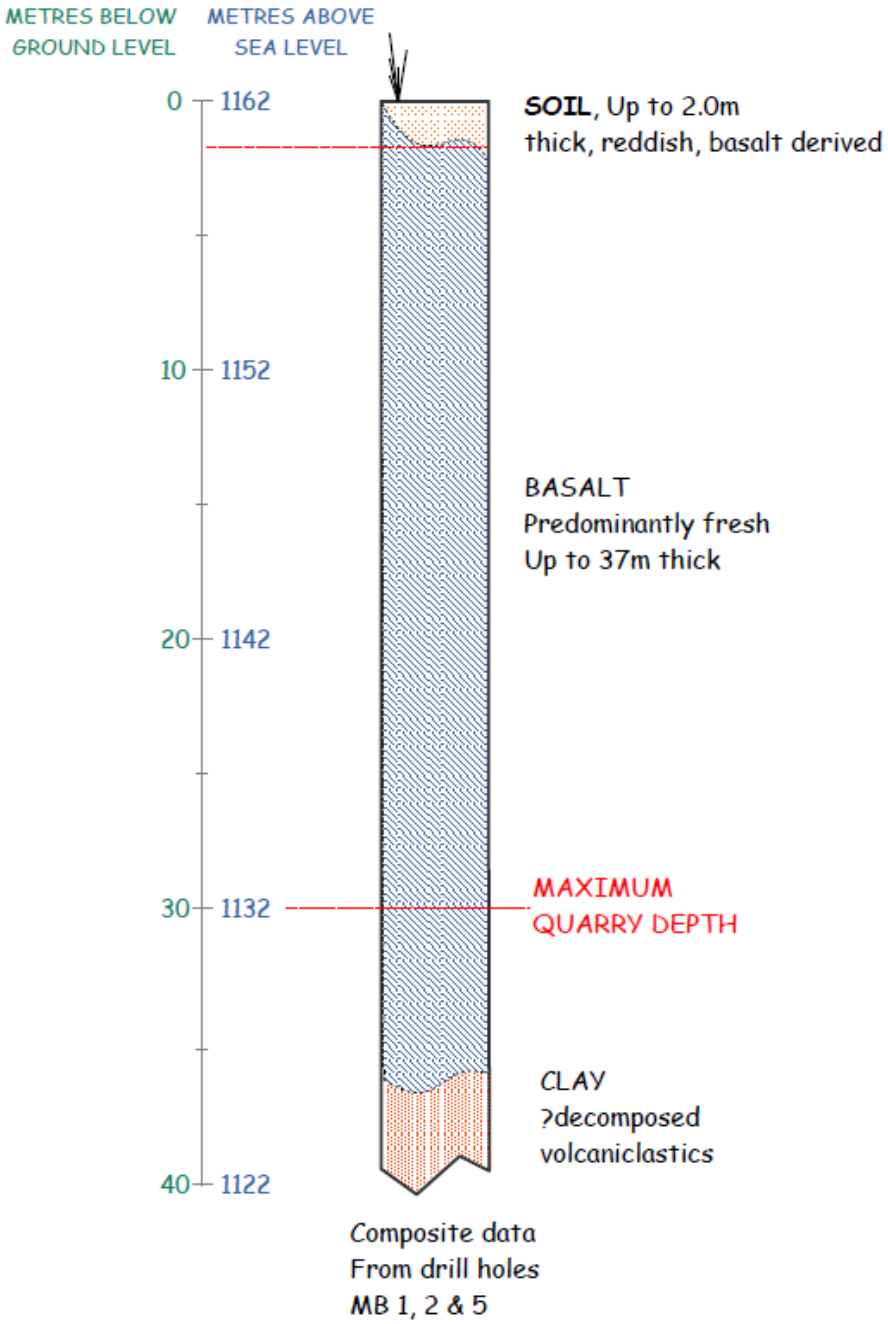


Figure 8 – Typical geological profile of site.

Plate 3 –Outcrop of Tertiary basalt, western edge of site.

3.3 CLIMATE

The site is located near the eastern edge of the Australian temperate sub humid zone[2] and receives about 807mm average annual rainfall, based on records from the Walcha Post Office over the 117 year period from 1879 to 1996 [3].

The closest data from the Bureau of Meteorology regarding wind observations is from the Woolbrook weather station, located about 7.4km west of the proposed quarry. Wind observations are taken at 9:00AM and 3:00PM each day. The 9:00AM observations from 1-1-1970 to 11-8-2019 do not show a strong directional trend, but the 3:00PM observations indicate a predominant wind from a westerly direction as shown in Figure 9 [4].

[2] Read, I.G. 1994 *The Bush A Guide to the Vegetated Landscapes of Australia*, University of New South Wales Press, Sydney, NSW.
[3] Bureau of Meteorology climate statistics for Walcha Post Office.
[4] Bureau of Meteorology climate statistics for Woolbrook.

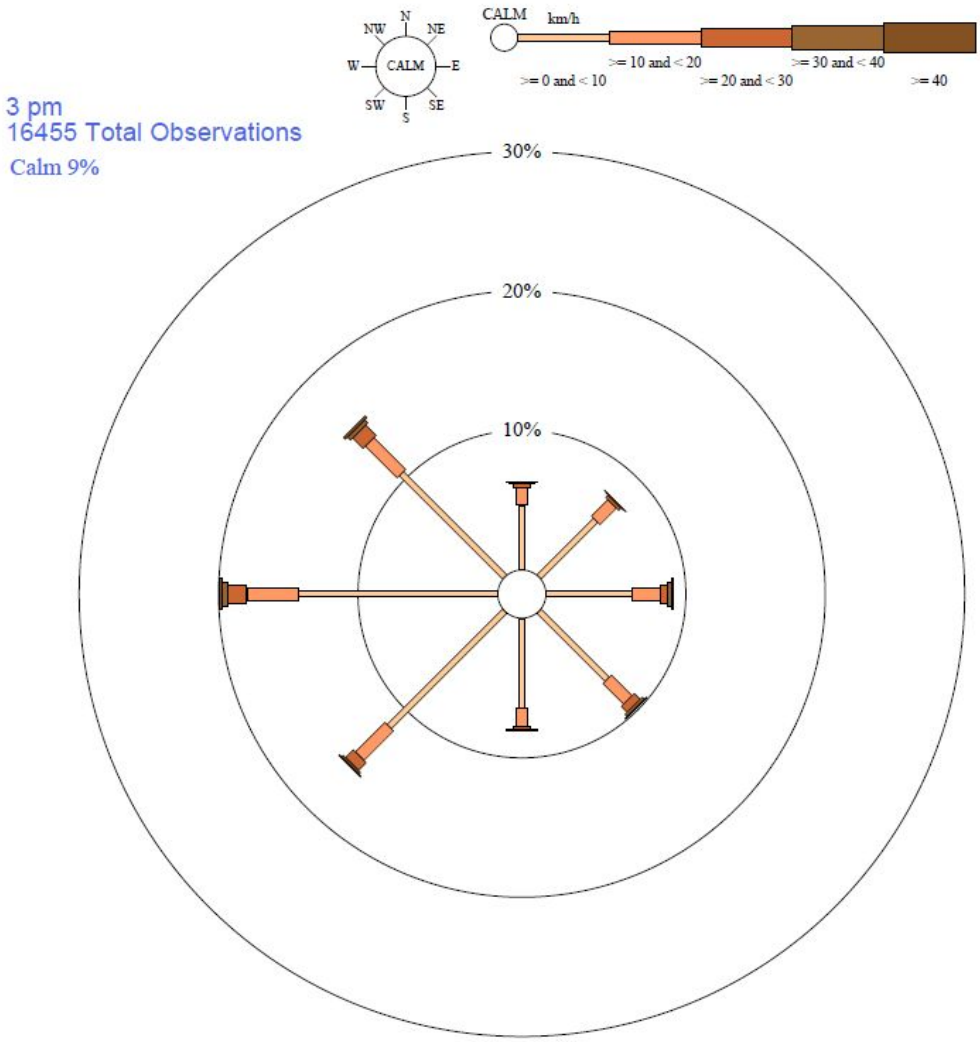


Figure 9 – Wind rose, 3:00PM @ Woolbrook, 1-1-1970 to 11-8-2019.

3.4 WATER

3.4.1 Surface water

There are no perennial watercourses within 1 kilometre of the proposed quarry, as shown in Figure 7 previously. Topography directs storm water runoff from the site towards gullies to the east and south that are part of the catchment of Surveyors Creek. This creek flows intermittently and has sporadic semi-permanent waterholes.

3.4.2 Ground water

The quarry will have a maximum depth of 30m and will expose layers (flows) of basalt, possibly with minor volcanic ash and agglomerate, as indicated in section 3.2. Significant

groundwater flows area unlikely to be encountered by the quarry under typical operating conditions given that:

- There are no nearby permanent watercourses, wetlands, springs or other features suggesting the presence of a near surface aquifer.
- No rock units with significant porosity have been identified on or near the quarry site.
- The quarry is located on the edge of an elevated ridge that forms part of the Great Dividing Range.

A detailed Groundwater Impact Assessment, including the drilling of 5 bore holes, has been undertaken and is the subject of a detailed report (see Appendix J).

3.5 LAND USE HISTORY

Sheep and cattle grazing have been the dominant land use in the immediate vicinity of the proposed quarry since about the 1830s. This has included:

- Regular applications of super-phosphate fertiliser via ground and/or aerial spreading.
- Periodic sowing of improved pastures by spreading in steeper and/or rocky areas and cultivation in other locations.
- Clearing most remnant native trees and shrubs from areas of moderate slope and fertile soil about 30 years ago.

3.6 CONTAMINATION

No significant sources of contamination were observed on the proposed development site or nearby during inspections. A targeted search was made for evidence of issues commonly associated with grazing land, such as:

- Rubbish & rubbish dumps (eg tyres, lead batteries, wire, glass, car bodies, asbestos building materials, herbicide containers, pesticide containers, etc).
- Sheep/cattle dips (contamination from arsenic, organophosphates, etc).
- Fuel tanks/workshops (oil and diesel spills).

3.7 NEIGHBOURING RESIDENCES

Figure 10 and Appendix K show the location of residences in the vicinity of the quarry. The nearest, "Brooklyn", is located about 660 metres north east and is part of the property owned by one of the applicants.

The closest unrelated residences are:

- "Yarooga Park", more than 1,150 metres to the north.
- "Mt Pleasant", more than 1,500 metres to the north east.
- "Yarooga", more than 1,700 metres to the north west.
- Village of Walcha Road, more than 2,200 metres to the north west.

The proposed quarry site is not visible from any dwelling or the Oxley Highway due to natural screening by a mix of topography (see Digital Terrain Model - Appendix L) and vegetation (see Digital Surface Model - Appendix M & Aerial photograph – Appendix K).

The NSW Department of Primary Industries recommends a minimum buffer of 1,000m between extractive industries using blasting and neighbouring unrelated residences[5] as a conflict avoidance strategy. This proposal is clearly compliant with the NSW Department of Primary Industries recommendation.

[5] Page 90, Living & Working in Rural Areas Handbook, NSW DPI 2007

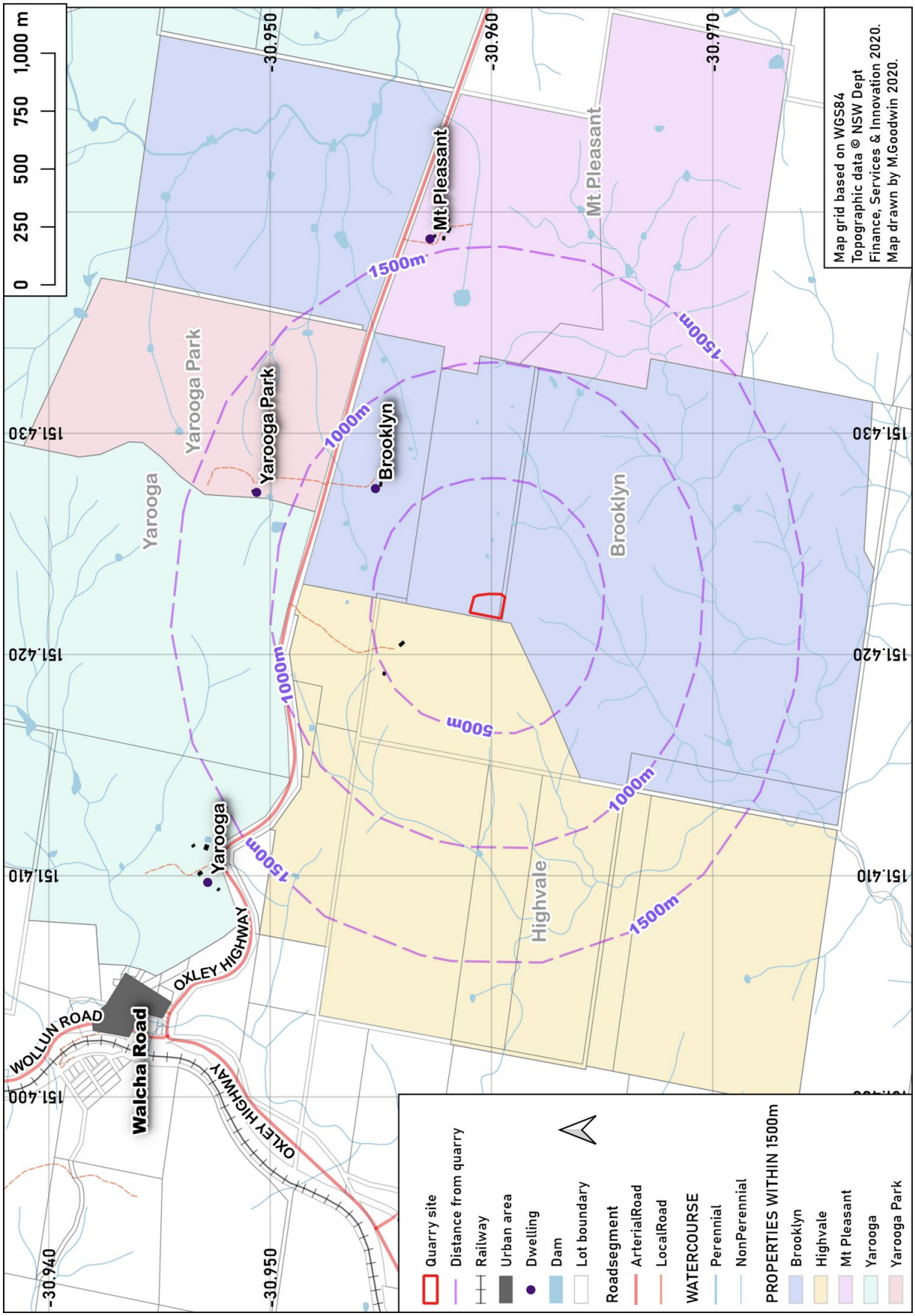


Figure 10 – Quarry location relative to nearby residences & properties.

3.8 FLORA

3.8.1 Species

Species of flora observed on the site during January and February 2020 are listed in Table 6. Some forbs (~15%) could not be identified as they were immature and lacked distinctive morphological features (eg seeds, mature leaves, flowers) that would facilitate reliable classification.

Table 6 – Site vegetation, Jan & Feb 2020.

SCIENTIFIC NAME	COMMON NAME	FORM	ABUNDANCE	STATUS
Pteridium esculentum	bracken fern	fern	common	native, ag. weed
Dysphania carinata	keeled goosefoot	forb	common	native
?Rumex sp.	sorrel	forb	common	?introduced
Acetosella vulgaris	sheep sorrel	forb	rare	introduced
Carthamus lanatus	saffron thistle	forb	occasional	introduced
Einadia nutans	climbing saltbush	forb	common	native
Geranium homeanum	northern cranes bill	forb	occasional	native
Malva parviflora	small flowered mallow	forb	common	introduced
Onopordum acanthium	Scotch thistle	forb	common	introduced
Oxalis perennans	grassland wood-sorrel	forb	common	introduced
Portulaca oleracea	pig weed	forb	common	native
Swainsona galegifolia	Darling pea	forb	common	native, ag. weed
Taraxacum officinale	dandelion	forb	occasional	introduced
Urtica urens	stinging nettle	forb	common	introduced
Xanthium spinosum	Bathurst burr	forb	rare	introduced
Agaricus sp.	mushroom	fungi	occasional	?native
Bothriochloa macra	red grass	grass	occasional	native
?Cyperus rotundus	nutgrass	grass	rare	introduced
Cynodon dactylon	couch	grass	common	introduced
Eleusine tristachya	goose grass	grass	rare	introduced

SCIENTIFIC NAME	COMMON NAME	FORM	ABUNDANCE	STATUS
Festuca arundinacea	demeter tall fescue	grass	common	introduced
Lolium sp.	rye grass	grass	common	introduced
Panicum effusum	hairy panic grass	grass	rare	native
Trifolium repens	white clover	grass	common	introduced
Cassinia quinquefaria	sifton bush	shrub	common	native, ag. weed
Crataegus monogyna	hawthorn	shrub	rare	introduced
Rosa rubiginosa	sweet briar	shrub	rare	introduced
Acacia sp.	wattle	tree	rare (sucker)	endemic
Angophora melanoxylon	rough barked apple	tree	rare (sucker)	native
Eucalyptus banksii	woolybutt	tree	occasional	native
Eucalyptus macrorhyncha	red stringy bark	tree	occasional	native
Cucumis myriocarpus	paddy melon	vine	rare	introduced
Hardenbergia violacea	native sarsparilla	vine	common	native
Rubus fruticosus	black berry	vine	occasional	introduced

3.8.2 Disturbance

The quarry site and proposed access track have been substantially disturbed by the clearing of the majority of the trees and shrubs, along with the cultivation of introduced pastures, to facilitate sheep and cattle grazing. Further evidence of the scale of disturbance is that more than half of the species noted in Table 6 are introduced, either intentionally or by accident.

3.8.3 Trees & shrubs

Scattered remnant mature red stringy bark (*Eucalyptus macrorhyncha*) trees form the dominant vegetation along with less common woolybutt (*Eucalyptus banksii*) trees. The tree canopy is not extensive, as shown in Figure 11 and Plate 4, and comprises a total of about 12 mature trees up to about 20m high.

A dead wattle (*Acacia sp*.) tree and a dead rough barked apple (*Angophora floribunda*) tree are present on the southern part of the site. Juvenile plants of both species, less than 0.3m high, were also observed.

On the southern slope there is an under-story almost exclusively composed of sifton bush (*Cassinia quinquefaria)* as shown in Plate 5. Sifton bush is regarded as a significant agricultural weed in NSW, even though it is a native species.

Plate 4 – Existing vegetation, looking S from N edge of site, 24-1-2020.

Plate 5 – *Cassinia quinquefaria* shrubs on south edge of site, 24-1-2020.

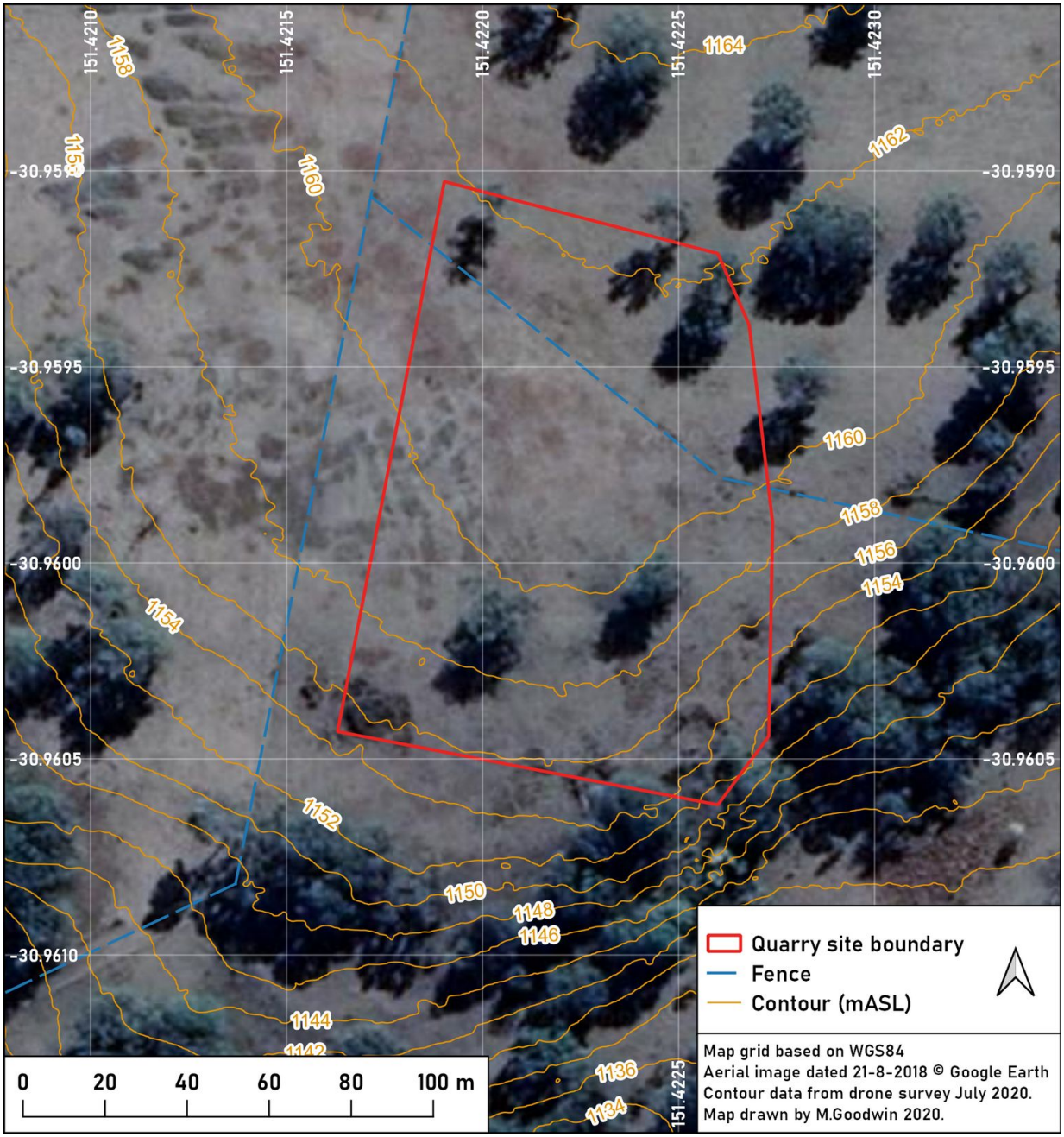


Figure 11 – Quarry site & tree coverage 18-8-2018.

3.8.4 Grasses & forbs

Ground cover vegetation during January 2020 was generally less than 5cm high and ranged up to about 50% foliage coverage as shown in Plate 6. The exceptionally low coverage follows a record drought for the 2019 calendar year over substantial parts of NSW, including the Northern Tablelands.

Dominant ground cover species included grasses and forbs, with a significant component of introduced species, as noted in Table 6.

Plate 6 – Ground cover, keeled goosefoot dominant, about 0.4m FOV, middle of site, 24-1-2020.

3.8.5 Threatened flora

A search was completed of the NSW Bionet database over the area bounded by North -30.91°, West 151.38°, East 151.48° and South -31.01° (World Geodetic System 1984 coordinates) covering approximately 106 square kilometres centred near the proposed development site, as depicted in Appendix E. The objective was to review reported nearby occurrences of threatened flora, listed under the provisions of the NSW Biodiversity Conservation Act 2016, as follows:

- Threatened flora, with results shown in Table 7.
- Threatened ecological communities, with results shown in Table 8.
- Endangered populations, with nil results.

Table 7 – Bionet data for threatened flora in the general vicinity, 6-2-2020.

NAME	FORM	NSW STATUS	COMM. STATUS	COMMENTS
Eucalyptus nicholii Narrow-leaved Black Peppermint	Tree	Vulnerable Part 3 Div 1	V	Usually on lower slopes on granite or metasedimentary rock. One Bionet record for granite soil site. Unlikely on site or nearby due as area is exclusively basalt derived soil on the crest and upper slopes of a ridge.
Thesium australe Austral Toadflax	Forb	Vulnerable Part 3 Div 1	V	Often found in grassy woodland, commonly with Kangaroo Grass (*Themeda australis*). Two Bionet records for granite soil sites. Unlikely on site or nearby as area is dominated by introduced pastures and lacks native grasses such as kangaroo grass.

Table 8 – Bionet data for threatened ecological communities in the general vicinity, 6-2-2020.

NAME	NSW STATUS	COMMENTS
Carex Sedgeland of the New England Tableland, etc.	EEC Sch 2, Prt 2	No carex sedgelands or suitable drainage depressions known on site, or nearby.
Howell Shrublands in the New England Tableland and Nandewar Bioregions		Community confined to areas of extensive granite outcropping. There are no granite ouctrops on site, or nearby.
McKies Stringybark/Blackbutt Open Forest in the Nandewar and New England Tableland Bioregions		Proposed site is significantly outside the mapped potential range for this community, lacks associated species and suitable lateritic soil.
Montane Peatlands and Swamps of the New England Tableland, NSW, etc		No peatlands or swamps on site or nearby.
New England Peppermint (*Eucalyptus nova-anglica*) Woodland on Basalts and Sediments in the New England Tableland Bioregion	CEEC Sch 2, Prt 1	Community occurs primarily in valley flats subject to cold air drainage. Site is on the edge of a ridge and species is not known on site or from nearby.
Ribbon Gum, Mountain Gum, Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion	EEC Sch 2, Prt 2	Suitable elevation and soils, but dominant community species absent from site.
Upland Wetlands of the Drainage Divide of the New England Tableland Bioregion		No wetlands on site or nearby.
White Box Yellow Box Blakely's Red Gum Woodland		Dominant community species absent from site. An associated species, red stringy bark, is known.

EEC = Endangered Ecological Community

CEEC = Critically Endangered Ecological Community

3.9 FAUNA

3.9.1 Species

Vertebrate fauna observed on the site, nearby areas or known to be common in similar habitat nearby are listed in Table 9. "Observation" includes seeing an animal, as well as locating a distinctive track or scat.

Table 9 – Fauna known to occur on & near site.

COMMON NAME	SCIENTIFIC NAME	STATUS	TYPE
Galah	*Cacatua roseicapilla*	Endemic	Bird
Crow	*Corvus sp.*	Endemic	Bird
Pee wee	*Grallina cyanoleuca*	Endemic	Bird
Magpie	*Gymnorhina tibicen*	Endemic	Bird
Willy wagtail	*Rhipidura leucophrys*	Endemic	Bird
Currawong	*Strepera graculina*	Endemic	Bird
Noisy miner	*Manorina melanocephala*	Endemic	Bird
Crested pigeon	*Ocyphaps lophotes*	Endemic	Bird
Swamp wallaby	*Wallabia bicolor*	Endemic	Mammal
Hare	*Lepus capensis*	Introduced	Mammal
Kangaroo	*Macropus giganteus*	Endemic	Mammal
Rabbit	*Oryctolagus cuniculus*	Introduced	Mammal
Fox	*Vulpes vulpes*	Introduced	Mammal
Brush tail possum	*Trichosurus vulpecula*	Endemic	Mammal
Tiger snake	*Notechis scutatus*	Endemic	Reptile
Long neck turtle	*Chelodina longicollis*	Endemic	Reptile
Red bellied black snake	*Pseudechis porphyriacus*	Endemic	Reptile
Cunningham's skink	*Egernia cunninghami*	Endemic	Reptile
Penny lizard	*Lampropholis guichenoti*	Endemic	Reptile

3.9.2 Habitat

Several mature trees provide feeding (eg. wood, flowers, leaves) and living niches (eg. bark, branch hollows). Their sparse distribution and relatively isolated context within a highly

disturbed environment means they have relatively low habitat value compared to less disturbed areas nearby.

Natural rock exposures are relatively common as in-situ outcrops and loose rock, but they lack slab like structures, cracks, holes and scree formations that could provide significant shelter niches for vertebrate species.

Overall there are limited feeding and living niches on the site, especially given the highly disturbed nature of the vegetation community. In that context it is quite unlikely that there are any significant resident populations of native vertebrate species, other than the generalist animals listed, especially when compared with less disturbed areas nearby.

3.9.3 Threatened fauna

A search was completed of the NSW Bionet database over the area bounded by North -30.91°, West 151.38°, East 151.48° and South -31.01° (World Geodetic System 1984 coordinates), an area of approximately 106 square kilometres, as depicted in Appendix E. The objective was to review nearby sightings of fauna listed as threatened under the provisions of the NSW Biodiversity Conservation Act 2016. Reported threatened species are listed in Table 10.

Table 10 – Bionet data for threatened fauna in the general vicinity, 6-2-2020.

NAME	TYPE	NSW STATUS	COMMENTS
Myuchelys bellii Bell's turtle	Reptile	Endangered Sch 1, Prt 2	Reported near junction of Surveyors Creek & MacDonald River. Habitat is shallow to deep pools in upper reaches or small tributaries of major rivers in granite country. Unlikely on site or nearby due to lack of water courses and granite.
Phascolarctos cinereus koala	Mammal	Vulnerable Sch 1, Prt 3	Site contains remnant mature Red Stringy Bark (*Eucalyptus macrorhyncha*) and woolybutt (*Eucalyptus banksii*) trees. Neither species identified as a koala feed tree in Schedule 2 of State Environmental Planning Policy 44. Highly disturbed nature of site means that site is quite unlikely to be used by species in any ongoing manner.

3.10 ABORIGINAL HERITAGE

Items of aboriginal heritage have a strong tendency to occur in association with:

- Permanent or intermittent water bodies, or;
- Rock outcrops that are suitable for:
    - Tool making, such as silcrete and chert,
    - Tool grinding, such as silcrete and sandstone.
    - Shelter, such as overhangs and caves, or;
- Sand hills.

None of the relevant natural features are present on the site. In the course of field observations no evidence was observed of any aboriginal heritage items such as fire hearths, flake scatters, grinding stones or grinding grooves. Observational conditions were exceptional, as record drought conditions during 2019 meant there was limited ground cover vegetation.

3.11 EUROPEAN HERITAGE

No significant evidence of European heritage has been observed on the site and none is expected.

3.12 BUSH FIRE RISK

Bush Fire Prone Land mapping for the Walcha Shire was not available via Council's web site. A review of aerial photography indicates:

- Within 200m of the site, a "grassy woodland" [6] vegetation formation is dominant, and is unlikely to support a crown fire. A grass fire is more likely to occur.
- About 200m to the west, east and south of the site, there is a higher density of vegetation, consistent with a "wet sclerophyll forest" with a generally "grassy sub formation" [7]. These areas have the potential to support a crown fire under exceptional circumstances.

Brian Blake has owned "Brooklyn" since 1978 (>41 years) and during this period there has never been an uncontrolled (unplanned) bush fire on the property.

[6] Based on categories in Table A2.1 in Planning for Bushfire Protection, NSW RFS 2006
[7] Based on categories in Table A2.1 in Planning for Bushfire Protection, NSW RFS 2006

In the event of a bush fire or grass fire the quarry would cease operations and it is expected egress would be feasible under nearly all circumstances.

No residential use of the quarry site will occur, hence most of the provisions of Planning for Bushfire Protection, published by the NSW Rural Fire Service, are not relevant to this proposal.

4 KEY ENVIRONMENTAL ISSUES & MANAGEMENT

Quarry operations generate various potential environmental issues ies Nevertheless, various strategies will be applied to minimise the potential for quarry excavation and processing activities to have any significant environmental impacts, on neighbours or the environment, as outlined below.

4.1 STORMWATER

4.1.1 Access track issues

The quarry access track through "Brooklyn" will be constructed from gravel and raised above natural ground level, hence there will be some change to natural stormwater flow paths.

4.1.2 Access track mitigation

Table drains and culverts along the proposed access tracks will be used to direct stormwater flows into existing natural drainage hollows and existing dams on the "Brooklyn" holding.

4.1.3 Quarry perimeter issues

Diversion channels and/or earth bunds will be used to divert stormwater flows around the perimeter of the quarry into existing, and/or new, dams for domestic livestock. Stormwater redirection will be necessary to prevent the quarry void filling with water, as well as minimising potential soil erosion and sedimentation issues.

4.1.4 Quarry perimeter mitigation

Key strategies that will be applied include ensuring that stormwater diversion channel:

- Beds are predominantly composed of bedrock, where feasible.
- Where bedrock is absent and the channel has a relatively high gradient, the bed and sides are lined with suitable rock.
- Flows into a dam, or existing gully with a natural base in bedrock.

4.1.5 Quarry site issues

Stormwater within the quarry site may contain elevated levels of sediment derived from soil and aggregate stockpiles. No significant contaminants are known, or are likely, within the basalt rock or associated soils that will be disturbed by the quarry.

4.1.6 Quarry site mitigation

All stormwater flows from the quarry site will directed to, and held within, a sump in the quarry floor. Sediment will be able to settle within the sump and the water used for dust suppression activities. The sump will be relocated within the site over time as quarry operations progress.

4.2 SOIL

4.2.1 Issues

Quarry operations will remove about 0 to 2m of topsoil and subsoil from the area being quarried. There may also be minor amounts of waste rock that is not suitable for commercial use, such as weathered basalt.

4.2.2 Mitigation

Topsoil and waste rock will be stockpiled for subsequent use in rehabilitation, where appropriate, and the creation of stormwater diversion banks/channels around the quarry perimeter.

4.3 DUST

4.3.1 Workplace standards

Dust will arise from quarry operations and quarry management is responsible for ensuring compliance with relevant workplace health and safety standards. The current standards [8] are based on 40 hours per week (8 hours, 5 days per week), with a maximum worker exposure of:

- Respirable dust = 3 mg/m^3.
- Respirable crystalline silica = 0.05 mg/m^3.
- Inhalable dust = 10 mg/m^3.

The crystalline silica (quartz) content of basaltic rock is typically less than 1%, hence levels of respirable crystalline silica are expected to be very low.

[8] '*Dust safety in the metals and extractives industries*', 2nd edition, 2020, NSW Resources Regulator

4.3.2 Quarry issues

NSW Health advice indicates that the vast majority of dust from mining/quarry activities consists of coarse particles (around 40 per cent) and particles larger than PM10, generated from natural activities such mechanical disturbance of rock and soil materials, for example by blasting, crushing and vehicles driving on dirt roads. Particles are also generated when wind blows over bare ground and different types of stockpiles. Larger particles can have amenity impacts as well as health impacts.

Fine particles from vehicle exhausts and mobile equipment are also produced at mine/quarry sites, though they only account for about 5 per cent of the particles emitted during the mining process. Fine particles are manly from vehicle and mobile equipment exhausts.

It is expected that the primary sources of dust associated with the operation of the proposed quarry will be:

- Drilling rock.
- Blasting rock (see section 4.7 for more information).
- Crushing & screening rock.
- Transport trucks accessing the site.

Basalt will be the primary material being excavated, which is comparatively hard. There are no significant amounts of friable rock or earth present in the geological profile below about 2 metres.

4.3.3 Quarry mitigation

To ensure worker safety a mixture of dust mitigation measures will be applied and amended in response to weather conditions, rock moisture content, plant location, etc. Those measures will be consistent with industry standards[9] and include:

- Application of chemical surfactants.
- Enclosing conveyor transfer points.
- Implementation of water truck procedures.
- Installation of sprays at conveyor transfer points.
- Operator training and fit testing for respiratory protective equipment.

[9] '*Targeted Intervention Program – Respirable Dust in Quarry Operations*', November 2019, NSW Resources Regulator

- Programmed maintenance of spray nozzles, pumps and plumbing.
- Regular inspections of operating dust controls.

The performance objective will be to ensure that:

- Quarry operations are conducted in accordance with the NSW Resource Regulator's 2020 workplace safety standards specified in the "*Dust Safety in the Metals and Extractives Industries*" document.
- No significant dust resulting from quarry operations is present more than 500 metres from the site boundary.

4.3.4 Access track issues

Trucks hauling quarry products via the access track within the property is a potential source of dust that could impact residents of the "Brooklyn" dwelling. The proposed track passes within 290m of the dwelling, hence it will need to need to be used and maintained in an appropriate manner to avoid impacts, especially in dry and windy conditions.

4.3.5 Access track mitigation

Strategies that will be used to minimise potential dust impacts associated with the quarry access track include:

- Constructing and maintaining the track with a firm all weather surface.
- Signposting and restricting quarry truck speeds to a maximum of 20km/h on the track.
- Mandatory site induction for all staff which highlights compulsory signposted speed limit for quarry site and access road.
- If the above measures become inadequate during dry and/or windy conditions, then additional strategies will be applied, including one or more of the following:
    - Reducing quarry truck speeds to a maximum of 10km/h
    - Using a water cart to suppress dust along sections of the track which may impact the "Brooklyn" dwelling or neighbours.
    - Applying a dust suppression coating to the track, such as a polymer or bitumen based emulsion.

The performance objective will be to ensure that no significant dust resulting from quarry traffic is present more than 500 metres from the quarry access track, or on the site of any dwelling.

4.4 NOISE

4.4.1 EPA Noise policy

Noise associated with new developments is regulated under the 'Noise Policy for Industry', published in 2017 by the NSW Environmental Protection Authority (NSW EPA). A key intent of the policy is to apply all feasible and reasonable measures to reduce predicted noise levels to the "*project noise trigger levels*" when predicted noise levels are above these levels.

The "*project noise trigger level*" is the lower (most stringent) value of two different noise levels:

1. An "*intrusiveness noise level*" which limits the extent to which a noise source can exceed the background level (that is, background plus 5 decibels [dB]) above a minimum threshold.
2. A "*project amenity noise level*" provides an overall noise-level cap for different land uses.

In this case the levels are:

1. "*Intrusiveness noise level*" – Determined by rating background level (RBL) plus 5 dBA. The minimum RBL is 40 dBA during daylight hours in a RU1 Primary Production zones (Policy Table 2.1). The final intrusiveness noise level in this case is 45 dBA.
2. "*Noise amenity level*" – During daylight hours is 50dBA when measured at an unrelated rural residential dwelling (Policy Table 2.2). Cumulative industrial noise is not relevant in this case as further industrial development is unlikely in the area.

Ultimately the relevant "*project noise trigger level*" for this development, measured at unrelated rural dwellings, is the 45 dBA "*Intrusiveness noise level*".

It is relevant to note the NSW EPA 'Noise Policy for Industry' states:

> *"The reaction to noise varies widely from individual to individual. Because of this, it is not possible to set noise levels that will guarantee no one will experience an impact. There will usually be some members of the community who find any noise unacceptable, regardless of whether it meets the project noise trigger level, and others who will not be bothered by noise even if it is above the project noise trigger level."* [10]

4.4.2 Access issues

At the peak level of quarry operations shown in Table 2, there could be up to about 26 vehicle movements per day, including about 15 truck movements (see Appendix G for more information). Over an 8 hour day this will result in about 1 truck movement each 30 minutes and occasionally multiple vehicles would use the access at a similar time.

Indicative maximum noise levels from single and multiple vehicles accessing the quarry are shown in Table 11 below.

Table 11 – Maximum expected vehicle noise from quarry access [11].

EQUIPMENT USING ACCESS	SWL LAeq (dB(A))	SPL @7m (dB(A))	SPL @ 300m L Aeq (15 min) (dB(A))
1 Truck (>20 tonne)	106	81	40
1 Light vehicle (eg 4WD)	103	78	37
2 trucks & 1 light vehicle	110	82	44
For this development the "*Project noise trigger level*" measured at unrelated rural dwellings is 45 L Aeq (15 min) (dB(A))			

Table Notes:

- *2nd last row assumes all vehicles operating a single location, which would only occur rarely for brief periods.*

The "Yarooga Park" dwelling is located about 310m from the quarry access track at the closest point and a similar distance from the Oxley Highway.

[10] Page 4, 'A guide to the Noise Policy for Industry' NSW EPA, 2017
[11] Figures calculated using NSW RMS Construction & Noise Estimator Tool

As noted in section 2.6.1, 2011 NSW Roads and Maritime traffic volume data for the Oxley Highway indicates that there are about 105 truck movements per day in either direction. If the quarry reaches peak production levels, then there will be an average of about 15 additional truck movements per day along the highway, increasing truck movements by up to 14%.

Overall the available information indicates that transport activities associated with the quarry on the access road and highway are quite unlikely to substantially increase existing noise levels in the vicinity.

4.4.3 Access mitigation

Strategies that will be used to minimise potential noise impacts from use of the quarry access track include:

- Only transporting quarry products during daylight hours.
- Signposting and restricting all quarry truck speeds to a maximum of 20km/h on the track.
- Ensuring a consistent moderate gradient on the access track and highway access point to minimise the potential need for the use of exhaust braking.

4.4.4 Quarry machinery issues

Quarry machinery and related noise will primarily arise from excavation, crushing and screening activities. Table 12 provides noise measurements for the equipment planned to be used during moderate to high levels of quarry production, based on Transport for NSW data (formerly NSW RMS).

Table 12 – Expected quarry machinery noise levels [12].

EQUIPMENT	SWL LAeq (dB(A))	SPL @7m (dB(A))
Front End Loader	113	88
PC400 45t tracked excavator with Hammer	122	97
PC400 45t tracked excavator	112	87
Air track drill	124	99
Rock crusher	118	93
Truck >20 tonne	106	81

An estimate of maximum quarry noise level over a 15 minute interval at dwellings in the vicinity has been prepared using the NSW RMS Construction and Noise Estimator Tool (21-3-2017 version) and is provided in Table 13.

Table 13 – Maximum quarry noise at dwellings [13].

SCENARIO / LOCATION	DISTANCE metres	ATTENUATION dB(A)			SPL L Aeq (15 min) (dB(A))
		TYPE	LIKELY	APPLIED	
All quarry machinery listed in Table 12 operating simultaneously	7	Nil	Nil	Nil	102
"Brooklyn" dwelling	660	Ridge	5-10	Nil	50
"Yarooga Park" dwelling	>1,150	Ridge	5-10	Nil	43
"Mount Pleasant" dwelling	>1,500	Ridge & trees	5-10	Nil	39
"Yarooga" dwelling	>1,700	Ridge & trees	>10	Nil	37
Walcha Road village	2,200	Ridge & trees	>10	Nil	17
The "*Project noise trigger level*" measured at unrelated rural dwellings is 45 L Aeq (15 min) (dB(A))					

Table Notes:

1. *Noise levels will decrease as excavation progresses and the quarry site becomes a recessed void.*

[12] Figures taken from NSW RMS Construction & Noise Estimator Tool
[13] Figures calculated using NSW RMS Construction & Noise Estimator Tool

Based on the indicative modelling data within Tables 12 and 13, the "*Intrusiveness Noise Level*" specified by the NSW EPA will not be exceeded at any unrelated dwellings. Furthermore, the modelled levels are likely to be significantly overestimated given that no provision was made for attenuation (reduction) of noise levels by land-form or vegetation. There is no line of sight between the quarry site and any dwellings, hence no direct path for sound to travel.

4.4.5 Quarry machinery noise mitigation

Noise associated with the operation of quarry machinery will be mitigated by:

- Only using excavating and processing machinery during daylight hours, as outlined in Table 3.
- Restricting days of operation, as noted previously in Table 3.
- Ensuring all machinery is fitted and maintained with suitable mufflers.

4.5 WASTE

4.5.1 Water issues

Sewage and greywater will be generated by the proposed staff amenity and office building.

4.5.2 Water mitigation

All sewage and greywater from staff amenities will either be disposed of off site by a waste dipsosal contractor or on site in accordance with the requirements of Walcha Council's On Site Sewage Management Strategy

4.5.3 Waste issues

Waste that will be generated includes sump oil, tyres, used oil filters, food containers and cardboard from the lunch room, office and equipment maintenance.

4.5.4 Waste mitigation

Recyclable and non-recyclable materials will be separated and temporarily stored on site prior to regular removal by quarry staff, or a commercial waste disposal contractor, to a suitable approved waste disposal facility.

4.5.5 Oil & fuel spills

In the event that there is a significant diesel fuel or oil spill (more than 100 litres), the following actions will be taken:

- All potential ignition sources will be removed to reduce the potential for fire.
- Access will be restricted to authorised personnel only.
- If there is potential for diesel to flow into an open waterbody or watercourse, the spill area will be bunded to isolate the diesel spill.
- Contaminated soil will be recovered and either:
  - Retained on the quarry site for natural attenuation (break down by natural micro-organisms), if the volume of contaminated soil is less than 2 cubic metres, or;
  - Disposed of at an authorised waste depot, if more than 2 cubic metres.

4.6 LANDSCAPE

4.6.1 Issues

In some situations operating and decommissioned quarries are regarded by sensitive individuals as an aesthetic 'scar' on the landscape. This tends to be a more frequent response to a quarry close to an urban area, unrelated dwelling/s and/or environmentally sensitive area.

4.6.2 Mitigation

The quarry site is not visible from the Oxley Highway, any nearby dwelling (see Digital Terrain Model- Appendix L and Aerial Photograph – Appendix K) or any significant environmentally sensitive area. In these circumstances no aesthetic mitigation measures are proposed or regarded as appropriate.

4.7 BLASTING

4.7.1 Standards

All blasting will be undertaken in accordance with Australian Standard 2187.2-2006 Storage & use of explosives - Part 2: Use of Explosives (Australian Standard 2187.2), which is effectively a mandatory requirement for compliance with NSW workplace health and safety and explosives legislation.

4.7.2 Site

The location of the proposed quarry is comparatively good for limiting the potential to adversely impact the public or neighbours from blasting, because it:

- Is not visible from any nearby public place.
- Is completely shielded by trees and landform from any dwelling within at least a 2 kilometre radius.
- Will become recessed below ground level over time.

4.7.3 Ground vibration issues

Quarry blasting will cause some "ground vibration", which is the radiation of mechanical energy within rock or soil. It comprises various vibration phases travelling at different velocities. Standard limits for ground vibration from quarry blasting within Australia are usually based on recommendations from the Australian & New Zealand Environment Council (ANZEC guidelines), as follows:

- 5 mm/s peak particle velocity is not to be exceeded for more than 5% of blasts and 10 mm/s peak particle velocity should not be exceeded at any time [14].

Ultimately the appropriate performance target for the quarry is 5mm/s peak particle velocity ground vibration at a sensitive site, such as an unrelated dwelling.

Modelling of mean ground vibration levels was undertaken using formula J7.3(2) in Australian Standard 2187.2, with the summary results shown in Table 14 below. More detail is provided in Appendix N (Table N1).

[14] 2.2 in Australian and New Zealand Environment Council, *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration 1990*.

Table 14 – Brooklyn quarry blasts that could cause 5mm/s ground vibration [15].

LOCATION	DISTANCE metres	EXPLOSIVES (MIC) kilograms
Quarry site	0	N/A
"Brooklyn" dwelling	660	490
"Yarooga Park" dwelling	**>1,150**	**1,490**
"Mount Pleasant" dwelling	>1,500	2,540
MIC = Maximum instantaneous charge, or mass of explosive detonating in some defined time period, usually 8 milliseconds.		

Australian Standard 2187.2 provides additional guidance on ground vibration limits, including:

- Ultimate limit of 100mm/s for control of damage to unoccupied steel and concrete structures;
- A human comfort limit of 25mm/s for non-sensitive receivers, such as industrial or commercial premises.
- A human comfort limit of 5mm/s (long term) and 10mm/s (short term) for sensitive receivers such as houses, schools, libraries, etc.

4.7.4 Airblast overpressure issues

Quarry blasting can cause "airblast", an airborne shock wave that results from the detonation of explosives. The severity of an airblast is dependent on explosive charge, distance, and especially the explosives confinement. Standard limits for airblast from quarry blasting within Australia are usually based on the ANZEC guidelines, as follows:

- 115 dB (linear peak) is not to be exceeded for more than 5% of blasts and 120 dB (linear peak) is not to be exceeded at any time [16].

Ultimately the appropriate performance target for the proposed quarry is 115 dB (linear peak) for airblast at a sensitive site, such as an unrelated dwelling.

[15] Based on formula J7.3(2) in AS 2187.2-2006 Storage & use of explosives - Part 2: Use of Explosives.
[16] 2.1 in Australian and New Zealand Environment Council, *Technical Basis for Guidelines to Minimise Annoyance due to Blasting Overpressure and Ground Vibration 1990*.

Australian Standard 2187.2 contains a formula (J7.2) for estimating airblast overpressure that lacks specific information regarding variables such as site constants. In that context modelling has been undertaken using more specific airblast data in the '*Explosives Engineers' Guide 2020*', published by Dyno Nobel Asia Pacific Pty Limited. A summary of the modelling results is provided in Table 15 below. More detailed information is contained in Appendix N (Table N2).

Table 15 – Blasting that may cause 115dB airblast exceedence [17].

LOCATION	DISTANCE metres	EXPLOSIVES (MIC) kilograms
Quarry site	0	N/A
"Brooklyn" dwelling	660	210
"Yarooga Park" dwelling	**>1,150**	**1,110**
"Mount Pleasant" dwelling	>1,500	2,480
Calculations based on confined blast hole charges, site exponent of -1.45 and site constant of 55 (mid range).		

4.7.5 Vibration & airblast mitigation via MIC

Based on the previous modelling, the maximum instantaneous charge (MIC) expected to meet both compliance targets for ground vibration and airblast, at all unrelated dwellings, will be less than 1,100kg (eg 1,000kg).

Based on a MIC of 1,000kg or less, it is predicted that quarry blasting operations:

- Can be readily designed and conducted in compliance with ANZEC guidelines and Australian Standard 2187.2.
- Will have no significant ground vibration or airblast impact on any unrelated dwellings, unrelated buildings or any public infrastructure.

[17] Based on airblast formula, p. 29, 'Explosives Engineers' Guide 2020', Dyno Nobel Asia Pacific Pty Limited.

4.7.6 Dust issues

Dust can arise from quarry blasting activities via:

- Disturbance of drill cuttings on the ground in the vicinity of the blast site.
- Explosives pulverising some of the rock being blasted.

Basalt is the primary rock being blasted and is comparatively hard, so relatively low levels of dust are expected. There is also no known friable rock or earth present in the geological profile below about 2 metres.

4.7.7 Flyrock issues

Occasionally quarry blasting can create "flyrock" which is rock that is ejected from the blast site creating a hazard from people, equipment, livestock and buildings. One or more factors are usually associated with a significant flyrock incident, including:

- Poor drill hole positioning.
- Inadequate drill hole stemming.
- Inadequate profile management.
- Excessive amounts of explosive.
- Inadequate exclusion of people and animals from site.
- Unusual geological conditions.

4.7.8 Standard practice mitigation

Standard practices that mitigate the environmental impacts of blasting are outlined in Table 16, below. Various elements of explosives handling and use are administered by Worksafe NSW and the NSW Resources Regulator.

Table 16 – Blasting practices & impact mitigation.

STANDARD PRACTICE	IMPACTS MITIGATED
Stemming - Use stemming (inert material) in the uppermost portion of drill holes. Explosives, other than detonators, are never initiated on, or near, ground level.	Noise, shockwave, flyrock, dust
Delayed initiation firing - Detonation of drill holes is delayed in a planned sequence so that each hole is fired individually in close succession.	Noise, shockwave, dust, ground vibration
Temperature inversion – When a temperature inversion or a heavy, low cloud cover is present, values of airblast overpressure will be higher than normal. Accordingly, blasting will be avoided if predicted values of airblast overpressure at unrelated dwellings exceed acceptable levels. If avoidance is not practicable, blasting events will be scheduled to minimise noise annoyance. This would generally be between 11am and 1pm on a given day .	Noise, shockwave
Powder factor - Ensuring that the amount of explosives used per cubic metre of rock excavated (powder factor), is as low as possible.	Ground vibration, flyrock
Blast design – All blasts designed in advance with regard for: • Australian Standard 2187.2. • Industry standards, such as the 'Explosives Engineers' Guide 2020', published by Dyno Nobel. • The shotfirers experience. • Site conditions.	All
Maximum instantaneous charge (MIC) – Use lowest feasible MIC.	Noise, ground vibration
Profile management – Checking "front" row of drill holes for consistent burden and geological conditions for full depth of each hole. If not consistent, then the quantity and position of explosives in affected holes is adjusted appropriately (eg. deck charging and/or reducing MIC).	Flyrock, dust
Dust management – If significant dust arises and/or conditions are quite dry, then: • The blast site will be watered prior to blasting to reduce dust dispersal from drill cuttings and/or fragmented fine dry rock. • Only using aggregate to stem blast holes.	Dust
Blast exclusion zone – A shotfirer is legally obligated to ensure that people (workers, neighbours, public) have been cleared from a designated blast exclusion zone prior to initiating any explosives. Elements of the exclusion process include: • Appropriate signage. • Suitable prior notification to potentially affected people (staff, landholder, neighbour/s). • Road blocks on site access roads/tracks. • Physically checking for unauthorised people in exclusion zone immediately prior to blast.	Noise, shockwave, flyrock

The maximum frequency of blasting is expected to be once per week, if high levels of production occur. No blasting explosives will be discharged on the ground surface.

If quarry basting operations proceed in accordance with "Australian Standard 2187.2-2006 Storage & use of explosives - Part 2: Use of Explosives" and current industry standards, including the mitigation measures outlined in Table 16, then it is quite unlikely that any significant adverse impacts will arise for neighbours, the public or the environment.

4.8 PUBLIC INFRASTRUCTURE & SAFETY

4.8.1 Highway access upgrade issue

The proponent has proposed to establish a new access to the Oxley Highway for both the proposed quarry and the existing "Brooklyn" holding. If the new access were to be constructed to a poor standard and/or had a significant adverse impact on highway traffic, then there could be an adverse impact on public infrastructure and public safety.

4.8.2 Highway access upgrade mitigation

The key strategies proposed to minimise impacts on public infrastructure are which could arise from the establishment of a new highway access include:

- Costs for the driveway establishment will be borne by the developer.
- The upgrade will be consistent with Transport for NSW requirements outlined in its letter dated 26 May 2020 (see Appendix H), including Austroads '*Guide to Traffic Management Part 6*' and Austroads '*Guide to Road Design Part 4A*'. Preliminary design work requested by Transport for NSW, has been completed and is provided as Appendix I.
- The proponent will install and maintain all quarry related signage requested by Council along the verge of the Oxley Highway.

4.8.3 Highway access mitigation

Strategies that will be used to minimise the potential for quarry traffic to adversely affect the Oxley Highway and members of the public include:

- Ensuring trucks are not over loaded and/or driven at excessive speed when entering the highway.
- Signposting and restricting quarry truck speeds to a maximum of 20km/h on the track.

- Mandatory site inductions for all staff which highlights:
  - Compulsory signposted speed limit for quarry site and access road.
  - Ensuring trucks are not over loaded and/or driven at excessive speed when entering the highway.

5 COMPILATION PROCESS

Core aspects of the various processes used to compile this Statement of Environmental Effects are outlined below.

5.1 DESKTOP REVIEW

After the initial field inspection, a desktop review was undertaken to identify and consider relevant published information, including:

- Recent aerial photographs from NSW Land and Property Information, Google Earth and Bing maps.
- Geographic information system (GIS) mapping data, including contours, cadastre, watercourses, roads, urban areas and geology, primarily from NSW government agencies.
- Geological and geophysical information, especially aeromagnetic data, available from the NSW Geological Survey.
- NSW bionet flora and fauna occurrences in the vicinity.
- NSW Biodiversity Offset Scheme (BOS) Entry Threshold Map (Appendix C).
- NSW Transitional Native Vegetation Regulatory Map (Appendix D).
- Walcha Development Control Plan 2019, adopted 31 July 2019 by Walcha Council.
- Relevant environmental planning instruments (LEP, SEPPs).
    - Walcha Local Environmental Plan 2012.
    - SEPP (Mining, Petroleum Production and Extractive Industries) 2007.
    - SEPP (Infrastructure) 2007.
    - SEPP No 44 - Koala Habitat Protection.

5.2 FIELD WORK

Field inspections of the site were undertaken on numerous occasions from January to July 2020 which included:

- Identifying and mapping dominant vegetation species.
- Photographing vegetation, outcrops and geological profile.
- Checking for evidence of vertebrate animals, including nests, scats and tracks.
- Mapping intended access route.

- Developing proposed site boundary with regard for existing vegetation, landform and resource.
- Aerial photography of site and surrounds with a DJI phantom 4 drone.

Geological investigation of the site and adjoining areas was undertaken via:

- Digging numerous costeans up to several metres deep with an excavator (January 2020). These costeans exposed the geological profile and enabled the recovery of subsurface rock samples.
- Engineering tests of numerous rock samples recovered from the costeans (Jan & Feb 2020).
- Preparing a geological map of rock exposures in the vicinity of the quarry (June 2020)
- Drilling and geologically logging 5 drill holes up to 38.5 metres deep (July 2020).
- Hydro-geological assessment of groundwater conditions via field work, drilling and seepage testing (July 2020). See separate hydro-geologist's report for more information.

5.3 SOFTWARE

This document was compiled using suitable software, including:

- Plans, maps and contour data with QGIS mapping software, version 3.14.
- Creation of orthomosaic imagery, digital surface model and digital terrain model from drone aerial photography using Drone Deploy software.
- Figures, with Libre Office Draw, version 6.3.4.2.
- Text, with Libre Office Writer, version 6.3.4.2.

5.4 CONSULTATION

Extensive discussions and correspondence have been undertaken with the proponent and landowner regarding all relevant matters, including:

- Nature of proposed quarry operations.
- Potential environmental impacts and mitigation measures.
- Draft versions of maps, figures and Statement of Environmental Effects.

Prior to lodging the Development Application with Council, meetings and discussions were undertaken with neighbouring landholders, as summarised in Table A1 of the Land Use Conflict Risk Assessment (Appendix A).

On 21 February 2020 a copy of version 1.0 of the Statement of Environmental Effects was provided to Janet Norton, the occupier of Mt Pleasant. On 18 April 2020 the author met with Janet Norton and Warwick Sivell (geologist) on the proposed quarry site and had various discussions regarding geology, aquifer, noise and dust issues.

Following Council's receipt of objection letters from Janet Norton and family members during Council neighbour consultation regarding the Development Application, a detailed Groundwater Impact Assessment has been prepared and submitted to Council (see Appendix J). Further consultation occurred between Janet Norton and the principal of Ground Doctor Pty Ltd, James Morrison, as outlined in Section 2.6.3 of the Groundwater Impact Assessment, [Appendix J]).

5.5 EXPERIENCE

The author's previous work and consulting experience has been used extensively to prepare the document, including:

- 19 years of land use planning, development assessment, GIS mapping & analysis.
- 30 years of mine and quarry operating practices, environmental impact mitigation, rehabilitation and explosives use.

6 MATTERS FOR CONSIDERATION

Section 4.15 of the Environmental Planning and Assessment Act 1979 (Act) requires Council, as the consent authority, to consider certain matters in relation to a Development Application. Those matters are dealt with under the respective headings below.

6.1 ENVIRONMENTAL PLANNING INSTRUMENT – Act 4.15(1)(a)(i)

6.1.1 Walcha Local Environmental Plan 2012

Planning approval (development consent) is required for certain types of development under the provisions of the Environmental Planning and Assessment Act 1979 and the Walcha Local Environmental Plan 2012 (LEP). The proposed quarry is defined as an "*extractive industry*" by the LEP.

The proposed development site is within a "*RU1 Primary production*" zone under the LEP where "*extractive industries*" are a permissible land use with development consent from Walcha Council.

"Primary production" zones in NSW typically enable all forms of primary production including agriculture, forestry, mining and extractive industries. This includes a basalt quarry where Council is satisfied that the proposed development is consistent with section 4.15, relevant environmental planning instruments and is unlikely to have any significant adverse impacts.

6.1.2 Mining SEPP 2007

Clause 12 of State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007 requires the consent authority, Walcha Council, to consider the compatibility of the proposed quarry with existing, approved and likely preferred land uses in the vicinity, amongst other things. The proposal is compatible with such uses given that:

- The quarry is located within a RU1 Primary Production zone.
- Council does not have any publicly available planning proposals or policy documents indicating that it is considering rezoning any land in the vicinity.

- On a local, regional and state wide basis quarries are predominantly located in RU1 Primary Production zones along with a mix of agricultural, forestry and resource extraction industries.
- The quarry will provide a source of gravel and aggregate for the local community.
- The quarry has a substantial buffer of more than 1 kilometre to the nearest unrelated dwelling.

Clause 15 of the SEPP requires the consent authority to consider the efficiency the development in terms of resource recovery. The proposed quarry will extract rock in an orderly manner subject to demand, which is typical of such quarries in similar settings.

Clauses 14, 16 and 17 require the consent authority to consider the imposition of conditions relating to natural resource management, environmental management, transport and rehabilitation.

6.1.3 State Environmental Planning Policy (Infrastructure) 2007

The Oxley Highway is a NSW Roads and Maritime Services "classified road", hence Council is required to comply with clause 101 of State Environmental Planning Policy (Infrastructure) 2007 when considering this Development Application. Sub-clause 101(2) is the most relevant part, as reproduced below:

> (2) The consent authority must not grant consent to development on land that has a frontage to a classified road unless it is satisfied that:
>
> (a) where practicable and safe, vehicular access to the land is provided by a road other than the classified road, and
>
> (b) the safety, efficiency and ongoing operation of the classified road will not be adversely affected by the development as a result of:
>
> (i) the design of the vehicular access to the land, or
>
> (ii) the emission of smoke or dust from the development, or
>
> (iii) the nature, volume or frequency of vehicles using the classified road to gain access to the land, and

Matters arising from sub-clause 101(2) are:

- (2)(a) – There is no alternative road via which vehicular access is practicable.

- (2)(b)(i) – The proponent has outlined a proposal for improved Oxley Highway access in section 2.6 and provided preliminary designs (Appendix I) consistent with Transport for NSW requirements (Appendix H).
- (2)(b)(ii) – The proposed quarry site is located more than 700 metres (direct line) from the Oxley Highway at the closest point, hence significant dust impacts from quarry operations are quite unlikely. Potential dust from trucks transporting quarry products through the "Brooklyn" property onto the Oxley Highway will be managed as outlined in section 4.3.1.
- (2)(b)(iii) – Quarry traffic estimates have for various levels of production have been prepared and included as Appendix G. The actual number is expected to fluctuate significantly from year to year depending on the actual number of orders and the volume of product required, as noted previously. These estimates have been used to prepare appropriate designs for highway access (Appendix I).

6.1.4 State Environmental Planning Policy 44 – Koala Habitat Protection

It is noted that State Environmental Planning Policy (Koala Habitat Protection) 2019 commences on 1 March 2020. For Development Applications lodged prior to 1 March 2020, it is the proponent's understanding that State Environmental Planning Policy No 44—Koala Habitat Protection (SEPP44) remains in effect and takes precedence.

As indicated in Section 3.8, the site contains some remnant mature Red Stringy Bark (*Eucalyptus macrorhyncha*) and woolybutt (*?Eucalyptus banksii*) trees. Neither species is identified as a koala feed tree in Schedule 2, hence the land is not potential koala habitat under clause 7 of SEPP44.

6.2 PROPOSED ENVIRONMENTAL PLANNING INSTRUMENT – Act 4.15(1)(a)(ii)

No draft environmental planning instruments have been identified as applying to this development.

6.3 DEVELOPMENT CONTROL PLAN – Act 4.15(1)(a)(iii)

The Walcha Development Control Plan 2019 (DCP) does not contain any specific provisions relating to extractive industries, but there are several items in Chapter 4 Rural Development

that are relevant. Relevant items are listed in Table 17 and addressed within the identified sections of this Statement of Environmental Effects.

Table 17 – Relevant DCP clause review.

DCP CLAUSE	ADDRESSED
4.4 i) Sewage Development involving the on-site management of wastewater must comply with Council's [DRAFT] On-site Sewage Management Strategy 2015-201X.	Section 4.1.6 of SEE
4.4 j) Bush Fire Prone Land Development within bushfire prone land must meet the relevant requirements of the Rural Fire Service and Planning for Bushfire Protection 2006 (and any amending guidelines).	Section 3.12 of SEE.
4.4 l) Koala habitat Onus is on the applicant to demonstrate to Council that the land is not potential or actual Koala habitat and that the development will not adversely impact Koala habitat.	Section 6.1.4 of SEE.
4.5 Vehicular access requirements The developer will be responsible for construction or upgrading of any vehicle access in accordance with Council standards, including: • A suitable width all-weather pavement from the road to the entrance gate or stock grid. • Where the access crosses a table drain, a minimum 375mm diameter pipe with headwalls, or concrete dish drain on the alignment of the table drain. • Any entrance gate or stock grid should be set back a minimum distance of 15 metres from the edge of the traffic lane for single unit truck access, or 22 metres for semi-trailer access. • The access is to be located at where safe intersection sight distances can be achieved, including a minimum gap sight distance of 5 seconds .	An upgraded shared access for the property & quarry is proposed Section 2.6 of SEE.
4.6 a) Slopes >20% Development shall not be carried out on slopes greater than 20%. If development on slopes greater than 20% is unavoidable, a geotechnical assessment may be necessary.	Maximum slope of site along southern boundary is 18% (10°).
4.8 Land use buffers Buffers from development to rural land uses are to be established in accordance with the NSW DPI Land Use Conflict Risk Assessment Guide.	Section 3.7 of SEE and LUCRA assessment provided in Appendix A.

6.4 PLANNING AGREEMENT – Act 4.15(1)(a)(iiia)

No major detrimental impacts are expected to be placed on public infrastructure or services as a result of the development. Accordingly, no planning agreement is being proposed by the applicant.

6.5 REGULATIONS – Act 4.15(1)(a)(iv)

6.5.1 Part 6, Division 8, EPAR 2000

Part 6, Division 8 of the Environmental Planning and Assessment Regulation 2000 prescribes additional matters for consideration in association Development Applications. None of the clauses in that part apply to this proposal.

6.5.2 Designated development

Item 19 of Schedule 3 of the Environmental Planning and Assessment Regulation 2000 prescribes various thresholds at which an "*extractive industry*" is also "*designated development*" under the provisions of the Environmental Planning and Assessment Act 1979, as shown below.

19 Extractive industries

(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 nearest known extractive industry site is a quarry in the 9 Mile Stock Reserve, located about 3.4 kilometres to the East, operated on a sporadic basis for road gravel.

The proposed quarry will not exceed any threshold for "*designated development*".

6.6 LIKELY IMPACTS – Act 4.15(1)(b)

6.6.1 Environmental impacts

The existing site has limited remnant native flora diversity or density. Nevertheless, the proposed quarry will have some environmental impacts, including:

- Excavation and removal of rock.
- Removal of remnant vegetation.
- Noise from quarry operations.
- Dust from quarry operations, as well as traffic entering and leaving the site.
- Altered traffic flows.

As the site is relatively disturbed and appropriate mitigation measures have been outlined in section 4, the quarry operations are unlikely to have any significant adverse environmental impacts.

6.6.2 Social impacts

No significant negative social impacts are expected given the:

- Rural setting of the quarry, within a RU1 Primary Production zone.
- Substantial distances between the quarry and residences of neighbouring landholders.

The proponent will be relocating to the Walcha area with his family and reconnecting with the local community and extended family. Positive social impacts will arise from the family's involvement in local sporting clubs, schools and the business community

6.6.3 Economic impacts

Positive economic impacts will arise for the local community via increased demand for services, fuel, parts, equipment maintenance and employees. The proponent expects to hire local people and contractors to support the operation, where possible.

Establishing a local source of aggregate is expected to significantly reduce raw material costs for projects in the vicinity that use asphalt, concrete, crusher dust or related materials.

6.7 SITE SUITABILITY – Act 4.15(1)(c)

The proposal is consistent with NSW Department of Primary Industries recommended minimum buffer of 1,000m between extractive industries using blasting and neighbouring residences [18]. It is also unlikely to have any significant adverse impacts on neighbours, the environment, the public or community infrastructure.

6.8 SUBMISSIONS – Act 4.15(1)(d)

Neither the Environmental Planning and Assessment Act 1979 or Environmental Planning and Assessment Regulation 2000 make provision for public submissions regarding 'local' development for a quarry development at this scale. Nevertheless, it is expected that Council will give appropriate consideration to any public submissions that may arise.

6.9 PUBLIC INTEREST – Act 4.15(1)(e)

This proposal has been developed on the basis that it should comply with all current land use planning standards and have no significant adverse impact on neighbours, the public, the environment or public infrastructure. Mitigation measures have been also been proposed that are appropriate for the scale of the quarry and the context in which it will be located.

The proponents believe that it is in the public interest that this development should proceed, given that it:

- Creates economic diversity via the establishment of a new extractive industry.
- Will reduce construction costs for local roads, buildings and infrastructure by enabling a local source of aggregate supply.
- Diversifies local employment opportunities.
- Creates additional local jobs.
- Reduces truck traffic on highways and regional roads to source aggregate and quarry products from elsewhere.

[18] Page 90, Living & Working in Rural Areas Handbook, NSW DPI 2007

- It is quite unlikely to have any significant adverse impacts on the environment, neighbours, community or public infrastructure.

7 BIODIVERSITY LEGISLATION

The Biodiversity Conservation Act 2016 establishes various requirements for development proposals that may have an impact on native flora and fauna. These requirements are reviewed below in the context of the proposed quarry.

7.1 BIODIVERSITY OFFSETS SCHEME THRESHOLD

The Biodiversity Offsets Scheme Threshold is a test used to determine when is necessary to engage an accredited assessor to apply the Biodiversity Assessment Method to assess the impacts of a proposal.

The Biodiversity Conservation Regulation 2017 sets out threshold levels for when the Biodiversity Offsets Scheme will be triggered. The threshold has two elements:

- Whether the amount of native vegetation being cleared exceeds a specified area.
- Whether the impacts occur on an area mapped on the Biodiversity Values map published by the Minister for the Environment.

If clearing and other impacts exceeds either trigger, the Biodiversity Offset Scheme applies to the proposed development, including biodiversity impacts prescribed by clause 6.1 of the Biodiversity Regulation 2017.

7.1.1 Area Clearing Threshold

The relevant lot size map under Walcha Local Environmental Plan 2012 specifies a minimum lot size of 100 Ha for the land comprising the Brooklyn property. Clause 7.2 of the Biodiversity Conservation Regulation 2017 specifies that an area of clearing greater than 1 hectare would exceed the biodiversity offsets scheme threshold. This information is reflected in the Biodiversity Report within Appendix C.

The area clearing threshold will not be exceeded as:

- There is less than 0.5 hectare of remnant woodland and shrub-land on the quarry site, as shown in Figure 11.
- Ground cover vegetation is dominated by introduced plant species, as listed in Table 6.

Transitional arrangements in place for native vegetation regulatory issues in NSW include:

- The Local Land Services Act 2013 (LLSA 2013) has broad definitions for "native vegetation" (section 60B) and "clearing" (section 60C).
- Clearing of land under Part 5A of the LLSA 2013 is not regulated for "Category 1 – exempt land".
- Sub-section 60H(1)(a) of the LLSA 2013 defines Category 1 land as including land cleared of native vegetation as at 1 January 1990.
- Clause 114 of Local Land Services Regulation 2014 provides that "*native vegetation that comprises grasslands or other non-woody vegetation is taken to have been significantly disturbed or modified (and therefore cleared)*" if there is detectable variation in the structure or composition of non-woody vegetation.

As indicated in Sections 3.5 and section 3.8, the structure and range of native flora has been substantially disturbed by clearing, regular grass seed spreading and super-phosphate fertiliser application. The quarry site and associated areas clearly fall within the definition of "Category 1 – exempt land", hence the restrictions on clearing under the provisions of Part 5A of the Local Land Services Act 2013 do not apply.

7.1.2 Biodiversity Values Map threshold

A review of the Biodiversity Values Map on 13 January 2020 showed that the development site is located more than 1.1 km north east of the nearest area mapped with biodiversity values, which is along the Surveyors Creek. An extract from the Biodiversity Map in included in Appendix C. The proposal does not exceed the map threshold.

7.2 KEY THREATENING PROCESSES

A review of key threatening processes listed in Schedule 4 of the NSW Biodiversity Conservation Act 2016 was undertaken, with the results shown in Table 18 below.

Various processes were identified as being irrelevant to this development proposal, hence were excluded from further consideration, for one or more of the following reasons:

- Involved a marine or terrestrial coastal environment.
- Involved an introduced species not currently known from the area.

Given the scale, type and context of the proposed development, it is unlikely to make any significant adverse environmental impact for a listed key threatening process.

Table 18 – Key threatening processes, 6-2-2020.

THREATENING PROCESS	COMMENTS
Aggressive exclusion of birds from woodland & forest habitat by abundant Noisy Miners, *Manorina melanocephala* .	Development is unlikely to facilitate any significant opportunities for this species.
Anthropogenic Climate Change.	Currently all aggregate used in the Walcha Shire is transported via trucks from other local government areas. A new local aggregate source will substantially reduce diesel fuel consumption associated with aggregate consumption in the Walcha Shire. In these circumstances the development is expected to make a small reduction in carbon dioxide and other diesel exhaust pollutants within the Walcha Shire.
Bushrock removal (as described in the final determination of Scientific Committee).	"Bushrock removal" involves the disturbance and extraction of weathered outcrops of rock that provide habitat niches for animals. The listing does not apply to "the removal of rock from approved mining or quarrying activities". The impact on bushrock and associated species will not be significant as: • There is no scree, sheet like rock, or other rock formations likely to provide significant shelter niches for flora or fauna. • Basalt rock does outcrop and occur loose in the soil, but it lacks significant cracks, voids, slab like structures or scree formations that provide significant habitat niches for vertebrate animals. • No flora or fauna species listed in the final determination as threatened species which would be adversely affected by "bushrock removal" are known from the site.
Clearing of native vegetation (as described in the final determination of the Scientific Committee).	Proposed development will remove about 12 mature *Eucalyptus* sp. trees in a highly disturbed habitat. Overall this is unlikely to significantly increase the extent or magnitude of the impact of this key threatening process.
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus*.	Development is unlikely to facilitate any significant change in existing local population of this species.

THREATENING PROCESS	COMMENTS
Invasion of native plant communities by exotic perennial grasses.	Of the exotic perennial grass species listed in the declaration, serrated tussock (*Nassella trichotoma*) is the most significant one known to occur in the Northern Tablelands. Landholder advises that he is not aware of any occurrences of this species on "Brooklyn" or adjoining properties. The proposed development is not expected to facilitate the establishment or spread of any exotic perennial grasses.
Loss of hollow-bearing trees.	Development will remove about 12 mature *Eucalyptus* sp. trees in a highly disturbed habitat. Overall this is unlikely to significantly increase the extent or magnitude of this key threatening process.
Predation by the European Red Fox, *Vulpes vulpes*.	Development unlikely to facilitate predation by this species.
Predation by the Feral Cat *Felis catus.*	Development is unlikely to facilitate predation by this species.
Removal of dead wood and dead trees	Development will remove a small amount of dead wood and trees in a highly disturbed habitat. Overall this is unlikely to significantly increase the extent or magnitude of this key threatening process.

7.3 THREATENED SPECIES

Although the proposal does not exceed Biodiversity Offsets Scheme Thresholds, Threatened Species Test of Significance Guidelines[19] issued by the NSW Government require a development proposal to be assessed in accordance with section 7.3 of the Biodiversity Conservation Act 2016 to determine whether a significant impact on threatened species or ecological communities or their habitat is likely. This process is referred to as a "test of significance".

The "test of significance" is provided in Appendix B, and concludes that:

> *"The proposed development or activity is unlikely to significantly affect any threatened species or ecological communities, or their habitats. In that context a biodiversity development assessment report is not warranted in this case."*

[19] Threatened Species Test of Significance Guidelines, State of NSW and Office of Environment and Heritage, July 2018.

7.4 NATIVE VEGETATION REGULATORY MAP

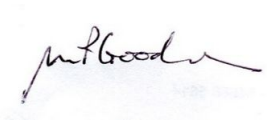
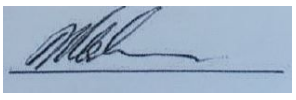
A check of the "*transitional native vegetation regulatory map*" was undertaken on 27 January 2020 and the proposed quarry site was not mapped as "vulnerable" or "sensitive" regulated land, as shown in Appendix D.

8 CONCLUSION

The development involves the establishment and operation of an extractive industry that will have a maximum surface area of 1.99 hectares. The application of mitigation strategies appropriate for the context, nature and scale of the development, as outlined herein, will ensure there are no significant adverse impacts on neighbours or the environment. The development will provide a local source of aggregate, opportunities for local employment and skills diversification. In the above context the proponent submits that it is appropriate for Walcha Council to issue development consent for the proposal, subject to appropriate conditions of consent.

Prepared by Matthew Goodwin
Bachelor of Land Management (USyd)
Graduate Diploma Urban and Regional Planning (UNE)
NSW Workcover Blasting Explosives Users Licence XBLS100131 endorsed for above & below ground mining
Phone: 0478 622 535

We certify that the information contained within this Statement of Environmental Effects is correct to the best of our knowledge.

	NAME	SIGNATURE	DATE
Author:	Matthew Goodwin		7-9-2020
Applicant & Landowner:	Brian Blake		7-9-2020
Applicant:	Scott Blake		7-9-2020

9 APPENDIX A – Land Use Conflict Risk Assessment

9.1 Introduction

The aim of this Land Use Conflict Risk Assessment (LUCRA) is to identify and assess the potential for land use conflict issues and risk of occurrence before a proposed change in land use proceeds and disputes arise.

In this case, the proposed change of land use is the establishment of a basalt quarry with a maximum area of 1.98Ha on the "Brooklyn" property, over parts of lot 103 DP 753846, lot 2 DP 1173956 and lot 47 DP 1082562. The land is currently being used for sheep and cattle grazing.

9.2 LUCRA Process

The approach taken in this LUCRA is based on the NSW DPI Land Use Conflict Risk Assessment Guide published in October 2011. This involved:

- gathering information about the site and locality;
- undertaking a site inspection;
- talking to neighbouring landholders within 1.5 kilometres of the proposed development site;
- undertaking a land use conflict risk assessment; and
- documenting strategies to reduce the risk or consequence of any conflicts.

Details on how a risk assessment is undertaken are included in the DPI Guide.

9.3 Consultation

Neighbouring landholders were consulted as outlined in the table below.

Table A1 – Neighbour consultation.

PROPERTY	DATE & METHOD	COMMENTS
Highvale	From 7.30AM on Friday 24 January 2020 Meeting at quarry site with: • John Boughton, director of Strathleigh Grazing Pty Ltd. • Hugo Bartlett, associate of JB. • Brian Blake, land owner. • Matthew Goodwin, planning consultant. BB & MG discussed with JB the proposed: • New road access off Oxley Highway to Brooklyn. • Access track from Oxley Highway to quarry site. • Quarry site staked out with 20m buffer off the "Brooklyn" & "Highvale" boundary fence.	Mr Boughton did not raise any specific issues of concern. He indicated that he would need to consult with another company director (Nathan Gilbody) regarding their views. Subsequently Mr Boughton and Mr Gilbody requested the boundary fence between Highvale and Brooklyn be upgraded to reduce the potential for livestock to get through the fence to the vicinity of the quarry. The proponent has given a verbal commitment to them to upgrade the fence at his expense.
Yarooga Park	Tuesday 11 February 2020 – Matthew Goodwin rang Flo Smallmon & informed her: • New quarry proposal by Scott Blake on "Brooklyn". • New driveway proposed for "Brooklyn" about 200 west of existing driveway. • Quarry will be about 1.2km south of her house. • Additional information & maps were available.	Flo Smallmon indicated that she "did not think there would be any problems" and she did not need additional information.
Yarooga	Tuesday 11 February 2020 – Matthew Goodwin rang Peter Blake & informed him: • New quarry proposal by Scott Blake on "Brooklyn". • New driveway proposed for "Brooklyn" about 200 west of existing driveway. • Quarry will be more than 1.7km from house. • Blasting with explosives would be part of the quarry operations.	Peter Blake indicated he was aware of the proposal, had no concerns and did not need any additional information.

PROPERTY	DATE & METHOD	COMMENTS
Mt Pleasant	Tuesday 11 February 2020 – Matthew Goodwin rang Janet Norton & informed her: • New quarry proposal by Scott Blake. • Quarry will be about 1.5km west of her house. • Explosives would be used at quarry. • Wanted to provide her an opportunity to get further information, if required. 11-2-2020 MG subsequently sent e-mail confirming phone conversation with a map showing quarry site, proposed new highway access and distance from Mt Pleasant.	As of 18-2-2020 Ms Norton had not raised any issues or concerns.

9.4 Initial risk identification & risk ranking

The most likely sources of land use conflict in this situation are potential impacts from quarry related operations on adjoining land holder's:

- Livestock grazing land use.
- Residential amenity.

Three main types of quarry related activity that could generate conflict are blasting, excavation and transport. A site specific potential impact assessment is detailed in the risk ranking table below.

Table A2 – Potential conflict risk ranking for proposed Brooklyn Quarry.

POTENTIAL CONFLICT	RISK RANKING			REASON
	PROBABILITY	CONSEQUENCE	RANKING	
Blasting noise	C	4	8	Unrelated dwelling >1km away, therefore impacts & conflict unlikely under normal operating conditions.
Blasting dust	C	4	8	
Blasting ground vibration	C	4	8	
Blasting flyrock	C	2	18	Boundary with Highvale property located nearby (20m).
Excavation noise	C	4	8	Nearest unrelated dwelling >1km away
Excavation dust	C	4	8	
Transport noise	C	4	8	Unrelated dwelling about 350m away from highway access point.
Transport dust	C	4	8	
Transport traffic	C	3	13	Community concern if highway surface damaged by quarry truck movements.

9.5 Risk reduction controls

The simplest method of avoiding land use conflict is to ensure an adequate separation of potentially conflicting uses. The proposed quarry is located at least 1,000m from the nearest unrelated dwelling, hence complies with the minimum separation distance for extractive industries and residential land use typically applied in NSW [20]. This buffer significantly reduces, but does not eliminate, the potential for conflict.

Risk reduction controls for the two highest risks identified in the Potential Conflict Risk Ranking (Table A2) are addressed below.

9.5.1 Blasting flyrock

Blasting flyrock has been given a high risk rating primarily because the quarry is located close to the neighbouring property, "Highvale". Inadequate flyrock management would pose a hazard to workers and livestock. It tends to arise in situations where:

[20] Page 90, Living & Working in Rural Areas Handbook, NSW DPI 2007

- Inadequate prior notice of a blast is provided to affected people.
- Excessive amounts of explosive are used.
- Inadequate blast hole stemming.
- There is inadequate, or inconsistent, burden (rock thickness) between a drill hole and the quarry face at the time of blasting.
- Geological factors create unexpected voids or weakness in the rock.

Appropriate risk reduction controls include:

1. Providing the "Highvale" property owner/manager with at least 48 hours notice of intended blasting dates and times.
2. No blasting is to be undertaken if any non-quarry staff are present within a 500 metre radius of the quarry.

9.5.2 **Transport traffic**

A high risk rating has been applied to transport traffic as trucks hauling aggregate and gravel have the potential to damage the surface of the Oxley Highway in situations where:

- They are overloaded.
- They are driven at excessive speed when entering and turning onto the highway.
- The access driveway into "Brooklyn" is not maintained and the pavement surface becomes lower than the highway.

Appropriate risk reduction controls to minimise potential for conflict include:

1. Ensuring trucks are not over loaded and are not driven at excessive speed when entering the highway.
2. The access drive way linking the Oxley Highway to the "Brooklyn" property is maintained with an all firm all weather surface at the same height as the highway.

9.5.3 **Recommended risk reduction strategies & performance targets**

In Table A3, a range of recommended management strategies and performance targets for the operation of the proposed Booklyn Quarry are provided. These strategies are regarded as the most relevant to avoiding potential conflicts with neighbours and the public. Additional mitigation strategies are outlined in the section titled "4. Environmental Impact Mitigation" within the SEE.

Table A3 – Recommended risk reduction strategies & performance targets.

POTENTIAL CONFLICT	MANAGEMENT STRATEGIES	REVISED RISK RANKING	PERFORMANCE TARGET
Noise from blasting	Do not blast during early morning, dusk or during temperature inversions. Ensure adequate depth & type of stemming in blast drill holes. Dampening site to reduce dust, if dust issues arise.	(D 4) 5	No complaints to quarry operator, Council or Mines Inspectorate.
Dust from blasting		(D 4) 5	
Ground vibration from blasting		(D 4) 5	
Flyrock from blasting	Provide "Highvale" property owner/manager with ≥ 48 hours notice of intended blasting dates and times. No blasting undertaken if any non-quarry person is present with a 500 metre radius of site.	(C 4) 8	
Noise from excavation	Excavation only undertaken during daylight hours.	(D 4) 5	No complaints to quarry operator or Council
Dust from excavation	Dampening site to reduce dust, if issues arise.	(D 4) 5	
Noise from transport	Haulage only undertaken during daylight hours.	(D 4) 5	
Dust from transport	Dampening access road, if dust issues arise.	(D 4) 5	
Traffic from transport	Ensure quarry related trucks are not over loaded or driven at excessive speed when entering the Oxley Highway. Maintain access drive way linking the Oxley Highway to the "Brooklyn" property with a firm all weather surface at same height as the highway. Install & maintain quarry related signage requested by Council along the verge of the Oxley Highway.	(C 4) 8	No complaints to quarry operator, Council or NSW Roads & Maritime Services

9.6 Limitations/assumptions

This LUCRA has been prepared on the basis of:

- Existing land use patterns.
- The scale and nature of quarry operations indicated by the proponent and documented in the Statement of Environmental Effects.
- Discussions with adjoining landholders.

- An assumption that all blasting operations will be undertaken in accordance with Australian Standard 2187.2-2006 Storage & use of explosives - Part 2: Use of Explosives.

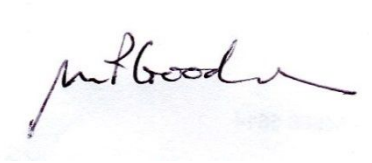
9.7 Key documents

- Land Use Conflict Risk Assessment Guide, NSW DPI, Oct 2011.
- Living & Working in Rural Areas Handbook, NSW DPI 2007.
- Statement of Environmental Effects for Brooklyn Quarry.
- Australian Standard 2187.2-2006 Storage & use of explosives - Part 2: Use of Explosives., Standards Australia, Feb 2006.

9.8 Conclusions & Recommendations

The table titled "*Potential conflict risk ranking for proposed Brooklyn Quarry*" (Table A2) provides a structured assessment of the most likely conflict risks associated with the quarry operation.

The documented risks are typical for this type of development and can be managed by a competent quarry manager and shotfirer via the strategies listed in the table titled "*Recommended risk reduction strategies & performance targets*" (Table A3). In the event that they are not appropriately managed, various administrative and enforcement mechanisms are available to government authorities.



Matthew Goodwin
18 February 2020

10 APPENDIX B – Threatened species test of significance

Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats, from sub-section 7.3(1) of the Biodiversity Conservation Act 2016.

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

Response: The proposed development is unlikely to have a significant effect on the life cycle of a threatened species as:

- *The habitat is substantially altered from its natural state with more than 80% cleared for more than 40 years and it has been sown with introduced pastures for a longer period.*
- *Remnant mature trees are not contiguous with surrounding woodland and are often in poor condition.*
- *There are limited habitat niches for feeding, shelter or occupation compared to nearby areas with substantially more intact vegetation communities.*
- *Under the circumstances above, it seems quite unlikely that threatened species would use the site other than on a transitory or peripheral basis.*

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

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

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

Response: The proposed development will not significantly affect or modify any endangered ecological communities as:

- *The habitat is substantially altered from its natural state with more than 80% cleared for more than 40 years and it has been sown with introduced pastures for a longer period.*

- *Remnant mature trees are not contiguous with surrounding woodland and are often in poor condition.*
- *Sites with similar soil, geology, elevation and climate, but significantly less disturbed vegetation, occur on the "Brooklyn" property and in the wider Walcha area.*

(c) in relation to the habitat of a threatened species or ecological community:

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

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

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

Response: The proposed development will not significantly remove, modify or fragment any established vegetation as:

- *No habitat of a threatened species or ecological community has been identified on the site or proposed access track.*
- *Less than 0.5 hectare of scattered mature trees will be cleared from a highly disturbed area.*
- *Existing isolated trees are quite vulnerable to dieback prompted by various factors including insect attack, mistletoe, ringbarking by livestock, wind, altered soil structure & chemistry, etc.*
- *No significant fragmentation or isolation will occur as a result of the proposed development.*

(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

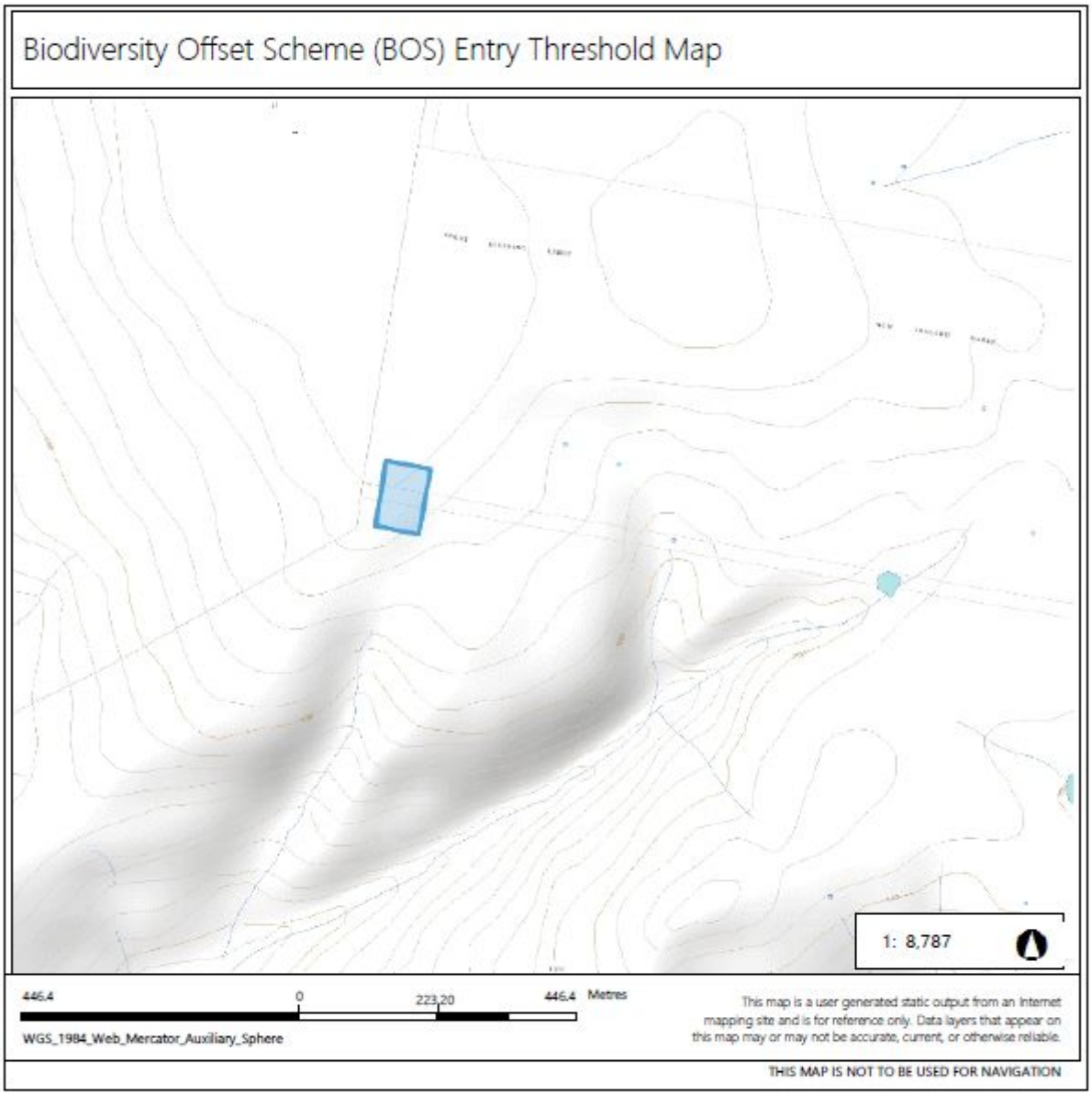
Response: A review of the Areas of Outstanding Biodiversity Value (AOBV) Register on 31 January 2020 showed four areas, none of which are located within 200km of the proposed development site. In that context the proposal is very unlikely to have any adverse effect, either directly or indirectly.

(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

Response: A review of NSW listed key threatening processes was undertaken as detailed within the SEE in Table 8. Potentially relevant processes have been considered, but the development is not expected to result in any significant increase in the impact of any key threatening process.

***Conclusion**: The proposed development or activity is unlikely to significantly affect any threatened species or ecological communities, or their habitats. In that context a biodiversity development assessment report is not warranted in this case.*

11 APPENDIX C – Biodiversity (BOSET) map & report



NSW GOVERNMENT

Biodiversity Values Map and Threshold Report

Results Summary

Date of Calculation	06/02/2020 8:05 AM		**BDAR Required***
Total Digitised Area	0.56	ha	
Minimum Lot Size Method	LEP		
Minimum Lot Size	100	ha	
Area Clearing Threshold	1	ha	
Area clearing trigger Area of native vegetation cleared	Unknown #		Unknown #
Biodiversity values map trigger Impact on biodiversity values map(not including values added within the last 90 days)?	no		no
Date of the 90 day Expiry	N/A		

*If BDAR required has:

- at least one 'Yes': you have exceeded the BOS threshold. You are now required to submit a Biodiversity Development Assessment Report with your development application. Go to https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor to access a list of assessors who are accredited to apply the Biodiversity Assessment Method and write a Biodiversity Development Assessment Report
- 'No': you have not exceeded the BOS threshold. You may still require a permit from local council. Review the development control plan and consult with council. You may still be required to assess whether the development is "likely to significantly affect threatened species' as determined under the test in s. 7.3 of the Biodiversity Conservation Act 2016. You may still be required to review the area where no vegetation mapping is available.

Where the area of impact occurs on land with no vegetation mapping available, the tool cannot determine the area of native vegetation cleared and if this exceeds the Area Threshold. You will need to work out the area of native vegetation cleared - refer to the BOSET user guide for how to do this.

On and after the 90 day expiry date a BDAR will be required.

Disclaimer

This results summary and map can be used as guidance material only. This results summary and map is not guaranteed to be free from error or omission. The State of NSW and Office of Environment and Heritage and its employees disclaim liability for any act done on the information in the results summary or map and any consequences of such acts or omissions. It remains the responsibility of the proponent to ensure that their development application complies will all aspects of the *Biodiversity Conservation Act 2016*.

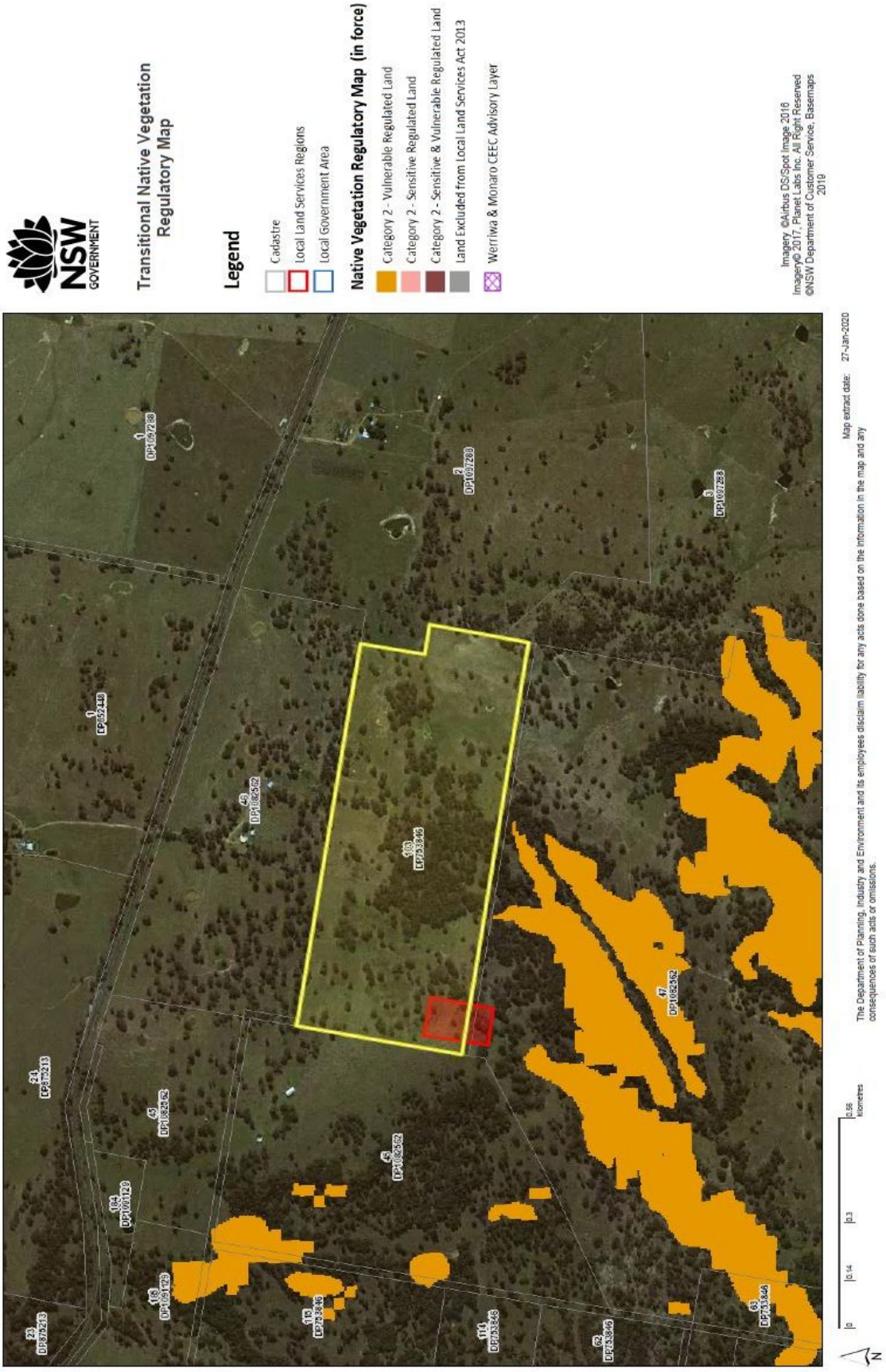
The mapping provided in this tool has been done with the best available mapping and knowledge of species habitat requirements. This map is valid for a period of 30 days from the date of calculation (above).

Acknowledgement

I as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

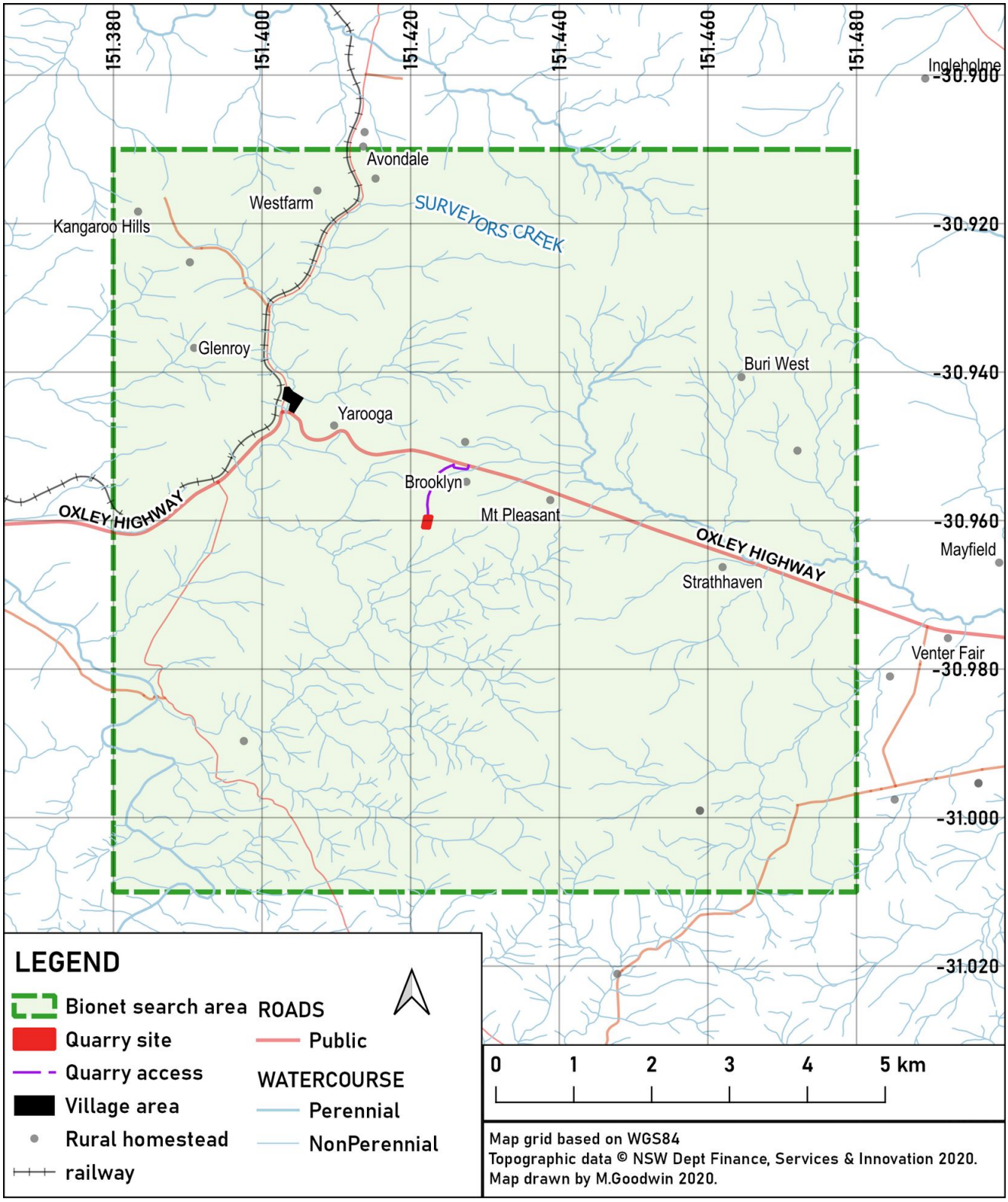
Signature_____ Date: 06/02/2020 08:05 AM

12 APPENDIX D – Transitional native vegetation regulatory map



13 APPENDIX E – Bionet search area

Figure showing extent of area used for NSW Bionet searches to identity previous reports of threatened flora and fauna in the general vicinity of the proposed Brooklyn quarry.



14 APPENDIX F – Highway access pictures


VIEW TO WEST ALONG HIGHWAY

15 APPENDIX G – Quarry Traffic Estimate

Estimates of quarry related traffic based on a range of production levels are provided in the table below. Assumptions used to prepare the table include:

a. Quarry product will be predominantly transported from the site with tip trucks (~11 to 12 tonnes) with a quad dog trailer (~24 to 26 tonnes). An average load is expected to be about 37 tonnes.
b. The in-situ (bench) density of basalt is about 3.0 tonnes per cubic metre.
c. Average density of loose basalt aggregate about 2.4 tonnes per cubic metre.
d. The rate of full time equivalent employees is expected to be about 1 per 5,000 loose cubic metres (LCM) of production, as outlined in section 2.9.1 of the SEE.
e. Typical employee working days is about 250 per year, about 500 return trips per year per employee.
f. No allowances have been made for:
    - Employee car pooling (therefore vehicles likely to be overestimated).
    - Trucks without quad dog trailers (expected to comprise a very small proportion of vehicles for economic reasons).
g. Contractor vehicle trips are based on the working days estimate in section 2.9.2 of the SEE.
h. Estimated average vehicle movements per workday (last column) is based on a Monday to Friday working week (ie. 261 days per year).

		TRUCK MOVEMENTS (2 way)			QUARRY STAFF (2 way)				CONTRACTORS (2 way)				VEHICLES
		QUARRY PRODUCT										TOTAL	/WRK DAY
LCM (m3)	TONNES	week	month	year	FTE	week	month	year	week	month	year	VEHICLES	261/YR
1,000	2,400	2.5	10.8	130	0.2	1.9	8.3	100	0.4	1.7	20	**250**	**1**
5,000	12,000	12.5	54.1	649	1	9.6	41.7	500	0.6	2.5	30	**1,179**	**5**
10,000	24,000	24.9	108.1	1,297	2	19.2	83.3	1,000	1.0	4.2	50	**2,347**	**9**
20,000	48,000	49.9	216.2	2,595	4	38.5	166.7	2,000	1.6	7.0	84	**4,679**	**18**
29,000	69,600	72.3	313.5	3,762	5.8	55.8	241.7	2,900	2.3	9.8	118	**6,780**	**26**

16 APPENDIX H – Letter - Transport for NSW

Transport for NSW

26 May 2020

File No: NTH00/00103/02
Your Ref: DA 10.2020.3

The General Manager
Walcha Council
PO BOX 2
WALCHA NSW 2354

Attention: Libby Cummings – Contract Planning Officer

Dear Sir / Madam,

Re: Development Application 10.2020.3 – Extractive Industry, Basalt Quarry
1643 Oxley Highway, Walcha Road

I refer to your email of 5 May 2020 requesting comment from Transport for NSW in relation to the abovementioned development application.

Roles and Responsibilities

From 1 December 2019, all functions and responsibilities of Roads and Maritime Services will now be vested in an integrated Transport for NSW (TfNSW). Our key interests are for the safety and efficiency of the transport network, the integrity of State infrastructure and the integration of land use and transport in accordance with *Future Transport Strategy 2056*.

Oxley Highway is a classified (State) road under the *Roads Act 1993* (Roads Act). Walcha Council is the Roads Authority for all public roads (other than freeways or Crown roads) in the local government area pursuant to Section 7 of the Roads Act. TfNSW is the roads authority for freeways and can exercise roads authority functions for classified roads in accordance with the Roads Act. Any proposed works on a classified (State) road will require the consent of TfNSW and consent is provided under the terms of a Works Authorisation Deed (WAD).

In accordance with Clause 101 of the *State Environmental Planning Policy (Infrastructure) 2007* (ISEPP) the Consent Authority is to have consideration for the safety, efficiency and ongoing operation of the classified road as the development has frontage to a classified road.

In accordance with Clause 16 of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, TfNSW is given the opportunity to review and provide comment on the subject development application.

Transport for NSW Response

TfNSW understands Council has requested further information from the applicant and has received a further updated SEE. It is noted that the SEE is not supported by a formal Traffic Impact Assessment, prepared in accordance with the Austroads Guide to Traffic Management Part 12: Traffic Impacts of Developments and RTA Guide to Traffic Generating Developments.

Transport for NSW
76 Victoria Street, Grafton, NSW 2460 | PO Box 576, Grafton NSW 2460
W transport.nsw.gov.au

Notwithstanding, TfNSW has reviewed the referred information and provides the following comments to assist the consent authority in making a determination;

- The development application does not provide sufficient detail of measures to mitigate the impacts of the proposed development on the classified road.

  TfNSW recommends that the Consent Authority should be satisfied that the application has sufficiently explained the impacts of the development and justified all proposed mitigation measures.

- The SEE identifies trip generation for the development in terms of annual, monthly and weekly vehicle movements. It is considered likely the trips generated by the proposed development will vary in response to demand for extracted materials. Typically, the impact on the site access to the classified road, should be considered in terms of daily and peak hourly movements, and that campaigns can be distributed entirely to the East or the West of the site access.

  TfNSW recommends the consent authority condition the maximum daily and hourly movements generated by the development.

- The SEE proposes a new rural property access driveway to replace the existing residential property access. Given the proposed development is of a commercial nature and will generate regular heavy vehicle movements, further consideration must be given to the impact of vehicles entering and leaving the property within the context of background traffic. The design of the access needs to be appropriate for the frequency of heavy vehicles accessing the site and provide appropriate treatments to manage the safety of vehicles turning to and from the classified road.

  TfNSW recommends that the Consent Authority request an assessment of turn treatment warrants in accordance with the Austroads Guide to *Traffic Management Part 6* and Austroads Guide to *Road Design Part 4A* for the site access, identifying the existence of the minimum basic turn treatments and addressing the need for any warranted higher order treatments.

  TfNSW further recommends the consent authority condition all redundant accesses to be legally and physically closed prior to commencement of use of the new access.

- Strategic (2D) design drawings of all proposed improvements to public roads and the site access to mitigate the traffic and road safety impacts of the development should be submitted to Council prior to the Consent Authority's determination. These drawings should demonstrate the functionality and constructability of the access and road improvements, available sight distances, and swept path analysis for the design vehicle.

- The SEE states that Clause 16 of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*, requires the Consent Authority to consider the imposition of conditions relating to transport.

  TfNSW recommends that the Consent Authority condition that a Traffic Management Plan (TMP) be developed addressing the construction, operation and decommission phases of

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the proposed development. It is recommended that any TMP include a Driver Code of Conduct that includes;

- A map of the primary haulage route/s highlighting critical locations.
- Safety initiatives for impacts residential areas and/or school zones.
- An induction process for vehicle operators and regular toolbox meetings.
- A complaint resolution and disciplinary procedure.
- Any community consultation measures proposed for peak periods.

- Council should consider the need for any regulatory signage (truck turning signs) and where necessary seek the endorsement of the Local Traffic Committee prior to Council approval the signage. Please refer to *A guide to the delegation to councils for the regulation of traffic*.

Any future roadwork on the classified (State) road will need to be designed and constructed in accordance with the current Austroads Guidelines, Australian Standards and TfNSW Supplements.

The developer will be required to enter into a Works Authorisation Deed (WAD) with TfNSW for any roadwork deemed necessary on the classified (State) road. The developer will be responsible for all costs associated with the roadwork and administration for the WAD. It is recommended that developers familiarise themselves with the requirements of the WAD process. Further information can be accessed using the following link:
http://www.rms.nsw.gov.au/projects/planning-principles/index.html

Advice to the Consent Authority

TfNSW highlights that in determining the application under the *Environmental Planning and Assessment Act 1979*, it is the Consent Authority's responsibility to consider the environmental impacts of any road works which are ancillary to the development. This includes any works which form part of the proposal and/or any works which are deemed necessary to include as requirements in the conditions of project approval.

Upon determination of the application it would be appreciated if Council could forward a copy of the approval for our records. If you have any further enquiries regarding the above comments please do not hesitate to contact Katrina Wade, Development Assessment Officer on (02) 6640 1362 or via email at: development.northern@rms.nsw.gov.au

Yours faithfully,

for Matt Adams
Manager Land Use Assessment, Northern

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17 APPENDIX I – Highway access design

See separate letter and plans from Planit Consulting dated 24-7-2020 providing Turn Warrants Assessment and 2D concept drawing for proposed site access into the proposed Brooklyn Quarry off the Oxley Highway in response to Transport for NSW letter dated 26 May 2020.

18 APPENDIX J – Groundwater Impact Assessment

See separate detailed Groundwater Impact Assessment prepared by Ground Doctor Pty Ltd dated 11 August 2020.

19 APPENDIX K – Aerial photograph

See separate A3 plan

20 APPENDIX L – Topography - Digital terrain model

See separate A3 plan.

21 APPENDIX M – Topography - Digital surface model

See separate A3 plan.

22 APPENDIX N – Blasting – modelling

Table N1 – Ground vibration estimates for relevant scenarios.

Basic formula to estimate ground vibration
AS 2187.2, formula J7.3(1)

$$V = K_g \left(\frac{R}{Q^{\frac{1}{2}}} \right)^{-B}$$

P = ground vibration, in mm/s
Q = maximum instantaneous charge
R = distance between charge & point of measuerment, in m
B & Kg = constants related to site & rock properties

Formula for free face in average field conditions
AS 2187.2, formula J7.3(2), estimates mean peak particle velocity

$$V = 1140 \left(\frac{R}{Q^{\frac{1}{2}}} \right)^{-1.6}$$

R	Q	V
distance	explosives	vibration
metres	kilograms	mm/s
660	470	4.82
660	480	4.90
660	490	4.99
660	500	5.07
660	510	5.15
1150	1470	4.94
1150	1480	4.97
1150	1490	4.99
1150	1500	5.02
1150	1510	5.05
1500	2520	4.97
1500	2530	4.98
1500	2540	5.00
1500	2550	5.02
1500	2560	5.03

Table N2 – Airblast estimates for relevant scenarios.

Dyno Nobel 2020 equation to estimate airblast
(also see AS 2187.2 equation J7.2)

$$P = K \left(\frac{R}{Q^{0.33}} \right)^{a}$$

P = pressure, in kilopascals
Q = explosives charge mass, in kg
R = distance from charge, in m
K = typical K (fully confined = 3.3)
a = site exponent (-1.2)

$$P = 3.3 \left(\frac{R}{Q^{0.33}} \right)^{-1.2}$$

R	Q	P		
distance	explosives	pressure	pressure	airblast
metres	kilograms	kilopascals	pascals	dB
660	190	0.01090	10.90	114.73
660	200	0.01112	11.12	114.90
660	210	0.01134	11.34	115.07
660	220	0.01155	11.55	115.23
660	230	0.01176	11.76	115.39
1150	1090	0.01118	11.18	114.95
1150	1100	0.01122	11.22	114.98
1150	1110	0.01126	11.26	115.01
1150	1120	0.01130	11.30	115.04
1150	1130	0.01134	11.34	115.07
1500	2460	0.01122	11.22	114.98
1500	2470	0.01124	11.24	114.99
1500	2480	0.01126	11.26	115.01
1500	2490	0.01127	11.27	115.02
1500	2500	0.01129	11.29	115.04

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Our Reference: J6778-CIV-LET-001

24 July 2020

SBR Excavations Team
Via email:
srbexcavations@gmail.com

Attention: Scott Blake
Dear Scott,

Turn Warrants Assessment

Response to RMS Letter (File No: NTH00/00103/02) dated 26 May 2020 – Re: Development Application 10.2020.3 – Extractive Industry, Basalt Quarry, 1643 Oxley Highway, Walcha Road

Planit was engaged by SBR Excavations Team to produce this Turn Warrants Assessment letter and 2D concept drawing for the proposed site access into the proposed Brooklyn Quarry on 1643 Oxley Highway, Walcha Road. The site is located within the Walcha Council Area.

The purpose of this assessment is to confirm the proposed access layout, appropriate turn treatments, sight distance check and Swept Path Analysis to address the above-mentioned letter from RMS.

1. Sight Distance from proposed access location on 1643 Oxley Highway:

Refer to the below photos showing available sight distance along Oxley Highway from the proposed access location. Sufficient sight distance is available at the proposed access location of approximately 300m to the west and more then 500m to the east. The current signed frontage road speed of 100km/hr requires a minimum SSD of 160m.

Table 3.6: Sight distance requirements at accesses

Frontage road speed [1] km/h	Distance (Y) along frontage road m		
	Accesses other than domestic [2]		Domestic property accesses [3]
	Desirable 5 second gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	Use values from "Minimum SSD" column	130	Use values from "Minimum SSD" column
100		160	
110		190	

Source: RTA Supplement to Guide to Road Design Part 4A

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Figure 1: Looking West from proposed site entrance.

Figure 2: Looking East from proposed site entrance.

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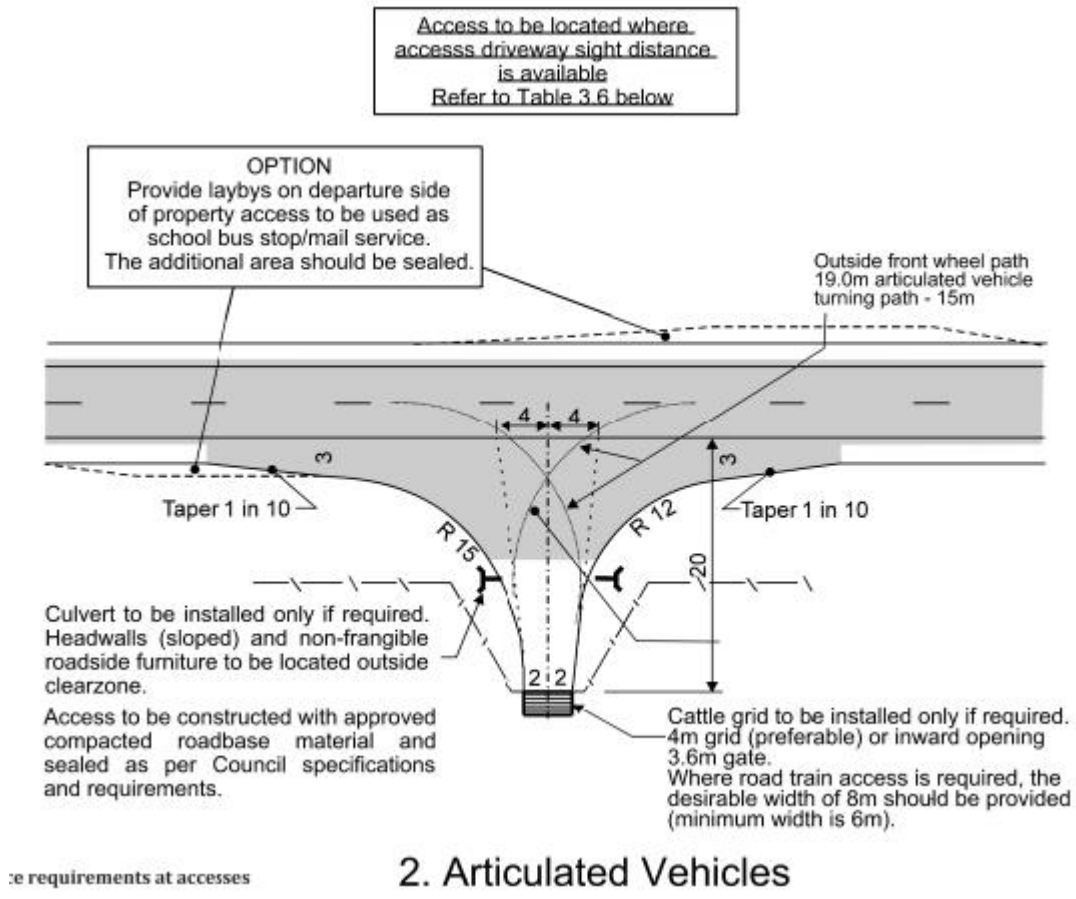
2. Proposed driveway layout based on RMS standard drawing 19.07.2016:



3. Projected Traffic Volumes and Turn Warrants Assessment:

		TRUCK MOVEMENTS (2 way) QUARRY PRODUCT			QUARRY STAFF (2 way)				CONTRACTORS (2 way) MAINT, EXPLOSIVES, CRUSHING			TOTAL
LCM (m3)	TONNES	week	month	year	FTE	week	month	year	week	month	year	VEHICLES
1,000	2,400	2.5	10.8	130	0.2	1.9	8.3	100	0.4	1.7	20	**250**
5,000	12,000	12.5	54.1	649	1	9.6	41.7	500	0.6	2.5	30	**1,179**
10,000	24,000	24.9	108.1	1,297	2	19.2	83.3	1,000	1.0	4.2	50	**2,347**
20,000	48,000	49.9	216.2	2,595	4	38.5	166.7	2,000	1.6	7.0	84	**4,679**
29,000	69,600	72.3	313.5	3,762	5.8	55.8	241.7	2,900	2.3	9.8	118	**6,780**

Figure 3: Estimated Traffic Volume Generated from Quarry

- Traffic Volume increase & Turn Volume generated from the proposed Quarry is expected to be 130.4 trips per week, assumed 5 working days a week (26.08 trips per day), assumed 9 hours per day (3 trips per hour). The existing traffic volumes are based on 2007 and 2011 traffic count data on RMS Traffic Volume Viewer website, Station 92702 and projected for 2020 traffic volumes using a growth rate of 2.2% as shown in the table below.

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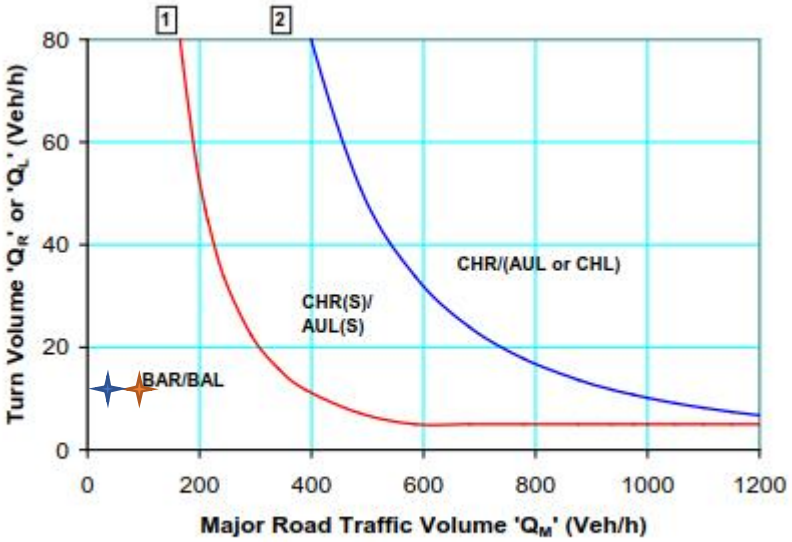
Year	Direction	Class	12am	1am	2am	3am	4am	5am	6am	7am	8am	9am	10am	11am	12pm	1pm	2pm	3pm	4pm	5pm	6pm	7pm	8pm	9pm	10pm	11pm	Daily_Total
2007	Eastbound	All Vehicles	2	1	1	2	1	3	6	9	19	22	23	23	25	26	27	26	22	20	13	9	5	4	2	1	292
2007	Westbound	All Vehicles	1	1	1	1	2	4	5	16	16	25	24	24	25	26	24	24	21	18	13	7	5	3	3	1	290
2011	Eastbound	All Vehicles	2	2	2	2	2	3	7	17	19	20	26	27	25	27	28	19	23	21	15	9	5	6	4	2	313
2011	Westbound	All Vehicles	2	2	3	2	3	3	7	14	21	23	23	23	30	26	26	25	27	23	19	8	4	4	3	2	323
2020	Eastbound	All Vehicles	2	2	2	2	2	4	9	21	23	24	32	33	30	33	34	23	28	26	18	11	6	7	5	2	381
2020	Westbound	All Vehicles	2	2	4	2	4	4	9	17	26	28	28	28	36	32	32	30	33	28	23	10	5	5	4	2	393

- Eastbound = 381 Daily Total, Westbound = 393 Daily Total and peak hourly volume occurring at 12pm Eastbound = 30 vph, Westbound = 36 vph.
- Major Road total Traffic Volume Eastbound = 33 Veh/h & Westbound = 39 Veh/h (assuming additional increase of 3 Veh/h generated from quarry).
- Turn Volumes from/into Quarry Site (assumes worst case 50% traffic generated from the Quarry coinciding with peak hour traffic on Highway) = 14 Veh/h (assumes 14 Veh/h turning right & 14 Veh/h turning left as a worst case if all demand is entirely Eastbound or Westbound).

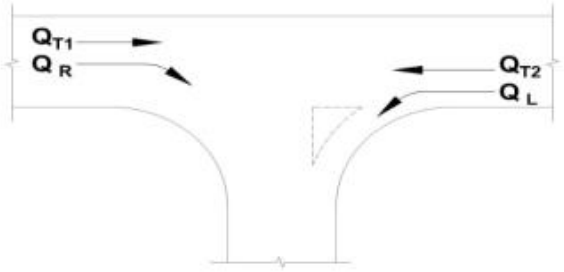


(b) Design speed < 100 km/h

Source: Arndt and Troutbeck (2006).

- Q_L = 14 Veh/h
- Q_R = 14 Veh/h
- Q_M = 86 Veh/h {Q_{T1} + Q_{T2} + Q_L (33 + 39 + 14)} Right Turn (Blue star)
- Q_M = 39 Veh/h {Q_{T2}(39)} Left Turn (Red star)

Figure A 11: Calculation of the major road traffic volume parameter Q_M



Turn type	*Splitter island*	*Q_m (veh/h)*
Right	*No*	*= Q_{T1} + Q_{T2}+Q_L*
Right	*Yes*	*= Q_{T1} + Q_{T2}*
Left	*No/yes*	*= Q_{T2}*

Source: Arndt and Troutbeck (2006).

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Based on the Turn Warrants Assessment BAR/BAL treatment is required. Refer to attached 2d layout plan Drawing Number J6778-0001 showing the proposed driveway layout in accordance with RMS standard drawing 19.07.2016 and supplemented with BAR/BAL in accordance with Austroads Part 4A, Figure 7.6 & 8.2.

I trust that the above writing and attached Drawing Number J6778-0001 by Planit Consulting provides a satisfactory response to RMS Letter (File No: NTH00/00103/02) dated 26 May 2020, but if you have any further concerns, please feel free to contact the undersigned on MattP@planitconsulting.com.au

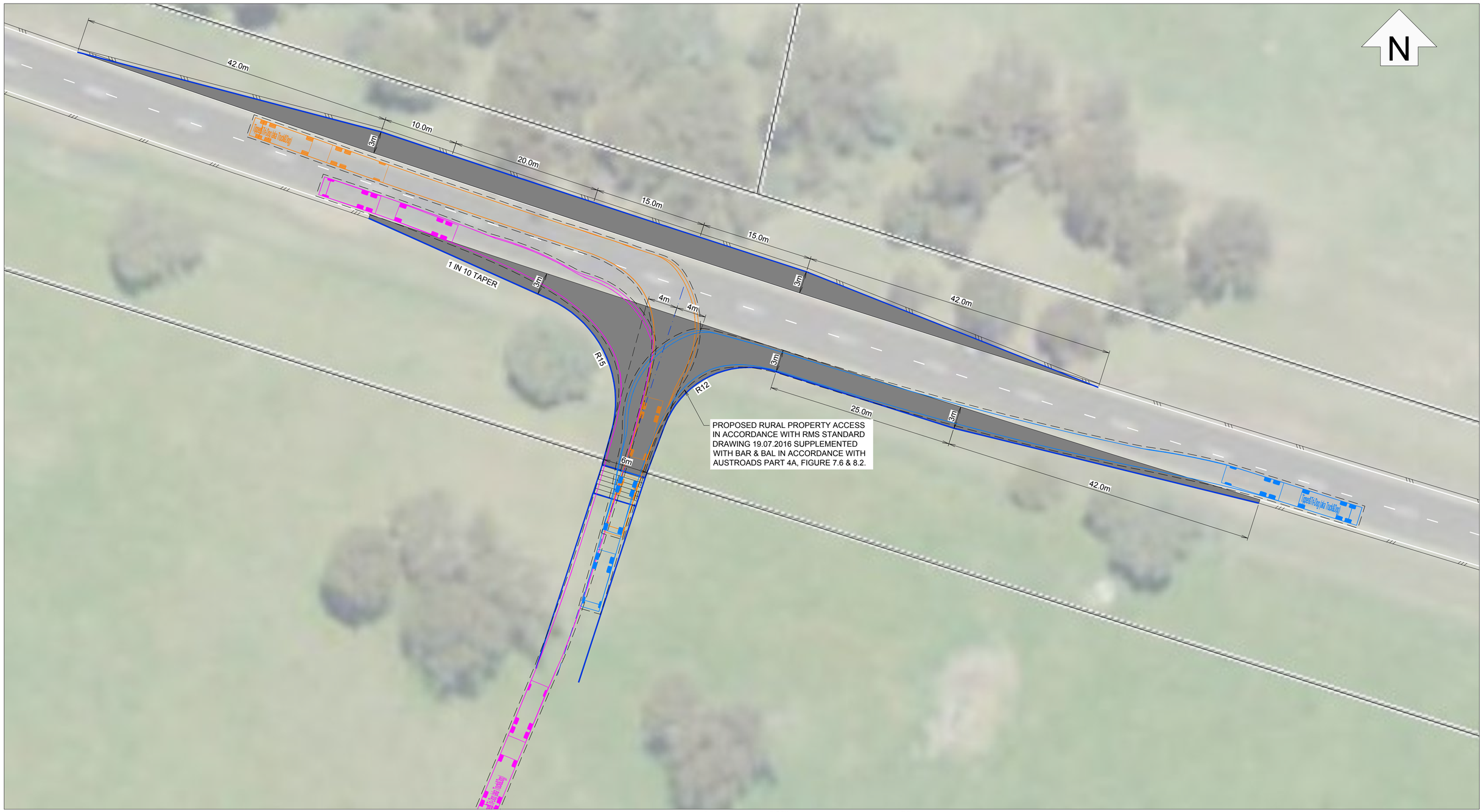
Yours sincerely

Matt Plain

Associate / Senior Civil Engineer

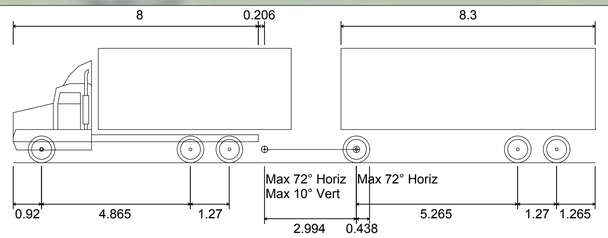
Attachment No.1 – Drawing Number J6778-0001 by Planit Consulting

100mm AT ORIGINAL SIZE



Tipper&Tri-Dog (aka Truck&Dog)

Overall Length	19.000m
Overall Width	2.500m
Overall Body Height	3.738m
Min Body Ground Clearance	0.417m
Track Width	2.500m
Lock-to-lock time	5.00s
Curb to Curb Turning Radius	12.640m



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REV	DESCRIPTION	DATE	DRAWN	DESIGN	CHECK	APPROVED
A	ISSUED FOR APPROVAL	01/07/20	SGA	SGA	MP	MP
B	ISSUED FOR APPROVAL	22/07/20	SGA	SGA	MP	MP

SCALES:
0 2.5 5 10 15
Full Size 1:250 ; Half Size 1:500
Scale (m)

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DRAWN BY: S. AVERKOFF
DESIGN BY: S. AVERKOFF
APPROVED BY:
DATE:

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TELEPHONE: 02 6687 4666
ABN: 20 099 261 711
EMAIL: administration@planitconsulting.com.au

CLIENT: SBR EXCAVATIONS TEAM

PROJECT: BROOKLYN QUARRY ACCESS

DRAWING TITLE: PROPOSED LAYOUT PLAN & SWEPT PATHS
1643 OXLEY HIGHWAY, WALCHA ROAD

LOCAL GOVERNMENT AUTHORITY: WALCHA COUNCIL

ORIGINAL SIZE:	PLANIT JOB No.:	DRAWING No.:	REV:
A1	J6778	0001	B

CAD FILE: S:\J6778 - BROOKLYN QUARRY 1643 OXLEY HWY, WALCHA ROAD\6 - ENGINEERING\6.4 DRAFTING\LAYOUT PLAN.DWG PLOTTED BY: SCOTTA PLOT DATE: 22/07/2020 10:05:40 AM