7. Environmental Assessment

7.1 Overview

The identification and prioritisation of environmental issues associated with the proposed Gulgong Quarry Project has enabled the impact assessment contained in the EIS to focus on key impacts and environmental mitigation strategies. Details of all quarry mitigation measures are contained in Sections 3, 4 and 7 of the EIS report and comprise a fundamental part of the quarry development proposed: *per* the decision of Preston CJ in *Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Limited* [2010] NSWLEC 48 at [83]. They are to be be read in conjunction with the following assessment.

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation 2021) form the statutory framework for planning approval and environmental assessment in NSW. The identification of approval pathways and assessment requirements are set out in environmental planning instruments (EPIs) that may be made under Division 3.3 (State environmental planning policies) or Division 3.4 (local environmental plans) of the EP&A Act.

7.1.1 Compliance with Section 4.15 of EP&A Act

Section s 4.15(1)(a) of the EP&A Act mandates consideration of those planning instruments that 'apply to the land to which the development application relates'. The engagement of a particular planning instrument will often be a matter that goes to any consent authority's power to determine a development application, however, it is ultimately up to the consent authority to determine what planning instrument is engaged for any particular DA: *Ross v Lane* [2022] NSWCA 235. Where the finding of a particular fact engages the power to determine a DA, that fact is often called a "jurisdictional fact", considered further in the following.

Section 4.15(1) of the EP&A Act applies to the determination of this development application. It requires an assessment of the impact of various planning and environmental issues engaged for consideration by s 4.15. In this regard Section 4.15(1) provides:

> *"(1) In determining a development application, a consent authority is to take into consideration such of the following matters as are of relevance to the development the subject of the development application:*
>
> *(a) the provisions of:*
>
> *(i) any environmental planning instrument, and*
>
> *(ii) any proposed instrument that is or has been the subject of public consultation under this Act and that has been notified to the consent authority (unless the Planning Secretary has notified the consent authority that the making of the proposed instrument has been deferred indefinitely or has not been approved), and*
>
> *(iii) any development control plan, and*
>
> *(iiia) any planning agreement that has been entered into under section 7.4, or any draft planning agreement that a developer has offered to enter into under section 7.4, and*
>
> *(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),*
>
> *(v) Repealed*
>
> *that apply to the land to which the development application relates,*
>
> *(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,*
>
> *(c) the suitability of the site for the development,*
>
> *(d) any submissions made in accordance with this Act or the regulations,*
>
> *(e) the public interest."*

A summary of the overall compliance of the quarry development with the preceding s.4.15 matters for consideration is set out in the accompanying Table 7.1.

Table 7.1: Compliance of Gulgong Quarry Project with Relevant Section 4.15 Matters (Summary)

Relevant matters for consideration s.4.15	Compliance of Proposed Quarry Development
(a)(i) The provisions of: Any environmental planning instrument	*The quarry development is permitted by Mid Western Regional Local Environmental Plan (LEP) 2012 and is also permissible with consent under State Environmental Planning Policy (Resources and Energy) 2021. It also complies with the provisions of applicable SEPPs. Refer Section 5.2 and Sections 7.1-7.3 of this EIS for details.*
(a)(iii) Any development control plan	*The proposed development is generally consistent with the Mid Western Regional Development Control Plan. [NOTE: There are no provisions within this DCP that specifically apply to extractive industries.] Refer Section 5.2.2 for details.*
(a)(iv) The regulations	*The details required to accompany this development application under s.24 of the EP&A Regulation 2021 are contained in this EIS report, accompanying specialist reports, and application form.*
(b) Likely impacts	▸ *The Project optimises the quarry operation and enables full economic recovery of the quarry resource, enabling the servicing of roads and infrastructure projects and providing employment for workers -positive social and economic impacts.* ▸ *The quarry management and mitigation measures proposed will minimise impacts on neighbouring receivers, in particular in terms of noise, air quality and visual impact.* ▸ *The truck numbers/volumes proposed can be satisfactorily accommodated by the internal quarry haul route, the (upgraded) highway intersection, and Castlereagh Highway.* ▸ *There will be no likely adverse impacts on the environment or agriculture. Almost all of the proposed quarry site has stony, shallow soils with limited agricultural suitability.* ▸ *The land here is cleared, with no ecological or habitat significance.* ▸ *The site of the proposed quarry has not been identified as containing any significance in terms of Aboriginal or European heritage values.* ▸ *With the exception of the nearest residence to the north-west, the quarry will not be visible from any nearby residences with fleeting views from a short stretch of the Castlereagh Highway. Visual impacts are considered to be Nil to Low.* ▸ *Stormwater flows can be satisfactorily accommodated with the quarry footprint. All drainage from within the active quarry area will be directed to the sediment basin system, to be then re-used for dust suppression and processing of quarry rock.* ▸ *Acceptable air quality impacts are predicted. A raft of dust abatement measures are to be implemented on site.* ▸ *Acceptable noise and blasting impacts are predicted. Noise levels generated by the quarry or by quarry traffic will comply with the relevant noise criteria.*
(c) Suitability of the site	*The Project Site has been used in the past by landowners and the local council as a borrow pit for extractive purposes. The site is suitable for continued quarrying activities. The land the subject of the proposed quarry development is mostly cleared and disturbed land. The project site is well removed from residential areas in a relatively remote rural location. It has safe and adequate access arrangements.*
(e) Public interest	▸ *The Project is considered to be in the public interest as it has positive social and economic outcomes, and has satisfactory environmental impacts.* ▸ *The proposal would contribute to the economy locally and through employment generation and the provision of materials for roads and other infrastructure projects in the region, in particular renewable energy projects associated with the Central-West Orana Renewable Energy Zone (CWO-REZ), and in particular EnergyCo's transmission line project, within 3.1km of the site, and Acciona's Orana Wind Farm project, located as close as 2km to the project site.*

7.1.2 Compliance with ESD Principles

The Project complies with the objects of the *Environmental Planning and Assessment Act 1979* (EP&A Act)- refer to Section 5.1.4 of this EIS for further details. In addition to the above, the objects of the EP&A Act at s.1.3 include (b) "*the facilitation of ecologically sustainable development*" (ESD). ESD is defined in s 4 of the EP&A Act by reference to the definition in s 6(2) of the *Protection of the Environment Administration Act 1991* (NSW). The accompanying Table 7.2 shows that the proposed quarry development satisfies the principles of ecologically sustainable development.

Table 7.2: Compliance of the Gulgong Quarry Project with ESD principles

ESD Principle	What the Principle provides	How the Project is consistent with the relevant ESD Principle
The Precautionary Principle	*Considers any threat of serious and irreversible environmental damage and uncertainty.*	*After a full evaluation of the project, as considered in this EIS, it is concluded that the proposed quarry can operate within acceptable noise, blasting, air quality, soil, water, environmental, archaeological, traffic and visual criteria. No serious or irreversible environmental damage results from the Project, nor does does it give rise to any uncertainty in terms of what is proposed, likely impacts, or relationship to adjoining development: (Oates v Northern Beaches Council [2021] NSWLEC 1684 at [29].*
The Integration Principle	*The decision-making processes should effectively integrate both long-term and short-term economic, environmental and social considerations.*	*Quarry management measures have been proposed that will ensure that acceptable impacts will ensue in both the short-term and the long-terms. Quarries tend to be a long-term user of land, providing much-needed quarry products to communities for generations. During the operation of the quarry, employment benefits will arise in terms of workers at the quarry itself and in the broader community. The projects that the quarry development will serve-and in particular the renewable energy projects nearby- will benefit all members of the community, as well as future generations. In the longer term the quarry will be progressively rehabilitated and returned to agricultural use, including as a source of water for livestock.*
Intergenerational Equity principle	*The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.*	*The proposed quarry development will provide benefits for future generations by providing a secure source of road making material close to committed renewable energy projects nearby in the short-medium term. The environmental management measures that are contained in the currently approved quarry plan of management have been developed to minimise the impact of the project on the environment and community to the extent reasonably practicable.The proposed lateral extension of the quarry was also designed such that elements of the existing environment available to this generation, including the natural environment, water and local biodiversity, as well as archaeological artefacts, would continue to be available to future generations.*
Biological Diversity Principle	*Conservation of biological diversity and ecological integrity.*	*The Project Site is cleared land with no ecological values of note. As such, there is anticipated to be no additional adverse impacts on the surrounding biological environment arising from the proposed quarry.*
Valuation & Pricing of Environmental Resources Principle	*Improved valuation, pricing and incentive mechanisms as well as environmental factors.*	*Satisfied in that the Project seeks to fully utilise a known quarry resource. The Project optimises the valuation and pricing of the resource with minimal impact by maximising its efficient extraction. Moreover, the proposed quarry site has limited value to agriculture.*

▪ 7.2 Section 4.15(1)(a): Planning Instruments, DCPs, Regulations etc.

7.2.1 Background and Overview

In this case, the principal environmental planning instruments that are responsible for shaping the proposed Gulgong Quarry Project and in facilitating approval of the proposed quarry development include:

- *Mid Western Regional Local Environmental Plan (LEP) 2012* which permits 'extractive industries', as defined, in the RU1 zone. Relevantly, the Project Site is not located within any conservation zone. The project complies with applicable zone objectives: NSW Land & Environment Court in *Codling v Central Coast Council* [2019] NSWLEC 1158 at [84], referred to in *Ingenia Communities Pty Ltd v Mid-Coast Council* [2021] NSWLEC 1131 at [34]:

  "84. It is clear from the terms of cl 2.3(2) that there is no requirement for development within the zone to comply with, or to achieve, each of the objectives of the zone. Nevertheless, the clause requires that the consent authority "have regard to" those objectives. They are therefore a mandatory consideration in the assessment process and a proposed development ought not be antipathetic to those objectives).

- Various state environmental planning policies (SEPPs), and in particular, *State Environmental Planning Policy (Resources and Energy) 2021*. The project is consistent with all relevant SEPPs assessed in this EIS.

It is also noteworthy that the provisions of the state environmental planning policy relevant to the proposed quarry development prevail to the extent of any inconsistency with any other environmental planning instrument. In this regard s.2.6 of *State Environmental Planning Policy (Resources and Energy) 2021* states:

> *"(1) Subject to subsection (2), if this Chapter is inconsistent with any other environmental planning instrument, whether made before or after this Chapter, this Chapter prevails to the extent of the inconsistency."* [NOTE 1: Sub clause (2) does not apply in this case. NOTE 2. As confirmed by Sheahan J in *Bella Ikea Ryde Pty Ltd v City of Ryde Council (No 2)* [2018] NSWLEC 204 in a decision dated 17 December 2018.]

The Project complies with the above relevant environmental planning controls and guidelines, including the provisions of the EP&A Regulation 2021. Refer also Section 5 of the EIS. No applicable proposed instrument applies to the Project or to the Project Site- refer Section 5.2.6 of the EIS.

7.2.3 Any Development Control Plan (s.4.15(1)(a)(iii))

In addition to the provisions of the LEP the provisions of *Mid-Western Development Control Plan 2013* (DCP) also applies. The purpose and status of development control plans are set down in s.3.42 of the EP&A Act:

> *"3.42 Purpose and status of development control plans(cf previous s 74BA)*
>
> *(1) The principal purpose of a development control plan is to provide guidance on the following matters to the persons proposing to carry out development to which this Part applies and to the consent authority for any such development—*
>
> *(a) giving effect to the aims of any environmental planning instrument that applies to the development,*
>
> *(b) facilitating development that is permissible under any such instrument,*
>
> *(c) achieving the objectives of land zones under any such instrument."*

Section 4.15(3A) of the EP&A Act requires consent authorities to consider the provisions of any development control plan when determining any DA. It makes clear that if a development control plan sets standards with respect to an aspect of the development and the development application complies with those standards, then the consent authority is not to require more onerous standards with respect to that aspect of the development. These standards have been addressed in Table 5.3 of this town planning assessment report.

It is noteworthy that the DCP does not contain any provisions relating to quarry developments *per se.* The quarry complies with the general objectives of the DCP, summarised in Table 5.6 in Section 5.2.2.of the EIS.

7.2.4 Any Planning Agreement (s.4.15(1)(a)(iiia))

No planning agreement has ben entered into with regard to the operation of the proposed quarry development.

7.2.5 "The Regulations" (s.4.15(1)(a)(iv)): NSW Environmental Planning & Assessment Regulation 2021

The term "the Regulations" refers to the *Environmental Planning & Assessment Regulation 2021* (EP&A Regulation 2021), which commenced on 1 March 2022. The proposed quarry operation is identified as 'designated development' in accordance with clause 26 of Schedule 3 of the EP&A Regulation 2021. As such, the application must be accompanied by an EIS. The application has been processed in accordance with the requirements of the regulations relating to Designated Development. As the proposal is also recognised as 'Integrated Development', as one approval is required, from the EPA. Clauses 190 and 192 of the EP&A Regulation 2021 relate to the form and content of an EIS, respectively. These requirements, and where they are addressed in this EIS, are set out in the accompanying Table 7.3 and Table 7.4.

Table 7.3: Compliance with clause 190 of EP&A Regulation 2021: Form of an EIS

An environmental impact statement must contain the following information	*Where contained in the EIS*
(2)(a) the name, address and professional qualifications of the person who prepared the statement,	*Certification page.*
(b) the name and address of the responsible person	*Certification page.*
(c) the address of the land	*Cover page and Certification page, as well as Executive Summary.*
(d) a description of the development, activity or infrastructure	*Executive Summary and Section 3.*
(e) an assessment by the person by whom the statement is prepared of the environmental impact of the development, activity or infrastructure	*Sections 2, 3, 4 and 7.*
(3) EIS declaration	*Certification page.*

Table 7.4: Compliance with clause192 of EP&A Regulation 2021: Content of an EIS

An environmental impact statement must also include each of the following	*Where contained in the EIS*
(1)(a) a summary of the environmental impact statement	*Executive Summary.*
(b) a statement of the objectives of the development, activity or infrastructure	*Section 3.1.*
(c) an analysis of any feasible alternatives	*Section 2.7.*
(d) an analysis of the development, including-	
(i) Description of the development	*Executive Summary and Section 3.*
(ii) General description of the environment likely to be affected or significantly affected by the development	*Sections 2 and 7.*
(iii) Likely impact on the environment	*Sections 3,4 and 7.*
(iv) Full description of mitigation measures	*Sections 3, 4 and 7.*
(v) A list of approvals that must be obtained	*Section 5.*
(e) a compilation (in a single section of the environmental impact statement) of the measures referred to in item (d)(iv)	*Section 4.*
(f) Reasons justifying the carrying out of the development	*Executive Summary, and Section 8.*

The above tables show that the requirements of clauses 190 and 192 of the EP&A Regulation 2021 have been satisfied.

▪ 7.3 Section 4.15(1)(b): Likely Impacts

In determining a development application a consent authority is required to consider the likely impacts of that development, including social impacts in the locality, at s 4.15(1)(b) of the EP&A Act, which requires consideration of the following matters:

> *"(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,"*

Quarrying inevitably involves clearing of land and excavation and removal of resource material. As such, the focus for any impact assessment will be on impact minimisation (*Gunlake Quarries Pty Limited v The Minister for Planning* [2022] NSWLEC 1570). The NSW Land and Environment Court has found that the description of the development the subject of the development application is not just restricted to the nature, extent and other features of the development but can also include ameliorative measures to prevent, mitigate, remedy or offset impacts of the development. However, in order to be able to be considered in answering the inquiry of likely impact, the ameliorative measures proposed are to be considered as part of the development application: *per* Preston CJ in *Newcastle & Hunter Valley Speleological Society Inc v Upper Hunter Shire Council and Stoneco Pty Limited* [2010] NSWLEC 48 at [83]. In the same judgement the Chief Judge also found that:"*likely" means "a real chance or possibility" and "significantly" means "important", "notable", "weighty" or "more than ordinary"*" at [84]. Similarly, the Court has determined that "the likely impacts of that development" should not be interpreted narrowly; they encompass not just the direct and immediate impacts of a proposed development on the site where construction will occur but also off- site impacts (*Ballina Shire Council v Palm Lake Works Pty Ltd* [2020] NSWLEC 41 at [6] per Preston CJ).

Mitigating factors

Following the above, the mitigation measures proposed form a functional part of the proposed Gulgong Quarry project. These measures are described in Section 3 of the EIS and summarised in Section 4. In addition to the above, the following mitigating factors need to be also recognised as part of any assessment of the Project:

- Rehabilitation of the quarry is proposed following the cessation of quarrying. Appropriate techniques and measures will be applied to ensure that appropriate species of grasses, trees and shrubs are planted out.
- Limited views are possible of the proposed quarry from the highway, with only one nearby rural residence having a clear, uninterrupted view of one side of the elevated knoll proposed for quarrying. It is proposed to quarry at depth, with the working quarry face located behind a topographic barrier, thus minimising acoustic and visual impacts.
- The proposed site of the quarry has been found to possess no archaeological artefacts.
- The Project Site forms a part of a region identified by a broad-brush BSAL agricultural land designation. However, the land proposed for quarrying comprises stony, shallow soils of limited agricultural worth.
- The proposed quarry footprint is almost completely cleared, and is not a part of any threatened ecological community under the NSW *Biodiversity Conservation Act 2016* (BC Act) or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) or groundwater dependent ecosystem. A referral under the EPBC Act is not required.
- The Project Site is not subject to landslip hazard, or subsidence or acid sulphate soils.
- Due to its elevated position and geology, the proposed quarry operation is unlikely to intersect with local groundwater.
- The Project Site is flood-free.
- The Project Site enjoys the benefit of an existing internal road which connects directly with the Castlereagh Highway. The existing intersection with the highway will be upgraded in order that it can safely and efficiently accommodate the quarry truck traffic volumes proposed.
- The Project Site is sufficiently buffered from sensitive receivers in a relatively remote rural location.

Having regard for the above, any environmental impacts arising from the project can be adequately assessed and managed through the imposition of appropriate conditions of approval, per the findings of the NSW Land and Environment Court in *Dellara Pty Ltd v Minister for Planning and Penrith City Council* [2012] NSWLEC 1186 at [160].

Key impacts to be assessed

The key impacts addressed in the this sub-section of the EIS focus on the following, in no particular order but addressing all matters raised in the issued SEARs:

- **Land resources**. Potential impacts on soils and land capability (including potential erosion and land contamination, agricultural worth) and proposed mitigation, management and remedial measures.
- **Noise**. Noise impacts on sensitive receivers, including monitoring and mitigation strategies to be adopted.
- **Blasting**. Blasting impacts on sensitive receivers, including monitoring and mitigation strategies to be adopted.
- **Air quality**. Air quality impacts on the surrounding area and measures to mitigate potential impacts.
- **Water**. Control of stormwater leaving the project site, impact on groundwater, and prevention of erosion.
- **Biodiversity**. Consideration of impacts on biodiversity values.
- **Heritage**. Consideration of heritage impacts of the Project.
- **Traffic and transport**. Consideration of existing and proposed traffic flows on the surrounding road network.
- **Waste**. Waste streams generated by the project and mitigation measures proposed.
- **Hazards and risk** including an assessment of the likely risks to public safety, paying particular attention to potential bushfire risks and the transport, storage, handling and use of any hazardous or dangerous goods.
- **Visual**. Consideration of visual impacts of the Project on surrounding properties and from Armidale Road.
- **Social and economic**. Likely social and economic impacts of the Project, including the significance of the resource and costs and benefits of the Project.
- **Rehabilitation**. Consideration of the rehabilitation measures proposed, justification of the final landform, and rehabilitation strategy.

7.3.1 Land Resources

Contamination Potential

Pursuant to s.4.6 of *State Environmental Planning Policy (Resilience and Hazards) 2021* a consent authority must consider contamination and remediation prior to the determination of a development application.

Ballpark Environmental Pty Ltd was commissioned to undertake Stage 1 contamination investigation ('PSI'-refer **Appendix I** in relation to the proposed Gulgong Quarry project, the results satisfying the relevant precondition under *State Environmental Planning Policy (Resilience and Hazards) 2021* *per* Preston CJ *Moorebank Recyclers Pty Ltd v Benedict Industries Pty Ltd* [2015] NSWLEC 40 and Dickson C in *Lippmann Partnership Pty Ltd v Canterbury – Bankstown Council* [2017] NSWLEC 1601 dated 9 February 2017 at paras [31-43].

The results of the Ballpark Environmental site investigation is summarised in the following:

- A review of historical photographs suggests the use of this site as a borrow pit has occurred since circa 1964.
- No buildings or other structures were constructed on this site and therefore it is unlikely that waste building materials, including asbestos, are present on this site.
- Observations made during the site walkover by Ballpark Environmental found that previous poor waste disposal practices have resulted in the partial burial of inert waste, including scrap metal machine parts, on the northeast margins of the borrow pit.
- A review of prepared for this PSI found no areas of environmental concern have been identified on this site.

Ballpark Environmental concluded as follows:

> "*In consideration of the results from this PSI we conclude that this site on part of Lot 1 DP1239728, 1848 Castlereagh Highway, Gulgong, has an acceptable low level of risk for site contamination and is suitable for its proposed industrial use as a quarry. The site is assessed to be suitable for its proposed industrial use, in accordance with Chapter 4 of the Resilience and Hazards SEPP (2021).*"

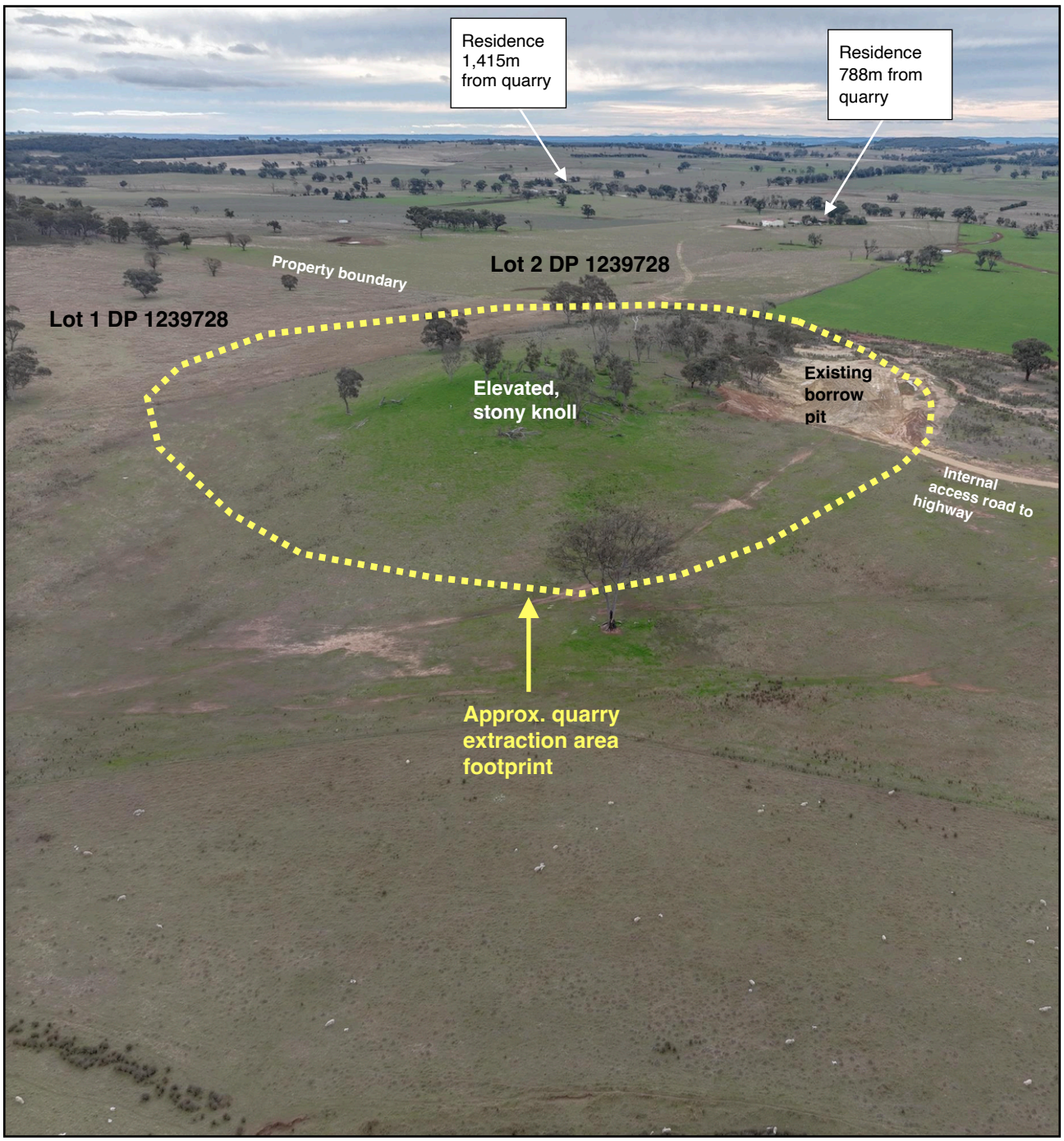
In summary, based on the preliminary site investigation undertaken by Ballpark Environmental, the Project Site is not affected by contamination and does not require remediation prior to the development being carried out. Consequently, the requirements of *State Environmental Planning Policy (Resilience and Hazards) 2021* Ch 4, s.4.6(1) have been satisfied. The Project Site has been assessed by Ballpark Environmental to be suitable for the use intended, namely, as an extractive industry.

Impact on Agriculture

The following Table 7.5 summarises the potential impact of the proposed quarry development on agriculture and land resources generally.

Table 7.5: Impacts of the Quarry Project on Land Resources & Agriculture

Issue	*Consideration of impacts*
Zoning requirements	*The provisions of State Environmental Planning Policy (Resources and Energy) 2021 and Mid Western Regional Local Environmental Plan 2012 permits quarries in the RU1 Primary Production zone. The land use table in the RU1 zone makes it plain that uses other than pure agriculture may occur in the RU 1 zone, including extractive industries. The proposal complies with the LEP and relevant zone objectives.*
Land use conflict potential	▸ *Quarrying has already been established on this site for many decades. There is already a quarry operating on the site, used by Council and the landowners since circa 1964.* ▸ *The proposed quarry is located in a sparsely populated rural area, with acceptable noise, vibration and visual impacts.*
Land capability and agricultural worth	▸ *The hill containing the extractive resource comprises land with a very limited agricultural value. The proposed quarry area and haul route do not comprise, nor are they proximate to or likely to have any impact on high value agricultural land.* ▸ *The footprint of the proposed quarry will occupy approximately 7.34ha, or 0.6% of the 1,191ha 'Talinga' rural holding. The project will not impose or affect the ongoing use of adjoining agricultural land or the 'Talinga' rural landholding, with the quarry floor returned to agricultural use after quarrying is completed- equivalent to 0.55% of the 'Talinga' holding. The assessment reasonably identifies potential agricultural land use impacts as Low.*
Rehabilitation	*A satisfactory rehabilitation strategy has been devised, including requirements for planting, weed management, monitoring and remedial action.*
Bush fire risk	*The vegetated land surrounding the quarry has not been identified as being bush fire prone. Various mitigation measures are proposed to address fire hazards within the proposed quarry development.*
Water	▸ *Groundwater is unlikely to be affected by the quarry.* ▸ *All stormwater to be contained within the proposed quarry pit and quarry infrastructure areas, with no resultant downstream impacts likely.*
Traffic and livestock	*No Travelling stock Routes affected by the proposed development. Low traffic speeds to be observed along the internal quarry haul route.*
Weed management	*Weed management measures have been proposed as a part of the management regime for the quarry development.*
Consultation	*Consultation with government agencies and local residents has formed a part of this EIS preparation process.*
Quarry management	▸ *A range of quarry management management measures are proposed.* ▸ *A quarry management plan is recommended to be implemented, to ensure that the quarry is operated in the future in accordance with 'best practice' quarry management measures. The basis for the quarry management plan is summarised in this EIS document.*



PHOTOGRAPH 7.1: Aerial drone photograph of the stony knoll and immediate surrounds proposed to be developed for a hard rock quarry: area 7.34ha, equivalent to 0.6% of the Talinga' farm holding, with 0.55% returned to agricultural use on completion of quarrying. Approximate extent of proposed quarry footprint shown with broken yellow line. View looking north from near the southern edge of the proposed quarry. Nearest residences to the north-west are also identified.

(Source: April 2024 aerial photograph by O'Ryan Geospatial)

To put the matter in context, the land the subject of this proposed quarry development comprises land with a low land capability and low agricultural value. The soils are shallow and rocky with the extractive resource found at or near the surface.

Because of these features the site has significant limitations to agriculture generally and is unsuited to cropping, limited grazing being the optimal use of the land here. However, it is these features that makes the project site so suited to that of a hard rock quarry. The footprint of the proposed quarry will occupy approximately 7.34ha, or 0.6% of the 'Talinga' rural holding. Following rehabilitation, approximately 6ha would be returned to grazing land- a loss of only about 0.8ha of land, or about 0.06% of 'Talinga' land holding-with the additional benefit of having a dam for livestock water needs also provided. The project is anticipated to have minimal impact on existing agricultural activities, with the project expected to coexist with the surrounding agricultural land uses in the locality or on site, thus satisfying the 'compatibility' test set down in *Project Venture Developments v Pittwater Council* [2005] NSWLEC 191.

Impact on Landform, Geology, Soils

The following factors are relevant:

- A part of the site has been used as a source of extractive material by both the landowners and by the local council over many decades, altering both the topography and lithology of the land. A review of historical aerial imagery suggests that the quarry borrow pit has been used on an ad hoc basis since circa 1964.
- No watercourses or dams are located on the proposed quarry site, with no impacts likely given that all stormwater from quarrying will be retained within the proposed quarry pit. The existing haul route from the quarry will be largely retained, with sealing of the first 100m nearest the highway, to reduce dust and sediment risk. The drainage and sediment capture systems to be employed will prevent erosion, as well as ensuring that run-off does not contaminate offsite areas or downstream waterways.
- A review of soils found within and adjoining he proposed quarry show that it has signifiant limitations to agriculture and possesses limited land capability related to the physical attributes of the soil, topography, presence of stone throughout the A horizon and shallow depth to bedrock/rock.
- It is proposed that quarrying will proceed at depth from Stage 1, establishing a quarry floor well below natural ground level. Stage 1 commences in the southern section of the site, working progressively to the north-west from the southern end of the pit. Stage 2 will continue with the same depth of extraction until the existing elevated knoll is progressively removed. At all times quarrying will be undertaken working at depth and always behind a topographic barrier.
- To minimise disturbance, topsoil will be stripped prior to quarrying in stages and stockpiled separately for later reuse in rehabilitation of the quarry pit. Extraction of the hard rock resource found on the site is proposed to be undertaken in stages, in order to minimise the area of disturbance at any one time
- Erosion and sediment controls will be implemented in accordance with *Managing Urban Stormwater Soils and Construction – Volume 2e Mines and quarries* (Landcom, 2004).
- The geological report by Douglas Partners predicts that the hard rock resource found underlying the site has the potential for use a s a road base or select fill.A copy of this report is provided in **Appendix N**.

Impact on Land Use

The site is zoned RU1 Primary Production under Mid Western Regional Local Environmental Plan (LEP) 2012, as is the surrounding area. Extractive industries are permissible with consent for the RU1 zone, and as such the proposed quarry project is consistent with intended land use of the area.

The site has been lawfully cleared due to historical agricultural land uses, with scattered paddock trees remaining. Extraction of the hard rock resource is proposed to be undertaken in stages in order to minimise the area of disturbance at any one time.The existing borrow pit has been in continuous use by landowners and the local council since circa 1964. The site and surrounding land is used for agriculture. As explained above, the quarry project would only impact land with a low suitability for agriculture, affecting about 0.6% of the 'Talinga' rural holding. Approximately 5.5% will be returned to agricultural use following completion of quarrying and rehabilitation of the site.

As such, the quarry project is not expected to impact the ability to use the project site for agricultural activities in the future. Due to the topography and soils, the project site is primarily suited to limited grazing, not to any form of intensive agriculture such as cropping- the latter land use confined to the base of the hill system and alluvial areas found on the 'Talinga' farm holding. Refer Photograph 2.7.

In short, it is concluded that the quarry project proposed will have minimal impact on adjacent existing agricultural activities, given that the quarry is capable of achieving acceptable blast, noise, visual, traffic and air quality impacts.

7.3.2 Blasting and Vibration

Overview

Vipac Engineers and Scientists Ltd (Vipac) was commissioned to conduct a blast impact assessment of the proposed Gulgong Quarry project- refer **Appendix C**.

Ground vibration and airblast overpressure are two common environmental effects of blasting that can cause human discomfort.

The quarry is proposed to operate from 7:00 am to 6:00 pm Monday to Friday, and from 7:00 am to 1:00 pm on Saturdays. Blasting would only occur between the hours of 9:00am and 3:00pm Monday to Friday.

Blasting Overpressure and Ground Vibration Standards

Blasting is to be undertaken within accepted ground vibration and air blast overpressure requirements. The Australian and New Zealand Environment Conservation Council (ANZECC) provides the following guidelines to minimise the annoyance due to blasting overpressure and ground vibration.

Vibration criteria are also determined in accordance with the NSW *Assessing Vibration: A Technical Guideline* (2006) and EPA guidelines. Refer Section 3.5.3 and 4 of the EIS for further details of blasting protocols and mitigation measures proposed, to be integrated into an overall quarry management plan once the quarry project is consented to.

The EPA standards for blast ground vibration and airblast overpressure at quarries has been provided in Table 3.3, but for convenience has been reproduced in the accompanying Table 7.6.

Table 7.6: EPA Quarry Blasting Limits

Noise/Blasting item	*Principal Standard (Limit) Nearest Residence*	*Maximum Level Permitted Nearest Residence*
Airblast Overpressure	*Airblast overpressure of 115 dBL (Lin Peak). This level may be exceeded on up to 5% of the total number of blasts over a period of 12 months*	*Airblast overpressure should not exceed 120 dBL (Lin Peak) at any time*
Ground Vibration	*Ground vibration level of 5 mm/s peak particle velocity (PPV).This level may be exceeded on up to 5% of the total number of blasts over a period of 12 months*	*Vibration should not exceed 10 mm/s peak particle velocity (PPV) at any time*

Summary of Findings: Blasting

From the above assessment by Vipac it can be concluded that blasting activities associated with the proposed quarry can be safely completed within EPA blast vibration and overpressure limits without damage to surrounding structures or nearby sensitive receivers provided that monitoring is conducted on all blasting operations.

It is an EPA requirement for monitoring of all future blasting operations, to ensure compliance is achieved at the closest receptors.

7.3.3 Cultural Heritage

An Aboriginal Cultural Heritage Assessment Report (ACHAR) was undertaken by OzArk Environment and Heritage in accordance with the SEARs requirements- refer **Appendix K**.A field survey was undertaken on 12 July 2024 by OzArk Archaeologist, Tenae Robertson, with a representative of the Mudgee Local Aboriginal Land Council. Three previously unrecorded Aboriginal sites were recorded:

- Two of which are manufactured from quartz (Tallawang IF1 and Tallawang IF3).
- One manufactured from mudstone (Tallawang IF2).

Refer to accompanying photographs of the Aboriginal artefacts found, all located outside of the areas proposed for quarrying and quarry-related purposes.

Quartz flake at Tallawang 1

Mudstone flake at Tallawang 2

Quartz flake at Tallawang 3

PHOTOGRAPHS 7.2-7.4: Aboriginal artefacts found all outside of proposed quarry footprint.

The recorded artefacts were all recorded in areas where the land had been severely affected by erosion which had resulted in deep gullying along drainages running-off from the hill crest, and larger washout erosions. The newly recorded sites are isolated finds consisting of unmodified flakes which are considered to be common based on the known archaeological characteristics of the region. No intangible Aboriginal cultural values specific to the study area have been identified through consultation with the Aboriginal community. As each of the recorded Aboriginal sites occur outside of the proposed quarry impact footprint, there are no identified impacts which may cause harm to the recorded Aboriginal sites at this time. However, their proximity to the proposed works means that they may be vulnerable to inadvertent harm, and the project should take into consideration the location of the known Aboriginal sites and avoid harm to the objects. The findings and recommendations of the OzArk ACHARS are as follows:

1. *" The proposed work may proceed at the study area without further archaeological investigation.*
2. *Contractors should be provided with the locations of 36-2-0631 (Tallawang IF1), 36-2-0632 (Tallawang IF2), and 36-2-0633 (Tallawang IF3). Each site should be marked on all plans as no-go areas. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment may be required.*
3. *Temporary fencing should be placed around 36-2-0631 (Tallawang IF1), 36-2-0632 (Tallawang IF2), and 36-2-0633 (Tallawang IF3) including a five metre buffer to ensure that the Aboriginal objects are not inadvertently harmed during the proposed work activities (see **Section 9.2**).*
4. *All land and ground disturbance activities must be confined to within the study area, as this will eliminate the risk of harm to Aboriginal objects that may be outside the study area.*
5. *This assessment has concluded that there is a low likelihood that the proposed work will harm Aboriginal cultural heritage items or sites, as long as the management measures are adhered to. If during work, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the Unanticipated Finds Protocol (Appendix 3) and the Unanticipated Skeletal Remains Protocol (Appendix 4) should be followed.*
6. *Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts."*

The above recommendations above form part of the mitigation strategies proposed for this project.

7.3.4 Hazard and Risk Potential

Overview

The risks associated with the proposed Gulgong Quarry project have been considered in this EIS having regard for the nature of the proposed quarry development, the mitigation strategies that form a part of the Project, and certainty in the likely impacts arising (*Weal v Bathurst City Council & Anor* [2000] NSWCA 88).

The mitigation measures proposed for the project are considered to be practical, feasible and reasonable from a cost, planning and design perspective, and form a fundamental part of this Project. It is important to note that a zero risk precautionary standard is inappropriate. Instead, precautionary measures should be taken to avert the anticipated threat of environmental damage, but they should be proportionate- per Preston J in the NSW Land & Environment Court case *Telstra Corporation Ltd v Hornsby Shire Council* [2006] NSWLEC 33.

The SEARs requires the following risks to be considered as a part of the EIS assessment:

> "*Hazards – including an assessment of the likely risks to public safety, paying particular attention to potential bushfire risks and the transport, storage, handling and use of any hazardous or dangerous goods.*"

The risk rating matrix commonly used is illustrated in accompanying Table 7.7, being a modified version of Standards Australia *HB 203-2006* Table 4(C) and *HB 89-2013*. The Risk Level for each activity, relevant to construction activities listed in the Planning Secretary's SEARS advice is then rated as Low (L), Moderate (M), High (H) or Extreme (E). It is similar to, but not the same as, the risk ranking matrix used by the DPI in its *Land Use Conflict Assessment Guide*.

Table 7.7: Risk Rating Matrix

(Source: modified after Standards Australia HB 203-2006 Table 4(C) and HB 89-2013)

Matrix	***Consequences (C)***				
Likelihood (L)	***1*** *Insignificant*	***2*** *Minor*	***3*** *Moderate*	***4*** *Major*	***5*** *Catastrophic*
A *(Almost Certain)*	***H***	***H***	***E***	***E***	***E***
B *(Likely)*	***M***	***H***	***H***	***E***	***E***
C *(Possible)*	***L***	***M***	***H***	***E***	***E***
D *(Unlikely)*	***L***	***L***	***M***	***H***	***E***
E *(Rare)*	***L***	***L***	***M***	***H***	***H***

LEGEND RISK LEVEL

E	***Extreme****- Immediate action required.This level of risk likely to preclude any development proceeding*
H	***High****- In-depth assessment required.Ultimately, may result in development not proceeding*
M	***Moderate****- Management responsibility (specified).Unlikely to preclude development*
L	***Low****- Routine management required only. Unlikely to have significant impacts*

This section of the EIS provides a preliminary assessment of the hazards, risk and health aspects of the proposed quarry in accordance with the issued SEARs, as well as with relevant legislation and guidelines. The risks have been assessed having regard for the specific nature of the proposed quarry operations proposed on the Project Site for the quarry project, and after incorporating the mitigation measures as described in the EIS document.

Through the implementation of the various proposed management and mitigation measures a residual (ie. mitigated) risk rating for the project has been derived. In most cases the potential environmental impacts have been reduced significantly, and in all cases to an acceptable level (ie. Low to Moderate-Low). The accompanying Table 7.8. illustrates residual risk remaining, after these mitigation measures have been implemented .

- Explosives and blasting: Possible (category D likelihood, Moderate consequence, Category B risk).
- Instability of quarry working faces /benches (category D likelihood, Moderate consequence, Category B-C risk).
- Transportation of dangerous goods and hazardous materials, impact on roads (category D likelihood, Moderate consequence, Category B risk).
- Storage of dangerous goods and hazardous materials on site (category D likelihood, Moderate consequence, Category C risk).

- Contamination of the site, existing or proposed (category D-E likelihood, Minor consequence, Category C risk).
- Natural hazards, like bushfire risk (category E likelihood, Minor consequence, Category C risk).
- Nearness to utlities, like power lines (category E likelihood, Moderate consequence, Category C risk).
- Unauthorised access to the quarry (category E likelihood, Minor consequence, Category C risk).

Table 7.8: Potential Hazardous or Offensive Risks of Quarry project

Risk Item	Assessment	Risk level
Explosives and blasting, noise, flyrock impacts	▸ *No explosives kept on site- to be provided by blasting specialists for each blast event. Quarry sufficiently removed from highway- no sentries required.* ▸ *Blasting at the quarry is conducted by a licensed blast contractor and each blast monitored in accordance with EPA guidelines for blast vibration and overpressure. Appropriate stemming and blast planning to be employed, to prevent flyrock and excessive air blast overpressure. Notification of surrounding landowners/occupiers within 2 km of the quarry pit prior to blast events.* ▸ *Having regard for the above, and the limited number of surrounding residences proximate to the project site, the safety and management procedures proposed, the risk to public safety and amenity from blasting and quarry noise will be minimal. No potentially offensive noise generated.*	*MOD-LOW*
Quarry stability	▸ *The overall slope proposed for the quarry batters will be approximately 51 degree slope with benches angled at 70 degrees- a design outcome that satisfies current quarry design 'best practice'.* ▸ *Stability of the quarry and surround areas would be monitored during the project, to ensure a safe work environment.*	*MOD-LOW*
Transportation of hazardous/ dangerous goods, roads impacts	▸ *All explosives to be transported by experienced blasting contractors in accordance with AS 2187.2-2006 "Explosives - Storage, Transport and Use".* ▸ *Intersection with Castlereagh Highway to be upgraded to TfSW requirements, to ensure traffic safety and efficiency. A low (max.30km/hour) speed limit to be applied to waste haulage vehicles on quarry site.*	*MOD-LOW*
Storage of dangerous goods	▸ *The only hazardous materials to be stored at the quarry will be restricted to diesel fuel and hydrocarbon products. Any fuel storage will be self-bunded and in full conformance to the Australian Standard AS1940-2017.*	*LOW*
Contamination	▸ *The project site has an acceptable low level of risk for site contamination and is suitable for its proposed use as a quarry.* ▸ *The likelihood of contamination resulting from the proposed quarry operations is considered extremely low as the proposed quarrying will remove naturally occurring rock from site only, without introducing any new material.*	*LOW*
Bushfires, flooding, drainage	▸ *The project site is not identified by the RFS as comprising bushfire prone land. The Project would not alter the bushfire risk of the proposed quarry site.* ▸ *A raft of fire safety measures are proposed- refer to EIS Sections 3.11 and 4 for details. Access to be provided to RFS fire vehicles in the event of a bushfire.* ▸ *The project site is free from flooding, with appropriate surface water management measures proposed.*	*LOW*
Utlities	▸ *In accordance with safety advice from Essential Energy, a small section of the internal haul route will be moved by a further 2 metres away from the power lines that traverse the site.*	*LOW*
Unauthorised access	▸ *The quarry site is protected by fencing and a locked gate on the eastern boundary, effectively limiting unauthorised, out-of-hours public access.*	*LOW*

Matters relating to characterisation as a potentially hazardous or offensive industry or occupational health and safety are dealt with under the following separate sub-headings.

Potentially Hazardous or Offensive Industry

State Environmental Planning Policy (Resilience and Hazards) 2021 consolidates and repeals the provisions of SEPP 33 – Hazardous and Offensive Development- the latter no longer referred to in the SEPP, nor is *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33 (Hazardous and Offensive Development Guideline – SEPP 33* specifically referred to in the SEPP.

State Environmental Planning Policy (Resilience and Hazards) 2021 aims to achieve a number of outcomes, including but not limited to the following:

- Amend the definitions of hazardous and offensive industries where used in environmental planning instruments.
- Renders ineffective a provision of any environmental planning instrument that prohibits development for the purpose of a storage facility on the ground that the facility is hazardous or offensive if it is not a hazardous or offensive storage establishment as defined in this Policy. NOTE: The Mid-Western LEP 2012 prohibits "storage facilities" in the RU1 zone, however "extractive industries" are a permissible use in the RU1 zone. Any storage facility proposed within the quarry is ancillary to, and subservient to, the dominant use of an extractive industry.
- To ensure that in determining whether a development is a hazardous or offensive industry, any measures proposed to be employed to reduce the impact of the development are taken into account.

The above SEPP defines potentially hazardous and potentially offensive industries as follows:

> "***potentially hazardous industry*** *means a development for the purposes of any industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would pose a significant risk in relation to the locality—*
>
> *(a) to human health, life or property, or*
>
> *(b) to the biophysical environment,*
>
> *and includes a hazardous industry and a hazardous storage establishment.*
>
> ***potentially offensive industry*** *means a development for the purposes of an industry which, if the development were to operate without employing any measures (including, for example, isolation from existing or likely future development on other land) to reduce or minimise its impact in the locality or on the existing or likely future development on other land, would emit a polluting discharge (including for example, noise) in a manner which would have a significant adverse impact in the locality or on the existing or likely future development on other land, and includes an offensive industry and an offensive storage establishment."*

The Guidelines for this SEPP state that "*the key consideration in the assessment of a potentially offensive industry is that the consent authority is satisfied there are adequate safeguards to ensure emissions from a facility can be controlled to a level at which they are not significant*."

It is considered that the project will not be hazardous or offensive to the surrounding area as:

- Management practices on the site during operation will ensure that there is no build up or emission of hazardous material on or from the site, as required by the Guidelines. The operator of the site will implement measures to limit any potential hazardous impact.
- All explosives and detonators will not be stored on the development site. Contractors, when attending the site during blasting, will bring all explosives and equipment required. Therefore, there is no permanent onsite storage, handling and management procedures required for explosives. The drill and blast contractor is responsible for storage and transport of explosives in accordance with statutory requirements.
- The blasting quarry rock is to be carried out in accordance with EPA blast vibration and overpressure criteria.
- The proposed quarry, including quarrying, processing of quarry rock and transport of quarried material off site is not considered to be offensive as it is to be carried out within relevant EPA noise limits.

- An “extractive industry” is not identified as being potentially hazardous or potentially offensive in the Mid-Western LEP 2012.
- The only hazardous materials to be stored at the quarry will be restricted to diesel fuel and hydrocarbon products. Any fuel storage will be self-bunded and in full conformance to the Australian Standard AS1940-2017 including appropriate separation distances from buildings or other storages of other combustible liquids.
- The storage and transport of hazardous materials is not considered to be hazardous, and a Low risk has been determined accordingly- refer Table 7.7.
- Specialist blasting contractors to be employed, who will prepare a drill and blast plan for each blast, to ensure safe practices and procedures for blasting operations, including the minimisation of flyrock hazard risk, the safety and minimisation of impact on on-site workforce, quarry plant and the environment, and compliance with applicable legislation. An exclusion zone to be provided for each blast.
- Based on the findings of this EIS, the project will not result in significant adverse impacts on the biophysical environment in the project locality, or on the existing or likely future development on other land.

Occupational health and safety

Responsible legislative compliance is fundamental to maintaining a safe workplace at any quarry. Under the provisions of the *Work Health and Safety (Mines & Petroleum Sites) Act 2013* quarry rock, stone or gravel is defined as a “mineral” and is thus covered by this Act and *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022*.

All work health and safety practices at the proposed quarry- and other quarries in New South Wales- are regulated by the NSW Mines Regulator (currently called the NSW Natural Resources Access Regulator).

The operator will be the person responsible for ensuring that the quarry operations are run in a proper and safe manner.

The NSW Natural Resources Access Regulator has released health and safety guidelines for the operation of quarries in NSW, in the document entitled *Health and safety at quarries* ,dated November 2018. A work health and safety plan would be developed for the quarry, once approved,, addressing worker safety, hazard identification and risk management. This plan would cover matters including site safety procedures, contact details for all emergency services in the area, fire fighting procedures, personal protective equipment requirements, incident management and first aid procedures. All site employees, contractors and visitors will be educated on emergency response procedures required to be followed as a part of any site induction. Environmental hazard reporting will be promoted and encouraged amongst the workforce. Identified hazards will be entered into the incident reporting database with agreed controls and timeframes for completion and signed off by a Site Supervisor. A site-specific Pollution Incident Response Management Plan (PIRMP) will be implemented at the quarry, once approved.

Summary: Hazards and Risks

In view of the generally Low hazard risk of the development and the implementation of mitigation measures proposed (refer also to Section 4), the risk hazards or offensive impacts will be adequately minimised. The proposed quarry development is therefore not likely to pose any significant risk to neighbouring land uses or the environment generally. Therefore, the proposed quarry project is not considered a potentially hazardous or offensive development.

7.3.5 Waste

The quarry operator undertakes to take the corrective actions recommended by Ballpark Environmental. It is also noted that if quarrying is approved the environment protection license to be issued for extractive activities will include enforceable conditions prohibiting the disposal of any waste generated by the quarry operations on this site. All waste would be managed in accordance with the requirements of the *Waste Avoidance and Resource Recovery Act 2001*, the POEO Act, and the *Waste Classification Guidelines* (NSW EPA, 2014) and the principles of the waste management hierarchy. The quarry operator will be responsible for collecting recyclable material (waste oil, metal, glass, and plastic) for collection by Council or appropriate recycling contractor. Any non-recyclable domestic waste will be disposed of via the local council collection service.

7.3.6 Visual Impact

Overview: Landscape Character

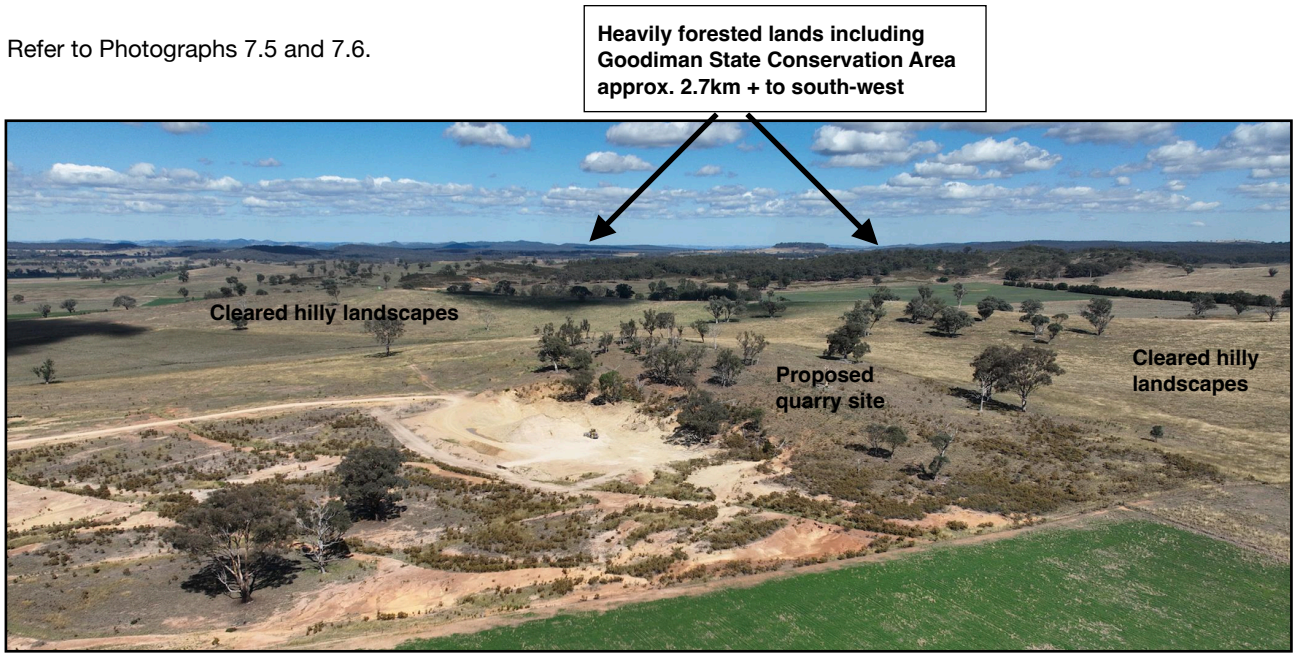
The landscape character and visual significance of land needs to be considered in the context of a range of factors, including landscape features, visual prominence and context in the overall landscape. The general visual character of land is established through an assessment of its topographic characteristics, land use and settlement pattern, ability to be viewed by others and vegetation cover.

Typically, quarries can have a visible impact on the landscape, if located in an exposed position. In this case, however, the proposed quarry is visually shielded or obscured from view from all but the neighbouring residence to the north-west by intervening topography and/or forested lands. Glimpses of the existing quarry on the eastern side of the elevated knoll are possible from Castlereagh Highway. It is also noted that the site of the proposed quarry, including internal haul route, is not within an area identified as possessing any visual sensitivity or landscape value (source: Mid-Western Regional Local Environmental Plan 2012 Flood Planning Map Active Street Frontages Map Visually Sensitive Land Maps, Mid-Western Regional Local Environmental Plan 2012 Heritage Map- Sheet HER_005).

Landscapes found within the near vicinity of the proposed quarry site predominantly comprises:

- Cleared, modified pastures used for Intensive agricultural production activities, including cropping and intensive grazing, found at the base of a hill system that runs parallel to the Castlereagh Highway and including broader alluvial landscapes closer to Tallawang Creek. Scattered patches of vegetation are visible along river and creek lines and dense roadside vegetation can be observed along stretches of the Castlereagh Highway to the immediate north and south of the project site. Considered to be of High scenic quality.
- Low hills, in the main cleared to accommodate agricultural activity in the form of lower intensity grazing of livestock- considered to have a Low- Moderate Scenic Quality. The project site forms a part of this landscape.
- Adjoining the above cleared hilly areas are remnant woodlands and undulating hillsides which adjoin more densely vegetated lands including surrounding National Parks and Conservation areas- the latter considered to be of High scenic quality, the former of Moderate scenic quality.

Refer to Photographs 7.5 and 7.6.



PHOTOGRAPH 7.5: The site of the proposed quarry is a low elevated knoll forming a part of cleared hilly lands used for low intensity grazing of livestock of Low-Moderate scenic quality and sensitivity. The hilly lands are backed by more densely vegetated lands- seen in the background. View from north-east looking south-west. The eastern side of the knoll is already being worked as a quarry.

(Source: April 2024 aerial photograph by O'Ryan Geospatial)

PHOTOGRAPH 7.6: Undulating to flat landscapes used for intensive agriculture are generally located to the east of the project site- in background. The site of the proposed quarry is a low elevated knoll forming a part of cleared hilly lands used for low intensity grazing of livestock- in foreground. View from south looking north and east.

(Source: July 2024 aerial photograph by O'Ryan Geospatial)

Visual Assessment Criteria and Landscape Setting

The aim of the landscape and visual impact assessment is to identify, evaluate and predict potential key visual impacts arising from the proposed quarry development. The assessment of visual impact combines sensitivity with predicted magnitude of change to establish the significance of residual landscape and visual effects. The visual quality of a site can be assessed in terms of the relative scenic quality of that landscape and the degree of visual prominence.

Scenic quality is determined by classifying the natural landscape features into three classes on the basis of their variety. These are as follows:

High Scenic Quality - Distinctive Variety

Moderate Scenic Quality - Common Variety

Low Scenic Quality - Minimal Variety

The method of classification is based on the assumption that scenic quality increases as relief and topographic ruggedness increases, vegetation become more diverse, natural and agricultural landscapes increase and altered landscapes decrease.

- Landscapes with a High Scenic Quality includes landform or land cover of outstanding, unusual, distinctive or diverse character eg. the intensively cropped agricultural land in the locality- refer Photograph 2.7.
- Moderate Scenic Quality landscapes includes landform or land cover which tend to be common throughout the region and are not outstanding in visual quality.
- Landscapes with a Low Scenic Quality include those areas with features of minimal diversity or variety and includes all areas not found under the other classes.

The west-facing side of the elevated knoll on the Project Site is considered to have a Low Scenic Quality, based on the fact that it is a relatively low hill that is obscured from view from all but one rural dwelling- and the view from this dwelling is oblique, and screened by intervening vegetation. The east-facing side of the elevated knoll is considered to have a Low- Moderate Scenic Quality, based on the fact that it presents as a relatively low hill backed by more visually dominant, more elevated forested lands in the near distance, with only glimpses possible from the highway when a short distance away (within less than 1km) screened in large measure by intervening topography and vegetation outside of the immediate viewing range.

Landscape sensitivity relates to the nature of the landscape itself, its scenic qualities, and sensitivity to change. Visual sensitivity is the ability of the landscape to be seen by others and and sensitivity to change. The landscape and visual sensitivity criteria are summarised in the accompanying Table 7.9.

Table 7.9: Landscape and visual sensitivity factors considered

Sensitivity Class	Landscape Sensitivity Criteria	Visual Sensitivity Criteria
High	*Landscape characteristics or features with little or no capacity to absorb change without fundamentally altering their present character* *Landscape designated for its international or national landscape value* *Outstanding example in the area of well cared for landscape or set of features.*	*Dwellings with views orientated towards the proposed development.* *Users of outdoor recreational facilities, on recognised national cycling or walking routes or in national designated landscapes*
High-Medium	*Landscape characteristics or features with a low capacity to absorb change without fundamentally altering their present character* *Landscape designated for regional or county-wide landscape value where the characteristics or qualities that provided the basis for their designation are apparent. Good example in the area of reasonably well cared for landscape or set of features*	*Road users in nationally designated landscapes or on recognised scenic routes, likely to be travelling to enjoy the view.* *Users of outdoor recreational facilities, in locally designated landscapes or on local recreational routes that are well publicised in guide books*
Medium	*Landscape characteristics or features with moderate capacity to absorb change without fundamentally altering their present character Landscape designated for its local landscape value or a regional designated landscape where the characteristics and qualities that led to the designation of the area are less apparent or are partially eroded or an undesignated landscape which may be valued locally – for example an important open space* *An example of a landscape or a set of features which is neutral or mixed character*	*Dwellings with oblique views of the proposed development.* *Users of primary transport road network, orientated towards the development, likely to be travelling for other purposes than just the view.*
Medium-Low	*Landscape characteristics or features which are reasonably tolerant of change without determent to their present character. No designation present or of little local value. An example of an un-stimulating landscape or set of features*	*Primary transport road network users likely to be travelling to work with oblique views of the development or users of minor road network.* *People engaged in active outdoor sports or recreation and less likely to focus on the view.*
Low	*Landscape characteristics or features which are tolerant of change without determent to their present character No designation present or of low local value. An example of monotonous unattractive visually conflicting or degraded landscape or set of features*	*Road users on minor access roads travelling for other purposes than just the view.* *People engaged in work activities indoors, with limited opportunity for views of the development.*

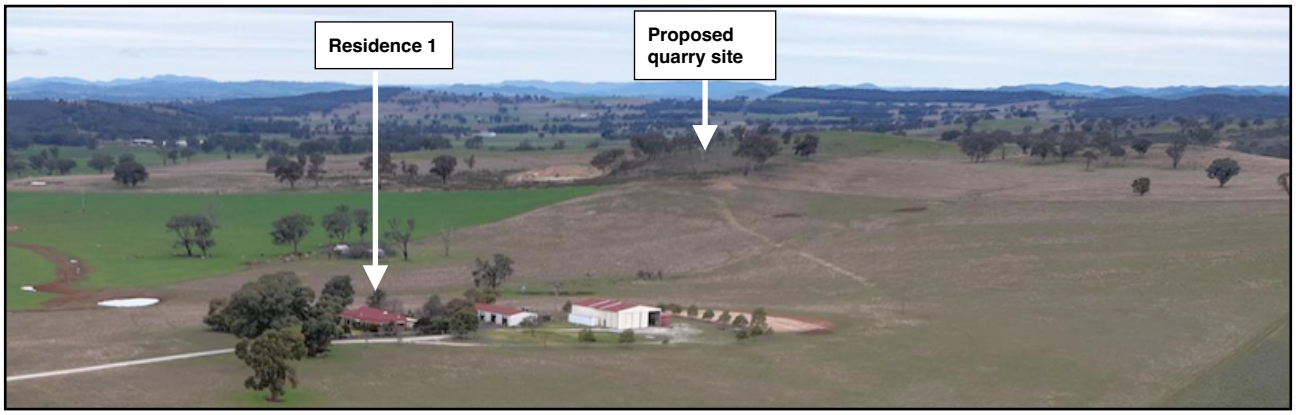
Given the characteristics of the proposed quarry site it is concluded that:

- The eastern side of the elevated knoll, visible from the highway, and northern and western side of the knoll, capable of being viewed from the nearest residence (located 788m to the north-west) are is of Medium-Low landscape and visual sensitivity, is reasonably tolerant to change.
- The western sides of the elevated knoll, not visible from either the highway of from the nearest residence, are of Low landscape and visual sensitivity, tolerant to change.

Views of the Project Site

As a basic visual assessment principal, any type of development in the landscape will become less perceptible the greater the distance that the viewer is removed from the development. A site located approximately 2km or less from a viewer is considered close enough to allow identification of significant detail. Any positions within this range with open uninterrupted views of a development would generally receive the greatest visual impacts. The visibility of the project site from nearby rural residences and from the highway (refer **Figure 7.1**) is as follows:

- Residence 1:The northern and western sides of the project site are visible from the the nearest residence, located 788m to the north-west.
- Residence 2: The project site is not visible from the residence located approximately 1,415m to the north-west- views being obscured by the ridge on which Residence 1 sits.
- Residence 3: Views of the project site from this residence, located approximately 1,345m to the north-east, are screened and/or obscured by intervening vegetation stands.
- Residence 4: Views of the project site from this residence, located approximately 1,460m to the north-east, are obscured by intervening vegetation.
- Residence 5: Views of the project site from this residence, located approximately 1,900m to the north-east, are obscured by intervening vegetation and topography.
- Views from highway traveling north. Views of the eastern side of he elevated knoll only visible from about 660m away, screened by stands of trees along the highway for the first 500m after that. Brief uninterrupted glimpse only of elevated knoll possible when directly opposite- a minor view only. Similarly, uninterrupted glimpses only of the knoll are possible when traveling south when the viewer is almost directly opposite.



PHOTOGRAPH 7.7: Views of the northern and western sides of the elevated knoll are possible from Residence 1, located 788m away to the north-west. Some localised screening by vegetation in an around this dwelling.

(Source: July 2024 aerial photograph by O'Ryan Geospatial)

PHOTOGRAPH 7.8: Views of the elevated knoll are screened by intervening vegetation from Residences 3, 4 and 5.

(Source: July 2024 aerial photograph by O'Ryan Geospatial)

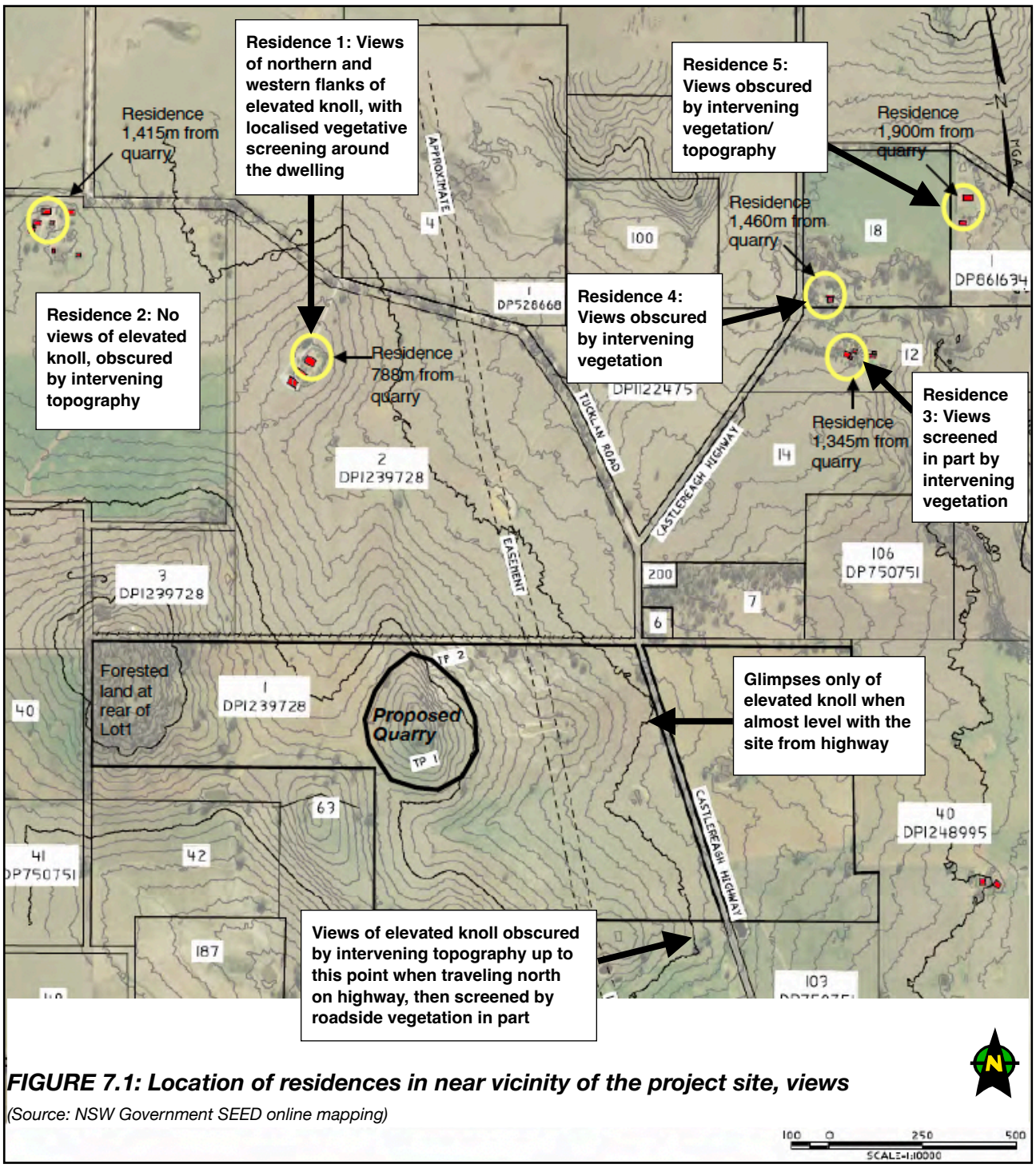


FIGURE 7.1: Location of residences in near vicinity of the project site, views

(Source: NSW Government SEED online mapping)

Visual Assessment Planning Principles

The NSW Land and Environment Court has established planning principles relating to visual impact assessment. This includes planning principles relating to the assessment of view impacts, as per the judgements contained in *Tenacity Consulting v Warringah* [2004] NSWLEC 140 (*Tenacity*) and *Rose Bay Marina Pty Limited v Woollahra Municipal Council and anor [2013]* NSWLEC 1046. These two key Court cases are considered in the following. *Tenacity* sets out the planning principle for considering the acceptability of the impact of a proposed development on the views enjoyed from private property in the vicinity of the development.

PHOTOGRAPH 7.9: View of the elevated knoll, the site of the proposed quarry, are possible from Residence 1, located 788m away to the north-west. Some localised screening by vegetation in an around this dwelling. The knoll presents as a low rise landform of no visual prominence. Proposal involves quarrying being undertaken behind a topographic barrier, and progressive lowering of hill below ground level, with no quarrying visible. Assessed LOW visual impact.

PHOTOGRAPH 7.10: View of the elevated knoll viewed from near Tuklan Road/Castlereagh Highway intersection. The knoll presents as a low rise landform of minor visual prominence. Proposal involves quarrying being undertaken behind a topographic barrier, and progressive lowering of hill below ground level, with no quarrying visible. Assessed LOW visual impact.

In this regard the proposed quarry development does not block views considered further in the following. The visual impact assessment framework adopted here is broadly consistent with (but not identical to) the matters raised for consideration in *Tenacity*.

The steps that the Court has set down for determining the acceptability of the impact of a development on views are summarised in the following Table 7.10.

Table 7.10: View Impact Assessment

Visual Assessment Steps/ Considerations	Relevance to Proposed Quarry Development
Step 1: identify the nature and scope of the existing views, including: ➢ *Nature and extent of obstruction of view (by the development).* ➢ *Elements of the view, important elements within the view.* ➢ *Whether the change in view is temporary or permanent*	*The elevated knoll proposed for the quarry project is a low topographic feature in the overall landscape, of no visual prominence. The existing quarry workings are able to be viewed from the highway.* *Views of the elevated knoll are shielded from view from all residences in the immediate locality by intervening trees and/or topography- with the exception of the nearest residence to the north-west (788m from quarry) and residence to the north-east (1,345m from quarry).* *Views from both of these rural residences is screened in part by vegetation surrounding each dwelling (in the case of the nearest residence 788m from quarry) or by intervening vegetation (in the case of the nearest residence to the north-east, located 1,345m from quarry. Refer Photographs 7.7- 7.9.* *From the nearest residence to the north-west glimpses are also possible of the recent excavation work undertaken by this northern neighbour to extract hard rock found near the common boundary, proximate to the elevated knoll.* *No views are being blocked by the proposed quarry development.* *The quarry design allows for quarrying to commence in the south-east corner of the site at depth. This work should not be visible from the nearest residence to the north-west. The quarry design provides for the removal of a currently exposed quarry working face.* *However, the temporary stockpiling of topsoil/overburden on the existing borrow pit will be visible- but only for a short time until sufficient depth of quarrying is achieved in Stage 1. In summary, quarrying will not be visible from any nearby residence.* *Occasional views possible of quarry truck traffic entering and leaving the site.* *The later stages of the quarry involve quarrying to continue at depth, out of sight from any nearby residence, progressively removing the knoll from behind. The loss of the knoll will be a gradual visual impact.* *The site will be revegetated once quarrying is completed. The landform will be altered in that the elevated knoll will have been removed and replaced with a lower topography, all be it once that will be vegetated.*
Step 2: identify the locations from which the potentially interrupted view is enjoyed.	*Refer to the above*
Step 3: Identify extent of the obstruction at each relevant location.	*No obstructed views. Impacts considered to be acceptable.*
Step 4:identify the intensity of public use of those locations where that enjoyment will be obscured, in whole or in part, by the proposed private development.	*No obscuring of views from Castlereagh Highway or other public places—considered acceptable.*
Step 5: the importance of the view to be assessed.	*Low/Moderate scenic quality and landscape sensitivity.*

The visual impact assessment criteria are set down in accompanying table 7.10.

Table 7.10: Visual Impact Assessment Criteria

Visual Impact	Significance of visual and landscape impact
Low	*The development would cause very minor changes to the existing view or landscape. Development would either not be visible or barely visible, with minor changes in the shape of the overall topographic panorama evident. Small area only affected, with no significant adverse impact on overall visual character. Impacts capable of being mitigated or offset by beneficial impacts.*
Moderate	*The development would cause minor changes to the existing view or landscape. Noticeable change to a significant proportion of the landscape, affecting some key characteristics and the experience of the landscape, and introduction of some uncharacteristic elements. Moderate impact on visual character. Impacts typically capable of mitigation in part or whole.*
High	*The changes to the landscape and/or views would result in extensive, noticeable change and introduction of many incongruous elements into the landscape. Development highly visible within a direct line of sight from nearby residences and nearby public viewing places, typically within 1km from operations. Visual impacts not capable of being mitigated, with impacts more than likely being more permanent in nature.*

It is also relevant to note that the visual impacts associated with nearby renewable energy projects, including EnergyCo's recently approved transmission line project, will be significant. In contrast, the visual impact of the proposed quarry project will be very small relative to these projects. The visual impact of these projects will transform the character of the rural areas so affected- not the case with the proposed quarry project.

Based on the above, quarrying within the pit would not be visible from any nearby residence, being effectively shielded from view. The eastern side of the knoll is set well back from the highway, with the view of this landform feature appreciated by motorists and their passengers for only a fleeting moment when near the site. As such, it is concluded that the Project would have a negligible-Low impact on the visual amenity of people living in or traveling through the landscape, or of the surrounding area, based on the visual impact assessment criteria set down in Table 7.10, in particular having regard for the following. The proposed removal of the elevated knoll would be a noticeable change, however:

- The elevated knoll is an unremarkable landform feature of no visual prominence, with a Low-Moderate visual quality and landscape sensitivity, and is not a key element of the landscape.
- The proposed quarry site is not identified in the Council LEP or DCP as forming a part of any significant landscape. Related to this point, there is no obligation for all of the land in the RU1 zoned area to be only rolling fields of green. The range of other permissible uses allowed in this zone make that plain. Moreover, the eastern side of the elevated knoll has been used for the purposes of quarrying for many decades.
- Relative to the renewable energy projects approved or proposed vin the locality, a small area of land is proposed to be quarried, with a Low visual impact. The proposed quarry, confined to only a small area with limited visibility from nearby residences has a Low visual impact only.
- The removal of the knoll will be a gradual, rather than an abrupt visual impact. As well, there will be a small change only to the overall topographic panorama, with no significant adverse impact on overall visual character.
- All quarrying is proposed to be undertaken at depth and working behind the topography, shielded from view- refer **Figure 3.2**. No views will be possible from any local vantage point of the working quarry face or quarry pit. As such, the overarching landscape character of the locality will not be materially altered due to the majority of disturbance occurring below existing ground level.
- The proposed progressive rehabilitation of the quarry benches with vegetation will soften the visual impact associated with the loss of the elevated knoll.

In summary, the visual impact of the proposed quarry is considered to be acceptable having regard to the planning, physical and visual context of the site and the quarry development proposed. No further mitigation measures are considered required in order to further reduce the visual impact of the Project.

7.3.7 Water

Overview

Martens and Associates, engineers and hydrologists, was engaged by Outline Planning Consultants Pty Ltd to prepare a Water Management Report for the site of the proposed Gulgong Quarry project, as well as an assessment of hydrology, as a component of an Environmental Impact Statement (EIS), to address the Secretary's Environmental Assessment Requirements (SEARs) for the proposed quarry operation. Refer also to **Appendices F** and **G**.

The key features of the project that have the potential to impact upon water resources include:

- The proposed quarry operations including drilling and blasting, excavation, transport and processing and haulage of material off site.
- Progressive deepening of the quarry down to RL496m AHD, with an additional 5m of depth provided at the sediment basin.
- The requirement for water at the quarry for processing of material and dust suppression. In this regard it is noted that quarrying will be undertaken at depth, relatively sheltered from winds. Moreover, the first 100m length of the internal access road from the highway will be sealed, to reduce dust potential and reduce the need for water for dust suppression.
- Construction of additional infrastructure including sediment basin.
- Progressive rehabilitation of disturbed areas.

Final Landform

Following completion of quarrying activities the processing and stockpiling areas will be backfilled with stockpiled overburden and topsoil and revegetated for agricultural use. The final landform of the processing and stockpiling areas will be shaped to slow runoff and allow vegetation to establish to create a stable vegetated surface that produces clean runoff. The dirty water catchment drains and sediment drains will be maintained on the site until the site revegetation has fully established and no quarry ('dirty') water runoff is occurring. The final landform of the quarry infrastructure area will be shaped to create a free draining surface, with the sediment basin maintained as a source of water for stock. The main pit area will retain its final form, with some backfilling.

Capture of Quarry Runoff within Quarry

In accordance with 'best practice' stormwater management in quarries, the stormwater runoff from within the quarry pit ('dirty' water) will be collected and conveyed to the sediment basin located within the quarry pit. From time to time small silt traps may also be utilised to trap silt and sediment in localised parts of the quarry.

The dirty water catchment drains and sediment basin system have been designed to convey and store flows in accordance with *Managing Urban Stormwater- Soils and Construction-Volume 2E Mines and Quarries* (DECC, 2008, Landcom 2004) and *NSW MUSIC Modelling Guidelines* (2015) for the various stages of the quarry development, as calculated by Martens and Associates- refer **Appendix G**.

The catchment sizes draining to the sediment basin are:

- 4.98ha for Stage 1. Minimum sediment basin size of 2.6ML.
- 7.34ha for Stages 2 and 3. Minimum sediment basin size of 4.2ML.

The sediment basin will be constructed prior to the commencement of Stage 1 quarry operations. It will be expanded before each subsequent stage, as per the proposed size for each stage of the project. This approach ensures that all contaminated water generated onsite is effectively collected and treated. Water collected in the sediment basin will be used for process water and dust suppression on the haul road.

Consistent with Section 6.1 of *Managing Urban Stormwater- Soils and Construction-Volume 2E Mines and Quarries* (DECC, 2008, Landcom 2004) the following design parameters were adopted for the purposes of calculating sediment basin sizing:

- Type D soil classification.
- Soil hydrologic group D.
- Erodibility (K-factor) of 0.05.
- Volumetric runoff coefficient of 0.74.
- A 95th percentile 5-day design criteria was adopted (50.7mm).

The required sediment basin volume was determined as:

V = settling zone + sediment storage zone

Sediment Basin Calculations: Stage 1

The storage requirements for the sediment basin in each of the proposed quarry stages was calculated in accordance with the equation provided in Section 6.3.4(i) of *Managing Urban Stormwater- Soils and Construction-Volume 2E Mines and Quarries* using the adopted default parameters. The capacity of the sediment storage zone was calculated as 50% of the settling zone volume. The calculations for the sediment basin for Stages 1, 2 and 3 are detailed in Table 7.11.

Table 7.11: Sediment Basin Volume Calculations for Each Quarry Stage

Quarry stage	Calculation item	Formula and calculation	Result
Stage 1	*Settling Zone*	*10 x Cv x A x R = 10 x 0.74 x 4.98 x 50.7*	*1,868 m^3*
	Storage Zone	*50% of Settling Zone*	*934 m^3*
	Total Sediment Basin Volume	*Settling Zone + Storage Zone*	*2,803 m^3 2,900 m^3 (rounded up)*
Stages 2 & 3	*Settling Zone*	*10 x Cv x A x R = 10 x 0.74 x 7.34 x 50.7*	*2,754 m^3*
	Storage Zone	*50% of Settling Zone*	*1,377 m^3*
	Total Sediment Basin Volume	*Settling Zone + Storage Zone*	*4,131 m^3 4,200 m^3 (rounded up)*

(Source: Martens & Associates water balance assessment 2024)

Water Balance Assessment

A water balance model was employed by Martens and Associates to assess the overall water cycle for the quarry operations, considering the following components:

- Site Water Demand: Consideration of quarry operational water demands.
- Site Water Supply: Assessment of site water supply (surface water runoff).
- Site Water Balance: The balance of supply and demand is assessed based on a range of climatic conditions to determine the need for additional supply or to detail the excess water released to the environment.

Utilising climate data sourced from the Bureau of Meteorology (BoM) weather station located at Dunedoo (Station No. 64009) the water balance assesses the likely adequacy of site water assessing the following rainfall scenarios:

- 'Average' year: recorded rainfall 622.7 mm.
- 'Dry' year: recorded rainfall 389.8 mm.
- 'Wet' year: recorded rainfall 886.8 mm.

The site water balance for the proposed quarry at Stage 1-3 is summarised in Table 7.12.

Table 7.12: Quarry Water Balance Results (ML)- Non-Potable water

Rainfall Year	Catchment Runoff	Basin Evaporation	Production Water	Dust Suppression	Non-Potable Water Balance (ML)
Stage 1 Quarry					
Average	24.46	-1.36	10.00	0.9	12.2 (surplus)
Dry	15.03	-1.36	10.00	0.9	2.77 (surplus)
Wet	35.75	-1.36	10.00	0.9	23.49 (surplus)
Stage 2 & 3 Quarry					
Average	36.06	-1.97	10.00	0.9	23.19 (surplus)
Dry	22.16	-1.97	10.00	0.9	9.29 (surplus)
Wet	52.69	-1.97	10.00	0.9	39.82 (surplus)

(Source: Martens & Associates water balance assessment 2024)

The calculated sediment basins for each stage have been modelled to assess water supply adequacy. The water balance assessment (for each stage) demonstrates that for all modelled years (average, dry and wet) the site shall generate, capture and store sufficient runoff to provide for all non potable water demands (10.9 ML/year).

A potable water deficit is estimated at 50 kL(0.05ML)/year based on site staff requirements which can be provided via collected roof water and/or tanker delivery.

Erosion & Sediment Controls

The volume of sediment-laden stormwater runoff will be satisfactorily minimised by implementing the following erosion controls (per *Managing Urban Stormwater: Soils and Construction Volume 2E Mines and Quarries*:

- Minimise the area of exposed soils.
- Stabilise exposed areas.
- Reduce erosive effect of stormwater. The proposed water management system is to be operated as a closed system. All runoff from within the quarry is to be directed to the stormwater sumps/basins proposed, located in the upper and lower portions of the quarry. Sedimentation basin capacities have been designed to comply with those required by the 'Blue Book'. Water captured within the sedimentation basins may be immediately re-used for dust suppression within the quarry.
- Manage unsealed roads. Unsealed sections will be watered in order tor reduce dust nuisance.
- Protection of quarry product stockpiles from upslope stormwater flows. In order to protect stockpiles a suitable stormwater flow diversion system will be established immediately up-slope of any dedicated quarry stockpile area.
- Site exit controls. Site exit points will have appropriate controls such as shaker ramps to prevent off-site transport of suspended solids.
- 'Clean' water to be diverted where practicable around the working quarry area.
- Maintenance. All structures for erosion control will be maintained on a regular basis, and will be repaired as necessary. Sediment accumulation within the sedimentation zones is to be regularly assessed. Where sediment accumulation fills the specified sediment storage zone sediment is to be removed from that basin.

Groundwater

The hydrogeology within the site comprises of fractured or fissured extensive aquifer systems with low to moderate productivity. This has much to do with the geology of the site and surrounds. A number of faults occur in and around the site-refer to **Figure 7.2**. Notably, all groundwater bores in the locality are located within those areas mapped as containing Quaternary alluvial deposits (Qa), with no bores located elsewhere- refer Table 7.13, and **Figures 7.2-7.3**.

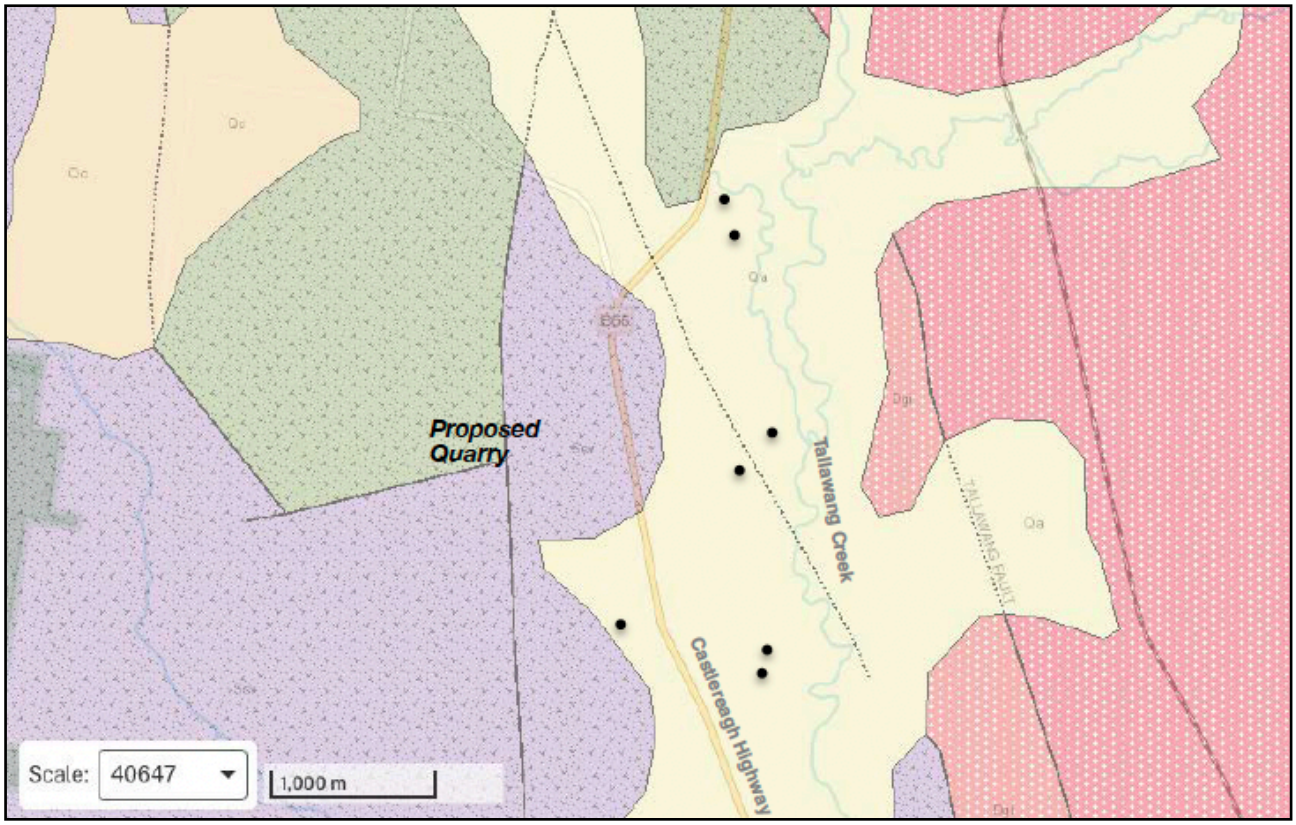


FIGURE 7.2: the site comprises of fractured or fissured extensive aquifer systems, reflected in the numerous faults occurring in the locality. The black dots represent licensed groundwater bores- all of which confined only to areas mapped as being Quaternary alluvial deposits (Qa).

(Source: NSW SEED mapping 2 August 2024)

Table 7.13: Licensed Groundwater Bores in Locality

Bore ID	Figure 2.13 Bore No.	Distance from proposed quarry (m)	Drilled Depth (m)	Standing Water Level (metres below ground level)
GW044690	4	1,429.1m	33.5m	No water encountered down to approx. RL 449m AHD
GW066655	2	1,437.6m	38.4m	21.3m, water at approx. RL464m AHD
GW801045	1	1,502.8m	45.7m	9.1m, water at approx. RL471m AHD
GW058156	3	1,505.5m	40.0m	No water encountered down to approx. RL 468m AHD

(Source: Ballpark Environmental July 2024 Preliminary Site Investigation Proposed Gulgong Quarry – Lot 1 DP1239728, 1848 Castlereagh Highway, Gulgong NSW 2852)

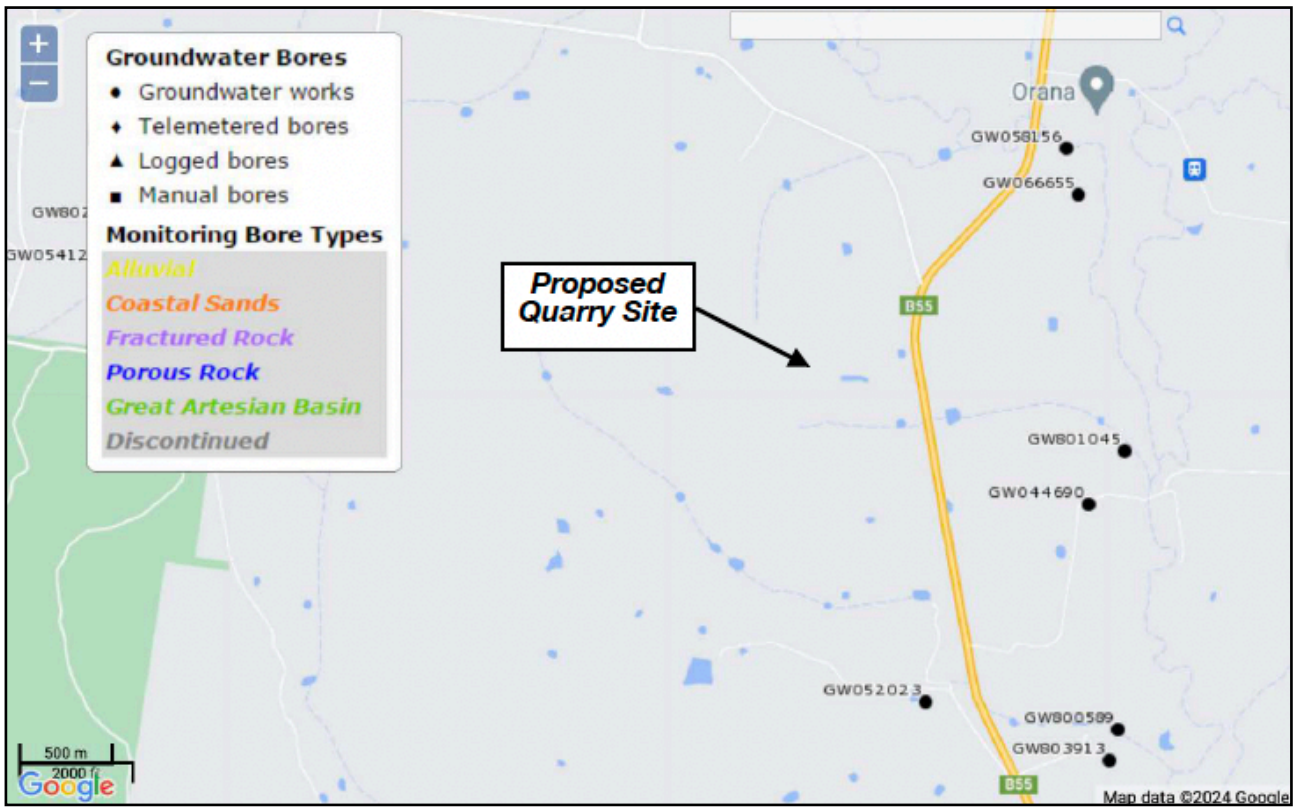


FIGURE 7.3: All licensed groundwater bores in and around the project site are located near or within the Tallawang Creek floodplain or on other watercourses. There are no licensed groundwater bores in the hilly country in the locality to the west of the highway

(Source: Water NSW Groundwater Bores- All Groundwater Map 1 August 2024)

A review of the Bureau of Meteorology (BoM) Groundwater Dependent Ecosystems Atlas (GDE Atlas) identifies in detail the location of Low to High high potential Groundwater Dependent Ecosystems (GDEs) are in the surrounding locality. Within the locality, the High priority GDEs are generally limited to small patches within remnant vegetation areas and along surface water drainages. The Project Site is mapped as being Low potential GDE.

In terms of potential for groundwater impacts arising from the proposed quarry development Martens and Associates conclude:

> "*Given the proposed depth of quarry excavation, topography and licensed groundwater bore information, there is not evidence that confirms that the proposed quarrying work will intercept permanent groundwater. Further, the elevation and location of mapped potential GDEs are such that the proposed development is not likely to have any significant affect on the mapped potential GDEs. Further site specific data may be developed through the installation of appropriate site groundwater bores and monitoring*."

Surface and Groundwater Impacts

In regard to potential surface water and groundwater impacts:

- The proposed development was assessed against the NSW Farm Dams Policy and Harvestable Rights Order. As the proposed water management system captures, contains and recirculates drainage and/or effluent that conforms to best management practice and prevents the contamination of downstream watercourses the proposed sediment basins are exempt from the Harvestable Rights calculation.
- The water balance shows that the quarry can be operated without exceeding water requirements.
- There are no direct downstream water users from the proposed development site. The site is sufficiently set back from any 'waterfront land' for the purposes of the *Water Management Act 2000*.

- All stormwater runoff within the quarry will be contained within the quarry void. The quarry is not directly linked to any drainage lines and hence any the development will not impact any downstream water users. Utilising the water management strategies outlined in the EIS the proposed development can be operated with no adverse impact on water quality.
- Satisfactory erosion and sediment control measures are proposed.
- Satisfactory cumulative impacts are predicted.
- Given the proposed depth of quarry excavation, topography and licensed groundwater bore information, there is not evidence that confirms that the proposed quarrying work will intercept permanent groundwater.
- Given the elevation and location of mapped potential Groundwater Dependent Ecosystems (GDEs) are such that the proposed development is not likely to have any significant affect on the mapped potential GDEs.

7.3.8 Social and Economic

The SEARs for the EIS required an assessment of the likely social and economic impacts of the proposed Gulgong Quarry project.

Economic Impacts: Overview

Quarries need to be close to markets to support building and infrastructure; processed quarry stone being an essential component used in the construction of airports, industrial developments, roads, railways, homes, schools, hospitals and shopping centres and-in particular in this case- to major renewable energy infrastructure projects. In this regard the proposed development will have direct access to the Castlereagh Highway and nearby projects.

As such, quarries underpin the country's ongoing development and maintenance of essential infrastructure, and play a vital role in Australia's economy.

> *"Australian quarries support our vital building and construction industries which generate over $200 billion in revenue each year and directly employ more than one million Australians. The building and construction industry demands more than 200 million tonnes of construction aggregates each year to meet the need for our homes, workplaces, public buildings and roads. As well as providing these essential materials, quarries stimulate local communities through investment and by providing jobs. In fact, the quarry industry creates over 10,000 jobs directly and supports another 80,000 indirectly, often in rural and regional locations*." (Cement Concrete & Aggregates Australia website April 2022)

One of the most visible economic impacts of any quarrying operation on a community is the employment that it generates. Another economic impact is the industries and projects that are reliant on the the supply of processed quarry material to service their project. Employment is generated through the creation of jobs and economic within the quarry itself: direct employment.

Economic Impacts : Quarry

At peak production the Project will generate up to 4 full-time jobs on-site, generating wages of approximately $0.5 million per annum, with flow-on jobs in industries reliant on the quarry, as well as truck drivers employed by other contractors, suppliers and other sub contractors periodically engaged by the quarry, for example, blasting contractors. In short, the Project would provide direct economic activity, including jobs, to the local area economy, and indirect economic activity to the local area via both wage and non-wage expenditure.

The Project would provide major economic benefits in the form of annual operating income of between $6 million and $7 million at full production (ex pit value only), plus income from freighting the quarry product to end users. The continued operation of the quarry is likely to produce additional indirect effects to other local industries, potentially generating up to 12 more jobs locally, and assuming a multiplier of 150%, commonly applied to quarry projects, the potential to generate upwards of an additional $10.5 million of economic output in associated industries within NSW.

Economic Impacts: Servicing Central-West Orana Renewable Energy Zone (CWO-REZ) Projects

It is proposed that the quarry project will supply road base and other quarry products to the numerous renewable energy projects approved or proposed within the Central-West Orana Renewable Energy Zone (CWO-REZ). This an economic impact that goes well beyond the value of quarry production or quarry wages, best highlighted in the Department of Planning Housing and Infrastructure *State Significant Infrastructure Assessment Report (SSI 48323210)* dated June 2024:

> *"The Central-West Orana REZ Transmission project is critical for energy security and reliability in NSW as it would connect the NEM with electricity generating projects proposed in the CWO REZ and would play an essential role in supporting the transition from a long-standing reliance on coal-fired power stations to a reliance on renewable energy.*
>
> *It would also deliver significant economic benefits to NSW including a capital investment of $3.2 billion and creation of up to 1,800 construction jobs….*
>
> *The project is a critical component of the Electricity Infrastructure Roadmap, which is the NSW Government's 20-year plan to ensuring sufficient electricity transfer capacity is available to support the transition of the NEM and is critical to the successful operation of the CWO REZ."*

Central-West Orana REZ Transmission project	*$3.2 Billion* *capital investment*	*1,800-5,000* *construction jobs*

[NOTE: The value of these projects has been variously valued at $2 Billion to $3.2 Billion and with construction jobs ranging from 1,800 to 5,000 (or more) jobs]

This major renewable energy infrastructure project will be reliant on a reliable source of quarry products for road making and allied uses. The proposed quarry is the closest quarry to this project, with other benefits including the following:

- Potentially lower costs in building the roads and other materials required in the construction of this renewable energy project.
- Shorter haulage distances and less (costly) damage to local and regional roads, as well as resultant lower costs of maintaining local and regional roads.
- There are few quarries in the Mid Western Regional LGA capable of supplying the required volumes of processed quarry material to these renewable energy projects.
- Lower freight costs for supplying road making material to this project.
- Faster turn-around times for the supply of materials required for the construction of roads associated with this major renewable energy infrastructure project.

The predicted socio-economic impacts of the Project are therefore positive for the local region as well as for NSW generally.

The proposed quarry will provide additional reserves for the continued use of high quality hard rock resources for local and regional markets, including major infrastructure projects in the surrounding region. The quarry project will support long term economic prosperity in the locality by optimising the use of land and resources at a site known to have a proven quarry resource. The proposed development will operate as a quarry for the extraction and processing of hard rock for use in a wide of uses including but not limited to road base and as select fill. The proposed development will enable a continuation of revenues for the public sector by way of taxes, duties and excise and through payments for various government services. The State Government receives revenue from vehicle and quarry registrations, road and fuel tax.

The proposed quarry project is an economic opportunity which does not conflict with recreation or tourism or agriculture or rural amenity or environmental values.

Social Impacts : Gulgong Quarry Project

Poorly designed and/or excessively large-scale quarry projects can present long term social challenges like changing the character and amenity of a local area and way of life, impacts on health, safety, noise, dust, vibration and overpressure, quarry truck traffic impacting on local roads, and loss of agricultural jobs and agricultural way of life. Nevertheless, with careful planning and management, it is possible to minimise these effects. The proposed quarry, however, is modest in scale minimises these adverse social impacts, as set out in the following Table 7.13.

Table 7.13: Social Impact Assessment of Proposed Quarry

Issue	*Likely impact with mitigation*	*Relevance to Proposed Quarry Development*
Visual amenity (surroundings)	*LOW*	*The proposal has been designed to minimise visual amenity impacts.* ▸ *Screened views possible from only two residences.* ▸ *Quarrying at depth, out of sight from any nearby residence, progressively removing the knoll from behind. Loss of the knoll will be a gradual visual impact.* ▸ *The site will be revegetated once quarrying is completed.*
Noise amenity/ health (way of life)	*LOW*	*The assessment by Vipac shows noise emissions, including truck traffic noise, are expected to comply with EPA guidelines at the nearby sensitive receptors therefore minimising the possibility of any health impacts to the community.*
Air quality/ health (surroundings)	*MOD-LOW*	*The assessment by Vipac shows air quality/dust emissions are expected to comply with EPA guidelines at the nearby sensitive receptors therefore minimising the possibility of any health impacts to the community. Occasional dust my be visible but mitigated by measures proposed in this EIS.*
Blasting (way of life)	*MOD-LOW*	*The assessment by Vipac shows vibration and overpressure are unlikely to impact on nearby sensitive receptors in terms of meeting EPA requirements. Blasting will be noticeable, but infrequent.*
Quarry truck traffic	*MOD-LOW*	▸ *The proposal will utilise public roads for transportation, with acceptable capacities and impacts likely.* ▸ *Reduced haulage distances and use of roads in providing nearby renewable energy infrastructure projects with road making material, without truck traffic having to travel through the local townships of Gulgong or Mudgee.* ▸ *The proposal will not impact on access to neighbouring properties.*
Agricultural use of land (way of life)	*LOW*	▸ *No likely adverse impacts on either agriculture on neighbouring lands or the 'Talinga' farm holding. The project affects 0.6% of the 'Talinga' farm holding, with 0.55% returned to agriculture at completion of quarrying.* ▸ *No loss of agricultural jobs arise from the project.*
Heritage/ cultural	*LOW*	*The assessment shows the proposal protects the existing sites of cultural heritage by avoiding them.The proposal will implement the unexpected finds procedure.*
Safety, hazards	*LOW*	*The proposed quarry development has been assessed as not increasing safety risk, on or off-site.*

In addition to the above, the following measures will be implemented as part of the Project to reduce social impacts or to enhance the benefits:

- The quarry operator will communicate with nearby residents within a 2 km radius of the quarry who are not already registered to advise them of blasting notification procedures.
- The quarry operator will give a priority to hiring locals and purchasing goods and services from the local area where feasible and where practical, thereby enhancing potential direct economic benefits to employees and contractors, as well as to the local and regional areas through expenditure in the local area.
- Maintain liaison with local emergency services, in particular with the Rural Fire Service, to ensure that any accessibility impacts are identified and communicated early and consistently.
- The proposed quarry will operate in a location with suitable setbacks and buffers to prevent adverse amenity effects.

Cumulative Impacts

There are several concurrent development projects intended to operate in and around the area of social influence. These projects may contribute cumulative impacts in addition to those of the proposed quarry project.

A summary of nearby SSD and SSI projects as identified through the NSW DPIE (2024) Major Projects website in is given in Section 2.3.2 of this EIS. Few of these projects have been approved, let alone constructed. No new quarry projects have been approved in Mid Western Region LGA. As such, cumulative impacts are restricted to those most likely to proceed immediately, in particular EnergyCo's transmission line project. The Project aims to service these projects, once under construction, with road making material and select fill. The cumulative impacts arising are likely to include the following:

- Providing the roads and other materials required in the construction of this renewable energy projects will ensure that the projects can proceed, thus ensuring employment opportunities for workers on these projects, but also employment and economic opportunities for local businesses and suppliers.
- Improvements to local and regional roads.
- Maintenance of liaison with renewable energy project providers to ensure that any accessibility impacts are identified and communicated early and consistently.
- To a lesser extent, the proposed renewable energy projects have the potential to create new opportunities for retail and and other businesses opening, as well as schools and other social infrastructure. The proposed quarry will also increase local demand for supplies and contractors engaged in supplying quarries with the goods and services required.

7.3.9 Air Quality

Dust Generation Sources

By their very nature, quarries have the potential to generate dust and minor exhaust emissions and in particular:

- Total Suspended Particles (TSP), particulate matter.Particulate matter up to 50 microns in size.
- PM10-Particulate matter less than 10 microns in size.
- PM2.5-Particulate matter less than 2.5 microns in size.
- Dust deposition- deposited matter that falls out of the atmosphere.

Crushing and screening of the quarry resource, once won from the working quarry face, can also be a significant source of dust. Provided that dust is adequately controlled, the potential for any nuisance at any nearby residences can be minimised to a satisfactory degree, as is the case with the proposed quarry development.

The overall objective of the proposed quarry dust management regime will be to achieve acceptable air quality standards through the control of dust movement offsite and within the quarry. Such management measures are to form a part of any final quarry management plan, once the Project is approved.

Quarry activities at the site which have the potential to impact on air quality of the locality include the following:

- Removal of topsoil and overburden, extraction of rock from the quarry face and transportation of rock to the processing plant and away from the site. This includes the operation of plant including earthmoving machinery, digging equipment, loading, and dumping vehicles, haul trucks within the quarry and along the internal quarry haul route.
- Quarry crushing and screening operations, including the depositing of rock into primary and secondary crushers, openings at bins and chutes, quarry screening operations, material transfer points, and movement of crushed rock along conveyors.
- Dust generated by wind blowing over conveyors, stockpiles and disturbed areas, as well as during drilling and blasting operations including drilling of holes, stemming, and blasting activities.
- Dust generated by stockpiles, the loading and transport of quarry product.

Wind Roses TAPM-CALMET derived dataset

Vipac Engineers and Scientists Ltd was commissioned by Outline Planning Consultants Pty Ltd to conduct an air quality impact assessment for the proposed Gulgong Quarry project.

The assessment evaluated the potential impacts of air pollutants generated. A three dimensional meteorological field was required for the air dispersion modelling that includes a wind field generator accounting for slope flows, terrain effects and terrain blocking effects.

The Air Pollution Model, or TAPM, is a three-dimensional meteorological and air pollution model developed by the CSIRO Division of Atmospheric Research and can be used as a precursor to CALMET which produces fields of wind components, air temperature, relative humidity, mixing height and other micro-meteorological variables for each hour of the modelling period.

The TAPM-CALMET derived dataset for 12 continuous months of hourly data from the year 2023 and approximately centred at the proposed quarry project has been used to provide further information on the local meteorological influences. The wind roses from the TAPM-CALMET derived dataset for the project site for the year 2023 are presented in **Figure 7.4** and **Figure 7.5**.

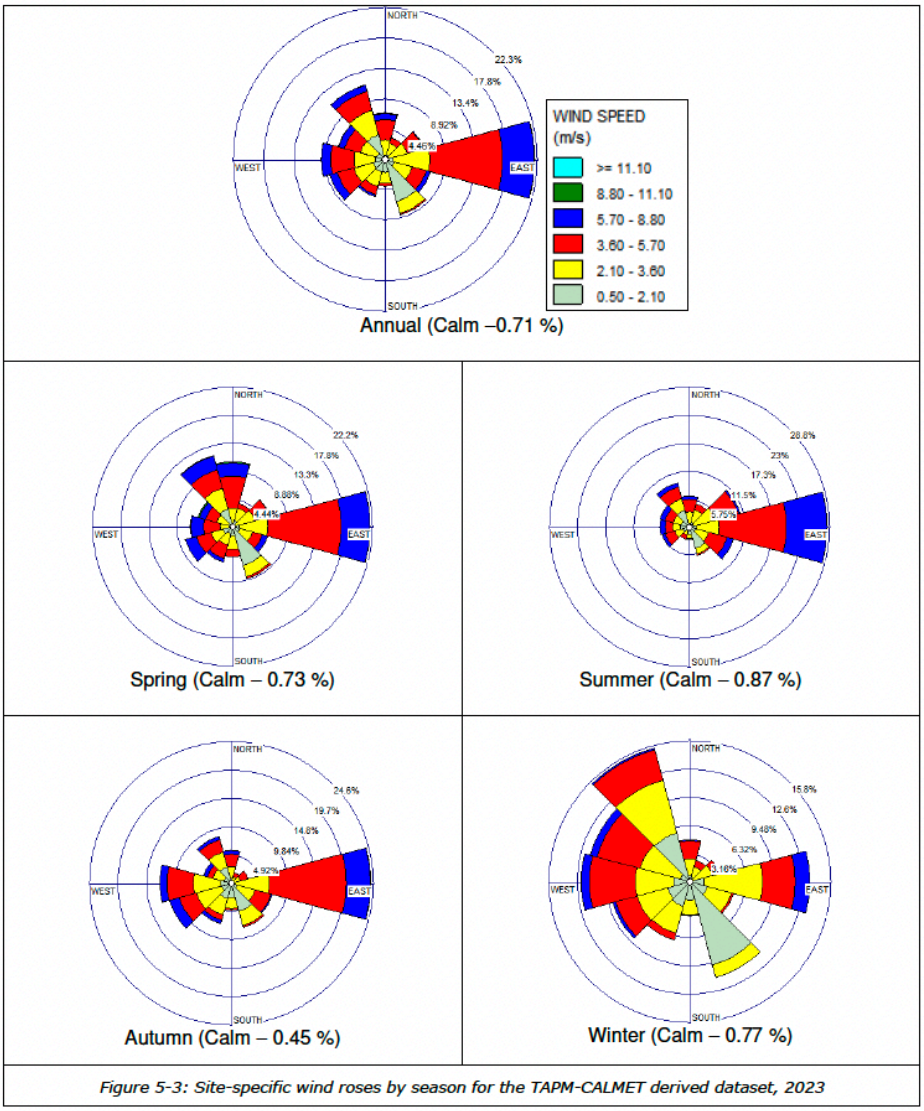


Figure 5-3: Site-specific wind roses by season for the TAPM-CALMET derived dataset, 2023

FIGURE 7.4: Site specific wind roses for the project site TAPM-CAMET 2023

(Source: Vipac 2024)

As shown in the figures, the annual wind patterns indicate that easterly winds are dominant during all seasons except winter. During the winter season, wind directions are variable, with winds from the northwest being dominant, along with prevalent westerly and easterly winds. Overall, winds from the south are infrequent which is likely indicative of the influences on wind flow from the elevated terrain in this direction.

Figure 7.3 shows the wind roses for the time of day during the year for 2023 for the modelled data at a site as close as possible to the Gulgong BoM Station site. It can be seen that easterly winds are dominant at both times with some westerly and north-westerly influences also apparent. These wind patterns are generally consistent with those shown for the long term measured data at the Gulgong BoM Station.

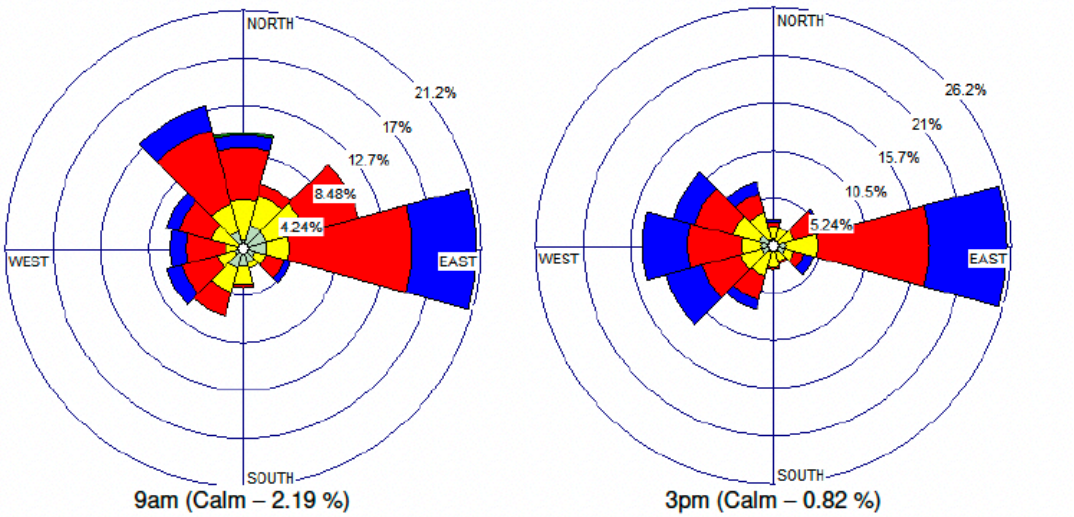


Figure 5-4: Gulgong site wind roses by time of day for the TAPM-CALMET derived dataset, 2023

FIGURE 7.5: Gulgong wind roses TAPM-CAMET 2023

(Source: Vipac 2024)

Existing Air Quality

Gulgong Quarry is situated within a sparsely populated rural area. Background dust levels are therefore expected to be primarily impacted by agricultural activities. The closest monitoring site to the Project site is at Merriwa, approximately 99 km to the east and is considered to provide a generally representative background estimation of the remote rural concentration levels expected for the project site. Of the pollutants of interest, PM_{10} and $PM_{2.5}$ are measured at the Merriwa site. As with all NSW air quality monitoring stations concentration levels of these pollutants were elevated by smoke from bushfires in summer.

The maximum measured 24 hour average $PM_{2.5}$ is already above the relevant criteria of 25 µg/m^3 and the maximum measured 24 hour average PM_{10} is very close to the criteria of 50 µg/m^3. Cumulative impacts are accounted for by adopting the background data which includes elevated concentrations of PM10 and PM2.5. These are therefore considered to be an over-estimation of background pollutant concentrations at the project site. Nevertheless, they are included in the assessment in accordance with the requirements specified in the *Approved Methods for the Modelling and Assessment of Air Pollutants in NSW*.

Refer Table 7.14.

Table 7.14: Assigned Background Air Quality Concentrations

Pollutant	Averaging period	Criteria	Maximum Measurements (in brackets) & Adopted background	Commments
TSP	Annual	90 µg/m^3	35.5 µg/m^3	Conservative assumption
PM10	24 Hour	50 µg/m^3	Varies (49.4 µg/m^3)	EPA Measurement
	Annual	25 µg/m^3	14.2 µg/m^3	
PM2.5	24 Hour	25 µg/m^3	Varies (27.1 µg/m^3)	EPA Measurement
	Annual	8 µg/m^3	4.7 µg/m^3	
Dust Deposition	Monthly Total	2 g/m^2/month	-	
	Monthly Total	4 g/m^2/month	2 g/m^2/month	Conservative assumption

(Source: Vipac 2024*Air Quality Assessment* Table 5-2)

Dust Mitigation Measures

The identification of potential sources of dust/air emission from the quarry site and quarry haul route has facilitated the nomination and design of various practical, effective mitigation measures for the control of dust, including the following:

- Use of water sprays on processing plant and materials stockpiles. A water tanker to be regularly used to spray water on working areas and the internal haul route back, to reduce dust nuisance.
- The first 100m of the internal haul route back to Castlereagh Highway is to be sealed.
- Covering of loads.
- Blasting will be restricted if windy conditions are likely to carry visible dust emissions beyond the quarry boundary, with blasting by sequential firing and using minimum force.
- Proper maintenance and tuning of the vehicles and equipment also assists in avoiding any off-site effects.
- Stabilising and revegetating of topsoil and overburden stockpiles.
- Enforcing a 30km/hour maximum speed limit on haul and access roads to minimise dust generation.
- Maintaining vegetated buffers between operational areas and site boundaries.

Air Quality Impact Assessment

The results of the modelling have shown that the TSP, PM10, PM2.5 and dust deposition predictions comply with the relevant criteria and averaging periods at all sensitive 24 receptors, summarised in the accompanying Table 7.15 and represented in **Figures 7.4-7.9**.

Table 7.15: Summary of Air Quality Predicted Impacts-Project in Isolation

Pollutant	Criteria	Range of Predictions at Nearest 24 Receptors	Compliance
		Operation	
TSP	90 µg/m^3	0.01-0.34 µg/m^3	Yes
PM10	50 µg/m^3	0.91-20.04 µg/m^3	Yes
	25 µg/m^3	0.03-0.45 µg/m^3	Yes
PM2.5	25 µg/m^3	0.19-4.41 µg/m^3	Yes
	8 µg/m^3	0.01-0.09 µg/m^3	Yes
Dust Deposition	2 g/m^2/month	0.002-0.74/m^2/month	Yes

(Source: Vipac 2024*Air Quality Assessment* from Table ES-1)

Table 7.16: Summary of Air Quality Predicted Impacts-Cumulative

Pollutant	Criteria	Range of Predictions at Nearest 24 Receptors	Compliance
		Operation	
TSP	90 $\mu g/m^3$	35.51-35.84$\mu g/m^3$	Yes
PM10	50 $\mu g/m^3$	50.32-69.44$\mu g/m^3$	Yes
	25 $\mu g/m^3$	14.23-14.65 $\mu g/m^3$	Yes
PM2.5	25 $\mu g/m^3$	27.31-31.51 $\mu g/m^3$	Yes
	8 $\mu g/m^3$	4.71-4.79 $\mu g/m^3$	Yes
Dust Deposition	2 g/m^2/month	0.002-0.74/m^2/month	Yes

(Source: Vipac 2024*Air Quality Assessment* from Table ES-1)

As summarised in Table 7.15 and Table 7.16, and **Figures 7.6-7.11**, the results of the modelling have shown that the TSP, PM_{10}, $PM_{2.5}$ and dust deposition predictions comply with the relevant criteria and averaging periods at all sensitive receptors modelled for the Project in isolation.TSP, dust deposition and annual average PM_{10} and $PM_{2.5}$ predictions are also less than criteria for the Project including background at all modelled sensitive receptors. Whilst the 24-hour average PM_{10} and $PM_{2.5}$ predictions are above, the exceedances are driven by the elevated background adopted for the assessment, which are already above or close to the criteria. No additional exceedances of the criteria at these receptors are predicted to occur as a result of the proposed quarry operations and that best management practices will be implemented to minimise emissions as far as is practical.

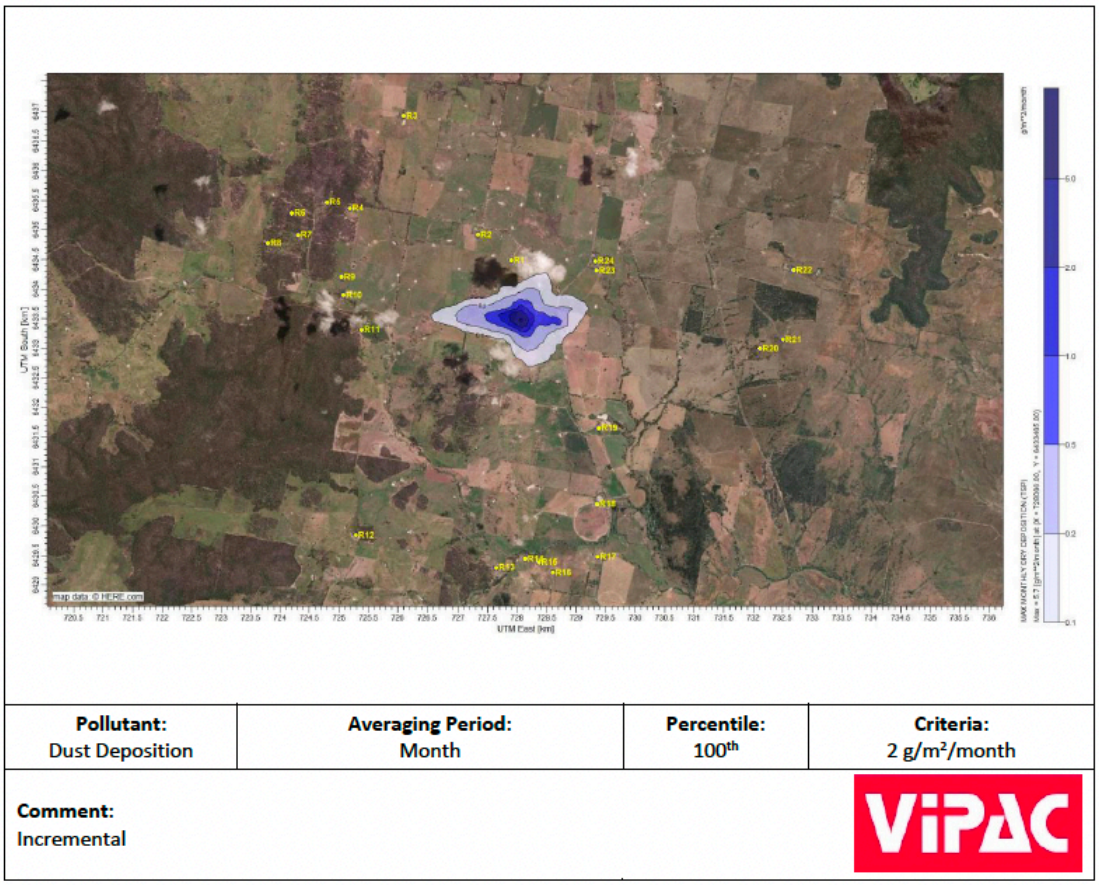
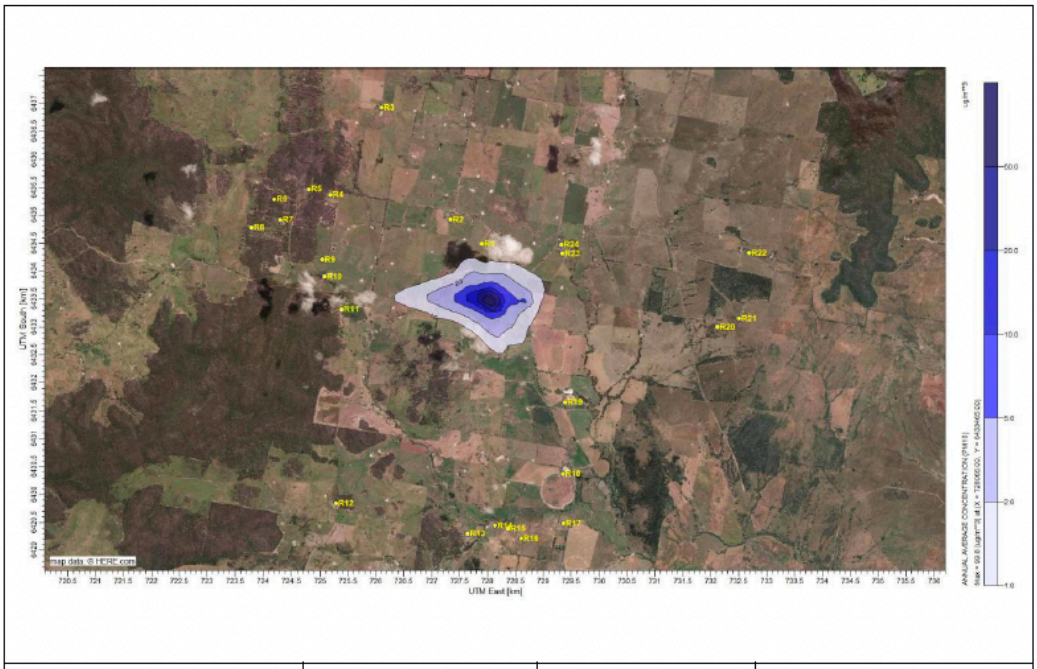


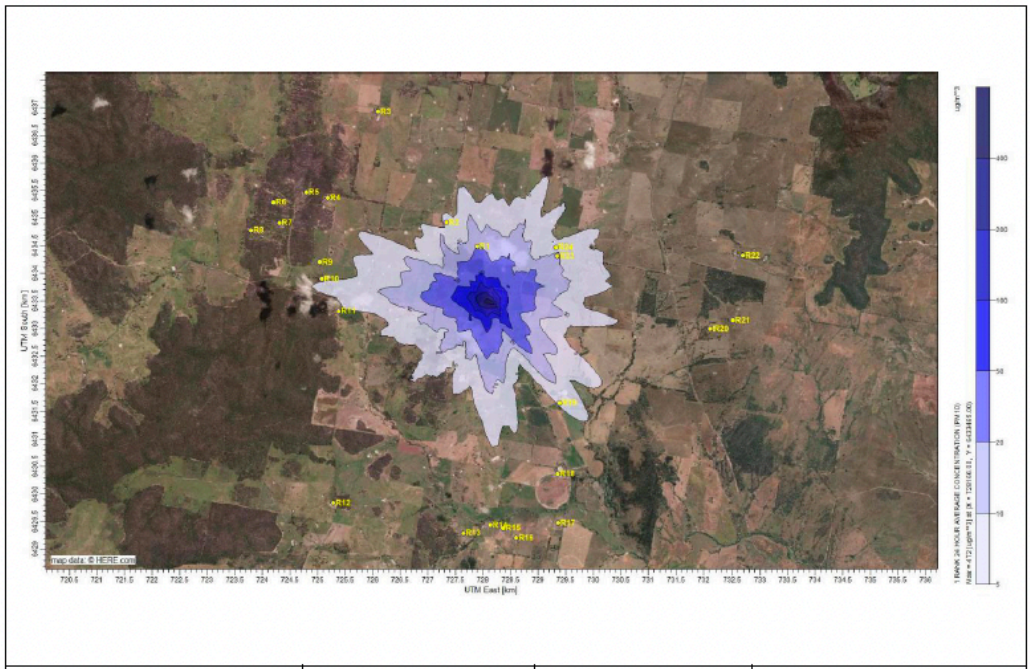
FIGURE 7.6: Predicted Dust Deposition Monthly
(Source: Vipac 2024 Air Quality Assessment)



Pollutant:	Averaging Period:	Percentile:	Criteria:
PM_{10}	Annual	100th	25 µg/m³

Comment:
Incremental

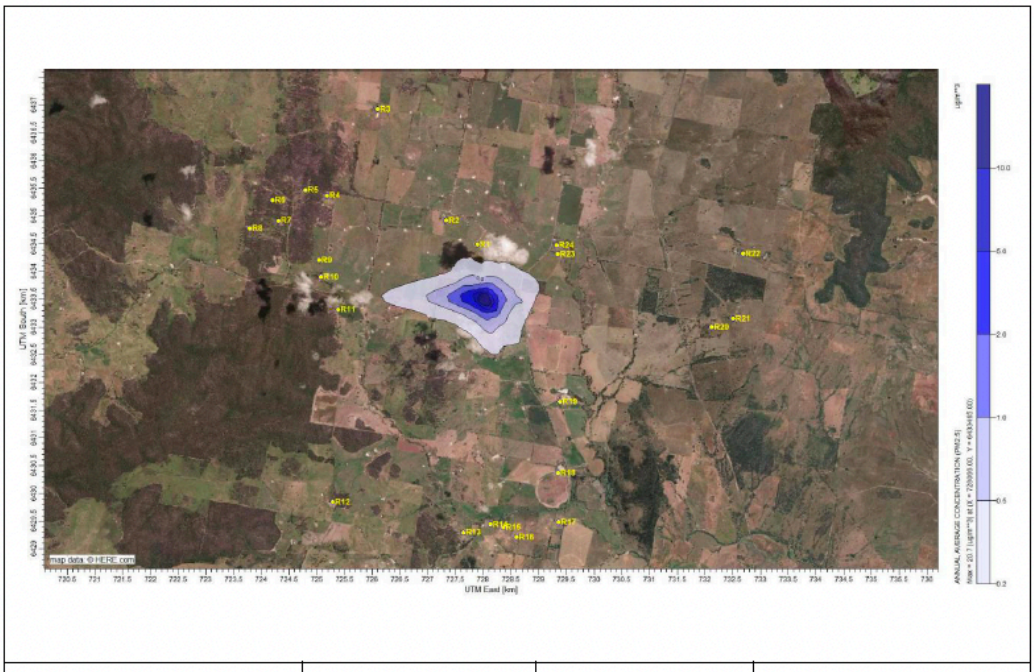
FIGURE 7.7: Predicted PM_{10} ANNUAL
(Source: Vipac 2024 Air Quality Assessment)



Pollutant:	Averaging Period:	Percentile:	Criteria:
PM_{10}	24 Hour	100th	50 µg/m³

Comment:
Incremental

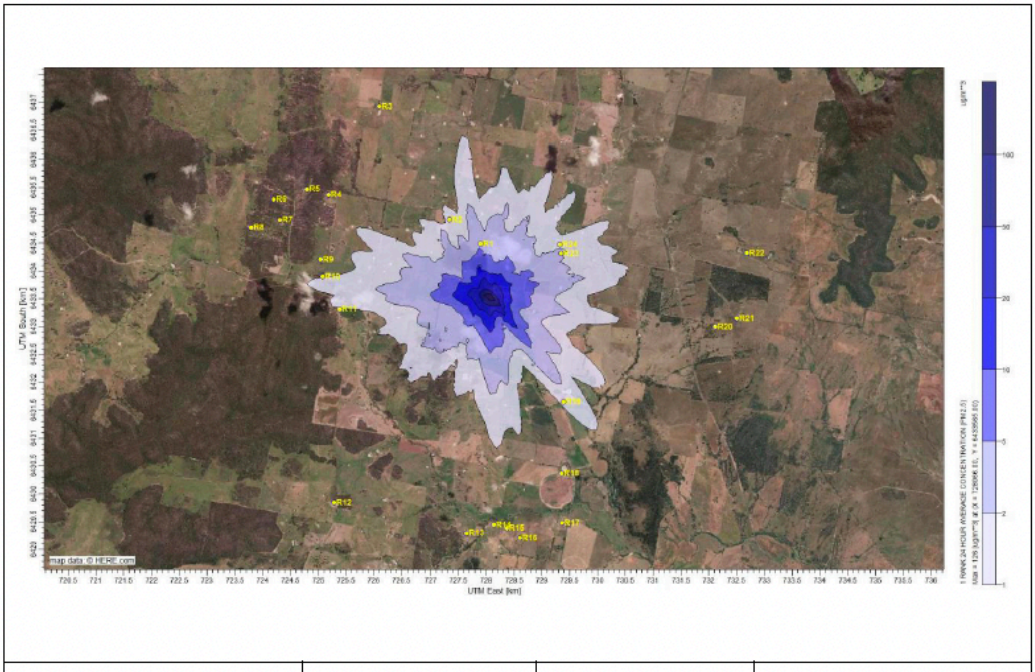
FIGURE 7.8: Predicted PM_{10} 24 HOUR
(Source: Vipac 2024 Air Quality Assessment)



Pollutant:	Averaging Period:	Percentile:	Criteria:
$PM_{2.5}$	Annual	100th	8 µg/m³

Comment:
Incremental

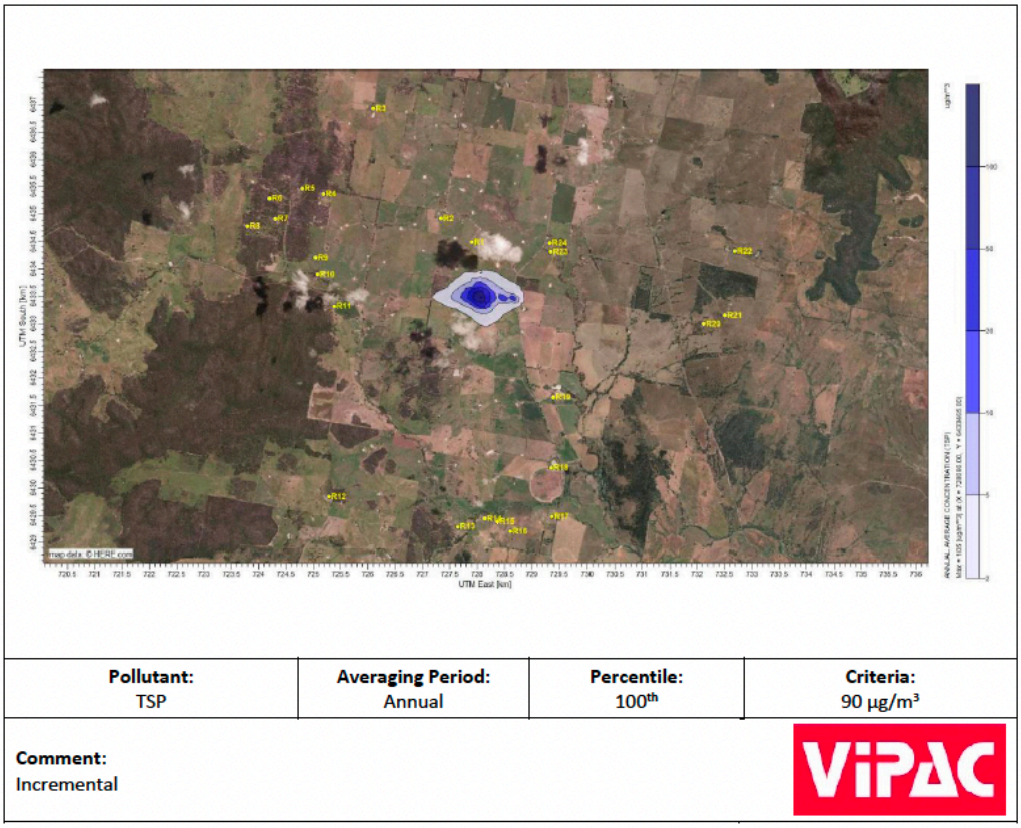
FIGURE 7.9: Predicted $PM_{2.5}$ ANNUAL
(Source: Vipac 2024Air Quality Assessment)



Pollutant:	Averaging Period:	Percentile:	Criteria:
$PM_{2.5}$	24 Hour	100th	25 µg/m³

Comment:
Incremental

FIGURE 7.10: Predicted $PM_{2.5}$ 24 HOUR
(Source: Vipac 2024 Air Quality Assessment)



Pollutant:	Averaging Period:	Percentile:	Criteria:
TSP	Annual	100th	90 µg/m³

Comment:
Incremental

FIGURE 7.11: Predicted TSP ANNUAL
(Source: Vipac 2024 Air Quality Assessment)

In the absence of the elevated background therefore, Vipac anticipate no exceedances of the criteria. As specified in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales*, under these circumstances no additional assessment is therefore required at these receptors. Emissions controls for dust abatement were included in the assessment. It should also be noted that some of the planned dust control measures are not easily quantifiable but will also still serve to reduce dust emissions. The dispersion modelling study applied by Vipac has taken a conservative approach and have not incorporated the effectiveness of these controls in the development of the emissions inventory. Vipac conclude that air quality should not be a constraint for proposed quarry.

7.3.10 Noise

Overview

Quarries have the potential, if unchecked, to produce significant levels of noise and vibration. As such, mitigation measures are required in order to ensure that the impact of noise on neighbours is appropriately mitigated and managed.

A noise assessment was undertaken by Vipac Engineers and Scientists Ltd to determine potential noise impacts on nearby sensitive receivers from the proposed Gulgong Quarry project- refer **Appendix C** and **Figures 7.12-7.20** for details.

This sub-section of the EIS provides a summary of the findings of the assessment in relation to potential impacts associated with the Project on noise. The proposed equipment for the ongoing quarry operation will utilise existing equipment currently in use on site for the current quarry operation. A maximum of 60 loaded quarry trucks per day is proposed.

Noise Sensitive Receptors (NSR)

The locality is sparsely populated, with the nearest rural residences described in the following- refer **Figure 7.2**:

- R1 - The quarry is approximately 1,415m to the south-east of this rural dwelling not associated with the quarry, situated on Lot 98 on DP750751, No.7 Corishs Lane, tallawang.
- R2 - The quarry is approximately 1,900m to the south-west of this rural dwelling not associated with the quarry, on Lot 1 on DP861634 at No. 40 Whistons Lane, Tallawang.
- R3 - The quarry is approximately 788m to the north of the nearest rural dwelling not associated with the quarry, at No. 117 Tucklan Road, Tallawang.
- R4 - The quarry is approximately1,400m to the NNW of the rural dwelling at 'Talinga', associated with the quarry, at No. 1848 Castlereagh Highway, Tallawang.
- R5 - The quarry is approximately 1,345m to the south-west of this rural dwelling not associated with the quarry, on Lot 1 DP861634 at No. 2152 Castlereagh Highway, Tallawang.
- R6- The quarry is approximately 1,460m to the south-west of this rural dwelling not associated with the quarry, on Lot 1 DP861634 at No. 2162 Castlereagh Highway, Tallawang.

The location of the nearest receptors is illustrated in the accompanying **Figure 7.12**.

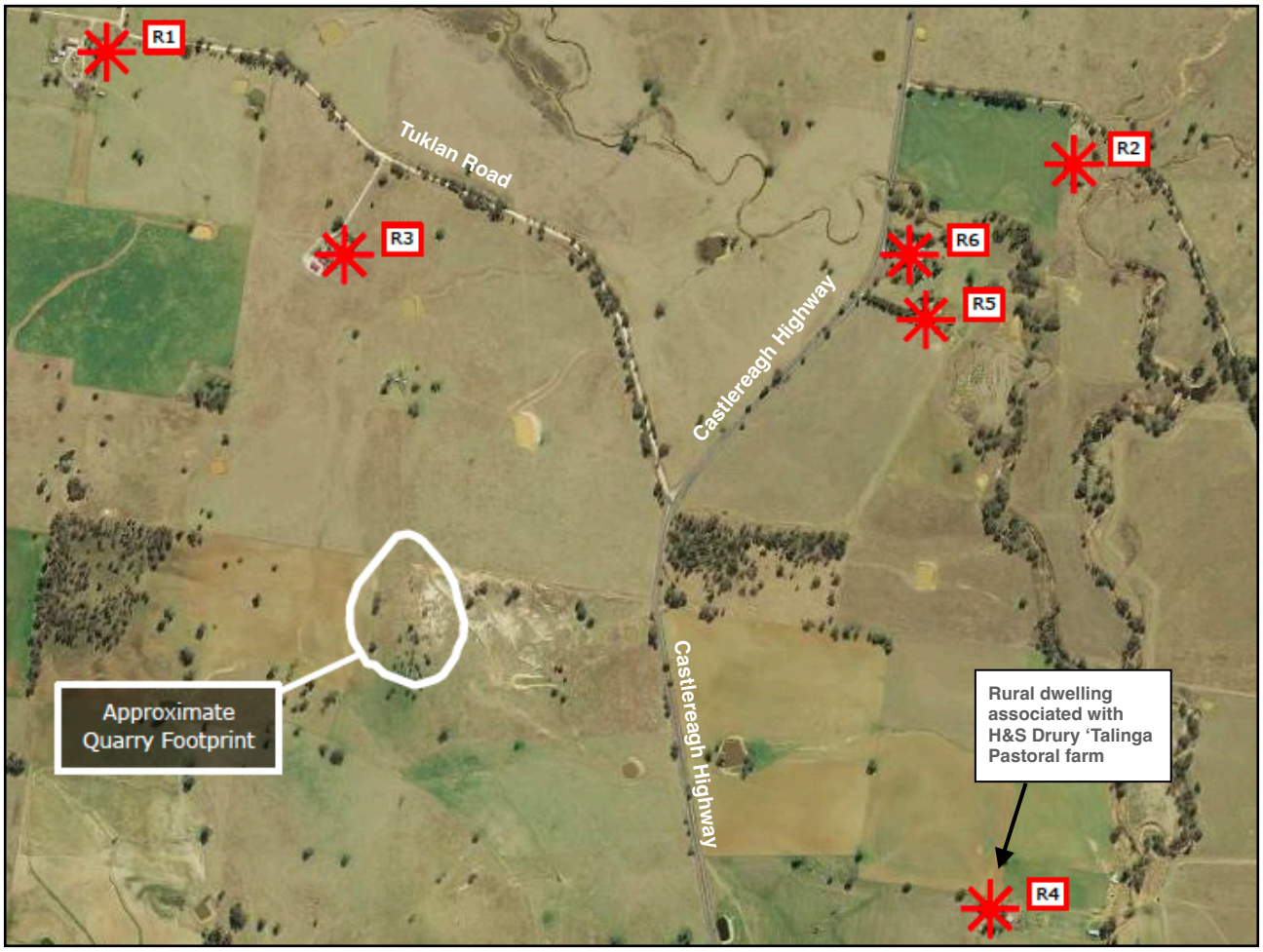


FIGURE 7.12: Map of nearest residential receptors to proposed quarry
(Source: Figure 2-1 Vipac 2024 Noise and Vibration Assessment)

Noise Criteria

The SEARs for this Project required an assessment of the following noise issues:

- The construction and operational noise and off-site transport noise impacts of the development in accordance with the *Interim Construction Noise Guideline* (ICNG), *NSW Noise Policy for Industry 2017* (NPI) and *NSW Road Noise Policy 2011* (RNP) respectively.
- Reasonable and feasible mitigation measures to minimise noise emissions.
- Monitoring and management measures.

The noise criteria applied in the noise assessment by Vipac are determined in accordance with the above.

Quarry development in the initial construction phase will consist of stripping of the (shallow) overburden, blasting of quarry rock, additional internal haul road improvements, the establishment of erosion and sediment controls, and levelling of pads to accommodate quarry plant and equipment required on site. A bulldozer or an excavator-but not both at the same time-will be employed to carry out this work in the construction stage. The following standard hours for construction and operational activities apply, anticipated to last for approximately 6 weeks:

- 7.00am to 6.00pm Monday to Saturday.
- At no time on Sundays or Public Holidays.

The above hours do not apply in the event of direction from police, or other relevant authorities, for safety reasons or

The project specific noise criterion limits the noise that a development can make in accordance with the NSW *Noise Policy for Industry* (NPI) (2017) in order to limit the impact of the development on the existing noise sensitive receptors. The NPI states that where the rating background noise level is found to be less than 35dB(A) for the daytime periods, then it is set to 35dB(A). The amenity criterion is specific to land use and associated activities. It aims to limit continuing increases in noise levels. The maximum ambient noise level for a residential receiver in a rural area should not exceed the acceptable noise levels specified in the following:

- Day (7.00am to 6.00pm): 50dB(A) LAeq.
- Evening (6.00pm to 10.00pm): 45dB(A) LAeq.
- Night (10.00pm-7.00am): 40dB(A) LAeq.

The quarry development proposes to operate between the hours of 7.00am-6.00pm. Therefore, only the Day period has been considered for assessment. The intrusiveness criterion states that the equivalent continuous noise level of the source should not be more than 5 decibels above the rated background level when measured over a 15 minute period. It aims to control intrusive noise impacts in the short term for residences ie. LAeq, 15 minutes to be less than or equal to the Rating Background Level (RBL) + 5 dB.

In this case the RBL was assessed to be 35dB(A), with the Project Specific Noise Level thus being 40dB(A). Refer to accompanying Table 7.17.

Table 7.17: Project Specific Noise levels (dBA)

Receptor	Time of Day	Rating Background level (RBL)	Intrusiveness Criterion	Amenity Criterion	Project Specific Noise Level
All	*Day*	*35*	*40*	*50*	***40***

(Source: Vipac 2024 *Noise and Vibration Impact Assessment* from Table 3-2)

Quarry Noise Impact Assessment: Construction and Operational Noise

Vipac has prepared comprehensive noise impact assessment for the proposed project. Details of the noise modelling approach undertaken by Vipac for the noise assessment are provided in **Appendix C**.

Noise modelling was undertaken using the SoundPLAN 8.2 computational noise modelling software package for two different operational scenarios supplied by Outline Planning Consultants plus the initial quarry construction.

Noise prediction modelling was carried out by Vipac to assess the potential impact associated with the proposed quarry operations at the nearest noise sensitive receptors for the proposed construction and operational scenarios. The predicted noise levels representative of each scenario for both neutral conditions and worst-case conditions during the day period are presented in the accompanying Table 7.18 and Table 7.19. All scenarios are predicted to to comply with relevant noise criteria. These results been reproduced graphically as Noise Contour Maps and are shown in **Figures 7.13-7.20**.

Table 7.18: Predicted Construction Noise levels (dBA)

Receptor	Noise Limit	Predicted Noise level with Dozer ($L_{Aeq\ 15\ minutes}$ dBA)		Predicted Noise level with Excavator ($L_{Aeq\ 15\ minutes}$ dBA)	
		Neutral Weather	Adverse Weather	Neutral Weather	Adverse Weather
R1	40 dBA	24	29	25	31
R2		19	25	20	27
R3		32	37	35	40
R4		22	27	23	29
R5		23	29	26	31
R6		23	29	25	31

(Source: Vipac 2024 *Noise and Vibration Impact Assessment* from Table 5-1)
[NOTES: 1. Receptor R4 is located on the 'Talinga' farm holding ie. associated with the proposed quarry.
2.The excavator and bulldozer will not be operating at the same time and they have been modelled separately].

Table 7.19 contains the predicted noise level from operational Stages 1 and 2 of the proposed Gulgong Quarry. Refer to **Appendix C** for further details.

Table 7.19: Predicted Operational Noise levels (dBA)

Receptor	Noise Limit	Predicted Noise level with Dozer ($L_{Aeq\ 15\ minutes}$ dBA)		Predicted Noise level with Excavator ($L_{Aeq\ 15\ minutes}$ dBA)	
		Neutral Weather	Adverse Weather	Neutral Weather	Adverse Weather
R1	40 dBA	23	29	25	30
R2		19	24	20	26
R3		30	35	32	37
R4		23	28	25	31
R5		21	26	25	31
R6		22	28	24	30

(Source: Vipac 2024 *Noise and Vibration Impact Assessment* from Table 5-1)
[NOTE: Receptor R4 is located on the 'Talinga' farm holding ie. associated with the proposed quarry.]

Noise levels are predicted to comply at all receptors.

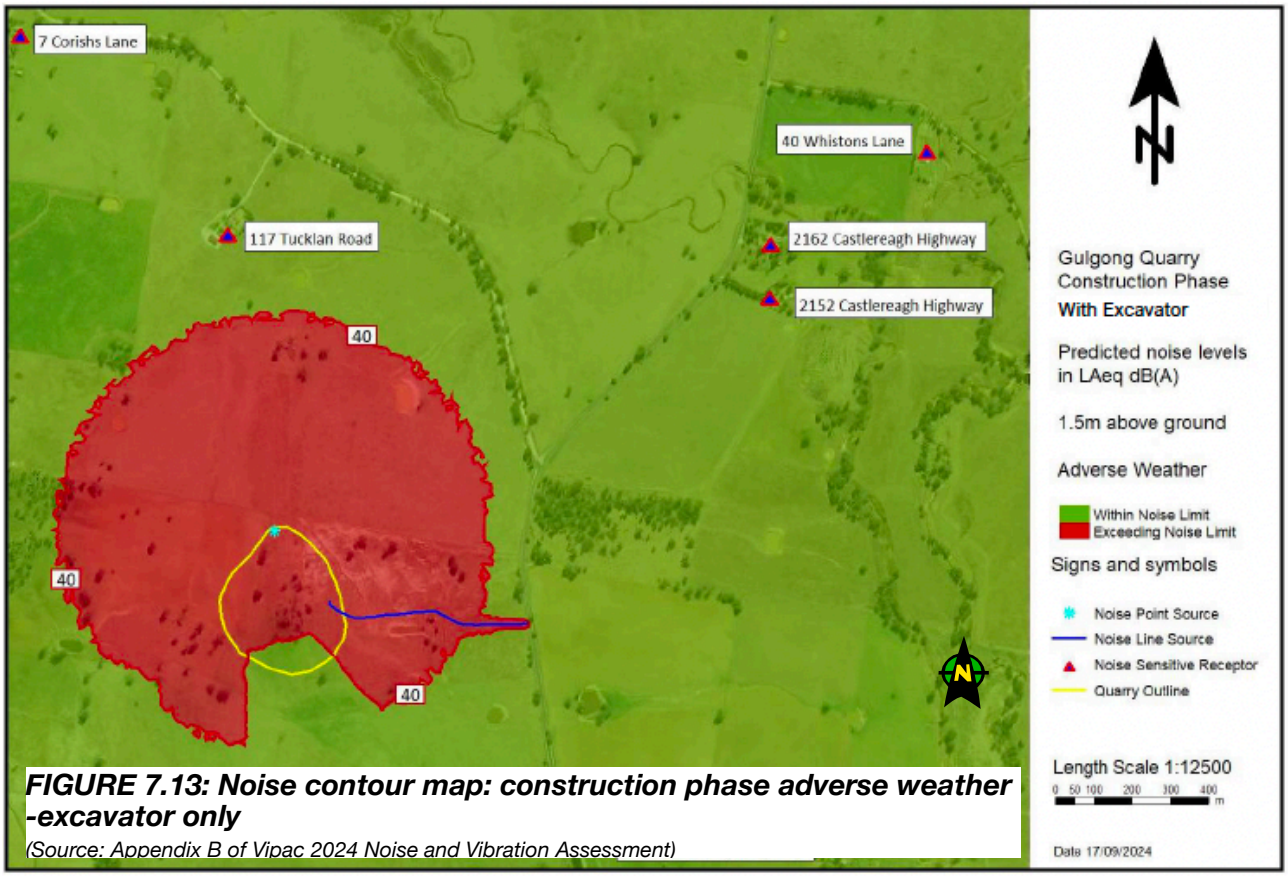


FIGURE 7.13: Noise contour map: construction phase adverse weather -excavator only

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

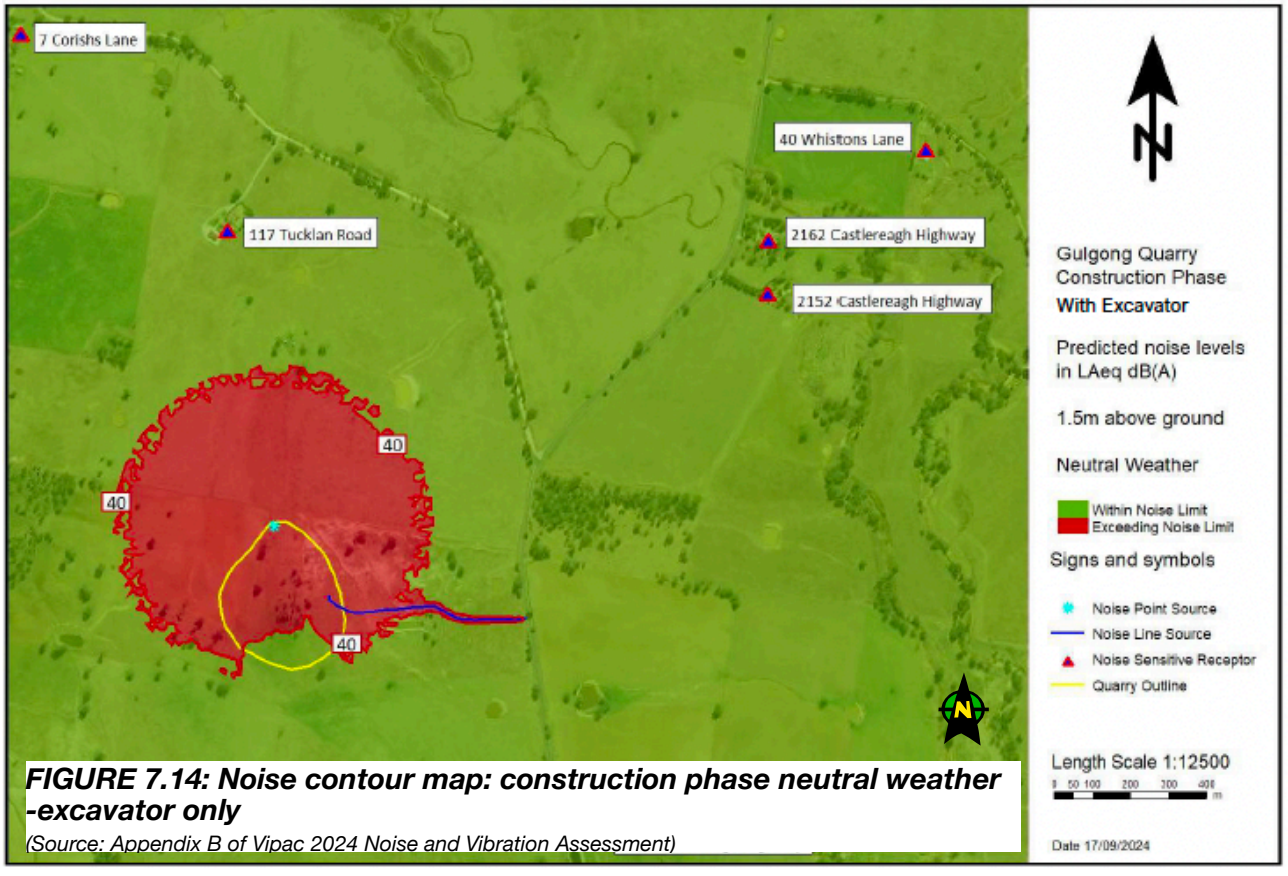


FIGURE 7.14: Noise contour map: construction phase neutral weather -excavator only

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

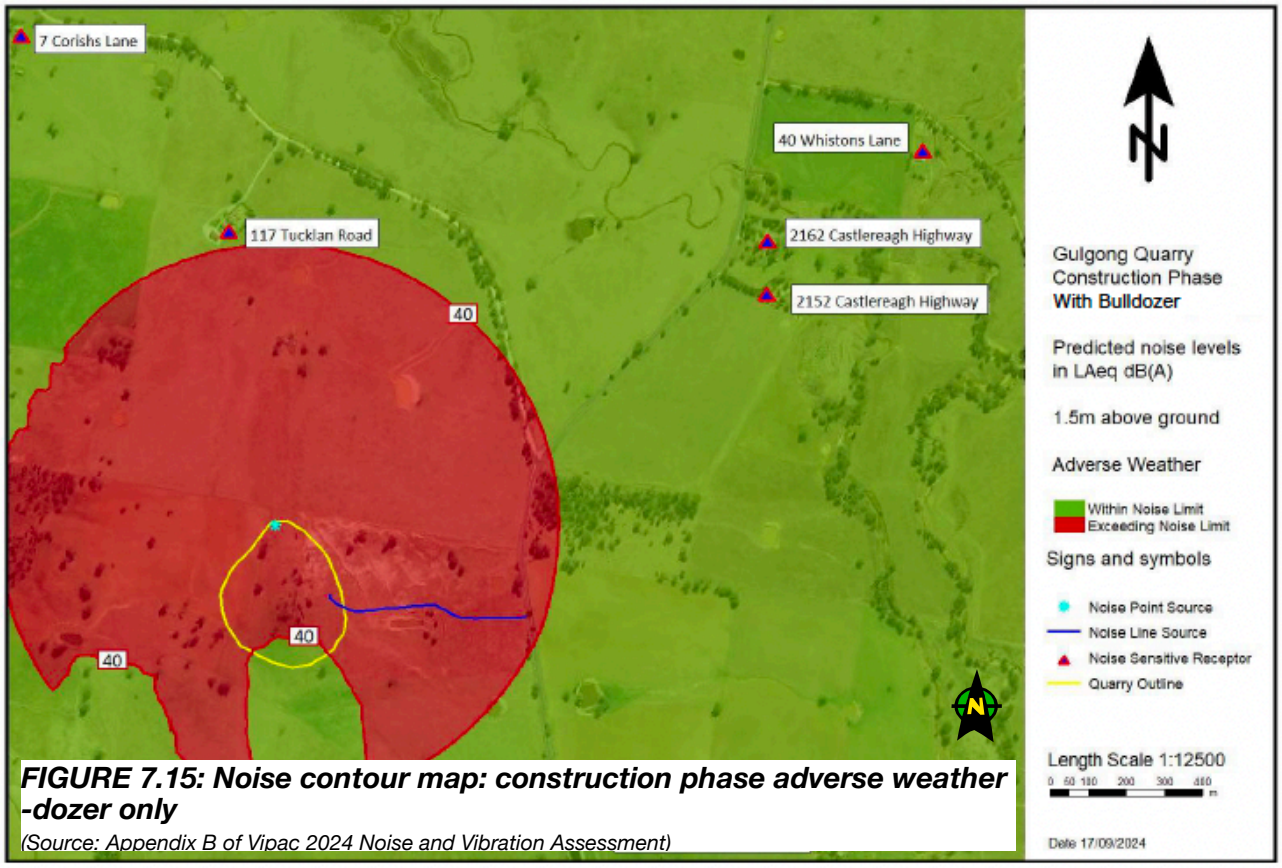


FIGURE 7.15: Noise contour map: construction phase adverse weather -dozer only

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

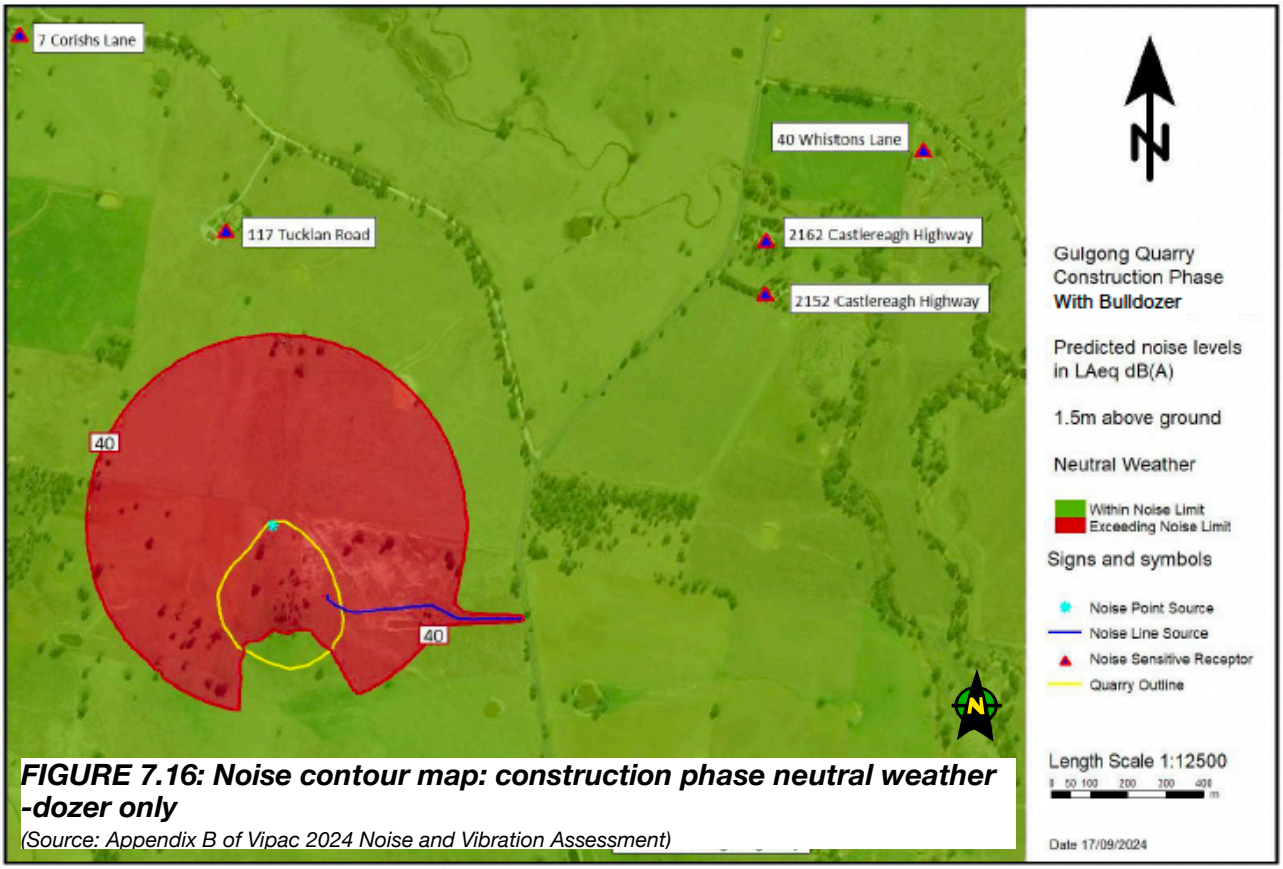


FIGURE 7.16: Noise contour map: construction phase neutral weather -dozer only

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

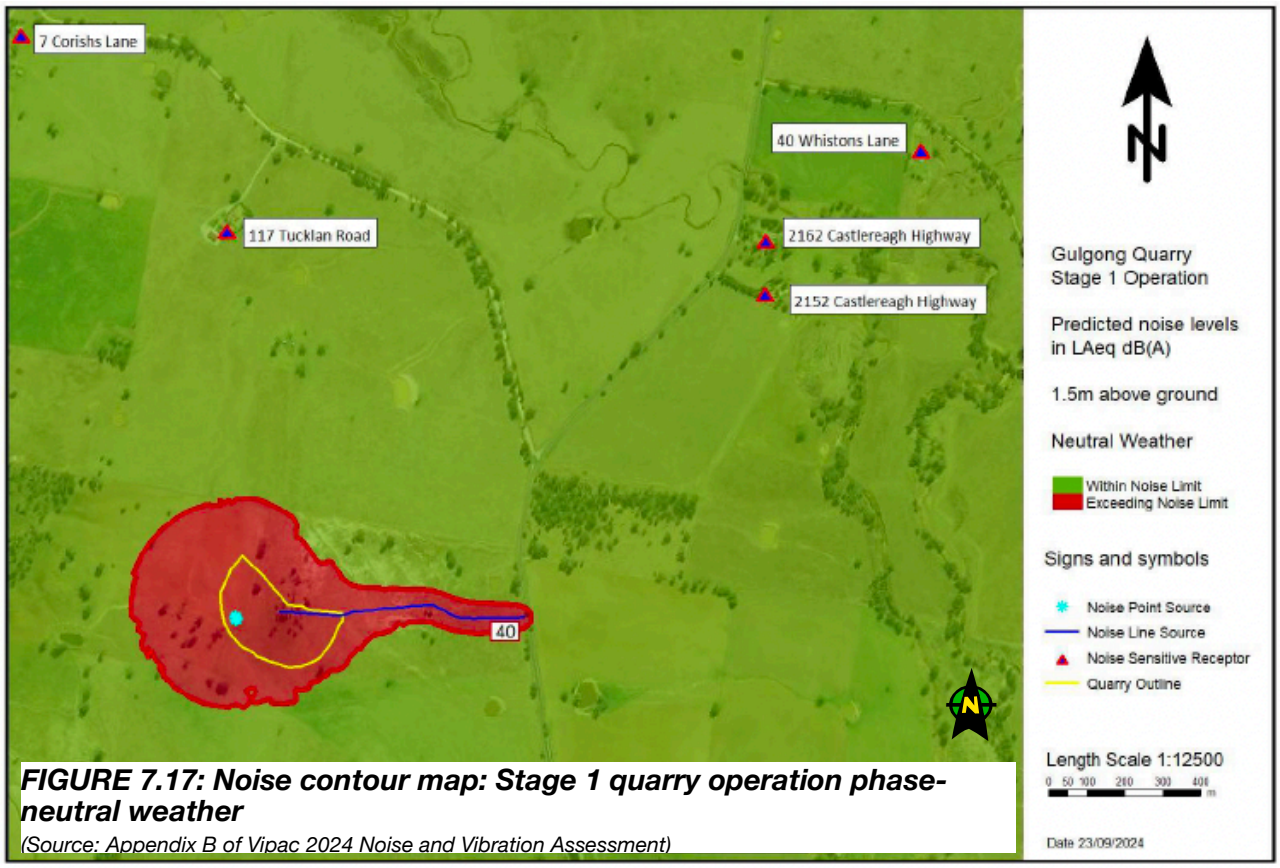


FIGURE 7.17: Noise contour map: Stage 1 quarry operation phase-neutral weather

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

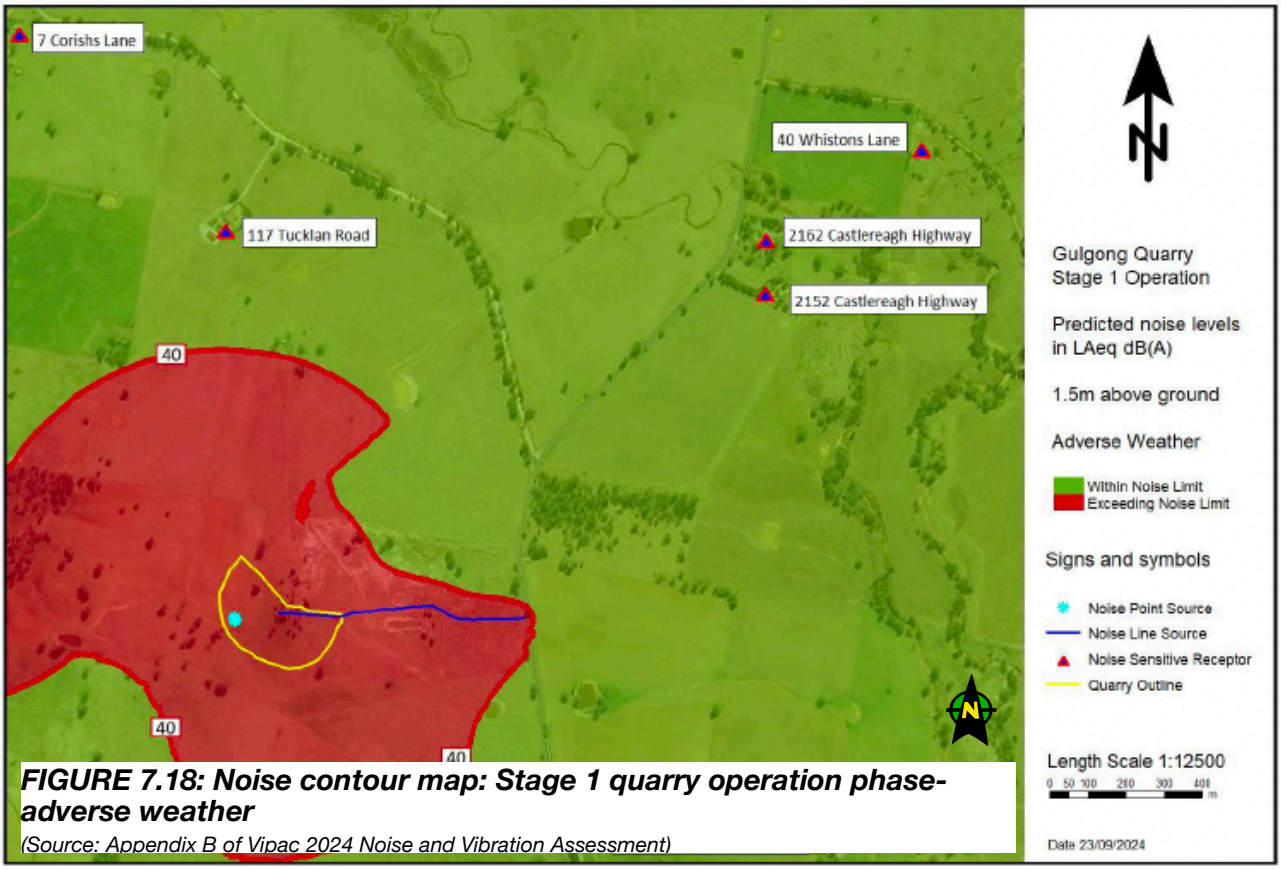


FIGURE 7.18: Noise contour map: Stage 1 quarry operation phase-adverse weather

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

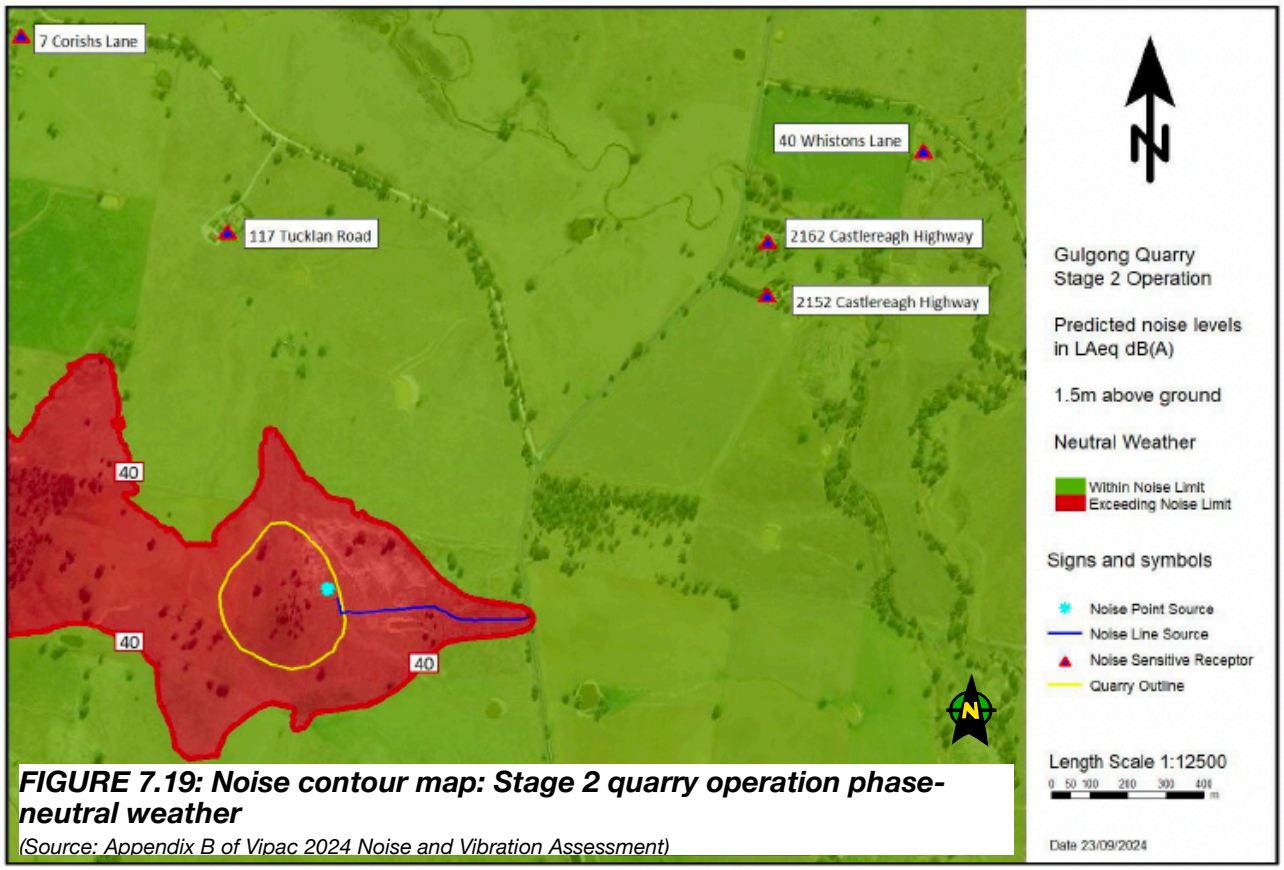


FIGURE 7.19: Noise contour map: Stage 2 quarry operation phase-neutral weather

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

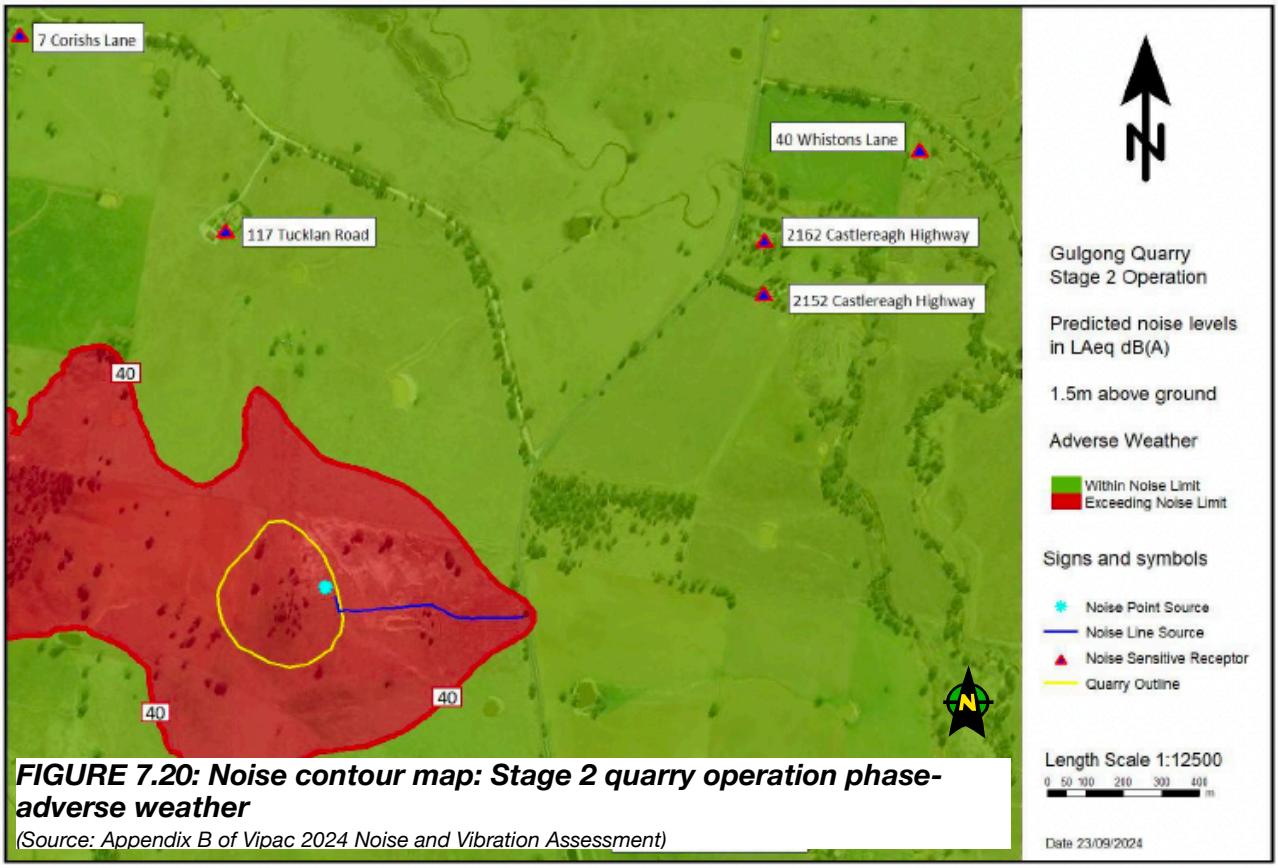


FIGURE 7.20: Noise contour map: Stage 2 quarry operation phase-adverse weather

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

Traffic Noise Impact Assessment

The Calculation of Road Traffic Noise (CoRTN) method of traffic noise prediction has been used, which is a method approved by the EPA. The assessment considers two worst-case scenarios, both assuming all quarry truck movements are on the Castlereagh Highway. This is equal to an additional 120 truck movements per day (i.e. laden and unladen) as a 'worst case'.

Project Site has direct vehicular access to Castlereagh Highway, a sub-arterial road. In accordance with the requirements of the NSW *Road Noise Policy 2011* (RNP) an external (day time) Assessment Criteria/Target Noise Level of 60dB(A) LAeq (15 hour) applies.

Residences experiencing increases in total traffic noise levels of 12 dB or more above existing traffic noise (LAeq (15 hour)) is likely to trigger community reaction, and should also be considered for mitigation.

The Vipac assessment finds that traffic noise generated by the project will comply with the RNP, without the need for mitigation. Vipac have applied *Calculation of Road Traffic Noise* (CoRTN) method to calculate traffic noise associated with the proposed additional quarry truck movements on the existing haul route.

The accompanying Table 7.6 below presents Vipac's traffic noise predictions for existing traffic, alongside future predicted traffic volumes at the nearest residential receptors, based on traffic predictions by Streetwise (**Appendix D**). Road traffic noise monitoring was not conducted as part of this traffic noise assessment, however, it is anticipated that existing traffic noise levels for all other receptors are below the current criteria for both local roads and principal haulage routes. The results predicted by Vipac are therefore intended to provide a conservative indication based on a worst-case scenario of the sole use of heavy vehicles travelling to and from the site. Refer to **Figure 7.21** showing the location of the receptors on the highway that were assessed.

Table 7.20: Predicted Operational Noise levels (dBA)

Receptor	Criteria	Predicted Noise ($L_{Aeq\ 15\ minutes}$ dBA-facade corrected)			
		Predicted Existing Traffic Noise, dB(A)	Predicted Future Traffic Noise, dB(A)	Predicted compliance	Maximum Difference* (Existing v Future) ≤2dB(A)
TR1	60 dBA	50.1	51.4	√ Yes	+1.3
TR2		42.4	43.7	√ Yes	+1.3
TR3		41.1	43.3	√ Yes	+2.2
TR4		51.8	53.4	√ Yes	+1.6
TR5		46.1	49.0	√ Yes	+2.9

(Source: Vipac 2024 *Noise and Vibration Impact Assessment* from Table 6-2 and Streetwise Traffic Impact Assessment report)

It can be seen in Table 7.20 that existing and future traffic noise levels at existing residential receptors are predicted to comply with the criteria without the need for acoustic mitigation.

Given the increase in noise levels between existing and future traffic flow are also well below the relative increase criteria (ie. existing traffic + 12dB), Vipac conclude that the increased traffic from the proposed quarry development is predicted to comply with the relevant road traffic noise criteria.

Vipac conclude that traffic noise associated with the additional quarry truck movements on the Castlereagh Highway are predicted to comply with the criteria without the need for acoustic mitigation measures.

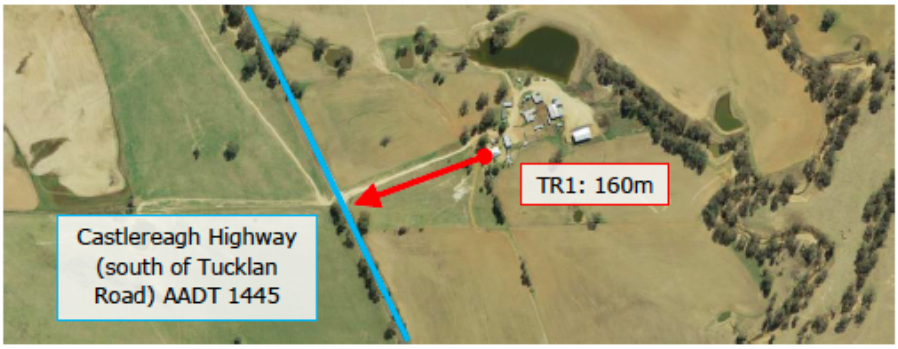
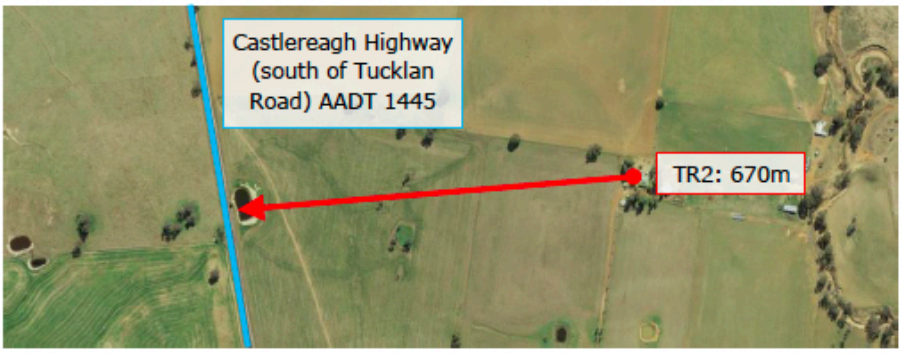
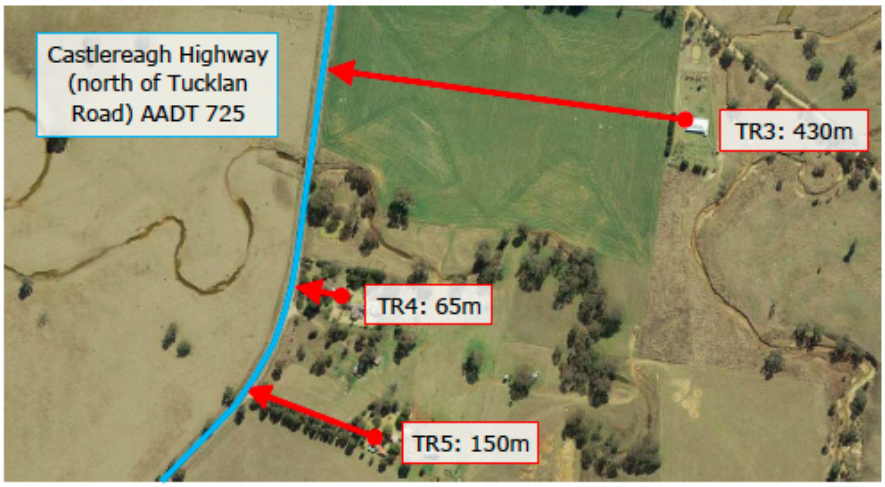
NSR	Distance to Road	Aerial Imagery
TR1: 2058 Castlereagh Highway	160m	
TR2: 1848 Castlereagh Highway (also known as R4)	670m	
TR3: 40 Whistons Lane (also known as R2)	430m	
TR4: 2162 Castlereagh Highway (also known as R6)	65m	
TR5: 2152 Castlereagh Highway (also known as R5)	150m	

FIGURE 7.21: Road traffic noise assessment receptor locations

(Source: Appendix B of Vipac 2024 Noise and Vibration Assessment)

Noise Impact Assessment: Conclusion

On the basis of Vipac's assessment of predicted traffic noise and quarry noise, and subject to the implementation of appropriate noise mitigation measures (refer Section 4.0 of this EIS and **Appendix C**), the operation of Gulgong Quarry is capable of complying with the relevant noise criteria at surrounding sensitive receivers.

7.3.11 Biodiversity

Overview

Quarrying involves impacts which cannot be avoided - quarrying inevitably involves clearing of land and excavation and removal of material. It is noted, however, that a similar deposit of quarry material, located on the site but further to the west, was rejected, inter alia, on environmental grounds. In any case, the focus for assessment of this quarry development will thus be on impacts and, where required, impact minimisation.

A Biodiversity Development Assessment Report (BDAR) has been prepared by Bower Ecology for the Gulgong Quarry project and is provided in **Appendix L**. A BDAR is a comprehensive document required under the *Biodiversity Conservation Act 2016* (the BC Act) that assesses the biodiversity impacts associated with a proposed development. The BDAR is required in order to ensure that a proposed development complies with biodiversity conservation requirements at the same time as identifying measures to avoid, minimise, or offset impacts to areas with vegetation mapped with biodiversity values: *IRM Property Group (No.2) Pty Ltd v Blacktown City Council* [2021] NSWLEC 1306. The concept of avoidance, minimisation and offsets to address impacts to biodiversity values is consistent with a key purpose to maintain a healthy, productive and resilient environments, as provided for in s.1.3(k) of the BC Act.

The BDAR was also prepared with reference to relevant guidelines and policies and the issued SEARs as well as with s.2.20(1)(b) of *State Environmental Planning Policy (Resources and Energy) 2021* which requires the following:

> *"2.20 Natural resource management and environmental management*
> *(1) Before granting consent for development for the purposes of mining, petroleum production or extractive industry, the consent authority must consider whether or not the consent should be issued subject to conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following—*
> *……,*
> *(b) that* ***impacts on threatened species and biodiversity, are avoided, or are minimised to the greatest extent practicable****,*
> …… [our emphasis in **bold**]

Under the NSW BC Act a proposed development (as assessed under Part 4 of the EP&A Act) is required to be assessed via the NSW Biodiversity Offset Scheme (BOS) when specific entry requirements are triggered. If the BOS is triggered a development agreement (DA) is required to be accompanied by a BDAR prepared in accordance with the Biodiversity Assessment Method (BAM). The outcomes of the assessment of these thresholds for the Project is as below.

It is noteworthy that the Project Site is not mapped on the NSW Government's online Biodiversity Values Map- refer **Figure 7.22**. Additionally, no areas of outstanding biodiversity values (AOBV) overlay the project site. Both the *Biodiversity Conservation Act 2016* and *Biodiversity Conservation Regulation 2017* apply to the Project Site.

As the proposed development proposes to clear 1.54 ha of native vegetation (greater than the applicable 1 ha trigger) and based on the native area clearing thresholds BOS will be triggered. more than 1ha of clearing offsets or Biodiversity Development Assessment Report (BDAR) are required.

In accordance with s.11 of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* the Bower Ecology ecological assessment also considers the potential for impact on the Koala. The assessment finds that the proposed quarry development will not have any impact on koalas or koala habitat. The Bower Ecology ecological assessment provides a summary of the potential impacts to threatened flora and fauna species from the Project, along with vegetation communities and potential habitat across the entire Project Site.

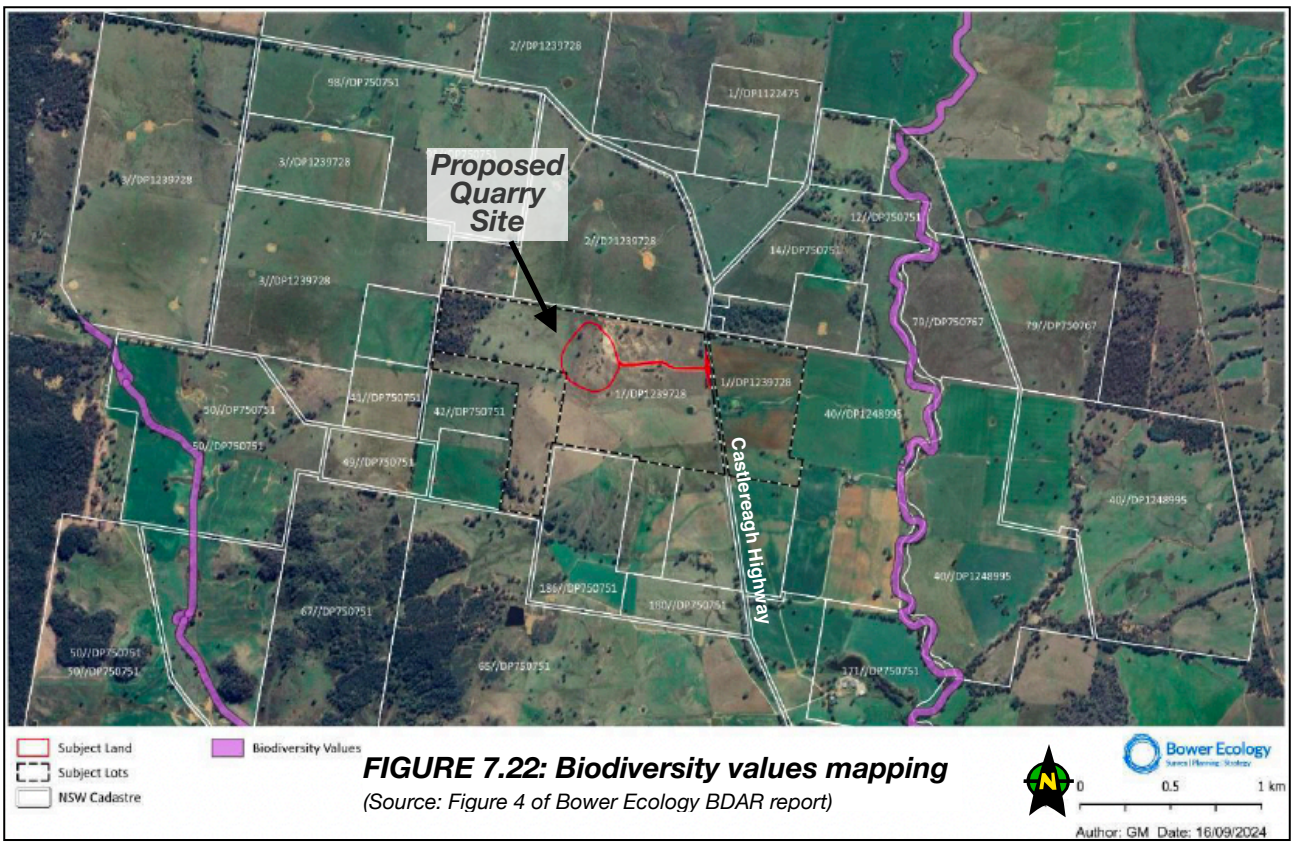


FIGURE 7.22: Biodiversity values mapping
(Source: Figure 4 of Bower Ecology BDAR report)

The *Local land Services Act 2013* was developed in order to develop a balanced approach to assessing biodiversity within designated for rural land management practices such as agriculture and grazing. The NSW Department of Planning Housing and Infrastructure has released the draft Native Vegetation Regulatory (NVR) map while the statewide NVR map is being updated by the department. For the purpose of this BDAR, the Draft LLS mapping is accepted- refer to **Figure 7.23**. Section 6.8 of the BC Act requires that the biodiversity assessment method is to exclude the assessment of the impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (within the meaning of Part 5A of the *Local Land Services Act 2013*, other than any impacts prescribed by the regulations under Section 6.3 of BC Act.

As per the draft NVR mapping, the proposed quarry site and access contains both Category 1 - exempt land and Category 2 – regulated land.

Category 1 - exempt land is defined as:

- Land that was cleared of native vegetation as at 1 January 1990, and
- Land that contains low conservation value grasslands.

Category 2 – regulated land is defined as:

- Land that was cleared of native vegetation as at 1 January 1990, and
- Land that contains grasslands that are not low conservation value grasslands.

Notwithstanding the acceptance of the NVR mapping, site surveys by Bower Ecology confirm the extent of Category 1 land, that is:

- Prior to clearing the majority of the area impacted by the proposed quarry did not constitute a Critically Endangered Ecological Community.
- It is clear from a review of historical aerial photography that the land was lawfully cleared of vegetation prior to 1990, and since it was cleared it has been used for intensive grazing.

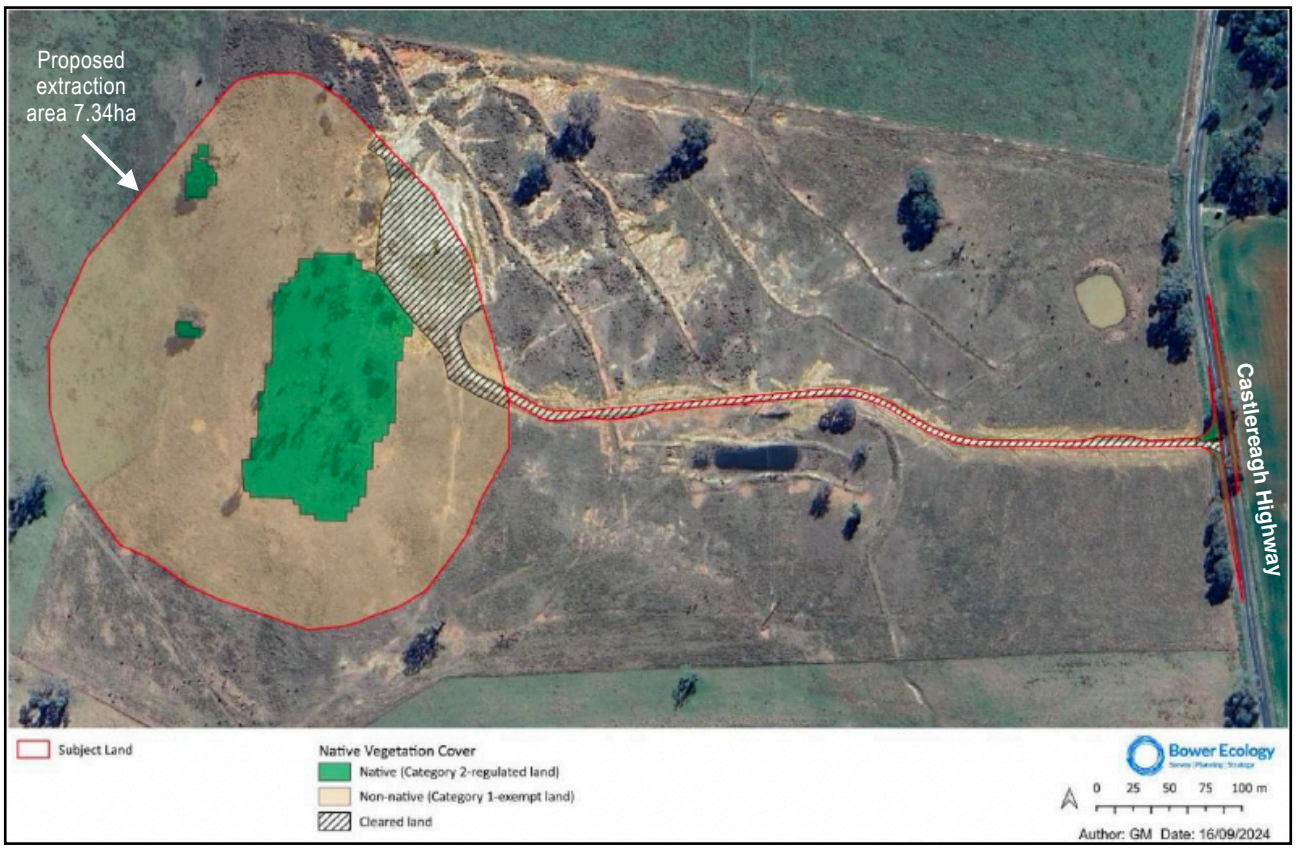


FIGURE 7.23: Native vegetation within the proposed quarry area
(Source: Figure 12 of Bower Ecology BDAR report)

Based on the site investigations by Bower Ecology it is concluded that the project site does not contain any feed tree species as listed in Schedule 1 of *State Environmental Planning Policy (Biodiversity and Conservation) 2021* and therefore the subject land does not contain 'potential koala habitat' or 'core koala habitat' under this SEPP.

The subject land did contain some 'koala use trees'[3] (e.g. *Eucalyptus blakelyi* and *Eucalyptus albens*), however, due to highly fragmented nature of suitable habitat, the species is considered unlikely to rely on the habitat within the subject land Nonetheless, koalas may occasionally traverse the subject land or use trees within the subject land for foraging habitat.

Vegetation

The project site has been historically cleared for agricultural purposes and is still currently utilised for such purposes. Historical aerial imagery has outlined that historical clearing has been conducted within the subject site as early as 1964. It has been extensively grazed by sheep and cattle resulting in degraded ecological health. In addition, the site contains an access track, fencing and constructed dams used for farming, along with the existing borrow pit.

Bower Ecology conducted the field surveys from 19-23 August 2024 to verify and update the vegetation extent and Plant Community Type (PCT) mapping. The vegetation within the Category 2 land areas of the subject land was ground-truthed to examine and verify known mapping of the condition and extent of different plant communities.

The Bower Ecology site surveys identified scattered canopy trees, including a small patch of canopy individuals within the central portion of the proposed quarry site. A large patch of dense vegetation was also observed to the west of the proposed quarry, located approximately 620 metres directly west of the proposed quarry. Refer **Figure 7.24**.

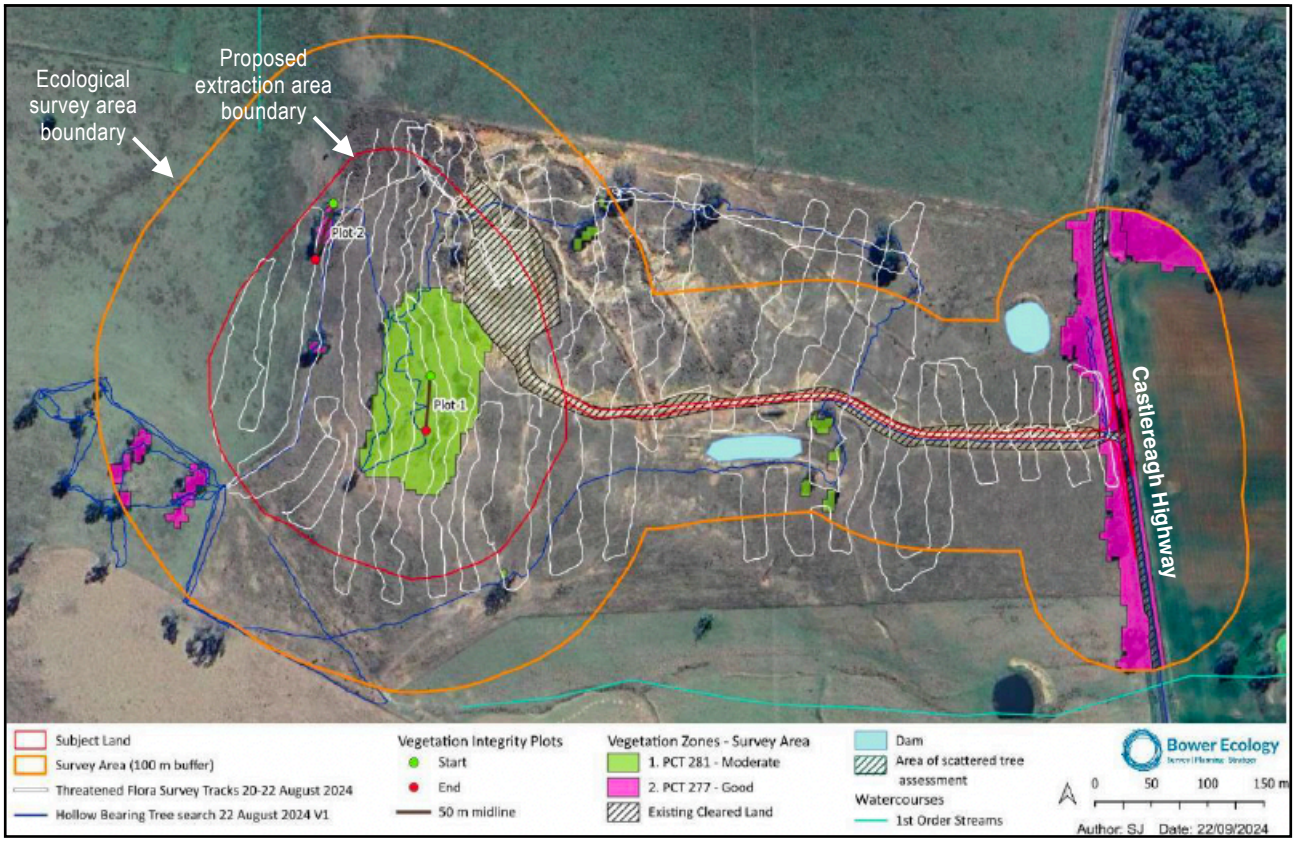


FIGURE 7.24: Bower Ecology flora survey locations
(Source: Figure 10 of Bower Ecology BDAR report)

Field surveys by Bower Ecology identified that the site contained a small sparse patch of remnant *Angophora floribunda* (Rough-barked Apple) individuals within the central portion of the site. There were also occurrences of large remnant individuals of species Rough-barked Apple, *Eucalyptus blakelyi* (Blakely's Red Gum), *Eucalyptus melliodora* (Yellow Box) and *Eucalyptus albens* (White Box) scattered across the subject lot and beyond. The remaining vegetation within the survey area contains mixed native and introduced grass species. Vegetation cover was mapped throughout the survey area through a combination of assessment for vegetation mapping, walking parallel threatened species survey transects, and the Vegetation Integrity plots. Category 2 land (assessable vegetation under BAM) within the subject land occupies 1.58 ha, which comprises 17.59% of the proposed quarry site.

The ground cover layer was inconsistent across the area investigated, with some patches of regrowth native grass species, while other areas were dominated by introduced pastoral grasses. Overall, while there were patches of native ground cover, the ground cover would be considered low conservation value as less than 50% of the vegetation cover consisted of native species. The vegetation within the area investigated by Bower Ecology was heavily degraded due to historical and current agricultural land usage.

Two Plant Community Types (PCTs) were identified in the Bower Ecology site survey:

- PCT 281: Rough-barked Apple-Red Gum-Yellow Box Woodland (Low condition) . A sparse PCT 281 woodland was found at the top of the elevated knoll, and a few trees near the dam nearer the highway. Refer Photograph 7.11.
- PCT 277: Blakelys Red Gum-Yellow Box grassy tall woodland (Moderate condition) . A few scatted trees on the site of the proposed quarry, as well as areas of scattered trees and low-quality native grassland proximate to the highway. Considered to be a threatened ecological community. Refer Photograph 7.12.

Figure 7.25 shows the general distribution of native vegetation and pasture across the land. In total, 7.10ha was Category 1 Exempt Land under the LLS Act draft mapping, with 1.54ha of PCT vegetation.

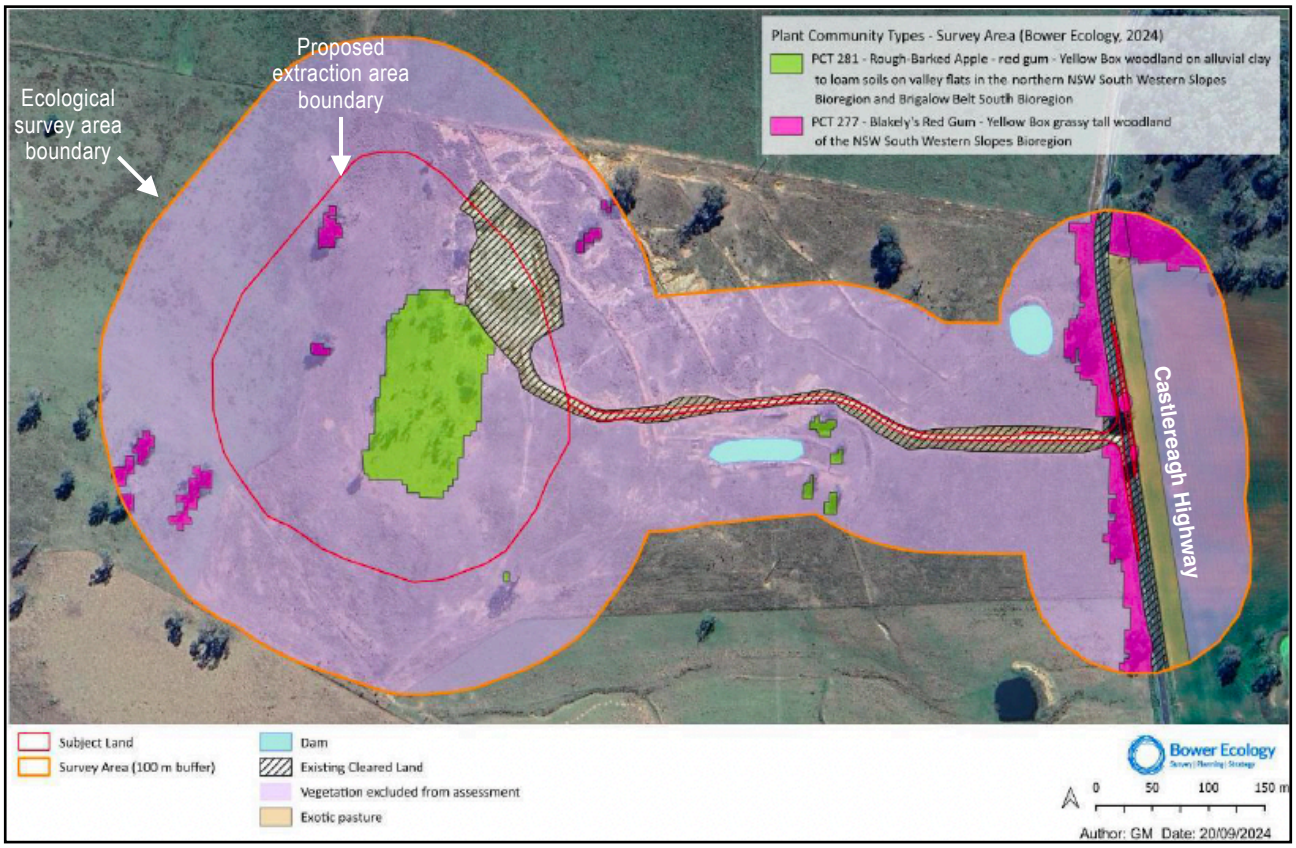


FIGURE 7.25: Plant community types
(Source: Figure 15 of Bower Ecology BDAR report)

The accompanying Table summarises the area and condition of each PCT encountered on site.

Table 7.21: PCTs and associated vegetation zones identified

Vegetation Zone and PCT ID	PCT Name	Vegetation Formation	Condition Class	Approx. Area (ha)
1a PCT 281	*Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.*	*KF_CH3 Grassy Woodlands*	*Low Condition Woodland*	*1.46 ha*
2a PCT 277	*2Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.*	*KF_CH3 Grassy Woodlands*	*Moderate Condition Woodland*	*0.08 ha*
				TOTAL AREA 1.54ha

(*Source: Table 10 of Bower Ecology BDAR report*)

No threatened flora species listed under the BC Act or EPBC Act were identified within the subject land during the threatened flora surveys by Bower Ecology.

PHOTOGRAPH 7.11: PCT 281: Low Condition Woodland within the central portion of the proposed quarry

PHOTOGRAPH 7.12: PCT 277: Moderate Condition scattered Eucalyptus blakelyi (Blakely's red gum) and Eucalyptus albens (White Box) individuals near the highway entry

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Fauna

Targeted threatened fauna surveys were undertaken by Bower Ecology for species credit species that were assessed as candidate species credit species for further assessment. The fauna species surveyed were as follows, with survey locations illustrated in **Figure 7.26**:

- Brush-tailed Phascogale: *Phascogale tapoatafa*.
- Koala: *Phascolarctos cinereus*.
- Southern Myotis; *Myotis macropus*.
- Squirrel Glider: *Petaurus norfolcensis*.
- Superb parrot (breeding): *Polytelis swainsonii*.
- White-bellied Sea-Eagle (breeding):*Haliaeetus leucogaster*.
- Pink-tailed Legless Lizard: *Aprasia parapulchella*.
- Striped Legless Lizard: *Delma impar*.
- Key's Matchstick Grasshopper: *Keyacris scurra*.
- Golden Sun Moth: *Synemon plana*.

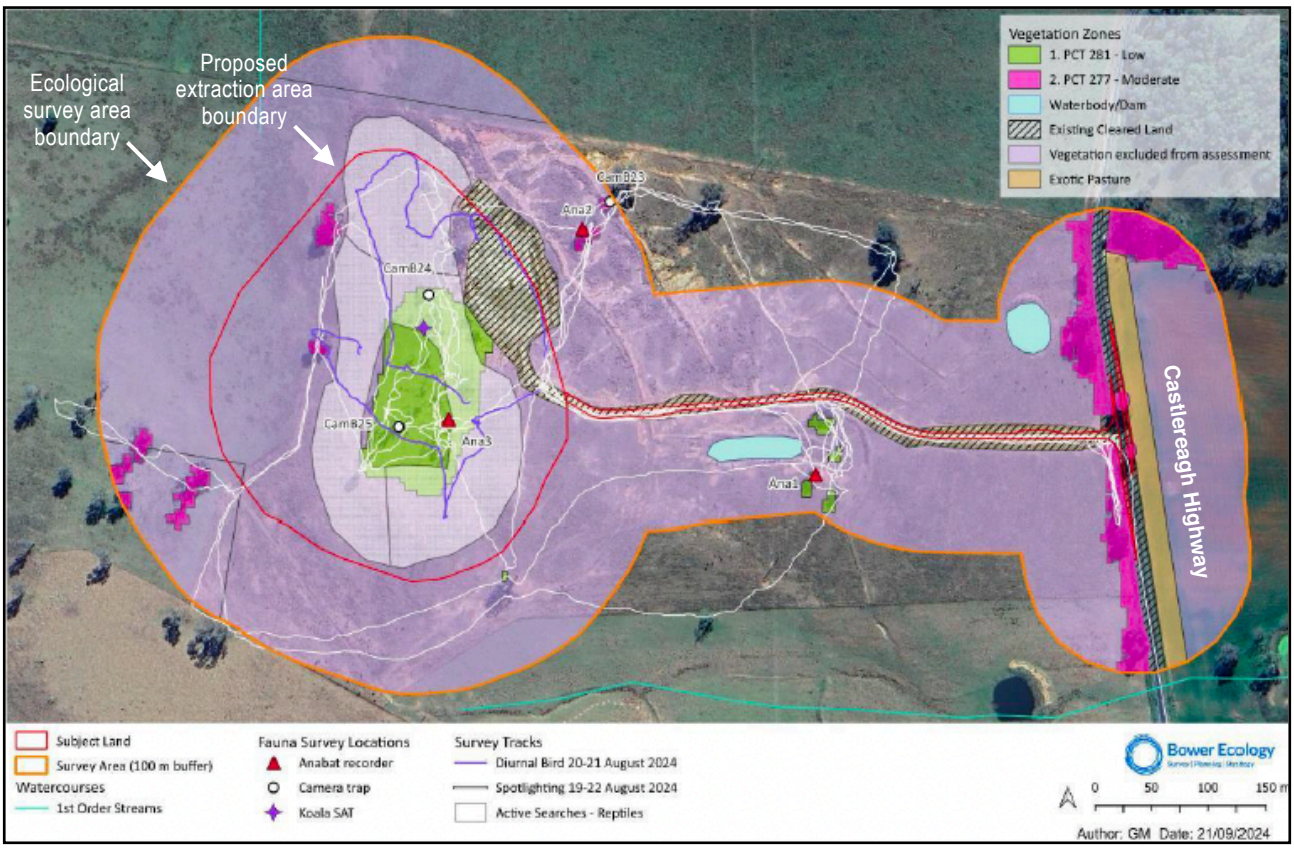


FIGURE 7.26: Fauna survey locations

(Source: Figure 11 of Bower Ecology BDAR report)

The survey methods adopted for each target fauna species was as follows:

- Spotlighting surveys. Target species: Brush-tailed Phascogale, Squirrel Glider, Koala. Spotlighting was undertaken once each night during between 19- 23 August 2024 in all areas of woody vegetation within the subject land for a survey period of approximately two hours each night.
- Motion sensor camera traps. Target species: Brush-tailed Phascogale, Squirrel Glider, Koala. The cameras were set on 20 August 2024 for a period of four weeks and removed on 17 September 2024.
- Spot assessment technique surveys. Target species: Koala. Surveys for Koalas were undertaken following the Koala *Biodiversity Assessment Method Survey Guide* (DPE 2022) using a method known as the Spot Assessment Technique. Spotlighting targeting the Koala was also undertaken during the field survey by Bower Ecology.
- Ultrasound call detention surveys.Target species: Southern Myotis. Three ultrasonic call detection units were placed in proximity to areas of the most suitable habitat and left onsite for a minimum of four consecutive nights to record microbat activity.
- Diurnal Bird Surveys Target species: Superb Parrot (Breeding), White-bellied Sea-Eagle (Breeding).
- Active search in suitable habitat. Target species: Pink-tailed Legless Lizard, Striped Legless Lizard.
- Meander Searches in Potential Habitat. Target species: Key's Matchstick Grasshopper, Golden Sun Moth. The surveys involved extensive meanders through the native grassland present within the survey area, with all the suitable habitat within the subject land covered during the search surveys.

Bower Ecology conclude that the site does not form part of a regional or local biodiversity corridor, or a flyway for migratory species. Additionally, there are no areas containing karst, caves, cliffs, or other geological features of significance within the site. However, the central knoll along the gentle slopes provides rocky area that may serve as a reptile habitat for a few species.

Impact Assessment: Direct Impacts

The direct impact resulting from the Gulgong Quarry Project is the loss of vegetation and associated habitat within the quarry site and (potentially) the loss of two trees as a result of the proposed highway intersection- the latter to be confirmed by an arborist at the detailed design stage.

A direct impact to fauna habitat (foraging/breeding/shelter resources) will also occur due to the extent of clearing proposed, including twenty hollow bearing trees. As the proposal quarry footprint is relatively small compared with the surrounding contiguous vegetation, Bower Ecology conclude that the direct impacts of the proposed clearing on fauna species are likely to be minimal.

Bower Ecology conclude that no significant direct impact to the fauna species is expected during vegetation clearing; however, the clearing itself does provide a residual risk to fauna due to direct mortality during clearing works. This risk can be minimised-but not completely eliminated.

Bower Ecology conclude that the likelihood of direct mortality of threatened species during clearing and quarry works is considered to be very low / improbable if appropriate mitigation measures are applied.

No threatened flora and fauna species were confirmed to occur within the subject land except for the threatened bat *Miniopterus orianae oceanensis* (Large bent-winged bat), which, due to the lack of breeding habitat on site, was inferred to be foraging. Additionally, the undifferentiated *Nyctophilus* sp. was recorded by Bower Ecology within the site. Bower Ecology conclude that there is a low likelihood that this was a threatened *Nyctophilus* species. In any case, the threatened *Nyctophilus spp*. are all ecosystem credit species and will therefore be compensated for via retirement of ecosystem credits. It is also worth noting however, that no *Nyctophilus sp*. are associated with the PCTs 277 or 281, per the NSW Threatened Biodiversity Data Collection.

No other threatened species was recorded to be present within the subject land during the field surveys. As a result, Bower Ecology conclude that no direct impacts are expected to occur to any of the threatened flora or fauna species.

Impact Assessment: Indirect Impacts

Various indirect impacts are considered in Table 7.22 and Table 7.23.

Table 7.22: Potential Indirect Impacts and Residual Risks/Impacts: Construction Stage

Potential Impact Construction	*Assessment*	*Residual Risk*
Impacts on adjacent habitats	▸ *Quarrying work limited to quarry footprint.*	*LOW-NEGLIGIBLE*
Dust impacts to surrounding lands	▸ *Likely negligible impacts- refer to air quality impact assessment in Appendix H.* ▸ *No impact to threatened fauna.*	*LOW-NEGLIGIBLE*
Water impacts, downstream sediment impacts	▸ *All quarrying limited to quarry footprint.* ▸ *All drainage within quarry directed to onsite sediment basin- no risk of any off site drainage impacts.*	*LOW-NEGLIGIBLE*
Noise/visual impacts	▸ *Likely negligible impacts to threatened fauna.* ▸ *No impact to native vegetation.*	*LOW-NEGLIGIBLE*
Light spillage- impact on nocturnal fauna	▸ *Will not occur during construction.*	*LOW-NEGLIGIBLE*
Transport of weeds. pathogens	▸ *Unlikely to negligible impact to native vegetation and threatened fauna.*	*LOW*

Table 7.23: Potential Indirect Impacts and Residual Risks/Impacts: Quarry Operational Stage

Potential Impact Construction	Assessment	Residual Risk
Dust impacts to surrounding lands	▸ Dust mitigation strategies form a part of the quarry project. ▸ Likely negligible impacts- localised to immediate vicinity of the working quarry- refer to air quality impact assessment in Appendix H. ▸ No impact to threatened fauna.	LOW-NEGLIGIBLE
Impacts on adjacent habitats-edge effects	▸ Likely negligible impacts- localised to immediate vicinity of the working quarry.	LOW-NEGLIGIBLE
Water impacts, downstream sediment impacts	▸ All quarrying limited to quarry footprint. ▸ All drainage within quarry directed to onsite sediment basin- no risk of any off site drainage impacts.	LOW-NEGLIGIBLE
Noise/visual impacts	▸ Limited blasting. Noise impacts confined to a small area around the working quarry and access. No impact to native vegetation and likely negligible to minor impacts to threatened fauna.	LOW-NEGLIGIBLE
Light spillage- impact on nocturnal fauna	▸ Daytime use only. Security lighting only to be utilised at night- no lighting associated with operational plant. ▸ No or negligible impact to native vegetation or threatened fauna.	LOW-NEGLIGIBLE
Transport of weeds. pathogens	▸ Unlikely to negligible impact to native vegetation and threatened fauna. ▸ The quarry unlikely to be a source of weeds.	LOW-NEGLIGIBLE
Increased risk of starvation or exposure, and loss of shade or shelter	▸ Not applicable given the degraded nature of the site and more suitable extent of contiguous habitat in the surrounding land ▸ Unlikely to negligible impact to native vegetation and threatened fauna.	NEGLIGIBLE
Loss of breeding habitat	▸ Negligible impact expected due to lack of mature forest adjacent to the site.	NEGLIGIBLE
Trampling of threatened flora	▸ Quarrying confined to a quarry void at depth. ▸ Very unlikely to occur.	NEGLIGIBLE
Impact on nitrogen fixation, increased soil salinity, fertiiser drift	▸ Quarrying confined to a quarry void at depth. ▸ Very unlikely to occur.	NEGLIGIBLE
Waste/rubbish	▸ Quarrying confined to a quarry void at depth, with site access restricted via locked gates, wastes managed. ▸ No impacts likely.	NEGLIGIBLE
Increase in predators/pests	▸ Quarrying confined to a quarry void at depth. ▸ No impacts likely.	NEGLIGIBLE
Change in fire regime	▸ The land is not bushfire prone. ▸ Fire management measures in place. ▸ No impacts likely.	NEGLIGIBLE

Prescribed Impacts

The Gulgong Quarry Project has been assessed in terms of three prescribed impacts:

- Geological features of significance: The elevated knoll has has rocky outcrops of approximately 3.9ha area that may serve as a habitat feature.The above-mentioned geological feature of significance will be permanently removed. The Bower Ecology survey found no threatened reptile species. A significant impact to this species is considered unlikely.
- Habitat connectivity: The site has a sparse woodland and the surrounding agricultural landscape only offers patches of one to three large trees and together may offer 'stepping stones' for the fauna moving across the more connected and larger patches of vegetation about 600 m to the west of the subject land and a similar patch to the east of the subject land. However, the project will not significantly change the movement patterns of wildlife in the larger area. Overall, the proposed project is unlikely to have a significant impact on the movement of fauna across the wider landscape. The proposed development will not result in any habitat fragmentation across the landscape.
- Vehicle strikes: The extensive fauna surveys have indicated that none of the threatened species are likely to occur within the subject land except a couple of microbat species that were detected moving through the subject land. The development footprint will be a disturbed area once the vegetation clearing has been carried out and the highly mobile threatened species are likely to avoid the area of subject land, thereby further reducing the potential vehicle strikes. The project is unlikely to impact the threatened species and all the fauna occurring on the site via vehicle strikes.

Mitigation Measures and Impacts

Some of the relevant mitigation measures proposed are considered in the following:

- Induction protocols for all staff members required to conduct works within the subject land to outline the mitigation measures being implemented to project biodiversity values within the study area i.e waste management, road rules, clearing limits. Refer EIS Sections 3 and 4 for further details.
- The clearing limits for the quarry will be suitably marked out.
- Preventing access to the site through fencing and locked gates- already in place.
- 30km/hour speed limit and draft Driver Code of Conduct applies, to reduce vehicle strike.
- Pre-clearance surveys/clearing protocols to be conducted prior to vegetation clearance. A pre-clearing survey will be undertaken within two weeks of clearing works by a Project Ecologist. Captured fauna to be removed responsibly.Should a koala be encountered within the project area during clearing activities, all work must cease within a radius of 50m of the tree in which the koala is observed.
- Weed prevention to be implemented.
- 'Best practice' erosion and sedimentation, dust controls to be implemented. Refer to EIS Section 3 for details.
- Various dust mitigation measures are proposed for the project. Refer to EIS Section 3.5.7 for details.
- Quarry to be rehabilitated- refer to EIS Section 3.14 for details.Progressive rehabilitation of the benches will be undertaken via seeding ground layer and shrub species, as well as planting of tube stock (for tree species).

Serious and Irreversible Impacts (SAII)

Only two SAII entities will be impacted by the proposed quarry development:

- The White Box Yellow Box Blakely's Red Gum Woodland (0.08 ha, represented by 5 paddock trees). Bower Ecology conclude that an SAII to this TEC is not anticipated.The Biodiversity Offset System (BOS) will be utilised to compensate for the loss via the requirement to provide ecosystem credits for loss of PCT 277.
- Loss of foraging habitat for the Large Bent-winged Bat. Bower Ecology conclude that an SAII to this TEC is not anticipated.

Bower Ecology identify 1 ecosystem credit is required for the loss of 0.08ha of Moderate Condition Woodland: PCT 277: Blakely's Red Gum Yellow Box grassy tall woodland. Further, Bower Ecology conclude that an EPBC Act referral is not required

7.3.12 Traffic and Transport

Introduction

A Traffic Impact Assessment (TIA) has been prepared by Streetwise for the Gulgong Quarry Project and is provided in **Appendix D**. The TIA describes the existing local and regional traffic network surrounding the existing site and assesses the impacts of the project on that network, and addresses both the SEARs requirements as well as the Traffic Impact Assessment requirements of Transport for NSW (TfNSW) accompanying the issued SEARs. The TIA has been prepared by suitably qualified experts in accordance with the Austroads *Guide to Traffic Management Part 12, Australian Standards* and any complementary TfNSW Supplements, and Roads and Maritime *Guide to Traffic Generating Developments*.

The TIA also includes a draft Traffic Management Plan that could be implemented following approval of the EIS, as well as a proposed Driver Code of Conduct for quarry haulage vehicles.

Existing Road Network: Castlereagh Highway

The Castlereagh Highway (B55) is a classified road providing a connection between Wallerawang in the south and the Golden Highway in the north via townships such as Mudgee and Gulgong. The formation generally provides for a single travel lane in each direction with widenings at intersections and for overtaking lanes along its route. In the vicinity of the proposed quarry the travel lanes are generally 3.20m wide in each direction with 0.50m to 1.00m wide sealed.

The proposed quarry truck traffic will rely on this route to service local infrastructure projects.

The posted speed limit in the vicinity of the proposed quarry operation is 100km/h. The Castlereagh Highway is an approved B Double route for heavy vehicles up to a length of 26.0m long.

Mid-Western Regional Council is the relevant Roads Authority for this route.

PHOTOGRAPH 7.13: View of Castlereagh Highway at entry to site looking south.

PHOTOGRAPH 7.14: View of Castlereagh Highway at entry to site looking north.

Existing Road Network: Tuklan Road

Tucklan Road is a local rural access road providing access to rural properties and the township of Dunedoo in the north. There is a gravel section of Tucklan Road between the Castlereagh Highway and 500m north of Artz Lane which is approximately 6.20km north of the Castlereagh Highway. The gravel formation width of Tucklan Road varies in width between 6.0 and 7.0m wide.

The posted speed limit of Tucklan Road in the vicinity of the proposed quarry operation is unrestricted (drive to the conditions). The “T Junction” intersection of Castlereagh Highway (B55) and Tucklan Road generally conforms to a minimum standard BAR / BAL intersection treatment.

It shall be noted that EnergyCo's CWO-REZ approved project nominates Tucklan Road as one of a number of construction routes providing access to the transmission lines. The impact of truck traffic servicing this project was addressed in the EIS for this project.

Existing Traffic Volumes and Capacities

EnergyCo's 2022 EIS referenced the following Average Daily Traffic (ADT) for the Castlereagh Highway:

- 725 ADT on that section between Golden Highway and Tuklan Road, with 19.4% heavy vehicles, with peak hour traffic flows of between 29-41 vehicles per hour.
- 1,445 ADT on that section north-west of Old Mill Road, Gulgong, with 18.5% heavy vehicles, with peak hour traffic flows of between 52-65 vehicles per hour.

Transport for NSW (TfNSW) have advised they do not have any traffic data information near the location of the proposed quarry site. However, they did indicate there was traffic data available for a site on the Castlereagh Highway approximately 4km north of Gulgong in 2021 where the two way volumes were 1,366 vehicles per day with approximately 15.70% of them being heavy vehicles.

Applying the Austroads *Guide to Traffic Management* in the determination of roadway capacity on two lane two way rural roads., Streetwise conclude that:

- The Castlereagh Highway is a Class I category rural road.
- The Castlereagh Highway has a current Level of Service (LoS) of LoS A- primarily free-flow traffic, with vehicles are completely unimpeded in their ability to manoeuvre within the traffic stream, and control delay at the boundary intersections minimal.
- Tuklan Road also operates at LoS A.

Traffic Generation by Proposed Quarry

It is predicted that the Gulgong Quarry Project may generate up to a maximum of 60 laden quarry trucks per day, with a mix of truck and dog combinations (32 & 37.50 tonnes), with larger (42 tonne truck and dog) and smaller trucks used where road weight limits allow. The accompanying Table 7.24 provides a summary of the predicted peak hour traffic generation of the proposed quarry operation.

Table 7.24: Peak traffic generation Gulgong Quarry Project

Land Use Operation	*Proposed Peak Hour Traffic generation*
Proposed Quarry Material Generation (Laden and Unladen Trips) (Maximum)	*60 daily laden trips* *120 daily laden & unladen trips* *5.50 laden trips / hour*
General Quarry Operation (staff & contractors)	*Up to 20 daily trips or 2 trips / peak hour*
Total Peak Hour Trip Generation	*8 laden trips / hour* *13 laden / unladen / general quarry operation trips/day and 140 laden/unladen quarry trucks/day*

(Source: Streetwise Traffic Impact Assessment)

Traffic Generation Accounting for CWO-REZ Projects

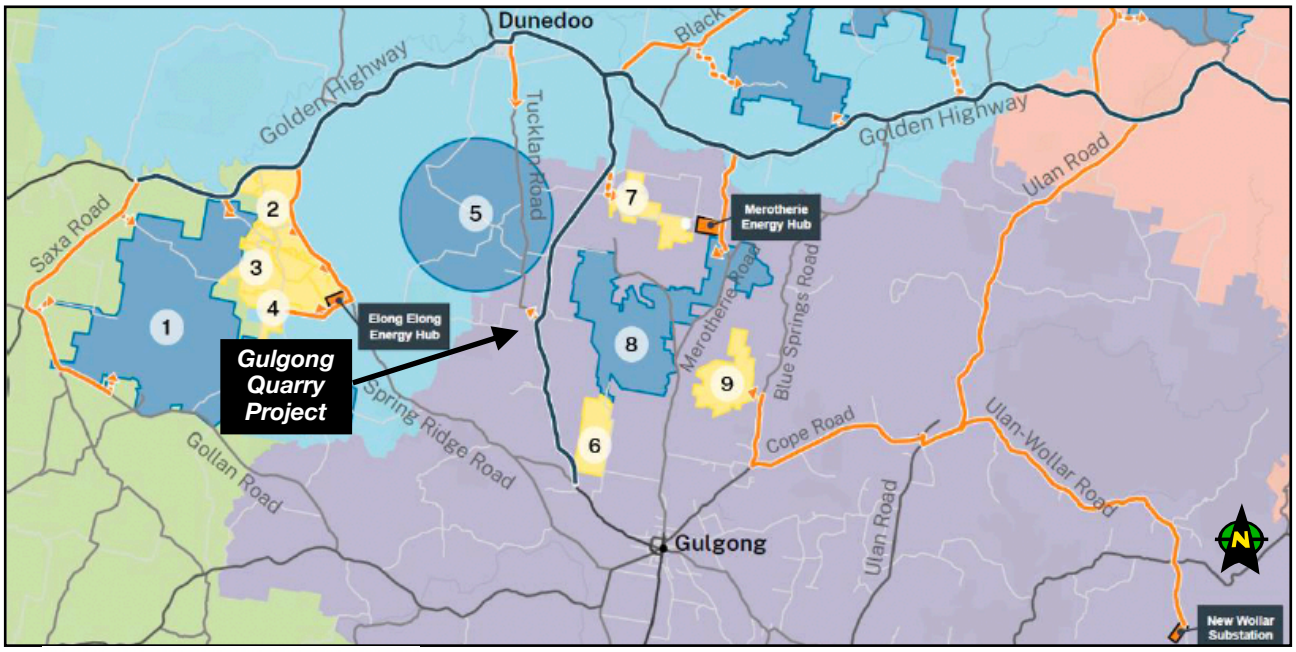
At the time of this report being prepared only four CWO-REZ projects have development approval with construction estimated to commence in the near future. A review of completed traffic impact assessments for these projects relating to construction traffic and ongoing increased operational traffic was assessed by Streetwise.

In summary, the environmental impact and traffic reports prepared in support of these projects indicate each has considered construction phase trips external to the site and the impacts these extra trips will have on the local road network.

The EnergyCo document entitled *Central West Orana Renewable Energy Zone Coordinating community impacts and benefits in the REZ* dated March 2023, makes this very clear:

> "*While upgrades to state roads will be shared by multiple proponents,* ***local road work will typically be specific to individual projects****. Each developer will be responsible for minimising and mitigating impacts of their project on the surrounding communities and environment under the requirements of their respective planning approvals.* ***Any proposed road upgrades required to meet construction and operational requirements will be outlined in each project's Environmental Impact Statement*** *(EIS)*. " (p.10 of the above EnergyCo report) [our emphasis in bold]

The local road upgrades required to service the various REZ nearest to the project site are illustrated in the accompanying **Figure 7.27**. These road upgrades are generated by, and will be responsibility of, each of the REZ projects.



Legend

Local government areas (LGAs)

- Dubbo Regional Council
- Mid-Western Regional Council
- Upper Hunter Shire Council
- Warrumbungle Shire Council

REZ infrastructure

- Energy hub footprint
- Indicative local access road
- Indicative site access road
- Wind development
- Solar development

Indicative only. Map not to scale.

Proposed generation projects with planned connections to the REZ network

1. Spicers Creek Wind Farm
2. Cobbora Solar Farm
3. Sandy Creek Solar Farm
4. Dapper Solar Farm
5. Orana Wind Farm
6. Tallawang Solar Farm
7. Birriwa Solar Farm and Battery Energy Storage System (BESS)
8. Barneys Reef Wind Farm
9. Stubbo Solar Farm

FIGURE 7.27: Local road upgrades generated by renewable energy projects in the Central-West Orana REZ -coloured orange.

"Any proposed road upgrades required to meet construction and operational requirements will be outlined in each project's Environmental Impact Statement"

(Source: p.10 of EnergyCo Central West Orana Renewable Energy Zone Coordinating community impacts and benefits in the REZ dated March 2023)

There are many other proposed renewable energy projects as well as other developments in the region, at various stages of the planning approval process. The construction timings for most of these projects unknown.

The CWO-REZ report used an annual traffic growth rate of 1.60% for its assessments of the Castlereagh Highway. This figure was based on statements in a 2016 report for the Golden Highway Corridor Study where it indicated the annual traffic growth rate of 1.60% was indicative prior to this report being released.

Assessing the TfNSW 2021 traffic data against the CWO-REZ 2022 data the annual traffic growth equates to an increase in traffic volumes of 5.45% per annum. A design horizon of 5 years (2025 to 2030) into the future was used to assess the impacts of the local road network allowing for ongoing CWO-REZ construction projects. Using the above scenarios for traffic growth the following Average Daily Traffic (ADT) volumes on the Castlereagh Highway were derived for 2024 as the CWO-REZ construction design horizon of 5 years—considered to be the period of peak traffic flows associated with construction of the various CWO-REZ projects. Refer Table 7.25.

Table 7.25: Predicted Average Daily Traffic (ADT) volumes on the Castlereagh Highway: 2024-2030

CWO-REZ (1.6% growth) 2024	CWO-REZ (1.6% growth) 2030	TfNSW (5.45% growth) 2024	TfNSW (5.45% growth) 2030
(725) 748 ADT	818 ADT	804 ADT	1,041 ADT

(Source: Streetwise Traffic Impact Assessment)

When the predicted traffic generations are added to the above traffic growth ADT figures the following predicted traffic volumes can be assumed for the Quarry Access and the Castlereagh Highway intersection- refer **Figure 7.28** (1.60% traffic growth Castlereagh Highway) and **Figure 7.29** (5.45% traffic growth Castlereagh Highway)

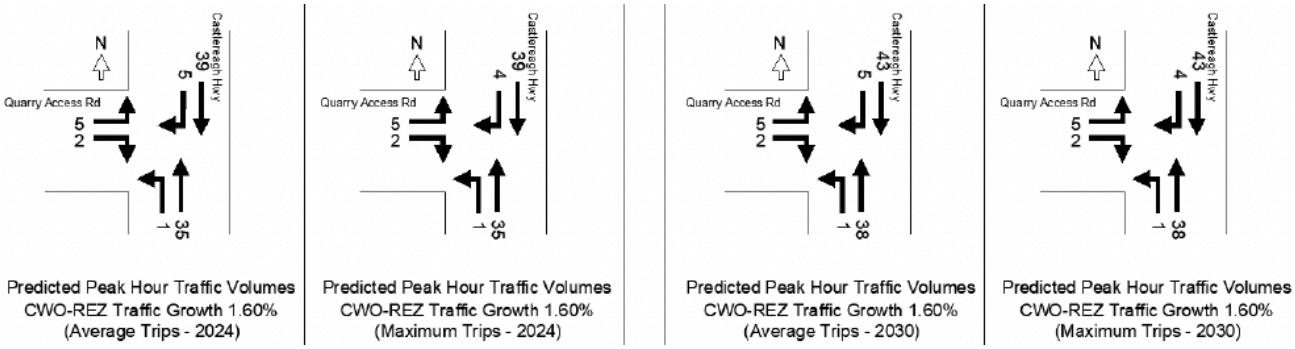


FIGURE 7.28: Predicted peak hour traffic volumes intersection of quarry access and Castlereagh Highway: CWO-REZ 1.6% traffic growth scenario 2024-2030

(Source:Streetwise Traffic Impact Assessment)

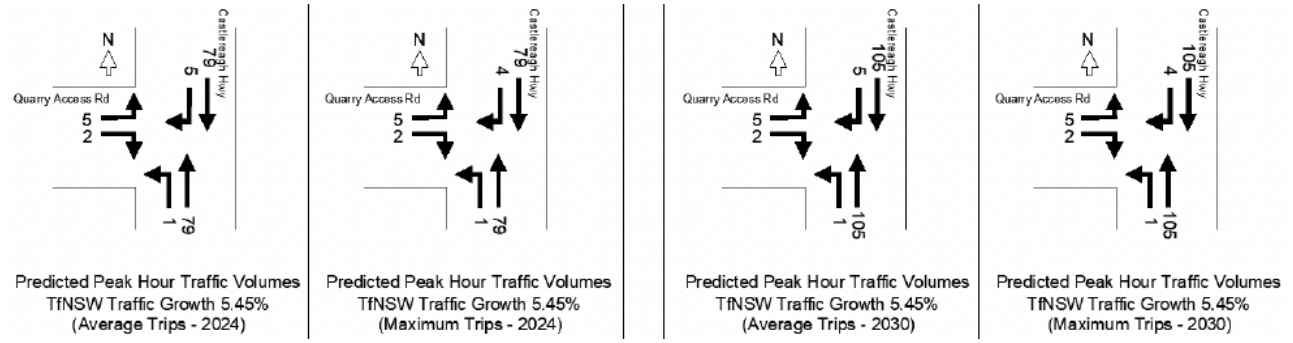


FIGURE 7.29: Predicted peak hour traffic volumes intersection of quarry access and Castlereagh Highway: TfNSW 5.45% traffic growth scenario 2024-2030

(Source:Streetwise Traffic Impact Assessment)

Streetwise conclude that the intersection of the quarry access road and the highway will require a Type BAL/BAR intersection layout in order to accommodate existing and future traffic flows. Streetwise also recommend the sealing of shoulders, having regard for the number of heavy vehicles predicted to use the highway and the quarry. In this case the sealing of the shoulders will improve the amenity of the intersection along with improving road safety and reduce the inherent maintenance issues that comes with heavy vehicles turning at intersections.

A site inspection of the proposed quarry access location by Streetwise finds that the quarry access with the highway will have adequate sight distance (at least 300m) in both directions for both the horizontal and vertical planes along the Castlereagh Highway from the proposed quarry access location. Streetwise also recommend that W5 – 22 (B size) signs (refer **Figure 7.30**) be erected at 150m on approach to each side of the quarry access, to make drivers more aware of heavy vehicles in the area and to improve road safety around the quarry access.

FIGURE 7.30: Typical W-22 sign face (TfNSW)

(Source:Streetwise Traffic Impact Assessment)

A review of the New South Wales Centre for Road Safety website does not indicate there has been any heavy vehicle crashes in the vicinity of the proposed quarry access for the period from 2018 to 2022. However, the website indicates three (2 Moderate Injury, 1 Non-Casualty Tow Away) light vehicle crashes in the vicinity of the Tucklan Road intersection on the Castlereagh Highway. There was also 1 reported serious injury crash on Tucklan Road. Considering the local climatic conditions the crash data did not indicate any of the recorded crashes were related to inclement weather condition (ie. rain events, etc) on either the Castlereagh Highway or Tucklan Road. desktop assessment of the haulage route, Castlereagh Highway between the proposed quarry access and Tucklan Road and Tucklan Road itself indicates they generally conform to the 85th percentile design standard. Where there are departures, adequate signposting has been installed as a road safety measure.

The quarry operation will generate a maximum of 6 laden trips and 6 unladen trips per hour or 60 trips (120 return trips) per day. This is a very minor number of trips when considering the overall construction phase of the CWO-REZ project. Any upgrade of Tucklan Road will not be a result of the quarry operation given the overall CWO-REZ construction requirements.

Currently there are no approved public bus routes in the vicinity of the quarry access on either the Castlereagh Highway or Tucklan Road. Following consultation by Streetwise with Ogden's Coaches it was advised there are school bus routes that run in the vicinity of the proposed quarry site. Impacts on these services will be minimal considering the minor amount of traffic to be generated by the quarry operation given the interactions may only be for a half hour period in the morning for pickup to the schools and the afternoon for the drop off from the schools.

The proposed quarry which is currently used as a farm borrow pit with an existing gravel track running between it and the Castlereagh Highway. The existing track does cross an electricity transmission easement. Consultation with Essential Energy has indicated the existing track / proposed access road will need to be located a minimum of 4.50m from any pole / tower infrastructure in the horizontal plane and a minimum of 3.00m from the overhead 66kv power lines in the vertical plane. A preliminary investigation has indicated the existing track is located 2.30m from its nearest edge to the existing transmission poles. Therefore, the proposed quarry access will need to be relocated so the minimum offset is 4.50m to the poles.

In order to maintain safe access between the quarry pit and the Castlereagh Highway 2 passing lay-bys are to be provided along the proposed access road. One for out bound traffic located 70.0m west of the proposed access road intersection and a second inbound bay located just before entry to the quarry pit area. Further detailed design is recommended for the relocation of the proposed quarry access road in order to satisfy the Essential Energy requirements.

It is proposed to establish on site amenities once the quarry pit of is sufficient size, including a small demountable site office with staff amenities. Initially, front-end loaders with calibrated scales will be used for loading and weighing of the hard rock resource won from the site into road trucks. It is anticipated that once production significantly increases a weigh-bridge will be installed.

Streetwise recommendations and conclusions are as follows:

"• *Design and Construction a Type BAR / BAL intersection treatment for the quarry access.*

• *W5-22 Advanced Warning signage is to be erected on both sides of the approach to the intersection to make drivers more aware of heavy vehicles in this location thus improving road safety.*

In summary, StreetWise Road Safety and Traffic Services recommend that the proposed development as being a suitable development based on the predicted traffic impacts. The additional vehicle trips to be generated by the development will not have a significant impact on the efficiency or safety of the local road network, and that the local roads and intersections have the capacity to cater for the additional trips generated by the development, with minimal upgrades required."

7.4 Section 4.15(1)(c): Suitability of the Site for Development

The suitability of the site for the development is a key consideration in the assessment of any application under s.4.15(1) of the EP&A Act per *Lippmann Partnership Pty Ltd v Canterbury – Bankstown Council* [2017] NSWLEC 1601 at [42]. In this regard, it is relevant to note that the Project Site contains an existing approved quarry, and is suitable for continued quarrying activities. Most-but not all- of the proposed quarry footprint comprises cleared land.

The suitability of the site for a Project is consistent with all relevant legislation, guidelines and policies applicable to the site and surrounding area including the zoning future use of the surrounding area. The use of the site is also consistent with the principles of ecologically sustainable development and with the objectives of the *Environmental Planning and Assessment Act 1979* - refer section 7.1.2 of this EIS for further details.

The Project Site is considered to be most suitable for the Gulgong Quarry project for a number of reasons, including:

- Availability of a known economic quarry resource from the Project Site.
- The proposed quarry is strategically placed in terms of its proximity to Central-West Orana Renewable Energy Zone (CWO-REZ) projects, including: EnergyCo's extensive, 1km wide CWO-REZ project (approximately 3.1km to the north of the project site); and Acciona's Orana Wind Farm project (as close as 2km to the project site). Truck traffic serving these projects does not need to travel through any townships or villages.
- The land is a stony outcrop with shallow soils with low agricultural value, underlain by weathered and unweathered phyllite and meta-siltstone suited to road making purposes to service the above infrastructure projects. Relatively small environmental footprint of the proposed quarry development, equivalent to 0.6% of the 'Talinga' farm holding. Refer to **Appendix E, Appendix N** and Section 2.2.3 for further details.
- The project site has an appropriate (RU1) zoning, which permits 'extractive industries' (as defined): *BGP Properties Pty Limited v Lake Macquarie City Council* [2004] NSWLEC 399 (NSW Land and Environment Court Planning Principle relating to weight to be given to the zoning of a site for any proposed development).
- The land is largely cleared land with a low ecological value. Refer to **Appendix L** for further details.
- Good road access is available to the highway for heavy vehicles to potential customers and nearby infrastructure projects. Refer to **Appendix D** for further details regarding traffic.

- The proposed quarry development will not impact on any known Aboriginal sites or relics. Refer to **Appendix K** for further details.
- Given the proposed depth of quarry excavation, topography and licensed groundwater bore information, it is unlikely that the proposed quarrying work will intercept permanent groundwater. Further, the elevation and location of mapped potential Groundwater Dependent Ecosystems (GDEs) are such that the proposed development is not likely to have any significant affect on the mapped potential GDEs. Refer to **Appendix F** for further details.
- The quarry is reasonably buffered from nearby dwellings not associated with the quarry. Measures are proposed to ensure that any increase in impact arising from the project, in particular relating to noise impacts, are sufficiently mitigated *per* *Stockland Developments v Wollongong Council and others* [2004] NSWLEC 470 (NSW Land and Environment Court Planning Principle relating to noise impacts). Refer to **Appendix C** for further details in regard to noise impacts and **Appendix H** in regard to air quality impacts.
- The contamination assessment undertaken finds that the site has an acceptable low level of risk for contamination and is suitable for its proposed use as a quarry, in satisfaction of *State Environmental Planning Policy (Resilience and Hazards) 2021*. Refer to **Appendix I** for further details.
- Limited views will be possible of the proposed quarry from any rural residences or from the highway.

Based on the above factors, the project site is considered the most suitable location for the project.

▪ 7.5 Section 4.15(1)(d): Any submissions made

This application will be subject to notification for submissions. Any issues raised in those submissions will be duly considered prior to any final determination of the application.

▪ 7.6 Section 4.15(1)(e): The Public interest

By the operation of s 4.15(1)(e) of the EP&A Act the public interest is identified as one of the mandatory considerations to be taken into account in the evaluation of the Gulgong Quarry Project. What comprises the public interest is not expressly stated in s 4.15. In *Minister for Planning v Walker* [2008] 161 NSWCA 224 it was held at [41] that: "*However, this requirement, so stated, operates at a very high level of generality, and does not of itself require that regard be had to any particular aspect of the public interest.*."

The objects of the EP&A Act (at s 1.3) include:

> *"(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) promote the orderly and economic use and development of land,*
>
> *(d) to protect the environment…"*

In this case the evidence is that the proposed development will advance the objectives of the EP&A Act which form part of the public interest, as well as the public interest generally. The proposed quarry development is considered to be in the public interest as it has positive social and economic outcomes, and has satisfactory environmental impacts including:

- The quarry resource is suitable for road making associated uses in the region.
- The project will provide for the employment of up to six quarry personnel, with additional support of employment in relation to road transport drivers and other contractors; resulting in positive flow on economic effects to the local and regional economy.
- The quarry has been operating to date without significant adverse impact on surrounding neighbours.
- The Project's physical impacts on surrounding development are acceptable *per* *Project Venture Developments v Pittwater Council* [2005] NSWLEC 191 and *Davies v Penrith City Council* [2013] NSWLEC 1141 (NSW Land and Environment Court Planning Principles relating to compatibility with surrounding development and impacts on

neighbouring properties, respectively). Almost 64% of the Project Site is to be retained as native vegetation.

- Acceptable visual impacts are predicted *per* *Tenacity Consulting v Warringah* [2004] NSWLEC 140 and *Rose Bay Marina Pty Limited v Woollahra Municipal Council and anor* [2013] NSWLEC 1046 (NSW Land and Environment Court Planning Principles relating to view impacts on views).
- The development has regard for, and is compatible with, relevant principles of ecologically sustainable development per *BGP Properties Pty Limited v Lake Macquarie City Council* [2004] NSWLEC 399 and *Telstra Corporation Limited v Hornsby Shire Council* [2006] NSWLEC 133 (NSW Land and Environment Court Planning Principles relating to ecologically sustainable development).
- The site of the proposed quarry has been mapped as forming a part of a broader area of land identified as BSAL land. However, the site of the proposed quarry is a stony, rocky outcrop with significant limitations to agriculture generally and is unsuited to cropping; limited grazing being the optimal use of the land here. It is these features that makes the project site so well suited to that of a hard rock quarry. Refer to **Appendix E** and Section 2.2.3 for further details. The footprint of the proposed quarry will occupy approximately 7.34ha, or 0.6% of the 'Talinga' rural holding. Following rehabilitation, approximately 6ha would be returned to grazing land- a loss of only about 0.8ha of land, or about 0.06% of 'Talinga' land holding-with the additional benefit of having a dam for livestock water needs also provided.
- The project is anticipated to have minimal impact on existing agricultural activities, with the project expected to co-exist with the surrounding agricultural land uses in the locality or on site, thus satisfying the 'compatibility' test set down in *Project Venture Developments v Pittwater Council* [2005] NSWLEC 191.
- The proposed quarry development maximises access to and enables the fuller utilisation and economic recovery of a valuable quarry resource.
- The proposed quarry development provides for the ongoing extraction of road base quarry products important for the continued growth and prosperity of NSW generally, and in particular in the supply of much-needed road making and fill material to service the renewable energy projects existing and proposed in the Mid-Western Regional LGA. Flow-on and multiplier effects can be expected, which will further enhance the local economy.
- Satisfactory environmental outcomes will ensue. Refer **Appendix L** for details relating to ecological impacts, and to **Appendices C and H** regarding noise and air quality impacts, respectively. It is proposed that the quarry will operate in accordance with a proposed plan of management, to be incorporated in the conditions of consent, per *Renaldo Plus 3 Pty Limited v Hurstville City Council* [2005] NSWLEC 315 and *Amazonia Hotels Pty Ltd v Council of the City of Sydney* [2014] NSWLEC 1247 (NSW Land and Environment Court Planning Principle relating to plans of management).
- On the basis of on-site investigations undertaken in conjunction with the local Aboriginal community, the proposed quarry development is unlikely to affect the heritage significance of any Aboriginal or non-Aboriginal heritage items found or likely to be found on the site. Refer **Appendix K** for details.
- Based on the groundwater assessment by Martens and Associates, consulting engineers (**Appendix F**) the proposed quarry pit is most unlikely to intersect with groundwater and is not subject to flooding.
- The quarry haul route, including the proposed intersection upgrade with Castlereagh Highway, , will be to a standard and capacity that can accommodate traffic likely to be generated by the proposed quarry development. Refer to **Appendix D** for details.
- The project incorporates measures to control and manage to appropriate levels potential environmental and amenity impacts. In this regard it is proposed that the quarry operate in accordance with a quarry plan of management, the key components of which having been described in this EIS.

The impact assessment contained in this Environmental Impact Statement (EIS) demonstrates that the project complies with relevant planning and environmental legislation and with the proposed quarry design and mitigation measures in place, will be capable of proceeding without significantly impacting the environment or that of the local community.

It is therefore concluded that the project is in the public interest and should be approved.

8. Conclusions, Justification of Project

8.1 Introduction

The owners, Hamish and Sally Drury of Talinga Pastoral Company, seek development consent to expand an existing borrow pit and to establish a planned quarry on an elevated, stony knoll on Lot 1 DP1239728, which forms a part of a larger rural holding known as 'Talinga', No.1848 Castlereagh Highway Gulgong NSW 2852: the Gulgong Quarry Project. The existing borrow pit has operated as a quarry for decades, including use as a quarry by the local council.

This Environmental Impact Statement (EIS) has been prepared by Outline Planning Consultants Pty Ltd to accompany a Development Application (DA) for the Gulgong Quarry Project, seeking consent to extract up to 350,000 tonnes per annum of quarry material within a quarry footprint of 7.34ha with a total resource of about 4.6 million tonnes. The internal access route to the quarry connects directly with the Castlereagh Highway. As part of this project the intersection of the internal haul route with the highway is proposed to be suitably upgraded.

The hard rock resource found on this elevated hill is proposed to be quarried and used as a road base or select fill, primarily to service nearby infrastructure projects undertaken within the Central-West Orana Renewable Energy Zone (CWO-REZ). A strategic advantage of the site is that it is proximate to these projects, in the main located in the northern part of the Mid-Western Regional Council area.

This EIS provides an assessment of the potential environmental impacts of the Project in accordance with the Secretary's Environmental Assessment Requirements (SEARs) for an EIS, issued on 5 June 2024 (EAR 1894), and in particular:

- Strategic position of the project site and close proximity to CWO-REZ projects.
- Site suitability and design of the quarry project, and agricultural worth of the site.
- The environmental, social and economic costs and benefits of the project.
- Statutory planning considerations under the EP& Act, including how the Gulgong Quarry Project satisfies local and state planning policies, and how it accords with the principles of Ecologically Sustainable Development (ESD) and the objects of the EP&A Act.

In accordance with the issued SEARs various environmental investigations were undertaken during the preparation of the EIS to assess the potential environmental impacts associated with the Gulgong Quarry Project, addressing environmental impacts including but not limited to noise and vibration impacts, ecological impacts, aboriginal heritage, soils and agriculture, contamination, traffic and transport, rehabilitation, hazards, land resources, air quality impacts, visual impacts, water and relevant environmental planning instruments.

The EIS has documented the potential environmental impacts associated with the Gulgong Quarry Project, considering both potential positive and negative impacts of the proposal, and provides details of practical, achievable mitigation measures to protect the environment where required, and in particular:

- Likely impacts on site ecology, agriculture, heritage and amenity generally.
- Impacts in terms of noise, air quality, blasting and vibration.
- Water management.
- End-use of the Project Site at the completion of quarrying.

The mitigation measures proposed are considered to be practical, feasible and reasonable.

As more than 30,000 tonnes per year of quarry resource is proposed to be extracted in any one year, an 'integrated development' approval is required from the NSW Environmental Protection Authority (EPA) under the *Protection of the Environment Operations Act 1997*.

8.2 Justification of Project

The Gulgong Quarry Project is justified for a number of reasons, including but not limited to the following:

- The project seeks the continuation of quarrying from an existing quarry which has been in operation since circa 1964. It is considered to be compatible with surrounding land uses and can co-exist with these uses.
- The proposed extraction area consists almost entirely of cleared land, limiting the potential ecological impacts of further disturbance.
- The views of the quarry project are limited, with visual impacts are considered to be either zero or Low. In order to appropriately manage visual and acoustic impacts, the quarry has been designed such that the working face is shielded from the most critical views at all times, at the same time achieve a suitable depth of quarrying.
- The Project will support the planned future growth of the region, maintain local employment and supply of quarry materials close to markets and existing and future Central-West Orana Renewable Energy Zone (CWO-REZ) projects. Road making materials are becoming increasingly scarcer in the region. The close proximity of the site to these projects means that haulage distances and impacts on the regional road system will be minimised.
- Suitable ,safe and direct access to the Castlereagh Highway is provided from the site without impacting adversely on the local road network. While the Gulgong Quarry Project and surrounding CWO-REZ projects would increase the number of heavy quarry truck traffic using the Castlereagh Highway, there is unlikely to be any detrimental impact on road safety given the existing low traffic volumes using this arterial road and reasonably high standard of the road. Moreover, a Driver Code of Conduct will be implemented.
- The project has been designed to ensure that noise and air quality impacts on surrounding properties are satisfactorily minimised.
- The project site is to be appropriately rehabilitated once quarrying is completed. The quarry benches, batters and slopes proposed are in accordance with current 'best practice'- *Guidelines for Open Pit Slope Design* (2009) promoted by NSW Trade & Investment- Mine Safety.
- The quarry is a permissible use in the RU1 zone under the *Mid Western Regional Local Environmental Plan 2012*. A quarry development is consistent with the zoning of the Project Site.
- The Project will provide employment for quarry workers and contractors dependent on the operation of the quarry.
- The Project would not result in disturbance to any identified Aboriginal heritage sites.
- The quarry is strategically positioned in terms of ability to service local growth areas as well as future infrastructure projects in the region.
- The project would generate flow-on economic benefits to the region of direct expenditure generated by wages, contractors fees and the sale of quarry products.
- The project accords with the objects of the EP&A Act (refer to Section 5.1.4 of this EIS) and in particular:
  - The project seeks to maximise the safe and economic recovery of the valuable quarry resource known to underlay the site.
  - The design of the quarry project achieves satisfactory environmental, social and economic outcomes generally, incorporating design features to reduce the potential for adverse impacts. Additional safeguards and mitigation measures have been proposed to minimise potential impacts.
  - The land proposed for the expansion of the quarry is lawfully cleared land.
  - No cultural sites affected.
- The project accords with the Ecologically Sustainable Development (ESD) (refer to Section 7.1.2 of this EIS) and in particular:
  - The Precautionary Principle: After a full evaluation of the project, as considered in this EIS, it is concluded that the proposed quarry can operate within acceptable criteria, with no serious or irreversible environmental damage resulting. Nor does does it give rise to any uncertainty in terms of what is proposed or likely impacts, or relationship to adjoining development.

- The Integration Principle: Quarry management measures have been proposed that will ensure that acceptable impacts will ensue in both the short-term and the long-terms. The project will serve in particular the CWO-REZ renewable energy projects nearby, which will benefit all members of the community, as well as future generations.
- Intergenerational Equity Principle: The project will provide benefits for future generations by providing a secure source of road making material close to committed renewable energy projects nearby in the short-medium term.
- Biological Diversity Principle: The site is land that was lawfully cleared prior to 1990, with limited ecological value. The potential impacts of the project have been described in this EIS, including the potential impact of the project on biodiversity.
- Valuation and Pricing of Resources Principle: The site of the proposed quarry site has limited value to agriculture. In any case, the quarry project affects only 0.6% of the 'Talinga' farm holding, with 0.55% returned to agriculture upon project completion.

From the above, there are demonstrable benefits associated with the project, and with appropriate conditions of approval, these benefits can be achieved without significant adverse social or environmental impacts.

8.3 Summary: Environmental Issues

In addition to the design of the quarry, the mitigation measures proposed also form a fundamental part of the quarry project. These measures proposed will ensure that satisfactory environmental impacts will ensue- refer to Section 4. The accompanying Table 8.1 summarises impacts by key issue identified in the SEARs.

Table 8.1: Compliance of quarry development by environmental issue (summary)

Issue	*Compliance of Proposed Quarry Development*
Soil and water resources	▸ *The proposed quarry site has limited value to agriculture.* ▸ *All stormwater to be contained within the proposed quarry pit.* ▸ *Groundwater unlikely to be encountered by quarrying, the floor of the quarry being 26m above known groundwater levels in the vicinity.*
Noise, vibration, blasting	▸ *The quarry can operate in compliance with applicable noise criteria.* ▸ *The quarry will operate only during daytime periods.* ▸ *Blasting can be undertaken to achieve EPA vibration and overpressure requirements.*
Air quality	*Dust abatement measures are to be implemented on site to ensure acceptable air quality impacts.*
Contamination	*The contamination assessment by Ballpark Environmental finds that the Project Site presents an acceptable low level of risk for site contamination and is suitable as a quarry.*
Heritage	*The Project Site does not contain any significance in terms of Aboriginal or European heritage values. No Aboriginal items or relics of heritage significance occur within the proposed quarry area.*
Traffic	*The traffic impact assessment by Streetwise has determined that acceptable roads and traffic impacts will ensue.The intersection with the Castlereagh Highway will be suitably upgraded.*
Ecology	▸ *The proposed extraction area extension consists almost entirely of cleared land, limiting the potential ecological impacts of further disturbance.* ▸ *No core Koala habitat or threatened vegetation of fauna communities have been identified.*
Bushfire	▸ *The site is not mapped as being bushfire prone land.* ▸ *Various various bushfire safeguards and controls are proposed.*
Visual impacts	*The proposed quarry will not be visible to the surrounding neighbourhood, save for two neighbouring residences-the latter which will have screened views in part. Low to zero visual impacts.*
Social and economic	*The proposal would contribute to the economy locally and through employment generation and the provision of materials for roads and other infrastructure projects in the region- and in particular existing and future Central-West Orana Renewable Energy Zone (CWO-REZ) projects.*

8.4 Conclusions

The Mid-Western Regional Council area is about to enter an era of major investments and employment arising from the NSW State Government's commitment to accelerate the roll-out of renewable energy projects in NSW: a transformation of NSW's energy landscape.

The recent approval of EnergyCo's Central West Orana Renewable Energy Zone (CWO-REZ) transmission project paves the way for the construction of essential transmission infrastructure to connect large-scale, wind, solar and energy storage projects in the Mid-Western Regional Council area, forecast to generate up to $20 billion in private investment and about 1,800-5,000 jobs during peak construction.

Less appreciated is the fact that all of these major projects will be reliant on sourcing a reliable, proximate source of road making and other quarry products to service these projects.

The site of the Gulgong Quarry Project is strategically located in terms of its close proximity to, and ability to service currently approved or proposed nearby infrastructure projects within the CWO-REZ zone. It proposes safe and adequate access suitable for the project. The project provides for the supply of much-needed quarry product to these projects, thus ensuring employment opportunities and maintaining stimulus to the economy of the Mid-Wester Regional Council area. The consequences of not proceeding with the Project also weigh heavily in favour of proceeding with the project.

This EIS has been prepared in accordance with the provisions of the EP&A Act and addresses the SEARs, as well as all relevant environmental issues raised by government and others. Moreover, the Gulgong Quarry Project accords with the principles of Ecologically Sustainable Development. The Project is classified as regionally significant development pursuant to the provisions of Schedule 6 of the State Environmental Planning Policy (Planning Systems) 2021 and the Western Regional Planning Panel (WRPP) is the consent authority for this proposed quarry development.

The land the subject of the Gulgong Quarry project is mostly cleared and disturbed land, and has no likely significant environmental constraints to the development. The project site is well removed from residential areas in a relatively remote rural location.

The potential environmental, social and economic impacts, both direct and cumulative, have been identified and thoroughly assessed as part of this EIS. The proposed quarry development has been designed to avoid and minimise adverse environmental, social and economic impacts and is anticipated to result in satisfactory environmental impacts in accordance with the jurisdictional requirements of s.4.15(1) of the EP&A Act.

As a result, it is concluded that the environmental and community impacts associated with the Gulgong Quarry Project are deemed to be acceptably low, and the project benefits outweigh any project negatives. Overall, this EIS concludes that the Gulgong Quarry Project is in the public interest and is not predicted to cause significant environmental impacts or pose significant environmental risks.

Consequently, the proposed quarry development is considered to be in the public interest, and should be approved, subject to conditions of consent appropriate for the development.

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10. Glossary of Terms

Term	Meaning
AADT	*Annual Average Daily Traffic.*
ABS	*Australian Bureau of Statistics.*
Aboriginal object, place	*Has the same meaning as the definition of the term in section 5 of the National Parks and Wildlife Act 1974.*
Acoustic	*Relating to hearing, noise and sound.*
Aggregate	*Rock crushed to the required size for use in concrete, masonry products, road sealing, pavement materials and other uses.*
AHD	*Australian Height Datum. The standard reference level used to express the relative elevation of various features. A height given in metres, AHD is essentially the height above sea level.*
Air Blast Overpressure	*Air vibration or air blasts are the pressure or shock waves that radiate in air from an exploding charge. When a pressure wave passes a given point, the pressure of the air rises rapidly before returning to atmospheric pressure after a period of oscillations. The maximum pressure is the 'Air Blast Overpressure' measured in dB.*
Ambient noise	*This is the total encompassing sound in a given situation at a given time where no particular sound is dominant. It is composed of sound from all sources near and far, normally experienced in the area. Ambient noise is measured as dB ('A' weighted) over a set period of time.*
Amenity	*The quality of a local environment.*
AS	*Australian Standard.*
ASS	*Acid sulfate soils.*
Attenuation	*Reduction in sound level between a noise source and another location.*
Avoid	*Measures taken by a proponent such as careful site selection or actions taken through the design, planning, construction and operational phases of the development to completely avoid impacts on the environment, includiing biodiversity values, or certain areas of biodiversity.*
A-Weighted Sound Level dB(A)	*A level of sound pressure in which the sound pressure levels of the various frequency bands have been weighted to accord roughly with human aural system frequency sensitivity.*
Basalt	*Fine grained, dark volcanic igneous rock.*
Batter	*The face of the slope eg. walls, banks, cuttings, etc.*
Bench (in a quarry)	*A ledge constructed in a batter or natural slope within a quarry. A step in the face of a quarry.*
Biodiversity	*The biological diversity of life at genetic, species and ecosystem scales. The maintenance of biodiversity, at all levels, is acknowledged internationally as a high conservation priority.Biodiversity values comprise vegetation integrity, habitat suitability and biodiversity values generally.*
BDAR	*Biodiversity Development Assessment Report*
Blasting	The operation of breaking rock in a quarry by means of explosives.

Bund	*An earthen mound wall which may be used for noise attenuation or visual screens or for redirecting stormwater/runoff around a part of a site. Bunds may also be used to contain spillage of liquid materials.*
Blue Book	*Means Managing Urban Stormwater: Soils & Construction (4th edition, Landcom, 2004), commonly referred to as the "Blue Book".*
Biodiversity	*Biological variety at genetic, species and ecosystem scales. The maintenance of biodiversity, at all levels, is acknowledged internationally as a high conservation priority.*
BoM	*Bureau of Meteorology (Commonwealth).*
Building Code of Australia	*Means means the document, published by or on behalf of the Australian Building Codes Board, that is prescribed for purposes of this definition by the regulations, together with— (a) such amendments made by the Board, and (b) such variations approved by the Board in relation to New South Wales, as are prescribed by the regulations*
CC	*Construction certificate.A Construction Certificate (CC) is a certificate that is issued by an accredited private certifier or a consent authority under the provisions of Environmental Planning and Assessment Act 1979. The Certificate allows for building work to commence on a project.*
Catchment	*Drainage area of a river, creek. Can also refer to a visual catchment, which is the area within view of a particular viewing location, or road catchment, which is the area reliant on a particular road in order to gain access to another centre or locality.*
CIV	*Capital investment value as defined by the Environmental Planning & Assessment Regulation 2021. Includes all costs necessary to establish and operate the project, with some exclusions.*
Consent	*Means development consent issued under the Environmental Planning and Assessment Act 1979.*
Contributions Plan	*Section 7.11 of the Environmental Planning and Assessment Act 1979 allows councils to levy contributions towards the cost of providing local infrastructure. Contributions plans set out the local infrastructure required to meet the demand from new development, and the contributions a council can levy on developers to fund the necessary land and works.*
Construction	*All physical works to enable operation, including but not limited to the demolition and removal of buildings, the carrying out of works for the purposes of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by this consent, but excluding the following: •building and road dilapidation surveys; •investigative drilling, investigative excavation or Archaeological Salvage; •establishing temporary site offices (in locations identified by the conditions of this consent); •installation of environmental impact mitigation measures, fencing, enabling works; and minor adjustments to services or utilities.*
Contamination	*The action or state of makings or being made impure by polluting or poisoning, or the state of containing unwanted or dangerous substances.*
Contour Drain	*Drainage channel constructed approximately along the contour, and which is designed to slow down and direct the flow of water across a disturbed area to a sediment trap for sediment removal.*
Council	*Mid Western Regional Council.*
Crushing	*The mechanical process of reducing quarry rock size usually by pressure or impact.*

DA	*Development Application.A Development Application (DA) is required for various types of development projects under the provisions of NSW Environmental Planning and Assessment Act 1979. It means an application for consent under Part 4 to carry out development but does not include an application for a complying development certificate.Sometimes also referred to as Development Approval.*
Daytime	*Means between the hours of 7.00am to 6.00pm.*
dB (A)	*To approximate the human response to sound, noise level meters have weighting networks which correspond approximately with subjective loudness. The 'A- Weighting' is used to simulate human hearing.*
DBYD	*Dial Before You Dig.*
DCP	*Development Control Plan. A development control plan provides detailed planning and design guidelines to support the planning controls in an environmental planning instrument.*
Department, DP&E	*NSW Department of Planning and Environment.*
Designated development	*Means development that is declared to be designated development by an environmental planning instrument or the regulations. All applications for designated development in NSW need to be accompanied by an EIS.*
Development	*The development described in the development application. For the purposes of the NSW Environmental Planning and Assessment Act 1979, "development" is any of the following: "(a) the use of land,(b) the subdivision of land, (c) the erection of a building, (d) the carrying out of a work,(e) the demolition of a building or work,(f) any other act, matter or thing that may be controlled by an environmental planning instrument." (2) However, development does not include any act, matter or thing excluded by the regulations (either generally for the purposes of this Act or only for the purposes of specified provisions of this Act). (3) For the purposes of this Act, the carrying out of development is the doing of the acts, matters or things referred to in subsection (1). (sub clauses 1.5(1)(2) and (3) of the NSW Environmental Planning and Assessment Act 1979).*
Development Consent	*Means consent under the provisions of NSW Environmental Planning and Assessment Act 1979 to carry out development and includes, unless expressly excluded, a complying development certificate.*
Deposited Plan (DP)	*Deposited Plans (DP) define legal boundaries of land and often record subdivisions, easements and the like.*
Designated Development	*Section 4.10 of the Environmental Planning and Assessment Act 1979 states that "Designated development is development that is declared to be designated development by an environmental planning instrument or the regulations." Schedule 3 of the Environmental Planning and Assessment Regulation 2021 defines the type of development which is classified as designated development.*
Drainage Line	*A natural depression with no stream bed channel, which may only carry surface water during rainfall events.*
Dust or particulate matter	*Dust or particulate matter are terms used to define solid or liquid particles that may be suspended in the atmosphere. The potential affect of particulate matter on the environment, human health and amenity depends on the size of the particles, the concentration of particulate matter in the atmosphere and the rate of deposition.*
Earthworks	*Bulk earthworks, site levelling, import and compaction of fill material, excavation for installation of drainage and services, to prepare the site for construction.*
EEC	*Endangered Ecological Community.*

Ecologically Sustainable Development (ESD)	*Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Ecologically sustainable development can be achieved through the implementation of the following principles and programs including: the precautionary principle; inter-generational equity; conservation of biological diversity and ecological integrity; improved valuation, and pricing and incentive mechanisms.*
EIS	*Environmental Impact Statement submitted with the application for consent for the development.*
Emission	*The release of material into the environment (eg dust).*
Evening period	*Means the period from 6.00pm to 10.00pm.*
Environment	*Includes all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings.*
Environmental Planning Instrument (EPI)	*An environmental planning instrument is the collective name for local environmental plans (LEPs) and state environmental planning policies (SEPPs) but does not include development control plans (DCPs). The provisions of EPIs are legally binding on both government and developers.*
Environment Protection License (EPL)	*Has the same meaning as the definition of the term in the Dictionary to the NSW Protection of the Environment Operations Act, namely:* *"a licence authorising the carrying out of scheduled development work or scheduled activities or controlling the pollution of water arising from non-scheduled activities, being a licence issued under Chapter 3 and in force."*
EP&A Act	*NSW Environmental Planning and Assessment Act 1979.*
EP&A Regulation ("regulations")	*NSW Environmental Planning and Assessment Regulation 2021.*
EPA	*NSW Environment Protection Authority constituted by the Protection of the Environment Administration Act 1991.*
EPL	*Environment Protection Licence.*
Erosion	*The process of wearing away of the land surface (whether natural or artificial) by the action of water, wind.*
ESCP	*Erosion and sediment control plan.*
Excavator	*Item of earth moving equipment either tracked or wheeled fitted with a bucket on an articulated boom and used for digging material from a quarry pit face in front of, or below the machine.*
Extraction	*A term synonymous with quarrying. Under the Environmental Planning and Assessment Act, 1979, quarrying is defined as "extractive industries".*
Feasible	*Means what is possible and practical in the circumstances.*
Flora and fauna	*Plants and animals.*
Flyrock	*Rock that is ejected from beyond a blast site, typically with the potential to cause injury or damage to property. Proper planning can reduce the incidence of flyrock.*
Groundwater	*Water found in the subsurface in the saturated zone below the water table or piezometric surface i.e. the water table marks the upper surface of groundwater systems.*
ha	*hectare.*
Habitat	*The place where an organism normally lives; habitats can be described by their floristic and physical characteristics.*

Haul Road	*Road used for haulage of material from/to the worked quarry face to/from markets beyond.*
Hazard	*A source of potential harm; a potential occurrence or condition that could lead to injury, damage to the environment, delay or economic loss.*
Heritage	*Encompasses both Aboriginal and historic heritage including sites that predate European settlement, and a shared history since European settlement.*
Heritage item	*A place, building, work, relic, archaeological site, tree, moveable object or precinct of heritage significance, that is listed under one or more of the following registers: the Heritage Act 1977 (NSW), a state agency heritage and conservation register under section 170 of the Heritage Act 1977 (NSW), a Local Environmental Plan under the EP&A Act, the World, National or Commonwealth Heritage lists under the Environment Protection and Biodiversity Conservation Act 1999 (Cth), and an "Aboriginal object" or "Aboriginal place" as defined in section 5 of the National Parks and Wildlife Act 1974 (NSW). An item as defined under the Heritage Act 1977, and assessed as being of local, State and/ or National heritage significance, and/or an Aboriginal Object or Aboriginal Place as defined.*
Integrated development	*Development (not being State significant development or complying development) that, in order for it to be carried out, requires development consent and one or more approvals from the government agencies listed in s.4.46 of the NSW Environmental Planning and Assessment Act 1979.*
Incident	*An occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance with an issued consent.*
km	*Kilometre.*
kV	*Kilovolt.*
Land	*Has the same meaning as the definition of the term in section 1.4 of the NSW Environmental Planning and Assessment Act 1979.*
Land Capability	*The ability of land to support agriculture on a sustainable basis.*
Land Use Table	*A table in an environmental planning instrument (EPI) listing the objectives of any land use zone, along with uses permitted and prohibited under any zoning.*
Landscaped area	*Means a part of a site used for growing plants, grasses and trees, but does not include any building, structure or hard paved area.*
L_{Aeq}(time)	*Equivalent sound pressure level: the steady sound level that, over a specified period of time, would produce the same energy equivalence as the fluctuating sound level actually occurring.*
L_{A90}(time)	*The A-weighted sound pressure level that is exceeded for 90 per cent of the time over which a given sound is measured. This is considered to represent the background noise e.g. LA90 (15 min).*
Lithosol	*An azonal soils having no clearly expressed soil morphology and consisting of a freshly and imperfectly weathered mass of rock fragments; largely confined to steep hillsides or areas where rock tends to outcrop close to the surface.*
Local Environmental Plan (LEP)	*Local Environmental Plans are planning documents prepared by a Council which detail the zoning of land and the type of development which is permitted with consent in a particular zone. Controls on development are also provided.*
Management Plan	*A plan which demonstrates how the management objectives for an environmental matter will be achieved. Also referred to as Environmental Management Plan (EMP).*
Minister	*NSW Minister for Planning (or delegate).*

Mitigation	*Activities associated with reducing the impacts of the development prior to or during those impacts occurring.*
ML	*Megalitre: 1,000,000 litres.*
m/s	*Metres per second*
MIC	*Maximum instantaneous charge for blasting, measured in kg per drill hole.*
Modification	*A change to a project that is implemented by modifying an existing development consent. An application must be made under s.4.55 of the EP&A Act before the modification can be approved.*
Monitoring	*The regular measurement of components of the environment to ensure that environmental guidelines standards are being met.*
Night	*Means the period between 10.00pm and 7.00am.*
NSW planning portal	*Means the website with the URL of www.planningportal.nsw.gov.au, or any other website, used by the Planning Secretary to provide public access to documents or other information in the NSW planning database.*
OEH	*(former) NSW Office of Environment & Heritage*
Overburden	*Subsoil and decomposed rock overlying the main quarry rock body- a low value quarry material.*
Peak Particle Velocity	*A measure of ground vibration caused by quarry blasting reported in millimetres/second (mm/sec)*
Plan of Management/ Environmental Management Plan	*A document that details the management measures (including controls, monitoring and other safeguards) to be implemented during a the life of a development eg. for a quarry, landfill or resource recovery facility.*
(Quarry) Processing Plant & Facilities	*In the case of a quarry extraction operation, the combination of crushers, screens, conveyors and the like used to reduce the size of the rock and separate it into various sized products. Used in association with other quarry plant that includes aggregate pre-coating facility, fuel storage, sheds, offices, haul roads, weigh bridge and sediment basins, collectively forming a part of a quarry infrastructure area.*
Planning Secretary/ Secretary	*Planning Secretary under the EP&A Act, or nominee.*
POEO Act	*Protection of the Environment Operations Act 1997.*
Project	*The development the subject of an application for consent or approval on a site ("project site").*
Proponent	*The person or entity seeking consent or approval for a project, including any associated entities that have been engaged to assist with project delivery.*
Reasonable	*Means applying judgement in arriving at a decision, taking into account: mitigation, benefits, costs of mitigation versus benefits provided, community views, and the nature and extent of potential improvements.*
RL	*Reduced Level means height above the Australian Height Datum, being the datum surface approximating mean sea level that was adopted by the National Mapping Council of Australia in May 1971.*
Rehabilitation	*The restoration of land disturbed by the development to a good condition, to ensure it is safe, stable and non-polluting. Typically involves the preparation of a final landform after a project is completed and its stabilisation with grasses, trees and/or shrubs.*

Risk, Risk Assessment	*The chance of something happening that will have an impact on objectives. Risk assessment is the overall process of risk identification, risk analysis and risk evaluation.*
Road	*Means a public road or a private road within the meaning of the Roads Act 1993, and includes a classified road.*
Sensitive receivers	*Means a location where people are likely to work, occupy or reside, including a dwelling, school, hospital, office or public recreational area.*
Scenic quality/visual	*The values of visible components of landscape which contribute to its scenic characteristics.*
Sediment pond/ basin	*Collects waterborne sediment from disturbed areas within a development site and stores that water while suspended sediments fall out of solution (settle).*
SEE	*Statement of Environmental Effects, required for a development application (DA) lodged pursuant to the provisions of the (NSW) EP&A Act 1979.*
SEARS	*The Secretary's Environmental Assessment Requirements set out clear expectations on the level of assessment required for each relevant matter which must be addressed by the proponent in the EIS.*
Screening	*A process which separates quarry product into various sizes, usually involving a mechanical vibration of the rock over a series of decks fitted with steel mesh, steel plate and/or polyurethane and/or rubber mats with fixed sized apertures.*
Sealing aggregate	*Crushed rock usually of uniform size bonded by bitumen on the surface of the road to form a wear surface.*
Shot rock	*Rock won from blasting at a quarry.*
Siltstone	*Siltstone is a clastic (ie. rocks composed of broken pieces of older rocks) sedimentary rock that is mostly composed of silt-sized particles. It forms where water, wind, or ice deposit silt, and the silt is then compacted and cemented into a rock.*
State Significant Development (SSD)	*Development projects which have State significance due to their size, economic value or potential impacts assessed and approved under the EP&A Act.*
State Significant Project	*A State significant development or State significant infrastructure project as defined under the EP&A Act. Defined in State Environmental Planning Policy (State and Regional Development) 2011 requiring the consent of the Minister for Planning or delegate.*
Soil Landscape	*An area of land that has recognisable and describable topography and soils that are capable of being represented on maps and of being described by concise statements. The Soil Conservation Service of NSW has published a Soil Landscapes Series, describing the soils of NSW.*
Stakeholder	*Persons, groups, government and semi-government agencies, and non-government organisations with a legitimate interest in the process of assessment, its inputs and outcomes, as described in the Director General's Requirements.*
State Environmental Planning Policy (SEPP)	*A planning instrument made by the State. These Plans deal with planning issues of State significance.*
Scheduled Activity	*Has the same meaning as the definition of the term in the Dictionary to the POEO Act, namely: "means an activity listed in Schedule 1 [of the PIEO Act]." An Envioronment Protection License (EPL) is required for the operation of any schedule premises.*
The Site, or Project Site	*Refers to the land upon which the proposed development is to take place.*

Subdivision (of land)	*Means the division of land into two or more parts that, after the division, would be obviously adapted for separate occupation. Subdivision of land includes the procuring of the registration in the office of the NSW Registrar-General of a plan of subdivision.*
SWL	*Standing water level is the distance from the ground surface to the water surface for a well or bore.*
Tertiary	*Period of geological time, prior to the Quaternary, 65 million years ago- usually associated with volcanic activity.*
TfNSW	*Transport for New South Wales.*
Threatened species	*Species of flora and fauna that are listed as endangered species or vulnerable species.*
Use of land	*Includes a change of use of building use.*
Visual Analysis	*Landscape analysis based on visual qualities only, excluding consideration of heritage, cultural or social values*
Visual Catchment	*Land within view-sheds. View-sheds are edges or limits to views from a single place or combination of viewpoints.*
vpd, vph	*Abbreviations of vehicles per day (vpd), vehicles per hour (vph).*
WAL	*Water Access Licence, issued under Section 95 of the (NSW) Water Management Act 2000.*
Water Balance	*Means an assessment to determine the adequacy of water stored at a quarry site in meeting future water needs for that development in 'dry', 'average' and 'wet' years.*
Waterfront Land	*Means the bed of any river, lake or estuary and land within 40 metres of a river bank, lake shore or estuary mean high-water mark. Any proposed development fronting waterfront land, as defined, is a 'controlled activity' for the purposes of the Water Management Act 2000 and 'integrated development', requiring approval from the responsible agency listed in s.4.46 of the NSW Environmental Planning and Assessment Act 1979.*
Water Sensitive Urban Design (WSUD)	*Water-sensitive urban design (WSUD) is a and planning and engineering design approach which integrates the urban water cycle, including stormwater, groundwater and wastewater management and water supply, into urban design to minimise environmental degradation and improve aesthetic and recreational appeal.*
Weathered Rock	*Rock affected to any degree by the processes of chemical or physical weathering.*
Wind rose	*Means a graphics tool that summarises winds at any location, showing strength, direction and frequency.*
Zoning, Zoning Map	*A planning tool used to apply planning policy and provisions of an environmental planning instrument to specific areas of land within a local or sate government area.*

APPENDICES

Environmental Impact Statement

APPENDIX A

Secretary's Environmental Assessment Requirements (SEARS)

APPENDIX B

Quarry project plans

APPENDIX C

Noise impact assessment report by Vipac

APPENDIX D

Roads and traffic assessment by Streetwise

APPENDIX E

Agronomists report

APPENDIX F

Groundwater assessment by Martens & Associates

APPENDIX G

Water balance report by Martens & Associates

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APPENDIX H

Air quality impact assessment by Vipac

APPENDIX I

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APPENDIX J

RFS website

APPENDIX K

Aboriginal heritage by OzArk Environment & Heritage

APPENDIX L

Ecological assessment by Bower Ecology

APPENDIX M

Roads and traffic assessment by Streetwise

APPENDIX N

Geotechnical report Douglas Partners

APPENDIX O

Pre-lodgement meeting with Council

APPENDIX P

Newsletter distributed to neighbours