Oberon Quarries Scoping Report

September 2022

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OBERON QUARRIES SCOPING REPORT

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1.0 Background

Oberon Quarries Pty Limited (Oberon Quarries) operates a basalt hard rock quarry on Racecourse Hill, 4 km south of Oberon. Location of the quarry is shown on **Figure 1**.

Development consent (DA 92/164) for the establishment and operation of the quarry was first obtained from the Minister on 1 October 1993. Approval was granted for the extraction, processing and delivery of 12.7 million tonnes (Mt) of high-quality hard rock resource over a 20-year period.

Since gaining development consent in 1993, Oberon Quarries has serviced markets covering an area extending from the Central West to Greater Sydney and has gained a reputation for producing high quality basalt products.

The quality and consistency of the quarry products resulted in it being used in many high-profile projects such as the Sydney Harbour Bridge, Third Runway, Mount Panorama and more recently Western Sydney Aerotropolis.

The quarry is located within Lake Oberon catchment which provides drinking water to Oberon and the Blue Mountains. Runoff from the extraction and processing areas is contained within the quarry's water management system.

This system conveys runoff from the extraction and processing areas to a series of sedimentation dams and runoff controls. The water management system is well maintained and has not had any breaches or uncontrolled spills in the last 27 years of operations.

After gaining development consent in 1993, commercial quarry operations commenced in March 1995 after the completion of environmental control works required for the establishment of the processing area, haul road and quarry water management system.

The approved resource forms part of the larger Racecourse Hill resource that is estimated to contain approximately 37 Mt of high-quality basalt.

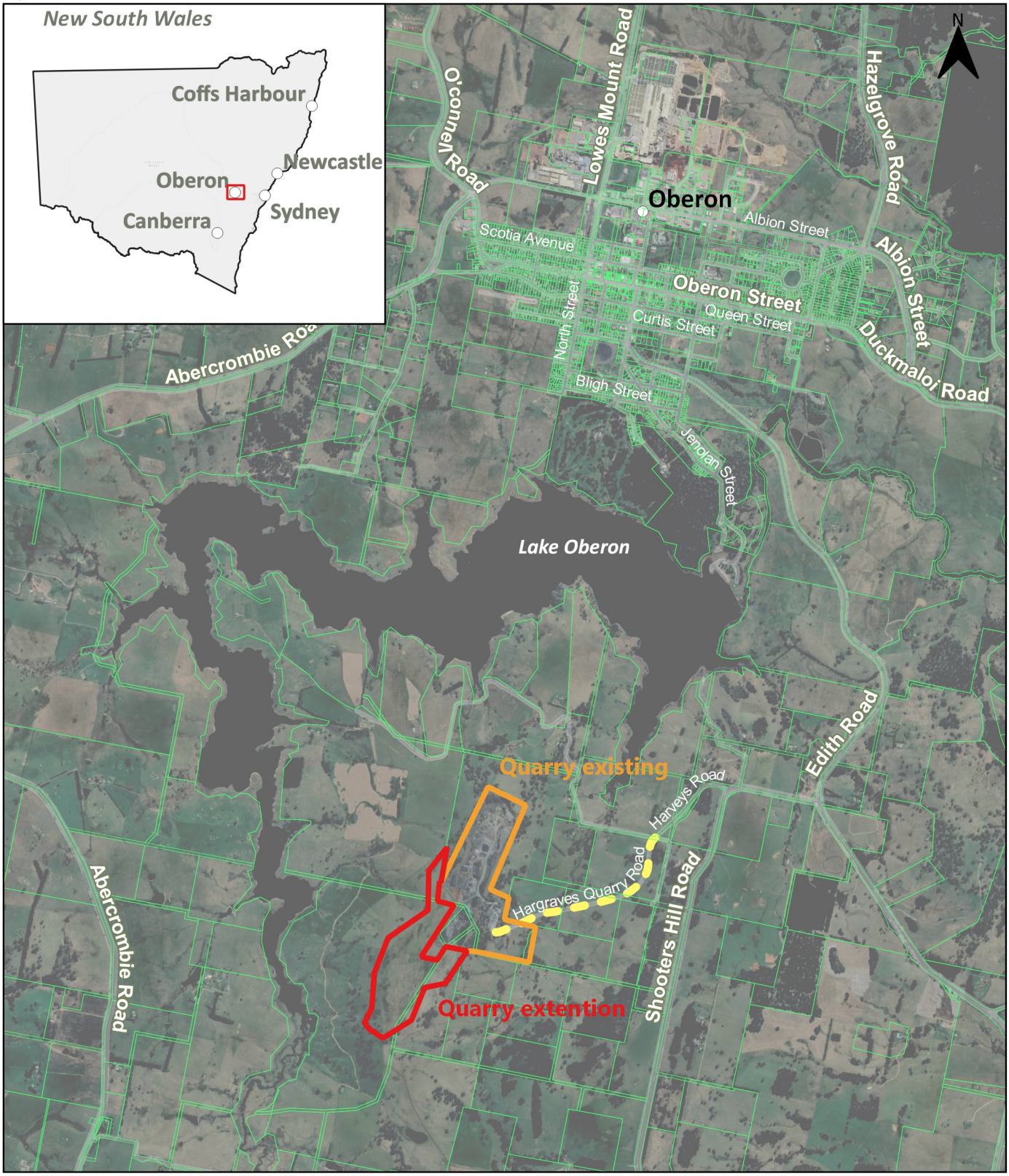
The extent of the Racecourse Hill basalt reserve is shown on **Figure 2**.

Other environmental control works undertaken prior to commercial operations commencing included upgrading intersections at Edith Road/Shooters Hill Road, Edith Road/Titania Road and Titania Road/Duckmaloi Road and complete reconstruction and widening of Titania Road.

Between 1993 and 2015 several modifications to the quarry were approved by the Minister including extending the life of DA 92/164 until May 2016. On 14 September 2015, a new Development Approval (SSD_6333) was granted for an additional 30 years to 2045.

Development Approval SSD_6333 also provided for an increase in production from an average of 200,000 tonnes per annum (tpa) over any 10-year period to a maximum of 400,000 tpa. Daily product transport was also increased from 2000 tonnes per day to 3000 tonnes per day.

Over its 27 years of operations, the quarry has been successfully operated and has maintained a high level of environmental management and control with limited complaints and no significant environmental or social impacts.



Data source: Oberon Quarries Pty Ltd 2021
Image source: Google Earth 2020

0 0.5 1 1.5 2 km

Quarry extension
Quarry existing
Carriageway right of way

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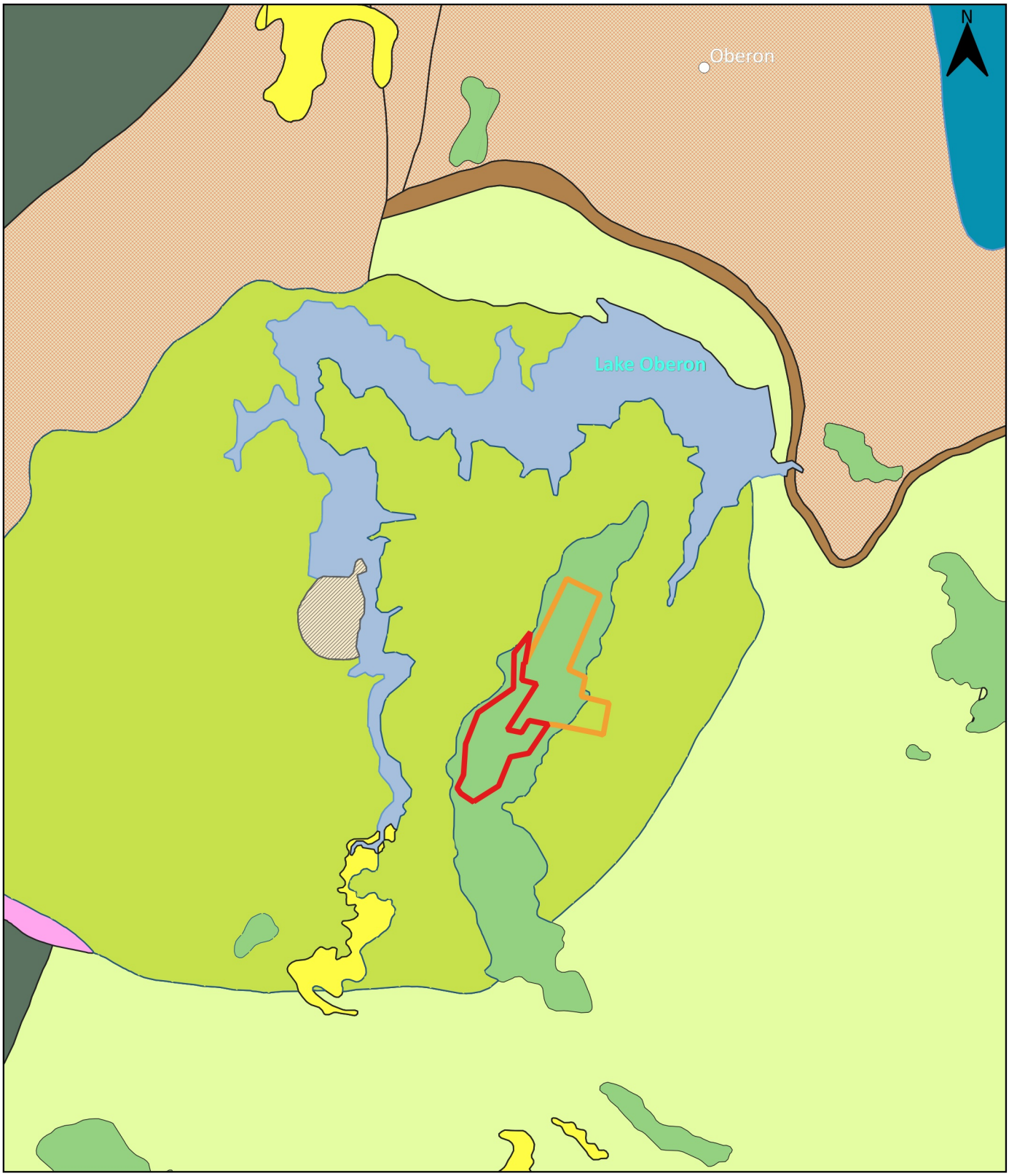
Figure 1. Locality Map



Data source: Bathurst SI55-08 Digital Geology Data Package

0 0.5 1 1.5 2 km

- Alluvium: gravel, sand, silt, clay
- Carbonaceous slate, shale
- Chert, siltstone, mafic volcanilithic sandstone
- Coarse-grained, equigranular biotite hornblende granite
- Coarse-grained, porphyritic biotite hornblende granite
- Pink, coarse-grained, megacrystic biotite granite
- Pyroxene olivine basalt, plagioclase basalt, alkali basalt, trachybasalt, trachyandesite
- Quartz sandstone, siltstone, slate, phyllite, black carbonaceous slate, chert
- Slate, phyllite, siltstone, feldspathic and quartz sandstone, limestone
- Volcanic sandstone, minor breccia and conglomerate
- Lake
- Quarry existing
- Quarry extension

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Figure 2. Geology

The layout of the quarry and its water management system provide a high degree of control in terms of managing and containing runoff and noise emissions. Extraction operations occur within the excavated rim of Racecourse Hill and processing is undertaken within a bunded area. This provides visual and acoustic screening from the surrounding residences with the exception of one property owned by Mr Hackfath which was built after the processing plant was established (see **Figure 3**). Oberon Quarries has an agreement covering quarry operations with Mr Hackfath.

Since the quarry was originally approved in 1993, Oberon Quarries has purchased three properties (Westrel, Linnane Park and Rocklea) which are located immediately to the east of the quarry. Over the last 27 years, Oberon Quarries has established good relationships and has agreements with other landholders whose properties adjoin or are in close proximity to the quarry.

Over this period it has demonstrated firstly, the quality and strong demand for quarry products from the Racecourse Hill basalt deposit and secondly, that it can consistently and sustainably generate and deliver quarry products from the quarry with negligible environmental or community impact.

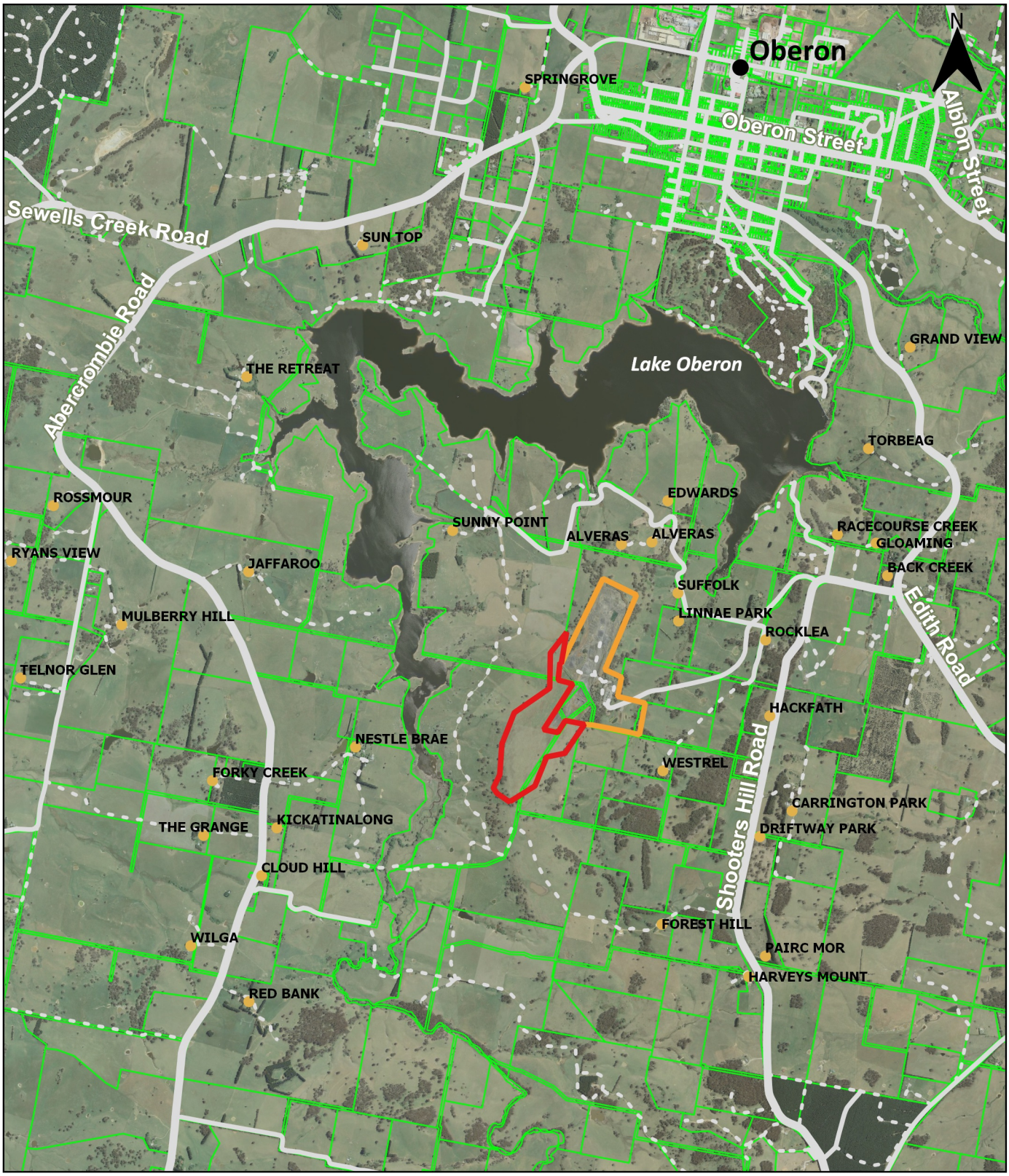

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Figure 3. Surrounding Residences

2.0 The Proposed Project

2.1 Extension to extraction area and hard rock resource

Oberon Quarries has undertaken exploration on Racecourse Hill within a 32.3 hectare (ha) area immediately to the south of the existing quarry. Drilling within the area indicates a high-quality basalt resource of approximately 12.6 Mt. Oberon Quarries is seeking approval to extend operations to access this hard rock resource.

The Project meets the criteria for State Significant Development under the provisions of the State Environmental Planning Policy (State and Regional Development) 2011, and the Minister for Planning and Environment will be the consent authority for the development. The proposed extension and existing quarry are on land zoned RU1 with quarrying being permissible under this zoning.

Approval for extraction within the proposed extension area, combined with resources within the existing approved extraction area will provide access to a total available resource of approximately 20 Mt.

2.2 Extraction, processing and delivery

Under the proposed extension, quarrying operations will continue to be undertaken within the outer rim of Racecourse Hill. This will continue to provide a high level of visual and acoustic screening from surrounding residences and properties. It will also enable runoff from disturbed areas to be contained and controlled in the same way and using the same water management infrastructure as has been used successfully at the quarry for the last 27 years of operation.

The proposed extension area is immediately to the south of and contiguous with the existing extraction area. At its closet point the proposed extension area is over 1.2 km from the nearest non-quarry related residence, Nestlebrae (see **Figure 3**).

Oberon Quarries has existing agreements or is seeking agreement in regard to acceptable levels of noise, blasting and air quality impacts with the owners of all non-quarry related properties that have residences within 1 km of the proposed extension area. It is proposed that these agreements will be further discussed once air quality, noise and blasting assessments for the proposed development are completed.

The proposed extended operations will use the same water management system, earth moving equipment, drilling and blasting equipment, processing plant layout and haul routes that are currently used.

The number of blasts per year will however increase from approximately 10 blasts per year to 12 blasts per year. Further modelling will be undertaken as part of the (Environmental Impact Statement) EIS to identify optimum blasting requirements for the range of products and product sizes generated by the quarry.

To better align with market and product delivery expectations, Oberon Quarries is seeking approval to commence extraction operations at 6 am Monday to Saturday rather than 7 am as is currently approved and enable loading and despatch of product to commence from 5 am Monday to Saturday rather than 6 am.

Demand for high quality products from the quarry continues to increase. To meet increasing demand and have capacity to drawdown the volume of product that is stockpiled on-site, Oberon Quarries is seeking to increase the maximum amount of product that can be transported off-site from 400,000 tpa to 950,000 tpa. This level of product generation will comprise up to:

- 600,000 tpa of existing crushing and processing capacity for gabion, aggregate and road base products
- 250,000 tpa of 5 mm minus and scalpings generated from crushing and processing
- 100,000 tpa of drawdown from existing product stockpiles.

Existing crushing and processing equipment at the quarry has the capacity to generate up to 600,000 tpa of gabion, aggregate and road base product. At this level of production, quarry operations will generate an additional approximately 250,000 tpa of scalpings and 5 mm minus material.

Historically only small amounts of scalpings have been incorporated into road base material and sold as product and only limited amounts of 5 mm minus material have been sold predominantly as manufactured sand. In the future it is proposed to make greater utilisation of the scalpings and 5 mm minus material in products generated by the quarry.

Analysis of a UAV-based survey of stockpiled material undertaken in April 2022 indicates that there is approximately 1 Mt of 5 mm minus and scalpings and an additional approximately 300,000 tonnes of processed quarry product comprising gabion, road base and aggregate stockpiled on the quarry floor.

Oberon Quarries has been exploring and developing a range of uses for the 5 mm minus and scalpings material that is generated as part of crushing and processing operations. Scalpings and 5 mm minus material (or crusher dust) currently make up approximately 25% to 30% of total material generated on-site.

Potential new markets for this material are also being explored. This has included investigating its use as a Negative Emissions Technology (NET) for Carbon Dioxide Removal (CDR) through its application as an organic rock dust fertilizer and soil ameliorant.

Oberon Quarries estimates that it will generate sales of products derived from 5 mm minus and scalpings of approximately 200,000 tpa to 350,000 tpa. To assist in achieving this, additional screening and processing of the material will be undertaken and sand washing facilities approved as part of SSD_6333 may be established on the quarry floor.

There are no other changes required in extraction and processing operations to accommodate the proposed increase in production as the currently approved extraction and processing operations have sufficient capacity to generate for delivery off-site up to 950,000 tpa of product.

Product delivery from the site will continue to use current haulage routes as shown on **Figure 4**. Assessment of the roads and intersections on Shooters Hill Road, Edith Road, Titania Road and Duckmaloi Road used for product delivery indicates that the intersections and the road network at these locations can continue to operate at acceptable levels of service at an annual production level of 950,000 tpa exported from the quarry.

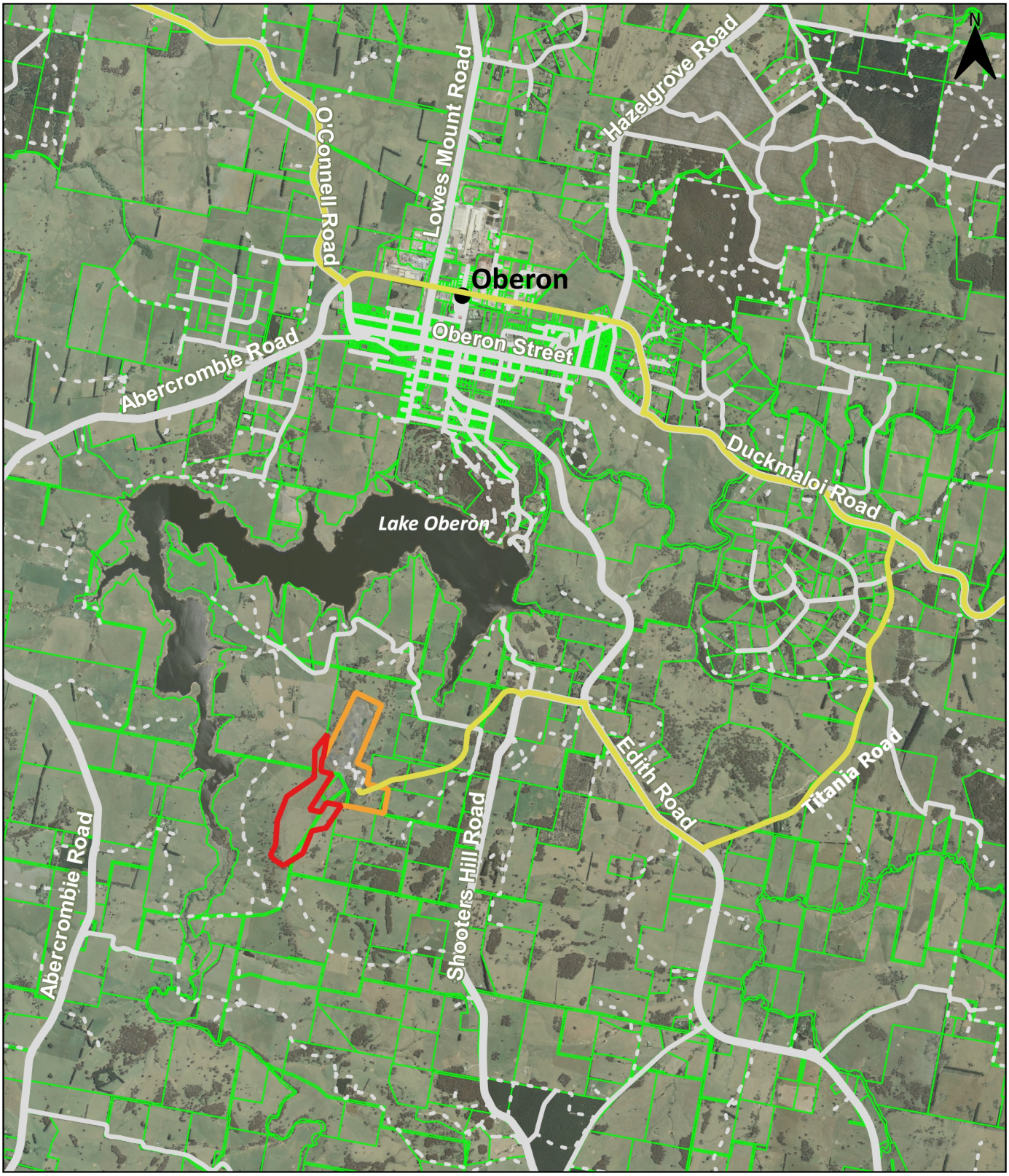

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Figure 4. Haulage Routes

2.3 Backloading of ENM and VENM

To assist in improving the overall efficiency of quarry operations, approval is sought to backload Excavated Natural Material (ENM) and Excavated Natural Material (VENM) to the quarry. Backloaded material will be incorporated into the final landform. This will maximise use of the excavation that has been created by the extraction of high-quality basalt products while also maximising the use and efficiency of the product haul trucks by backloading material to the site.

Any ENM or VENM brought to the site will be done so in accordance with consent conditions and the requirements of Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (Waste) Regulation 2014.

2.4 Expected life of extended operations

At an average annual extraction rate of approximately 700,000 tpa to 800,000 tpa, it is expected that it will take approximately 25 years to 28 years to extract the approximately 20 Mt of basalt resource that has been identified within the existing quarry and proposed 32.3 ha extension area.

Once extraction is completed, it is estimated that an additional 2 years will be required to complete landscaping and rehabilitation of the quarry. On this basis, Oberon Quarries is seeking approval to operate the quarry until 2053.

3.0 Key Environmental and Community Issues

3.1 Preliminary assessment of risks

The quarry has been operating since 1995 and over that time a thorough understanding of potential environmental, social and economic risks of operations at the quarry has been developed and appropriate environment control measures refined accordingly.

The operations are the subject of an Annual Environmental Review and 3 yearly Compliance Audits that document the environmental performance of the quarry. These Reviews and Audits have identified no significant environmental issues. Where issues have been identified, works and measures have been implemented to mitigate or rectify these issues.

The proposed 32.3 ha extension to the extraction area, while it will more than double the size of the extraction area and double the size of the available quarry resource, will involve extraction and processing of the same basalt resource that has been extracted since 1995. This material will be extracted from within the rim of Racecourse Hill plateau in the same manner as has been used over the last 27 years. Potential impacts on the surrounding area in terms of blasting overpressure and vibration will be similar to current operations with operations continuing to be visually and acoustically shielded from the surrounding area.

Water management for the proposed extension area will use the same water management infrastructure (catch drains, sediment dams, storage dams, level spreaders) that service the existing quarry and processing area. Similar to the existing operation, the quarry floor will be shaped to provide additional detention capacity to ensure that rainfall up to a Probable Maximum Precipitation event of 380 mm in an hour can be safely contained and managed.

Preliminary analysis indicates that the proposed increases in processing and product transport can be undertaken without resulting in significant offsite impacts.

Studies undertaken for the proposed extension of operations and feedback from the consultation process have identified potential impacts and key risks associated with the proposed continuation and expansion of quarry operations. Analysis indicates that risks and potential impacts are consistent with those that have been successfully managed and mitigated over the last 27 years of operations. These risks and impacts are well understood and able to be readily managed.

A range of mitigation measures have been identified and tested to ensure that any impacts associated with the proposed ongoing operations are reduced as far as is feasibly practical.

Assessment of the potential risks indicate that the proposed changes to the quarry site will not result in any significant adverse impacts on the surrounding area or fundamentally change quarry operations from those approved under SSD_6333.

3.2 Consultation

Oberon Quarries is in close contact with surrounding land holders and Oberon Council. This communication provides regular updates in regard to land holder and community issues. This has enabled ongoing operations to the quarry to be responsive to community concerns.

Oberon Quarries has maintained a website since the quarry commenced commercial operations. The website provides updated information in regard to quarry operations and environmental performance of the quarry. This includes environmental monitoring results, findings of the Annual Reviews and three yearly Independent Audits. The website also provides for community information and feedback including a complaints register.

The consultation program for the proposed extension and expansion of operations will include briefings with key government agencies to discuss key issues and proposed management measures. These agencies will include the Department of Planning, Industry and Environment and Oberon Council.

Over the life of the quarry, discussions have been held with key non-agency stakeholders and the immediate community (i.e. the surrounding landholders within the vicinity of the quarry). These discussions will continue during the preparation of the EIS and over the ensuing period of quarry operations.

During these meetings, the proposed project, the potential impact on the community and environment will be discussed and feedback sought. This feedback will be taken into consideration in preparation of the EIS and will continue to inform operations and environmental management controls at the quarry.

3.3 Planning and approval context

3.3.1.1 State Significant Development

The proposed development is an extension of an existing approved State Significant Development (SSD_6333).

As the proposed extension involves land parcels that did not form part of the existing approved quarry, a new development approval will be required.

As production is proposed to exceed 500,000 tonnes per year and the hard rock resource is over 5 Mt, the project is eligible to be considered as State Significant Development (SSD) and the consent authority will be the Minister for Planning and Environment.

Prior to lodging a development application (DA) for an SSD project, the applicant must consult with the Department.

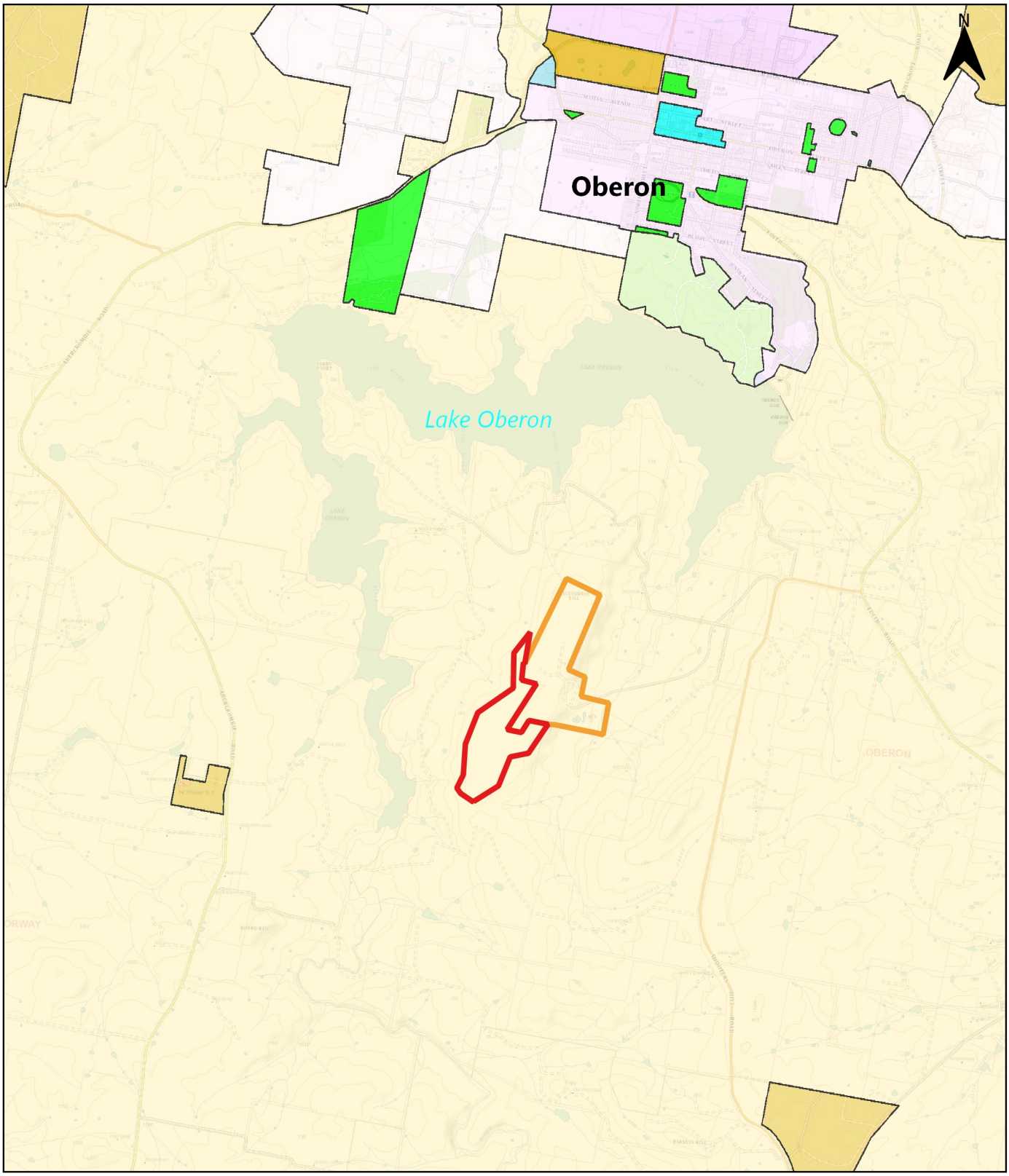
The purpose of this consultation is to clarify what approvals are required, identify what information must be included in the EIS, and determine what community engagement must be undertaken by the applicant during the preparation of the EIS. These requirements will be set out in Secretary Environmental Assessment Requirements (SEARs). To obtain SEARs, the applicant must lodge a request and Scoping Report online.

Following consultation, the Planning Secretary will issue the environmental assessment requirements (SEARs) for the EIS.

Key planning legislation and policies applicable to the proposed development include:

Oberon Local Environmental Plan 2013

Under the Oberon LEP 2013, the Project site is located within an area classified as RU1 Primary Production (see **Figure 5**). The existing quarry and proposed extension area are located on land zoned RU1 – Primary Production under Oberon LEP 2103. Extractive Industries are permissible in this zoning.



Data source: NSW Department of Planning, Industry and Environment 2021

0 0.5 1 1.5 2 km

- B2 - Local Centre
- B6 - Business Development
- IN1 - General Industrial
- R5 - Large Lot Residential
- RE1 - Public Recreation
- RE2 - Private Recreation
- RU1 - Primary Production
- RU3 - Forestry
- RU6 - Transition
- Quarry extension
- Quarry existing

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Figure 5. Zoning

The objectives of the RU1 Primary Production zone are outlined below:

- to encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- to encourage diversity in primary industry enterprises and systems appropriate for the area.
- to minimise the fragmentation and alienation of resource lands
- to minimise conflict between land uses within this zone and land uses within adjoining zones.
- to enable other forms of development associated with primary production activities, which may require an isolated location or which support tourism or recreational activities.

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

EPBC Act is administered by the Commonwealth Department of the Environment and Energy (DEE)). Approval is required by the Minister for any action that may have a significant impact on Matters of National Environmental Significance (MNES), including:

- World Heritage Properties
- National Heritage Places
- Ramsar wetlands
- Threatened species and ecological communities listed in the EPBC Act
- Migratory species
- Commonwealth land
- marine areas or reserves
- nuclear actions
- a water resource, in relation to coal seam gas development and large coal mining development.

Native Title Act 1993

The Native Title Act is administeredby the National Native Title Tribunal (NNTT). The NNTT is responsible for maintaining a register of Native Title claimants and bodies to whom Native Title rights have been granted. These Native Title holders and claimants must be consulted prior to the granting of a mining lease over land to which the native title claim or right applies.

Native Title is recognition by Australian law that indigenous people have a system of law and ownership of their lands that extends back before European settlement. Where that traditional connection to the land has been maintained and where Government legislation has not removed it, the law recognizes the persistence of Native Title.

Native Title may exist in areas such as:

- vacant Crown land

- National parks, forests and public reserves
- some types of pastoral leases
- lakes, rivers, creeks and other waters that are not privately-owned.

Environmental Planning and Assessment Act 1979

The EP&A Act is the primary legislation governing environmental planning and assessment for NSW.

The objects of the EP&A Act are:

a) to promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources

b) to facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment

c) to promote the orderly and economic use and development of land

d) to promote the delivery and maintenance of affordable housing

e) to protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats

f) to promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage)

g) to promote good design and amenity of the built environment

h) to promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants

i) to promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State

j) to provide increased opportunity for community participation in environmental planning and assessment.

Other NSW legislation to be considered for the proposed development includes:

- Environmental Planning and Assessment Regulation 2021
- *Protection of the Environment Operations Act 1997*
- *Roads Act 1993*
- *Crown Lands Management Act 2016*
- *Mining Act 1992*
- *Fisheries Management Act*

- *Water Management Act 2000* and Water Management Regulation 2018
- *National Parks and Wildlife Act 1974*
- *Wilderness Act 1987*
- *Heritage Act 1977*
- *Biosecurity Act 2015*
- *Biodiversity Conservation Act 2016Fisheries Management Act 1994*
- *Waste Avoidance and Resource Recovery Act 2001*.

Relevant NSW Environmental Planning Instruments to be considered include:

- State Environmental Planning Policy (Transport and Infrastructure) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Resources and Energy) 2021
- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Primary Production) 2021
- State Environmental Planning Policy (Biodiversity and Conservation) 2021.

3.4 Aboriginal archaeology

The area surrounding the quarry and proposed extension area was subject to previous archaeological assessment (Resource Planning, 1992) with further due diligence assessment undertaken in 2013. Recorded archaeological sites in vicinity of the quarry include two isolated artefact scatters (44-6-00600 and 44-60061) and one isolated find (44-6-0055) as shown on **Figure 6**.

The proposed extension to the extraction area has been previously disturbed by vegetation clearance, sowing with improved pasture and continued grazing.

Further archaeological assessment and consultation with registered Aboriginal groups will be undertaken as part of the preparation of the EIS.

3.5 Ecology and land use

The proposed 32.3 ha extension area is located on Racecourse Hill plateau adjacent to the existing extraction area. The area is predominantly vegetated with improved pasture that is used for cattle and sheep grazing (see **Figure 7**). There are some scattered Eucalypts located around the perimeter of the proposed extension area and a small stand of Eucalypts at the south-western end of the proposed extension area.

The land use surrounding the site is also grazing on improved pasture (see **Figure 8**). Analysis, based on the past 27 years of operations at the site, indicates that there will be no significant impact on agricultural viability of the surrounding area as a result of the extension and continued operation of the quarry.

Image source: Google Earth (2020)
Data source: Oberon Quarries Pty Ltd (2021), AHIMS (2014)

0 0.25 0.5 0.75 1 km

- Artefact scatter
- Isolated find
- Quarry extension
- Quarry existing

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Figure 6. Recorded Archaeological Sites

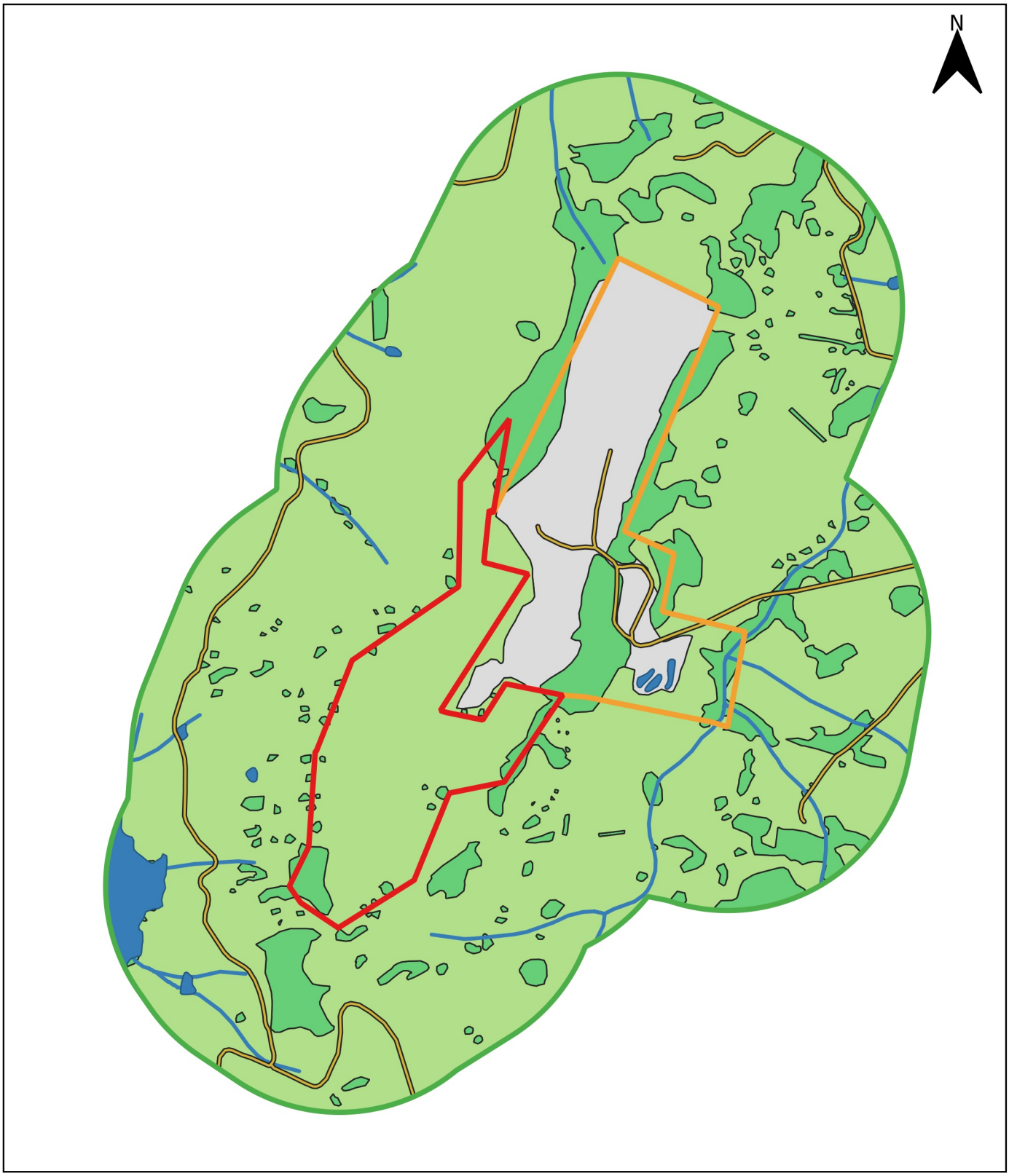

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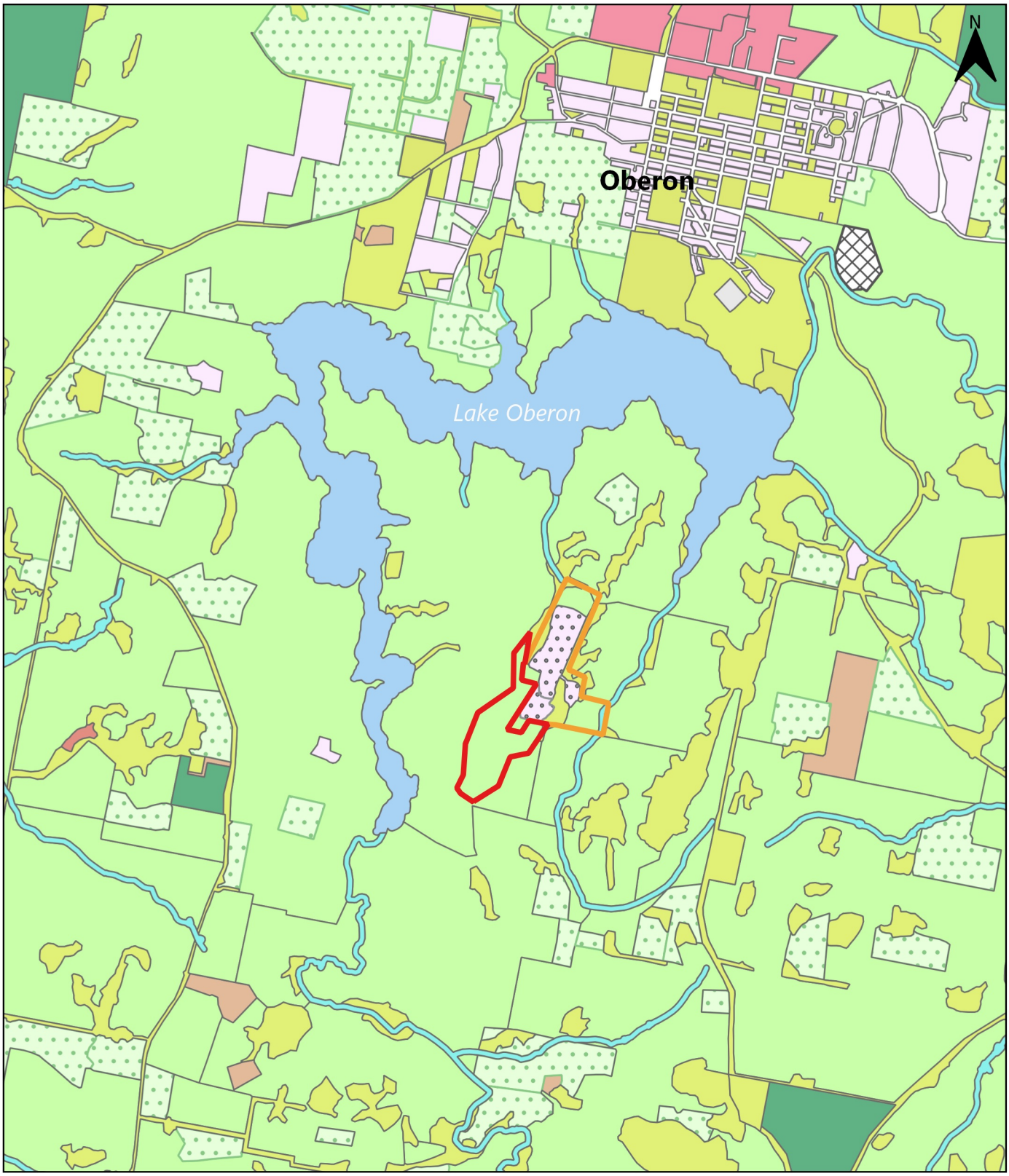
Figure 7. Ecology



Data source: NSW Department of Planning, Industry and Environment 2021

Landuse 2017 v1.2

- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 2.2.0 Production native forestry
- 3.1.0 Plantation forests
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 5.3.0 Manufacturing and industrial
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.6.0 Utilities
- 5.8.0 Mining
- 5.9.0 Waste treatment and disposal
- 6.1.0 Lake
- 6.2.0 Reservoir/dam
- 6.3.0 River
- Quarry extension
- Quarry existing

0 0.5 1 1.5 2 km

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Figure 8. Land use

The proposed extension area has been predominantly cleared of native vegetation and comprises improved grassland for grazing. Scattered eucalypt trees are located around the perimeter of the proposed extension area. Species include ribbon gum (*Eucalyptus viminalis*) and mountain gum (*Eucalyptus dalrympleana* subsp. *dalrympleana*).

In terms of the improved pasture, dominant species are cocksfoot (*Dactylis glomerata*), phalaris (*Phalaris aquatica*), prairie grass (*Bromus catharticus*), white clover (*Trifolium repens*), sorrel (Acetosella vulgaris), capeweed (*Arctotheca calendula*) and spear thistle (*Cirsium vulgare*).

Fauna species recorded on-site included striated pardalote (*Pardalotus striatus*), Australian raven (*Corvus coronoides*), Galah (*Cacatua roseicapilla*), superb fairy-wren (*Malurus cyaneus*), yellow-faced honeyeater (*Lichenostomus chrysops*), laughing kookaburra (*Dacelo novaeguineae*), crimson rosella (*Platycercus elegans*), sulphur-crested cockatoo (*Cacatua galerita*), yellow-rumped thornbill (*Acanthiza chrysorrhoa*), stubble quail (*Coturnix pectoralis*), fairy martin (*Petrochelidon ariel*) and common wombat (*Vombatus ursinus* – identified from the presence of an active burrow).

No threatened fauna species or endangered fauna populations were identified within or surrounding the proposed extension area. Given the lack of fauna habitat features present, disturbance of the proposed extension area is unlikely to significantly impact on any threatened fauna species.

No suitable habitat for threatened flora species, endangered species or threatened ecological communities (TECs) have been identified within the proposed extension area. Given the lack of suitable habitat for threatened flora species, endangered species or TECs in the proposed extension area, the proposed activities are unlikely to significantly impact on any threatened flora or fauna species, endangered species or TECs.

All other proposed activities are within existing operational areas and will not result in impacts on ecology and land use beyond those already approved under SSD_6333.

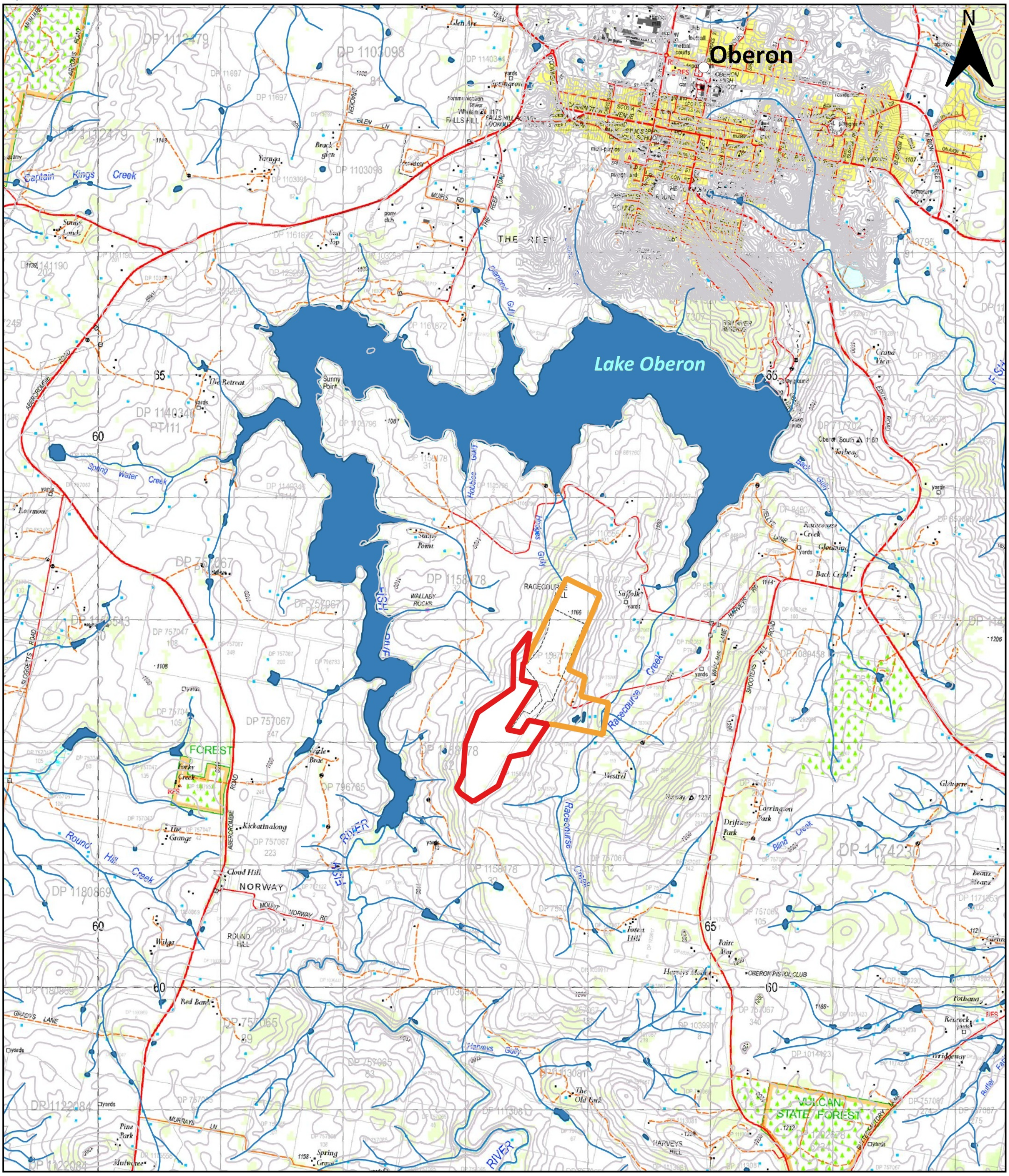
3.6 Topography and drainage

The proposed extension is located on Racecourse Hill which is a localized basalt plateau that is approximately 350 m wide and 2000 m long. The plateau has an elevation of approximately 1160 mAHD. The quarry and proposed extension are located within the catchment of Lake Oberon (see **Figure 9**).

The eastern side of the plateau drains to Racecourse Creek which has its headwaters off Shooters Hill Road approximately 2 km upstream of the proposed extension area. Racecourse Creek drains to Lake Oberon approximately 1.5 km downstream of the quarry. Runoff from the existing quarry excavation and processing area is conveyed to the quarry water management system which drains to Racecourse Creek as overland flow.

The western side of the plateau drains to Fish River arm of Lake Oberon via overland flow and intermittent drainage lines. The headwaters of Fish River are located in Vulcan State Forest near Shooters Hill and are approximately 18 km upstream of proposed the quarry extension area.

The flow path to Fish River arm of Lake Oberon varies in length from approximately 350 m at the southern end of the extraction area to 1500 m at the northern end of the extraction area. No runoff from the disturbed area of the quarry drains to the western side of Racecourse Hill.



Data source: Oberon Quarries Pty Ltd 2021

0 0.5 1 1.5 2 km

- Quarry extension
- Quarry existing
- Drainage line / stream
- Dam / water body

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Figure 9. Topography and Drainage

3.7 Surface water management

The water management system for the proposed extension area will be integrated into the quarry's existing water management system and will use the same design principles and control measures as the existing operation. This integrated system will cater for runoff from a Probable Maximum Precipitation (PMP) event through the use of a series detention basins that will be constructed on the quarry floor. Runoff from the existing and proposed excavation areas will be controlled and conveyed through the existing water management system.

The existing water management system includes:

- the entire extraction area and bunding around its perimeter
- diversion drains that have been constructed around the disturbance area and are vegetated
- catch drains adjacent to haul roads have been constructed with rock weirs and convey sediment-laden water to a series of sedimentation ponds and catch drains
- sedimentation dams on the quarry floor and immediately downstream of the processing area
- level spreaders that spread and dissipate runoff from sedimentation dams
- a 2 megalitre (ML) Storage Dam for storage of water for dust suppression and other quarry operations.

These controls are maintained in a fully functional condition and have serviced runoff from the quarry for the past 27 years.

Monitoring of Racecourse Creek downstream of the quarry over the last 27 years has shown that the quarry has been and can continue to be operated without adverse impact on water quality Racecourse Creek or Lake Oberon.

Oberon Quarries currently holds a Part 2 surface water licence under *the Water Act 1912* (80SL051088, WAL 34279) for the extraction of water from Racecourse Creek which forms part of the Fish River Water Source. Water is pumped when needed from Racecourse Creek to the quarry at a rate of 2 L/s.

3.8 Groundwater

Several small springs are located towards the base of the northern end of Racecourse Hill. These are bedded in Tertiary gravels that exist between the basalt and the underlying less pervious granitic material. Springs to the north and west of the existing quarry are located approximately 60 m below the top of Racecourse Hill at 1100 m Australian Height Datum (AHD) and are thought to be fed by water infiltrating through the Tertiary gravel sediments that occur below the basalt.

The proposed extension will not disturb the gravel layer that underlies the basalt.

It is proposed to utilise ENM and VENM material backloaded to the site as part of the final landform. This material is inert and will be tested for contaminants prior to be brought to the site as required by the requirements of Resource Recovery Order under Part 9, Clause 93 of the protection of the Environment Operations (Waste) Regulation 2014. The ENM and VENM will placed on the quarry floor above the groundwater bearing Tertiary gravel sediments and will not significantly impact on groundwater volume or groundwater quality.

Groundwater springs located around the perimeter of Racecourse Hill approximately 40 m below the base of the existing quarry floor will not be directly impacted by quarry operations.

3.9 Noise

The proposed extension to the extraction area, increase in annual production and backloading of VENM and ENM to the site will utilise the same or equivalent crushing and processing equipment and mobile plant as the existing operation and is therefore not expected to result in increases in peak noise emissions from the quarry operations.

Oberon Quarries has an agreement in regard to acceptable noise levels from crushing and processing operations with Mr Hackfath. Mr Hackfath's residence overlooks the processing plant area. Preliminary analysis indicates that the acceptable noise emission levels set out in the agreement are not expected to be exceeded as a result of proposed increases in product generation and product transport.

Extraction operations within the proposed extension area will be at the closest approximately 1.2 km from the nearest residence (Nestlebrae) and are not predicted to have a significant impact on the noise amenity at this location or any other residence surrounding the quarry.

Detailed noise modelling and assessment will be completed once the details of the proposed extension to operations have been fully scoped.

Oberon Quarries is committed to working to reduce noise impacts from its operations where practically possible and will work with surrounding neighbours in the implementation of mitigation and management measures to achieve this.

3.10 Blasting

It is proposed that within the existing approved area Oberon Quarries' blasting operations will continue to be undertaken using the two-bench system that has been utilised at the quarry since operations commenced in 1995.

Within the proposed extension area, it is proposed that blasting will be undertake using a single bench system with drill holes and blasting extending the full depth of the basalt resources (14 m to 16 m). This will reduce the number of blasts required and enable greater blending of the two layers of basalt that exist, reducing the amount of product mixing and blending required to generate consistent quarry products. This will also enhance the ability to rehabilitate areas progressively compared to the two-bench system that is currently used.

Oberon Quarries has developed and had approved a Blasting Management Plan for the control of site blasting operations. The plan has been developed based on the results of previous blast designs and blasting performance at quarry. In the past blasting has been successfully undertaken within 400 m of the nearest residence. Over the last 27 years of operation no adverse blasting impacts have been reported by any surrounding resident.

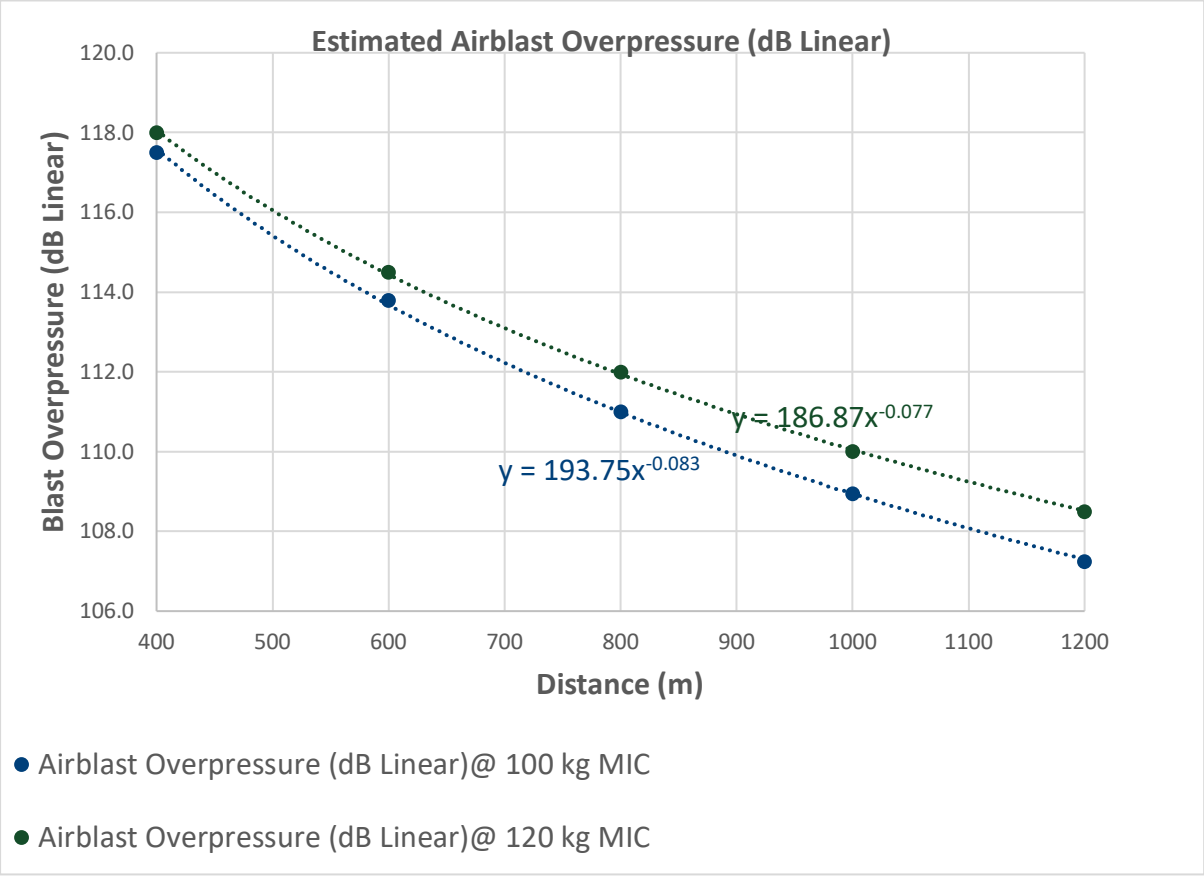
There have been a couple of occasions in the past where blast overpressure has exceeded 115 dB Linear at the nearest residence to the northern end of the quarry. Oberon Quarries has a blasting agreement with the affected landholder. The blast overpressure resulted from drill holes being placed too close to the rock face in fractured material which triggered elevated levels of blast overpressure being recorded at a residence 400 m from the blast. In accordance with the quarry's Blast Management Plan, controls have been put in place to ensure this does not happen in the future.

Blasting activities with the proposed extension area will be in excess of 1.2 km from the nearest non-quarry related residence. Analysis of past blasting activities at the quarry demonstrates that blasting can be readily undertaken with no exceedances of overpressure or vibration limits at this distance. As discussed, in the extension area drilling and blasting will be undertaken to depth of 14 m to 16 m fracturing the rock as one bench (i.e. the full extent of the basalt resource).

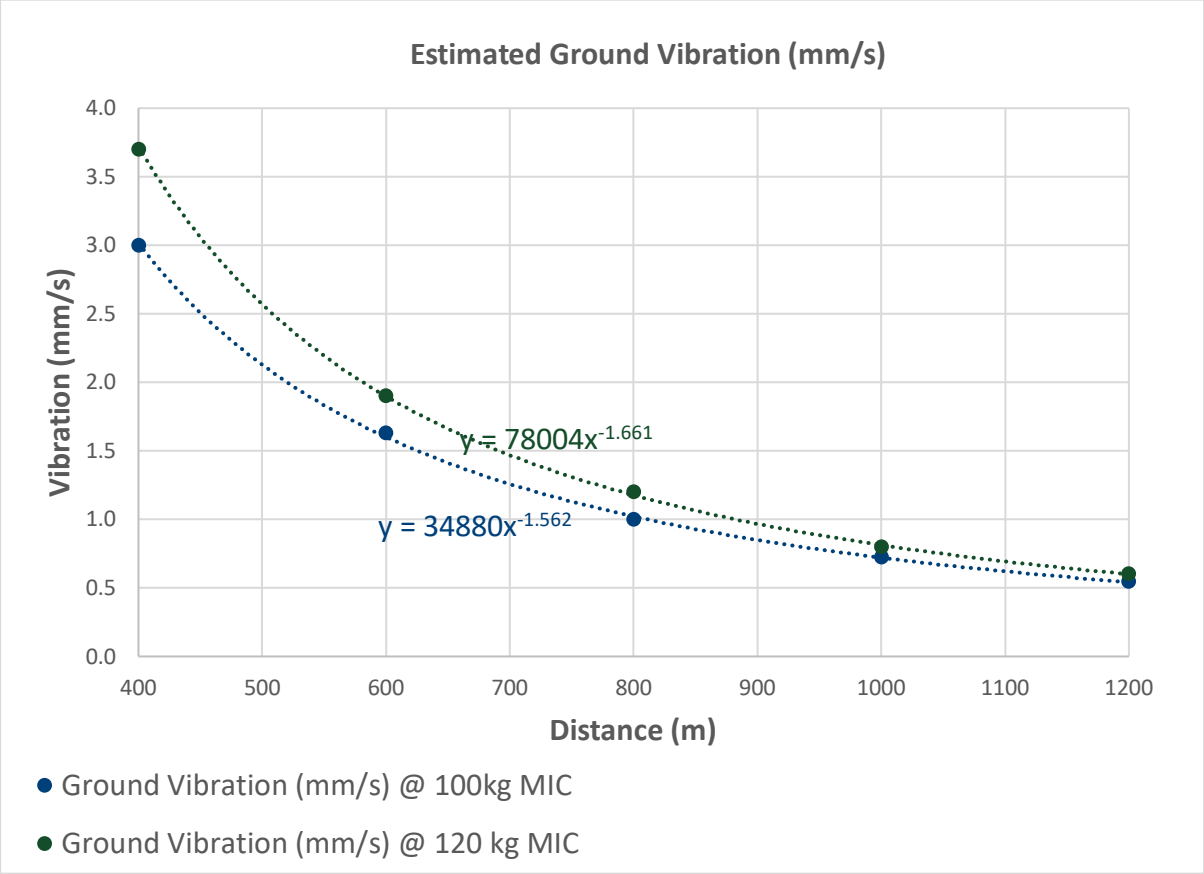
Oberon Quarries uses 89 mm diameter drill holes which are filled with explosive to within 2 m to 2.5 m of the surface. The upper 2 m to 2.5 m of the drill hole is then filled with stemming material to minimise fly rock and prevent excessive blasting impacts. The explosive used weighs approximately 7.47 kg per m length of drill hole. For a maximum hole depth of 16 m, explosive will be placed in the bottom approximately 14 m requiring approximately 105 kg of explosive which is the Maximum Instantaneous Charge (MIC) for that hole.

Blast Management Plan sets the maximum number of holes per blast at 150. A Nonel delay system is used to control how many holes are detonated instantaneously thus controlling the MIC.

As shown in **Graph 1** and **Graph 2**, Site Laws developed for Oberon Quarry indicate that for a MIC of 120 kg at a distance of 1.2 km (i.e. the closest residence to the proposed extension area), blast overpressure of approximately 108.5 dB Linear and a ground vibration of 0.6 mm/s are predicted. This indicates that blasting with a MIC of 105 kg required to blast the full bench height in one go can readily be undertaken within acceptable blasting limits (i.e. 115 dB Linear for blast overpressure and 5 mm/s for ground vibration).



Graph 1 Estimated Airblast Overpressure based on Oberon Quarries site laws



Graph 2 Estimated ground vibration

It is proposed that consistent with current operations, approximately 40,000 tonnes of material will be generated per blast will be generated where blasting is undertaken in two benches. This will increase to 70,000 tonnes per blast where blasting of the full depth of resource is undertaken.

MIC used at the site will be limited to 120 kg or less and the maximum number of drill holes per blast will be limited to 150 or less. It is estimated that to meet the proposed increase in production from 400,000 tpa to 950,000 tpa, the number of blasts will increase from approximately 10 times per year to approximately 12 times per year.

Drill hole spacing and Maximum Instantaneous Charge will vary depending on the size of the quarry product to be generated (i.e. closer spacing for smaller rock aggregates and larger spacing for gabion and rip rap material).

There are no proposed changes to currently approved blasting times which are between 9 am to 5 pm Monday to Saturday.

Oberon Quarries will continue to manage its blasting impacts through ongoing monitoring and review of the blast design, so that the overpressure and vibration criteria are not exceeded at private residences unless previously agreed with the resident.

With the ongoing adoption of appropriate controls and checks, no adverse impacts from blasting are predicted to occur on residences, property or stock as a result of the proposed Project.

3.11 Air quality

Modelling and monitoring of current quarry operations indicates that the quarry has been successfully operating without adversely impacting on air quality in the surrounding area.

The proposed expansion of quarry operations has the potential to increase air quality impacts through:

- increased rate of extraction, blasting and transportation of raw material
- increased crushing, process loading and dispatch of quarry product
- increased area of disturbance with the addition of the proposed extraction
- increased dust generation through the proposed backloading and emplacement on the quarry floor of ENM and VENM.

Further Air Quality Impact Assessment will be undertaken once the proposed extension to operations has been fully scoped.

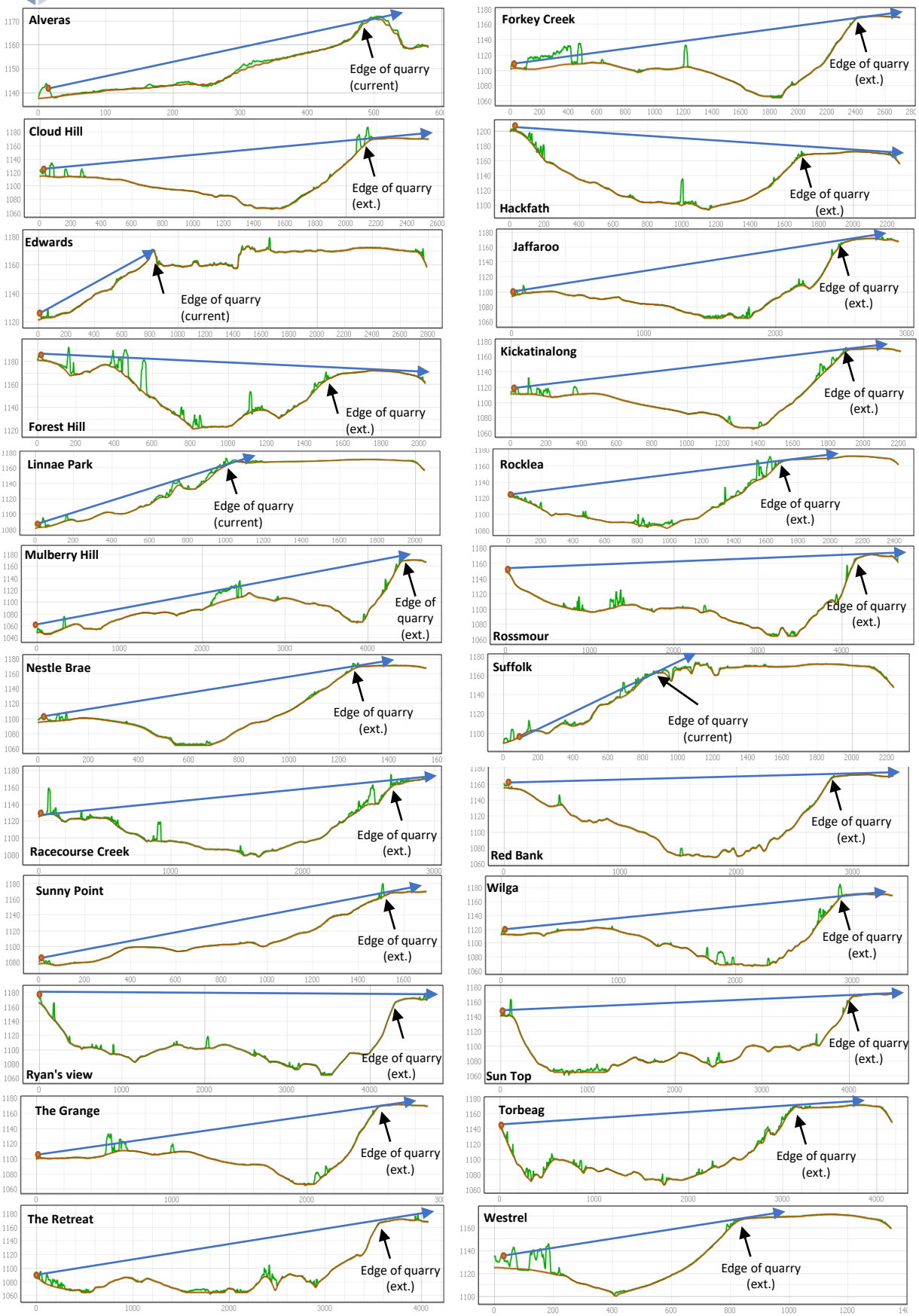
Matters to be taken into consideration in preparation of the EIS include:

- incremental change over a 30-year period
- potential impacts on Lake Oberon
- progressive rehabilitation from north to south that will ensure that there is no significant increase in dust generation potential from quarry operations
- landholder agreements
- outcomes from stakeholder consultation.

Oberon Quarries will continue to research and implement air quality mitigation and management measures to reduce as far as practical potential dust and air quality impacts from the proposed extension to quarry operations.

3.12 Visual amenity

A detailed visual assessment of proposed extension from the surrounding residences as shown on **Figure 3** has been undertaken using 3D terrain and vegetation information derived from aerial LiDAR and aerial imagery (see **Figure 10**).



Data source: Ground: ELVIS 2013 LiDAR

Notes: Y axis is elevation (m), X axis is distance (m)

Figure 10. Visual Transects

As shown in **Figure 10**, the assessment demonstrates that the proposed extension of quarry extraction operations will continue to be shielded from surrounding vantage points by intervening terrain (i.e. the undisturbed outer rim of Racecourse Hill) with the exception of the Hackfath property (see **Figure 3**) which will have limited views of upper level operations with quarry.

Limited operations such as the construction of topsoil and overburden bunds around the perimeter of the proposed extension area and operation of the drill rig may be visible from some locations. These locations are all distant from the quarry.

Analysis indicates that the proposed extension to quarry operations will have negligible impact on the visual amenity of the surrounding area.

3.13 Traffic and transport

To accommodate product delivery from the quarry of up to 950,000 tpa, Oberon Quarries is seeking to increase the maximum daily tonnage of product that can be delivered from 3000 tonnes/day to 6000 tonnes/day.

Since 1995 when the quarry commenced commercial operations the legal maximum payload was 29 tonnes. In 2022 the legal maximum payload has increased to 68 tonnes. It is estimated that initially average payload for trucks leaving the quarry will be approximately 35 tonnes with this increasing to approximately 55 tonnes over the next decade.

Analysis indicates that the peak number of trips will increase from 104 trips per day (3000 tonnes/day with an average payload of 29 tonnes) to approximately 172 trips per day (6000 tones/day with an average payload of 35 tonnes). Increases in payload over time to an average of 55 tonnes per load will decrease peak truck movements from 172 trips per day to 109 trips per day similar to current peak levels.

It is estimated that it this level of product transport there will be on average approximately 91 trucks/day or approximately 8 trucks per hour assuming product transport occurs 11 hours per day, 300 days per year.

At peak transport of 6000 tonnes per day, peak hourly truck movements from the quarry will be up to approximately 15 laden trucks per hour.

Preliminary analysis of the road system indicates that the intersections at Shooters Hill Road/ Edith Road, Edith Road/Titania Road, Titania Road/Duckmaloi Road that were previously upgraded by Oberon Quarries have adequate capacity to accommodate the proposed increase in truck movements without adversely impacting on traffic congestion, flow capacity or sight distance.

Proposed backloading of ENM and VENM to the quarry will not increase truck movements, only the utilisation of trucks used to transport quarry products increasing the overall efficiency of trucking operations.

It is envisaged that up to 500,000 tpa of ENM and VENM may be backloaded to the site using the same trucks that will be taking quarry product from the site.

Oberon Quarries will continue to pay Oberon Council a tonnage-based road maintenance contribution to help maintain the public roads used by the quarry. The contribution is a flat fee which in 2022 was $0.49/tonne of product delivered from the quarry. The contribution is indexed to CPI annually.

3.14 Rehabilitation and final land use

The land occupied by the quarry extraction area will be reshaped to be free draining and revegetated with improved pasture, native shrubs and native tree species consistent with that of the surrounding area.

The rim of the quarry will be maintained at its pre-quarrying elevation. The ultimate shape of the landform within the rim of the quarry will be determined by the amount of ENM and VENM that is backloaded to the site which could be up to 10-15 Mt over 30 years.

The final landform if ENM and VENM is not backloaded to the site will be consistent with that approved under SSD_6333 and will be created by placing and shaping overburden material that is stockpiled around the quarry rim on to the excavated floor of the quarry so that it is free draining as approved under SSD_6333. The excavated quarry face will be benched to provide maximum bench heights of less than 10 m. Topsoil will be placed on the benches and the quarry floor and then vegetated to establish a stable landform.

Any ENM and VENM backloaded to the site will be placed on the excavated quarry floor. Once the final backfilling height has been reached, the backfilled material will be covered with approximately 0.5 m of basalt derived overburden, interburden and topsoil that has and will continue to be stockpiled around the rim of the quarry over the life of quarry operations. The placement of 0.5 m of material over approximately 58 ha of disturbed area (including processing area) as part of rehabilitation will require the placement of approximately 300,000 m^3 (500,000 tonnes) of overburden, interburden and topsoil.

The rehabilitated quarry floor will then be seeded with improved pasture in accordance with the landowner requirements. Woodlots of native trees and shrubs will be established to provide shelter for stock and habitat for native fauna. Benches will be planted with native trees.

The final landform will be shaped to be free-draining and will be generally suitable for grazing and other productive uses.

Progressive construction and shaping of the final landform will be undertaken once the extraction of the basalt resource has been completed within sections of the quarry pit and as space on the pit floor allows.

As the lower bench in the existing extraction area still needs to be extracted to a sufficient extent to enable rehabilitation of the benches and quarry floor to be undertaken, it is envisaged that it will be approximately 5 years before any significant rehabilitation works can be undertaken in an efficient manner. Once the resource is extracted, the rate of rehabilitation will be enhanced by the emplacement of ENM and VENM at the site. During this time, disturbed areas will be within the perimeter of Racecourse Hill. This will assist in shielding the disturbed areas from prevailing winds and will ensure that runoff continues to drain to the quarry water management system.

As there is in excess of 20 Mt of hard rock resource remaining within the currently approved and proposed extraction areas, decommissioning of the processing plant and reshaping of the processing area is not expected to occur for approximately 30 years (i.e. 2053). Decommissioning will be planned and conducted in an appropriate manner. Where possible, and as agreed by the landholders, dams and roads will not be decommissioned.

The existing and proposed extraction areas will in total occupy approximately 55 ha with the processing area and water management dams occupying another approximately 3 ha of land that in 30 years could be used for a range of other land uses.

A range of alternate or additional contemporary land uses will be considered as part of final landform planning of the site. This planning will be undertaken 3 to 4 years prior to the planned closure of the site.

3.15 Greenhouse gas and energy

An assessment of energy usage and greenhouse gas emissions has been undertaken and methods of either minimizing energy usage or optimising the return on energy used in generating products have been identified. These include:

- Implementing approved changes to the crushing equipment to reduce the proportion of the total quarry product that is 5 mm minus material. It is estimated that these changes will reduce the amount of 5 mm minus material that is produced from approximately 15% - 20% to approximately 10% -15% of the total quarry product.

- Developing alternative uses and markets for 5 mm minus and scalping material. It is estimated that there is in excess of 1 Mt of 5 mm minus and scalping material stockpiled on the quarry floor. A significant amount of energy in the form of diesel, electricity and person hours has been used in generating this material. The benefit and return from this energy and resource usage has not yet been realised. The sale of 5 mm minus and scalping derived products will utilise this material and realize a substantial return on the energy already used. This will significantly improve the overall efficiency of quarry operations through additional product sales and through reducing the amount of double and triple handling that occurs in managing this material.

- Backloading of ENM and VENM to the quarry as proposed will result in higher utilisation of the void that has been created by extraction operations and greater return per truck kilometre travelled as a result of the trucks carrying a payload in both directions.

- The annual direct and indirect emissions of greenhouse gas from the ongoing operations at the quarry if not offset, is estimated to equate to approximately 0.000015 per cent of annual global greenhouse gas emissions (based on its projected Scope 1 emissions).

- Modelling (Goll et. al. ('Potential CO2 removal from enhanced weathering by ecosystem response to powdered rock' Nature Geoscience https://doi.org/10.1038/S4156-021-00708-x) indicates that the application of basalt rock dust as a soil ameliorant at a rate of 5 kg/m^2 has the ability, for every 1 tonne of basalt rock dust applied, to remove from the atmosphere 9 kg of CO_{2e} per year for the next 50 years. This equates to Carbon Dioxide Removal (CDR) of approximately 450 kg of CO_{2e} over a 50 year period per tonne of applied basalt rock dust.

- Over the next 28 years, it is estimated based on maximum production of 950,000 tpa of quarry products, that quarry operations will generate from all emission sources, approximately 234,000 tpa of CO_{2e}.

- Analysis indicates that the projected GHG emission of 234,000 tpa of CO_{2e} could be offset by the land application of on average 22,500 tpa of basalt rock dust. This equates to approximately 2% of annual maximum production of 950,000 tpa.

- Estimates indicate that fully offsetting the quarry's Greenhouse Gas emissions could be achieved by land application or basalt rock dust on 450 ha of land at an application rate of 50 tonnes per ha (5 kg/m^2).

Further measures to reduce Greenhouse Gas Emissions are being explored and additional modelling will be undertaken during preparation of the EIS.

Oberon Quarries recognises the global importance of reducing GHG emissions and in addition to the measures identified above, will continue to explore methods of improving energy usage efficiency and reducing greenhouse gas emissions from its ongoing operations.

3.16 Socio-economic

The generation of high-quality basalt products from Oberon Quarries has a significant benefit in terms of the broader economy through its importance to major infrastructure projects such as roads, rail, airports and the building industry.

This also supports the local economy through the supply of rock products for road, building and other construction activities in the region. The existing quarry is also a valuable source of employment through the provision of 35 jobs at the quarry and 10 jobs for truck drivers, as well as associated indirect jobs and regular engagement of local service contractors.

The proposed extension to the extraction area, increase in production to a maximum of 950,000 tpa and backloading of up to 500,000 tpa of ENM and VENM will increase the number of people directly employed to approximately 60 people plus associated indirect jobs and ongoing opportunities for contractors and others providing services to the quarry.

The proposed extension is not expected to place any significant additional demand on social infrastructure or result in any significant adverse changes to the potential socio-economic impacts of the quarry.

Consultation with surrounding landholders indicates that quarry operations are not adversely impacting on land use or amenity of the surrounding area. There are no anticipated significant increases to impacts on any neighbouring land uses, including agricultural activities, as a result of the Project.

4.0 Project Alternatives and Justification

4.1 Alternatives

A range of alternatives to the proposed project have been explored. Analysis of these alternatives has indicated that they are not the currently preferred options. The alternatives considered and the reasons they are not considered the preferred options are set out below:

1. Not proceeding with the proposed extension

The quarry has been operating for 27 years over which time there has been significant investment in resources and effort expended in setting up the quarry and establishing the environmental management controls for the quarry.

Access to an additional approximately 12.6 Mt of high-quality basalt resource in the proposed extension area will enable the ongoing use of the infrastructure and environmental control measures that have been put in place with minimal additional resources and effort required to achieve this. Operation of the quarry over the last 27 years has demonstrated that the quarry can be operated without significant adverse environmental impact.

Not proceeding with the proposed extension will result in the significant under-utilisation of the production capacity of the existing infrastructure and the energy and resources that have already been expended in establishing this infrastructure.

From an efficiency perspective, continued utilisation of the existing infrastructure means that the amount of overall energy and resources required to generate quarry products in the future and greenhouse gas generated will be substantially less than if the quarry products were to be generated from a greenfield site.

The quality and structure of the basalt varies laterally within the quarry and vertically across the two layers of the deposit. Extension of the quarry as proposed will provide greater flexibility to generate and blend quarry products through:

- being able to extract from various locations in the quarry at the same time
- blasting the two basalt layers as one bench providing greater mixing of the fractured basalt.

It is considered that access to an additional 12.6 Mt of high-quality basalt combined with the significant operational, efficiency and product quality benefits that will be achieved through accessing the proposed extension area warrant proceeding with the proposed extension.

2. Not increasing maximum production and product transport levels above 400,000 tpa

Oberon Quarries could continue to operate the quarry at a maximum production level of 400,000 tpa. Demand for existing products (i.e. gabion, concrete and sealing aggregate and road base) from the quarry has been steadily increasing and is projected to go beyond 400,000 tpa in the next few years. The existing crushing and processing facilities have the capacity to generate approximately 600,000 tpa of existing products.

Oberon Quarries is exploring the generation of a new range of quarry products that have the potential to utilise the 5 mm minus and scalping material that is generated as part of producing existing products. This material makes up about 30% of the total material that is crushed and processed on the site. At a production level of 600,000 tpa of existing products, an additional 250,000 tpa of 5 mm minus and scalpings will be produced. In addition to this there is approximately 1 Mt of 5 mm minus and scalpings material stockpiled on the quarry floor.

Taking the continued increase in demand for existing quarry products, current capacity of the existing crushing and processing facilities and the potential new products generated from of 5 mm minus and scalpings material into account, Oberon Quarries envisage that annual demand could increase to a maximum of 950,000 tpa.

Preliminary analysis of the road system indicates that the intersections at Shooters Hill Road/ Edith Road, Edith Road/Titania Road, Titania Road/Duckmaloi Road that were previously upgraded by Oberon Quarries have adequate capacity to accommodate the proposed increase in truck movements without adversely impacting on traffic congestion, flow capacity or sight distance.

On this basis, it is considered warranted to seek an increase in annual production from 400,000 tpa to 950,000 tpa.

3. Establishing additional crushing and processing plant within the existing quarry extraction area

Oberon Quarries has explored the potential to establish additional fixed crushing and processing facilities within the extraction area. This was originally proposed and approved as part of the 1993 consent (DA 92/164). This alternative has been not considered further due to the following:

- significant cost and disruption to quarry operations of establishing and commissioning the new facilities particularly when the existing plant has sufficient spare capacity
- potential impact of ongoing blasting operations on the safety of those operating crushing and processing facilities if the facilities were located on the quarry floor
- potential impact on ability to progressively rehabilitate the quarry given the space that would be required for the processing plant and associated facilities and the proposal to backload ENM and VENM to the site.

4. Not backloading ENM and VENM to the site

Oberon Quarries has to date not backloaded ENM and VENM to the site. Not backloading ENM and VENM in the future would make rehabilitation of the site simpler but would result in the landform being shaped around approximately a 20 M m^3 void within the rim of Racecourse Hill.

Through the extraction of basalt in generating high quality quarry products, significant resources have been expended in creating this void. This void could be used for the controlled and managed emplacement of ENM and VENM generated from major construction projects such as the upgrade of Great Western Highway and other major development within the Greater Sydney area.

ENM and VENM from these projects could be efficiently backloaded to the quarry and emplaced in a well contained and controlled void space enhancing the usability of the final landform of the quarry. It is estimated that up to 500,000 tpa of material could be backloaded to the site.

On this basis it is considered warranted to proceed exploring the potential to backload ENM and VENM to the site.

5. **Not exploring the utilisation of basalt rock dust for Carbon Dioxide Removal and as a soil ameliorant**

Based on research undertaken to date, there are significant potential benefits in terms of CDR and soil improvement that can be achieved through the application of basalt rock dust.

It is considered that these potential benefits warrant exploring the use of basalt rock dust generated from 5 mm minus and scalping material further.

6. **Installing solar power generation capacity to offset the quarry's mains power usage**

Initial analysis indicates that topography and cloud characteristics of the Oberon Quarry site are likely to impact on the reliability and efficiency of the solar generation potential of the site impacting on the viability of establishing sufficient solar capacity to offset or reduce mains electricity usage at the site.

Further analysis of this will be undertaken as part of the proposed development.

4.2 Justification of the Project

Over the last 27 years, Oberon Quarries has established and developed a highly valuable basalt resource that is relied upon by industries across the local area, central west and Greater Sydney.

The broad range of quarry products generated at Oberon Quarries are of the highest quality and are sought after across Sydney, Blue Mountains and the central west with the quarry having provided product to the following developments:

- Western Sydney Airport
    - Runways
    - M12 Connector
    - Terminal
    - Interconnecting hubs and industrial estates
- Central West – Power grid upgrade
- Western Sydney Concrete markets
- Central West Asphalts.
- Oberon Dam
- Sydney Harbour Bridge.

Limiting the supply of high-quality hard rock quarry products from Oberon Quarries' operations would further impose increased price pressures on the supply of quarry products to the Sydney, Blue Mountains, central west and local hard rock markets.

The proposed extension to the extraction area will provide access to an additional 12.6 Mt of high-quality basalt resource to service these markets.

Increased production, modifications to blasting, generation of new products and greater utilisation of 5 mm minus and scalping material combined with the ability to backload ENM and VENM to the site will

all contribute to increasing the efficiency of quarry operations providing greater yield and benefit per unit of energy used and per tonne of Greenhouse Gas generated.

Utilisation of basalt rock dust to assist in CDR has the potential to provide a significant offset of the Greenhouse Gas generated by quarry operations with initial analysis indicating that Level 1 emissions from the quarry could be offset by the application of basalt rock dust to approximately 450 ha of land per year of operation.

In addition to CDR capacity, application of basalt rock dust has been demonstrated to provide significant improvements in soil fertility and moisture holding capacity.

The proposed extension to the extraction area, increase in production to a maximum of 950,000 tpa and backloading of up to 500,000 tpa of ENM and VENM will increase the number of people directly employed to approximately 60 people plus associated indirect jobs and ongoing opportunities for contractors and others providing services to the quarry. This generates significant socio-economic stimulus for the Oberon area.

The proposed extension is not expected to place any significant additional demand on social infrastructure or result in any significant adverse changes to the potential socio-economic impacts of the quarry.

If approval for the proposed Project is not granted, the opportunity to extract and supply an additional 12.6 Mt of high-quality basalt resource from this site to markets in Central Tablelands, Bathurst, Blue Mountains and Sydney areas will be foregone as will the ability to continue to utilise a fully established and environmentally sustainable quarry operation that will provide ongoing direct employment for up to 60 people as the quarry reaches maximum production levels.

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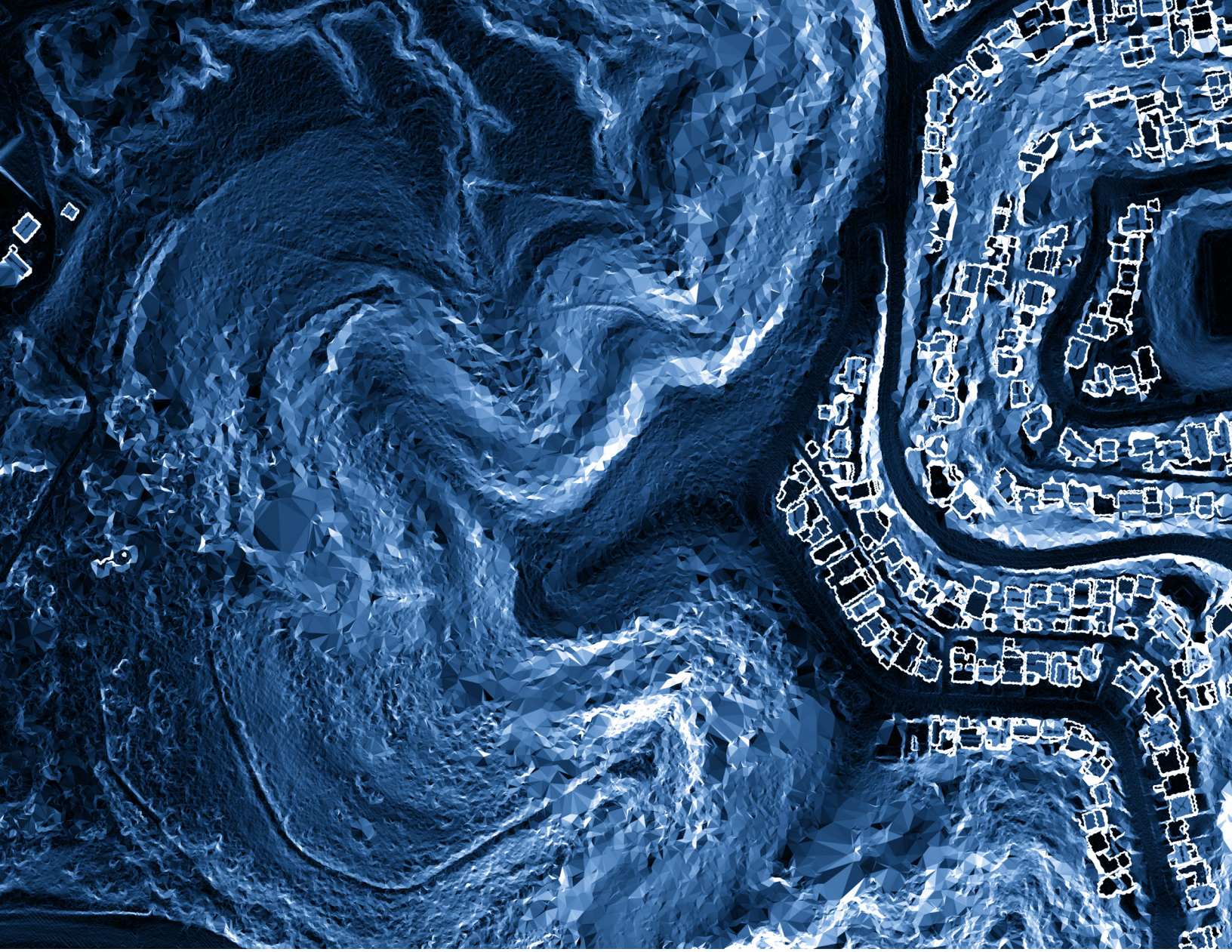
Appendix A – Scoping Summary Table

Level of assessment	Matter	Relevant Aspects to Consider	Scoping report reference
Consultation with proponent, Feasibility assessment	Proposed Development	• Continued utilisation of existing plant, equipment and infrastructure • Extension to extraction area • Increased production and delivery • Greater utilisation of material generated on-site • Backloading of ENM and VENM • Duration of quarry operations	Sections 2.1, 2.2, 2.3 and 2.4
Field exploration and analysis	Hard rock resource	• Exploration drilling extent and depth • Basalt quality and variability • Resource estimates	Section 2.1
Desktop review, Community, Agency and Council engagement	Community	• Government Agency and Council requirements • Amenity impact on surrounding landholders • Social impact on surrounding community	Section 3.2
Desktop review	Planning Context	• State Significant Development • Commonwealth EPBC Act • Commonwealth Native Title Act • State Planning Legislation • State Planning Policies and Guidelines • Other relevant Guidelines	Section 3.3
Desktop review, field assessment and consultation	Heritage	• Aboriginal party consultation • Due Diligence assessment	Section 3.4
	Ecology and Land Use	• Removal of scattered native trees on perimeter of proposed excavation area • Native vegetation incorporation in final landform • Biodiversity offsets	Section 3.5

Level of assessment	Matter	Relevant Aspects to Consider	Scoping report reference
Desktop review, consultation, field assessment and detailed modelling	Surface and Groundwater	• Potential for water quality impacts on Lake Oberon • Incorporation of extension area into existing water management system • Water demand to support increased production • Groundwater in Tertiary gravels below basalt layers to be extracted	Sections 3.6, 3.7 and 3.8
	Noise and blasting	• Proximity of residences to proposed extraction area • Increased blast size and frequency • Increased processing • Increased product transport noise and impacts on surrounding residences • Backloading of ENM and VENM • Increased hours of operation	Sections 3.9 & 3.10
	Air Quality	• Increased disturbance area • Increased blast size and frequency • Increased production capacity • Emplacement of ENM and VENM	Section 3.11
	Visual Amenity	• Location of surrounding residences • Viewshed, line of sight and visual screening • Visual impact and mitigation measures	Section 3.12
	Traffic and Transport	• Increased truck movements • Capacity of road network • Impact on roads and road maintenance contribution	Section 3.13
	Rehabilitation and Final Land Use	• Importation of ENM and VENM • Progressive rehabilitation • Final land use options	Section 3.14

Level of assessment	Matter	Relevant Aspects to Consider	Scoping report reference
	Greenhouse Gas and Energy	• GHG emissions • Improved energy efficiency • Negative Emissions Technology (NET) & Carbon Dioxide Removal (CDR)	Section 3.15
	Socio-Economic	• Employment generation for skills that already exist in the area • Limited additional demand on social infrastructure • Predicted low impact of quarry operations on surrounding landholders with opportunity to enhance soil fertility and grazing productivity through land application of basalt rock dust • Continued and increased supply of high-quality quarry products assisting in assuring supply for major infrastructure development such as Western Sydney Aerotropolis and in stabilising quarry product prices • Potential to assist in reducing net carbon emissions of quarry operations through application of basalt rock dust	Section 3.16
Desktop Review	Alternatives	• Not accessing adjoining additional 12.6 Mt of high-quality basalt resource utilising existing plant and equipment • Not increasing production to capacity of existing plant and equipment • Not increase transport and delivery capacity into a major project market where supply is limited • Building additional crushing and processing plant on quarry floor as originally proposed in 1993 EIS. • Not backloading ENM and VENM to the site • Not exploring potential benefits of land application of basalt rock dust • Exploring greater utilisation of solar power	Section 4.1

Level of assessment	Matter	Relevant Aspects to Consider	Scoping report reference
Desktop review, Field survey and field trials	Project Justification	• Continued employment for existing employees and contractors with the creation of up to an additional 25 full time jobs and additional opportunities for contractors and other related providers • Increased supply of high-quality basalt products for use in construction, infrastructure and major projects • Access to an additional 12.6 Mt of high-quality basalt resource that can be processed efficiently using existing equipment and infrastructure • Improved efficiency of operations through greater utilisation of 5 mm minus and scalpings material that has already undergone a high degree of crushing and processing with little additional energy required to convert this to saleable product • Potential to Negative Emission Technology to contribute to Carbon Dioxide Reduction through the land application of basalt rock dust.	Section 4.2



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