Annexure 1

STATUTORY PLANNING CONSIDERATIONS

In determining the Development Application, Council is required to consider those matters listed under Section 4.15 of the *Environmental Planning and Assessment (Amendment) Act, 1979.* Matters of consideration are as follows:

1 S.4.15 (1) (a)(i) Provision of any Environmental Planning Instrument

1.1 Gwydir Local Environmental Plan 2013 (GLEP)

The subject development is located with the Gwydir Shire Council area and as such is governed by the Gwydir Local Environment Plan 2013 (GLEP).

The relevant aims of this GLEP plan are:

(a) *to encourage the proper management, development and conservation of environmental, economic and social resources in Gwydir,*
(b) *to facilitate economic growth and development consistent with the aim specified in paragraph (a) and that:*

- *(i) minimise the cost to the community of fragmented and isolated development, and*
- *(ii) facilitates the efficient and effective delivery of amenities and services, and*
- *(iii) facilitates stimulation of demand for a range of residential, enterprise and employment opportunities and promotes agricultural diversity, and*
- *(iv) utilises, where feasible, existing infrastructure and roads when considering new development and future potential development,*

(c) *to facilitate development in accordance with flood management planning,*
(d) *to facilitate development that is compatible with adjoining and nearby uses,*
(e) *to facilitate development that is appropriate in scale and type to the characteristics of the zone,*
(f) *identify, protect and conserve places of European heritage significance and Aboriginal heritage and cultural significance,*
(g) *to identify, protect, conserve and enhance natural assets.*

Proponents Submission

No Submission

Staff Comment

The proposed quarry will utilise approximately 16.25 hectares (Extraction site – 9.25 Ha and Stockpile site – 7 Ha) of the property Tikitere (total property size - 1698.5 hectares) which operates mainly a dry land and irrigated cropping and grazing operation. The areas to be utilised by quarrying activities do not currently form part of the properties general operations and is not considered prime agricultural land. The Pearlman quarry extraction site is located along part of ridgeline known as 'Death Adder Hiill' and is predominantly

covered with native vegetation. An existing on-farm quarry is located along the southern side of the ridgeline which doesn't form part of the quarry's excavation footprint. This on-farm quarry has no prior development approval. Generally, the proposed quarrying operation will not significantly impact on timber, mineral, soil or water resources, nor areas of high scenic or recreational value. One item of indigenous heritage significance, previously unknown, was discovered during field assessment works and the quarry footprint has be modified to avoid and protect the object (being a scar tree) in situ.

No known places of archaeological or heritage significance shall be impacted by the quarry and the location of the unexpected find has been identified and protected.

It is considered that the operation of the proposed quarry satisfactorily meets the aims of the GLEP.

1.1.1 Land Use Definition

The proposed development is categorised as an "extractive industry" under the GLEP. Extractive industry is defined as:

> ***"extractive industry*** *means the winning or removal of extractive materials (otherwise than from a mine) by methods such as excavating, dredging, tunnelling or quarrying, including the storing, stockpiling or processing of extractive materials by methods such as recycling, washing, crushing, sawing or separating, but does not include turf farming."* (Gwydir Local Environment Plan 2013, 30 August 2013, Dictionary).

Extractive material is defined under the GLEP as:

> ***"extractive material*** *means sand, soil, gravel, rock or similar substances that are not minerals within the meaning of the Mining Act 1992."* (Gwydir Local Environment Plan 2013, 30 August 2013, Dictionary).

Proponents Submission

An extractive industry land uses within the RU1 Primary Production zone is a permissible land use with development consent.

Staff Comment

The proposed development complies with both the above definitions.

1.1.2 Zoning

The proposed development site is located within the RU1 Primary Production zone under the GLEP. Extractive industries are permissible land use in this zone with consent. The objectives of the RU1 Primary Production zone are as follows:

> "***Objectives of zone***
>
> - *To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.*

- *To encourage diversity in primary industry enterprises and systems appropriate for the area.*
- *To minimise the fragmentation and alienation of resource lands*
- *To minimise conflict between land uses with this zone and land uses with adjoining zones."*

Proponents Submission

The proposed development is for extractive industry, which is permissible, with development consent, within the RU1 Primary Production zone. The protection of natural resources and places has been fully taken into consideration in the planning for this development. The continued utilisation of the land will minimise fragmentation and alienation. The proposal is not considered to conflict with the adjoining land uses. The proposed development is therefore considered to be both compatible and consistent with the surrounding land uses and meets the objectives of the RU1 Primary Production zone.

Staff Comment

The proposed quarry is categorised as designated development in the RU1 Primary Production zone of the GLEP, and is therefore permitted with consent.

The proposed quarry is located on the 1698.5 Ha property "Tikitere" which is predominantly cleared for agricultural uses, as is the adjacent surrounding land. Part of the property consists of remanent patches of native vegetation including an approved, currently operating 500,000 tonne quarry (Tikitere Quarry) site.

Tikitere is surrounded by various other agricultural activities including cropping, grazing and feedlots. The Camurra Boggabilla Railway line runs from north to south dissects the property through the western half.

Access to mineral and other extractive materials will not be compromised.

The proposed quarry location will involve the clearing parts of remanent native vegetation including 1.73 Hectares of the Endangered Ecological Community – Semi-Evergreen Vine Thicket. However, the sites are not located in an environmentally sensitive area as provided by the GLEP.

The proposal will utilise the properties existing harvestable right via water captured in the proposed quarries sedimentation basins as the primary source of water, with ground water, for which a license is required, as a secondary source. No further impacts on water resources are expected.

There are no places, items and buildings of non-indigenous heritage significance identified at the proposed quarry. However, one previously undiscovered indigenous heritage item (being a scar tree) was identified by the Aboriginal Cultural Heritage Assessment. The proposed quarry footprint has be modified to exclude the scar trees location and measures have been provided to protect the item in situ.

The proposed quarry is surrounded by cropped areas but is not located on prime cropping and pasture land and does not relate to a farm adjustment, urban development, or impact on the community for amenities or services.

The courts have held that provided a development is consistent with one or more objectives within a zone, it can legally be considered by the Panel to be consistent with the objectives of the zone.

It is considered that the operation of the proposed quarry satisfactorily meets the above objectives of the RU1 Primary Production zone.

1.1.3 Relevant miscellaneous provisions under Part 5 of the GLEP

1.1.3.1Clause 5.9 Preservation of Trees and Vegetation

> *The objective of this clause is to preserve the amenity of the area, including biodiversity values, through the preservation of trees and other vegetation*.

Proponents Submission

No submission

Staff Comment

Although the proposed development will involve the removal of vegetation it is not considered that amenity of the area will be significantly affected and that in general the amenity of the area will be preserved. It is considered that the operation of the proposed quarry satisfactorily meets the above objective.

1.1.3.2 Clause 5.10 Heritage Conservation

> *The objectives of this clause are as follows:*
> *(a) To conserve the environmental heritage of Gwydir,*
> *(b) To conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,*
> *(c) To conserve archaeological sites,*
> *(d) To conserve Aboriginal objects and Aboriginal places of heritage significance.*

Proponents Submission

Heritage places and landscapes can include natural resources, objects, customs and traditions that individuals and communities have inherited and wish to conserve for future generations. Cultural heritage comprises places and items that may have historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance at a local, State, National or International level. As part of this EIS such matters were assessed by researching the following data bases; NSW State Heritage Register (SHR), NSW State Heritage Inventory (SHI), Gwydir Local Environmental Plan 2013 (GLEP), Relevant Section 170 Registers (S170), Relevant section of the National Parks and Wildlife Act 1974, and Commonwealth Heritage list and National Trust List (NT) listed under the EPBC Act 1999. The result of these searches revealed that there are no items of heritage at either Local, State or National level within 1 kilometre of the study area. 1 item on the National Estate Register is present within the wider area beyond the 1km search area of the site.

Many of the local Aboriginal people in the areas surrounding Croppa Creek and North Star area identify as being part of the Gamilaroi nation. The Moree Gamilaroi Local Aboriginal Land Council members are the Aboriginal custodians of the study area. It must also be considered that Aboriginal Cultures were not static and that clan and tribal boundaries, language groups and dialects most likely changed over many thousands of years. The native title claim is registered under the name of the Gomeroi People with the National title Tribunal. This claim was registered in 2012.

An AHIMS search was conducted as part of the preliminary assessment which revealed that there is one registered site located to the west of the site located within the adjacent rail corridor. Potential Archaeological Deposit (PAD) and area(s) 'of archaeological sensitivity' are used to describe areas likely to contain subsurface cultural deposits. An aboriginal archaeological assessment was carried out by Advitech to verify if any culturally sensitive areas were present of the site. The assessment was carried out in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (OEH 2011). A further Aboriginal Cultural Heritage Assessment (ACHA) was also completed across the site. As part of this assessment two registered Aboriginal party representatives were in attendance during the field work undertaken across the site.

Based on the finding from the field assessment completed by Advitech one culturally significant item was present on the proposed quarry site. As such the quarry footprint was modified to ensure the appropriate buffer area can be provided around this area to ensure that impact minimised to this area. Base on this the site does not require to be salvaged and will remain intact for the enjoyment of future generations.

Staff Comment

The proposed site of the development is not listed in Schedule 5 of the GLEP or the NSW Heritage Register as a place of or item of Aboriginal or European or environmental heritage significance.

However, the discovery, during the field assessment, of the location of previously unknown indigenous artefact, being a scar tree, must be avoided and protected. As such a condition shall be placed in the Draft Schedule of Conditions to ensure the location of the scar tree is adequately protected so that it shall remain in situ for the future. The location of the scar tree is also to be registered as a site of indigenous heritage significance with the Australian Heritage Information Management System (AHIMS).

1.1.3.3 Clause 5.11 Bush fire hazard reduction

> This clause relates to the carrying out of Bush Fire hazard reduction in accordance with the Rural Fires Act 1997.

Proponents Submission

Bushfire Prone Land is land that has been identified by local Council which can support a bushfire or is subject to bushfire attack. The NSW Rural Fire Service's Online Mapping Tool was accessed in May 2019, to assess whether the site is located on Bushfire Prone Land. Results of the search indicate that the site is not located in Bushfire Prone Land however advice received from the Rural Fire NSW as part of the SEARs consultation suggest that the site is partially mapped therefore Rural Fire Service (RFS) guideline "Planning for Bush Fire

Protection 2006" (RFS 2006). Results of the search result is provided below as **Figures 28 and 29** *(See page 53 of "Pearlman Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)*.

Staff Comment

The proposed development site is not located within the currently identified Bush Fire Prone areas. However, even land locate outside critical bush fire areas can be effected by grass fires and the like, so it is sensible to implement fire mitigation measure in all areas of the Gwydir to protect life, livestock, the environment and assets.

1.1.4 Relevant additional local provisions under Part 6 of the GLEP

Clause 6.1 Earthworks

The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

Proponents Submission

No submission

Staff Comment

By its very nature quarrying involves substantial earthworks, however the proposed site for the Pearlman Quarry on Tikitere have been chosen carefully to minimise and mitigate any impacts on the environmental functions and process of the area.

The proposed quarry operation, in total, shall remove 1.73 hectares of Semi-evergreen Vine Thicket Endangered Ecological Community (SEVT ECC) and 6.98 hectares of PCT type 418 (White Cypress Pine – Silverleafed Ironbark – Wilga shrub grassy woodland. The excavation site of the quarry will involve the removal of part of a volcanic flow which is surrounded mainly by cropping lands. The remnant native vegetation is considered to be in good to very good condition. As such the quarries footprint has been modified to avoid the high quality vegetation and to provide a 50m buffer along the northern boundary of the quarry's excavation site to allow retention of flora and safe passage for native fauna which are generally high mobile. In general the remaining 73 hectares SEVT ECC will remain untouched.

However, if erosion and/or contamination is not adequately managed throughout the quarry operations and rehabilitation processes soil degradation may threaten the viability of the area for both agriculture and ecological communities. It will be necessary for the proponent to ensure erosion and contamination controls form part of the overall quarry management plan.

The proposed quarry is deemed to have little or no effect on neighbouring uses and the discovered aboriginal heritage items is to be adequately protected in situ No other items or places of indigenous or non-indigenous heritage was located within the quarry footprint or immediately surrounding area which could be impacted by the proposed development.

1.2 New England North West Regional Plan 2036 (NENWRP)

The New England North West Regional Plans vision states: “Nationally valued landscapes and strong, successful communities from the Great Dividing Range to the rich black soil plans”.

In order to achieve the vision the NENWRP outlines the following regionally focused goals;

- A strong and dynamic regional economy
- A healthy environment with pristine waterways
- Strong infrastructure and transport networks for a connected future
- Attractive and thriving communities

In particular, the Gwydir Shires key priorities under the NENWRP include;

- Deliver a variety of housing options in Bingara and Warialda, and promote development that contributes to the unique character of Gravesend, Cobbadah, Upper Horton, Croppa Creek, North Star and Warialda Rail.
- Continue to develop access and logistics infrastructure on appropriate sites to encourage new industry opportunities.
- Support the development of employment lands.
- Expand nature-based, adventure and cultural tourism places and enhance visitor experiences
- Encourage diversification in agriculture, horticulture and agribusiness to grow these sectors and harness domestic and international opportunities
- Promote a vibrant, youthful and mobile workforce and provide service for the ageing population.
- Identify and promote wind, solar and other renewable energy production opportunities.

Proponents Submission

No Submission

Staff Comment

The proposed development is considered to satisfy the NENWRP’s objective to provide “Strong infrastructure and transport networks for a connected future” as the proposed quarry operation will provide material to the Inland Rail Project to enable the reconstruction of the Narrabri to Boggabilla rail line and material for the Newell Highway Project.

Similarly, the proposed development satisfies the following particular key priorities identified by the Gwydir Shire Council under the NENWRP:

- Continue to develop access and logistics infrastructure on appropriate sites to encourage new industry opportunities.
- Support the development of employment lands.

1.3 State Legislative Requirements

1.3.1 Environmental Planning and Assessment Act 1979 (EP&A Act) & Environmental Planning and Assessment Regulations 2000 (EP&A Reg)

Proponents Submission

This Environmental Impact Statement has been prepared in accordance with the requirements of the EP&A Act. It provides an environmental impact assessment and details of how the Quarry will be development and operated to protect the environment, community and provide for ecological sustainable development.

The site already includes the recently approved Tikitere Quarry for 500,000 tonnes per annum pursuant to the *Environmental Planning and Assessment Act 1979 (as amended)*. We are of the view that the Pearlman Quarry could not be added to the Tikitere Quarry approval through a modification because it would not remain "substantially the same" base on the scale of the impacts. Therefore, a new development application has been prepared for the Pearlman Quarry.

Staff Comment

Notwithstanding Council's Local Environmental Plan, the proposed quarry/extractive industry development is classified as *designated development* under s4.10 of the EP&A Act and the provisions of Schedule 3(1)(19) of the EP&A Reg. The proposed quarry seeks to extract, process and store more than 30,000m^3 per year and will disturb a total ground surface area greater than 2 hectares of land.

Further, the proposal is required to obtain approval from the NSW Environmental Protection Authority as a scheduled activity in accordance with s43(a) of the *Protection of the Environment Operations Act 1997* (POEO Act). The proposed quarry is considered to be a land based extractive industry involving the extraction, processing and storage of more than 30,000 tonnes per year under Schedule 1(19) of the POEO Act. As such and pursuant to s4.46 of the EP&A Act the proposed quarry is also deemed to be *integrated development*.

Thus it is determined that the proposed quarry is designated and integrated. In addition to the above the proposed development is considered to be regionally significant development under Schedule 7(7)(a) of State Environmental Planning Policy (State and Regional Development) 2011 and as such will be assessed by Council and determined by the Regional Planning Panel.

1.3.2 Biodiversity Conservation Act 2016

Proponents Submission

The Biodiversity Conservation Act 2016 (BC Act 2016) provides a framework for the management of flora and fauna on lands within NSW. Under this Act the principals of ecologically sustainable development are used to achieve the conservation and protection of biodiversity values. In conjunction with this the BC Act 2019 the Biodiversity Assessment Method (BAM) is a model for undertaking biodiversity values across the state. As the proposed clearing is above the thresholds under clause 7.23 of the Biodiversity Conservation Regulation 2017 a full assessment has been conducted against the relevant provisions of the

BAM. This assessment has calculated the biodiversity offset requirements to ensure the project will not have a net impact to the biodiversity values of NSW.

Staff Comment

The proponent has prepared a Biodiversity Impact Assessment Report (BDAR) in accordance as required by the Biodiversity Conservation Act 2016 (BC Act). As required a list of Threatened Species, Endangered Ecological Communities (ECC) and Plant Community Types (PCT) that may occur in the local area was prepared and are listed in Annexure 1.

The first revision of the BDAR was reviewed by the Biodiversity Conservation Division of NSW Planning Industry and Environment and as deemed to be generally adequate with some minor shortfalls which were easily corrected (See BDAR Rev 2). Thus not serious and irreversible impacts (SAII) were identified and the BDAR adequately addressed ways of avoiding, minimising and mitigating the developments impact on flora/fauna and Ecological Communities. The BDAR also adequate identified, with assumed presence in mind (see explanation in next paragraph), the local flora/fauna and PCT that would be impacted by the proposed development. Thus accurately producing the number of ecosystem and species credits required to offset under the Biodiversity Offset Scheme.

Generally, the BC Act requires that during adverse climatic conditions (flood, drought etc) or due to seasonal growth inclinations that any flora/fauna and PCT known to occur in the local area of a development site is to be assumed present even if at the time of field surveys are undertaken that flora/fauna or PCT is not currently found. The list of flora/fauna assumed to present can be reduced by preforming further field survey's at different seasons or in more favourable climatic conditions.

As such it is considered that the proposed development is compliant with this Act. For further detail, see section 4.6 of this report and Attachment 3 of the EIS

1.3.3 National Parks and Wildlife Act 1974

Proponents Submission

The National Parks and Wildlife Act 1974 (the NPW Act) aims to conserve and manage natural resources and aboriginal heritage. The proposal has been prepared in accordance with the requirements of this Act. There are no national parks, nature reserves, regional parks, state conservation areas, historical sites, karst conservation areas or Aboriginal areas within the subject area.

Staff Comment

The proposed quarry site is located within and alongside cleared and extensively disturbed agricultural land and consists of disturbed and undisturbed native vegetation. The implementation and operation of the proposed quarry will have no effect on national parks, nature reserves, regional parks, state conservation areas, historical sites or karst conservation areas. A search of the AHIMS has located a number of items/sites of indigenous heritage significant however, none of which are located within the quarry's excavation footprint or stockpile site.

An Aboriginal Cultural Heritage Assessment was carried out as a part of the Due Diligence process. A previously unknown item of indigenous heritage significance being a scar tree was discovered within the quarry's excavation footprint. The site of the scar tree has be excised from the quarry's footprint along with a 15m buffer zone surrounding the site. The proponent has committed to the exclusion zone along with signage and fencing/bunting to protect the site from accidental disturbance during quarry operations.

The proponent has also committed to include a Cultural Heritage Management Strategy to implement unexpected finds protocols, training and incident reporting. The Cultural Heritage Management Strategy will form part of the Quarry Environmental Management Plan.

It is considered that the proposed development is compliant with this Act.

1.3.4 The Heritage Act 1977

Proponents Submission

The Heritage Act 1977 (the Heritage Act) aims to conserve and manage the States Heritage, whether they be places. Buildings, works, relics, movable objects or precincts of Local or State Heritage significance. A property is a heritage item if it is listed in the heritage schedule of the Local Council's Local Environmental Plan or the State Heritage Register or register of places and items of particular importance to the people of NSW. If an item of heritage value was identified, then consultation would be undertaken with Gwydir Shire Council and an assessment undertaken in accordance with OEH guidelines for Assessing Heritage Significance (Heritage Office 2011). The heritage statement is the basis for policies and management structures that will affect an item's future. As part of this assessment the relevant data base searches have been performed that revealed no known heritage items present at the subject site, however a scar tree linked to aboriginal origin was identified. Measures to avoid harm to this site are explained in later sections of this report.

Staff Comment

No items or sites of Aboriginal, European or Cultural heritage significance were identified for the proposed site of the feedlot under the GLEP or State heritage register.

A submission was received, which will be discussed in greater detail elsewhere in this report, suggesting inadequacies in the EIS with regards to Aboriginal artefacts and ceremonial sites on the property 'Tikitere' and in the lack of consultation with the Aboriginal Community regarding the proposed development. The submission refers to items or sites of indigenous heritage significance along Tackinbri Creek. The submission also raised the possibility that the basalt ridgeline may have been used as a site of pre-colonial Aboriginal axe production.

It is confirmed that a previously unknown item of indigenous heritage significance, being a scar tree, was discovered during the Aboriginal Cultural Heritage Assessment field survey. The site of the scar tree along with a 15m buffer zone will be excluded from the quarry's excavation site and protected as a no-go area with signage and an exclusion fence. The find will also be reported to the Aboriginal Heritage Information Management System.

No other ceremonial sites were identified within the property bounds or at the proposed development sites. In the past an isolated artefact was also found in an area of erosion on

an access track bordering the rail line approximately 250m south west of the proposed development site. Extensive searches by both the Inland Rail Project and the proponent's consultant, accompanied by two registered Aboriginal parties, failed to locate any further artefacts. Any areas of Aboriginal heritage significance located along Tackinbri Creek will remain unaffected by the proposed development.

The proposed development was advertised and exhibited for a period 28 days in accordance with the EPA Act 1979. No other submissions were received by Council.

The proponent has satisfied the requirements of Due Diligence and as such it is considered that the proposed development is compliant with this Act.

1.3.5 Rural Fires Act 1997

Proponents Submission

No Submission

Staff Comment

The proposed development does not fall within the current Bush Fire Prone Area for the Gwydir Shire Council and as such is considered to be a low risk site. The applicant is to provide a low fuel buffer zone around the proposed site and adequate emergency mitigation and evacuation procedures. The site is to be compliant with any relevant requirements of the Rural Fire Services document 'Planning for Bushfire Protection 2006'.

The proposed site is deemed to comply with this act.

1.3.6 Protection of the Environment Operations Act 1997

Proponents Submission

Pursuant to Schedule 1(1)(19) of the Protection of the Environment Operations Act 1997 (POEO Act), the proposed development is identified as a "Scheduled Activity" as a land based extractive activity involving the extraction, processing or storage of more than 30,000 tonnes per year of extracted materials. The proposal therefore requires an Environmental Protection Licence (EPL) under Section 48 of the POEO Act. The Environment Protection Authority (EPA) administers the management of EPL's. A licence will be applied for once development consent is granted.

Staff Comment

The proposed quarry development involves the extraction, processing and storage of 500,000 tonnes of material per year which exceeds the threshold under cl 22, Schedule 1 of the Protection of the Environmental Operations Act 1997 and therefore requires an Environmental Protection Licence (EPL) from the Environmental Protection Authority (EPA). As such the proposed quarry will be conditioned to obtain an EPL and submit a detailed draft Quarry Environmental Management Plan for the operation of the quarry, including the mitigation measures proposed to manage and avoid environmental or social impacts.

In addition the EPA's General Terms will be included as Attachment A of the Draft Schedule of Conditions.

1.3.7 Water Management Act 2000

Proponents Submission

The objective of the Water Management Act 2000 is the sustainable and integrated management of the State's water resources for the benefit of both present and future generations by applying the principals of ecologically sustainable development to protect, enhance and restore water sources and their associated ecosystems, ecological processes and biological diversity and their water quality. The objectives of this Act were considered throughout the planning and design phases of this development. The watercourses and groundwater in the vicinity of the property will be protected through rigorous design and management practices, including diversion banks and sediment traps. Appropriate buffers are to be maintained in order to minimise the risk of stream pollution.

Staff Comment

The proposed development is to make use of the properties existing harvestable right by utilizing the surface water run-off captured in the quarries sedimentation basins for the purpose of dust mitigation, fire fighting and other operational needs. It is expected that water will be required to be found from external sources to meet anticipated shortfalls, especially during dry weather conditions. It will be responsibility of the proponent to ensure that any licensing requirements and/or other approvals needed under the Water Act 1912 and/or Water Management Act 2000 are obtained.

which has a water access entitlement of 486 megalitres per year (WAL15704). In addition, water captured in the quarries sediment pond shall also be utilised, primarily for dust suppression. No further licenses are deemed to be required however, it should be confirmed whether the existing bore licence is sufficient to satisfy the quarry operations and continue to gratify crop irrigation requirements for the property. If so, no further water licenses will be required and the application is considered to have satisfied the requirements of this Act.

The proposed quarry is consider to be compliant with the requirements of this act.

1.4 State Environmental Planning Policies

The proposal before Council is subject to the following relevant State Environmental Planning Policies (SEPP):
SEPP 33 – Hazardous and Offensive Development;
SEPP 44 – Koala Habitat Protection;
SEPP 55 - Remediation of Land;
SEPP Infrastructure 2007;
SEPP Mining, Petroleum Production and Extractive Industries 2007;
SEPP Rural Lands 2008; and
SEPP State and Regional Development 2011.

The proposed development has been assessed in relation to the objectives and provisions of these SEPPs.

1.4.1 SEPP 33 – Hazardous and Offensive Development

Proponents Submission

No submission

Staff Comment

This State Policy has the aim of ensuring that Council has sufficient information to assess whether a proposal represents hazardous or offensive development. Under the SEPP the definitions for a potentially hazardous industry and potentially offensive industry are given as:

> ***"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."*
>
> and
>
> ***"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 proposal has the potential to have an adverse impact on the amenity of nearby residents in terms of noise and dust emissions. The EIS provides sufficient information to address relevant matters for consideration under Clause 13 of the SEPP.

The Guidelines 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."

The EIS has demonstrated that the potential impacts of activities associated with the proposed development will take place outside of the minimum separation distance

criteria for rural residences and communities and therefore does not constitute a "potentially hazardous development" or "potential offensive industry".

It is considered that assessment under the SEPP has been complied with.

1.4.2 SEPP 44 – Koala Habitat Protection

Proponents Submission

The SEPP 44 encourages the conservation and management of areas of natural vegetation that provide habitat for koalas, to ensure a permanent free-living population over the their present range and reverse the current trend of koala population decline. Schedule 1 identifies the local government areas (LGA) subject to assessment under the policy of which Gwydir LGA is included, making assessment for koala habitat a requirement for the proposed development. An assessment of potential koala habitat on site was conducted in accordance with SEPP 44 as part of the ecological impact assessment carried out by Advitech. Accordingly, the assessment concludes that the proposed development does not include core koala habitat.

Staff Comment

The aim of SEPP 44 is:

> *"…to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas, to ensure permanent free living populations over the present range and to reverse the current trend of population decline.*
>
> *(a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and*
>
> *(b) by encouraging the identification of areas of core koala habitat, and*
>
> *(c) by encouraging the inclusion of areas of core koala habitat in environment protection zones."*

SEPP 44 applies to all local government areas listed in Schedule 1 – Local Government Areas; while Koala feed trees are listed in Schedule 2 – Koala Food Tree Species. Circular B35 (Department of Planning 1995b) accompanies SEPP 44 and guides its implementation. The former Barraba, Bingara and Yallaroi Shire Councils were listed in the Schedule.

SEPP 44 requires that development applications must consider the presence of 'potential' and 'core' koala habitat where the land area in question is greater than one hectare. Potential koala habitat is defined as 'areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component' (Department of Planning 1995a).

Where potential habitat is identified, the area must be investigated for core koala habitat, defined as 'an area of land with a resident breeding population of koalas,

evidenced by attributes such as breeding females and recent sightings and historical records of a population' (Department of Planning 1995a).

Under the EP&A Act, it is the responsibility of the consent or determining authority to form a view as to whether a proposed development or activity is likely to significantly affect koalas or their habitat. This is achieved by undertaking an Assessment of Significance under Section 5A of the EP&A Act. If the impact is deemed likely to be significant, a species impact statement must be prepared.

In NSW, the koala is listed as a vulnerable species on Schedule 2 of the TSC Act. A vulnerable species is one which is 'likely to become endangered unless the circumstances and factors threatening its survival or evolutionary development cease to operate'. A survey of koalas in 1986–87 found that the koala had disappeared from 50–75% of its historic range in NSW (Reed *et al*. 1990).

The conservation status of koalas on the western slopes and plains is variable. Clearing and degradation of koala habitat is continuing and/or threats associated with urban and semi-urban development are increasing. Habitat fragmentation is extreme in many parts of this area.

Feed tree species:

Eucalyptus tereticornis	Forest Red Gum
Eucalyptus microcorys	Tallowwood
Eucalyptus punctate	Grey Gum
Eucalyptus viminalis	Ribbon or manna gum
Eucalyptus camaldulensis	River Red Gum
Eucalyptus haemastoma	Broad leaved scribbly gum
Eucalyptus signata	Scribbly gum
Eucalyptus albens	White box
Eucalyptus populnea	Bimble Box or popular box
Eucalyptus robusta	Swamp mahogany

An assessment of the quarry site concluded that the proposed development does not include core koala habitat, however, one food tree was identified, Eucalyptus populnea (Bimble Box) within the excavation footprint. The assessment also failed to find any evidence of a koala population at the site.

Staff agrees with the proponent's submission that it is unlikely that the proposed development will have any impact on known or unknown communities or habitat. Conditions controlling the use of water across the property and clearing of remnant vegetation will be included in the draft consent conditions.

It is considered that assessment under the SEPP has been complied with.

1.4.3 SEPP 55 - Remediation of Land

Proponents Submission

The SEPP 55 promotes the remediation of contaminated land for the purpose of reducing the risk of harm to human health or other aspects of the environment. SEPP 55 requires

consideration of whether there have been activities carried out on the land in the past that may have resulted in contamination. If contamination may be present, the proponent is required to undertake suitable investigation and, if necessary, remediation works. On 20th of February 2019 a search of NSW contaminated land register was undertaken. The proposed development site is not considered as contaminated land as it has not historically been subject to any contaminating activities. Upon the cessation of resource extraction, the proposal will involve full rehabilitation of the site.

Staff Comment

This State Policy is required to be considered in the processing and determination of development applications.

The purpose of this policy is to provide a state-wide planning approach to the remediation of land. In particular, this policy aims to promote the remediation of contaminated land for the purposes of reducing the risk of harm to human health or other aspects of the environment.

In accordance with clause 7 of SEPP 55, following a search of Council records, the subject land is not identified as being potentially contaminated and is considered to be suitable for the intended use. The requirements of the SEPP are therefore satisfied.

It is considered that assessment under the SEPP has been complied with.

1.4.4 SEPP Infrastructure 2007

Proponents Submission

The infrastructure SEPP provides a consistent planning regime for infrastructure and the provision of services and public works across NSW, along with providing for consultation with relevant public authorities during the assessment process. The proposed development is not identified in Schedule 3 of the SEPP as traffic generating development to be referred to the Roads and Maritime Services. The proposed development is therefore taken to be 'Any other purpose' under Schedule 3 and it will not generate 200 or more vehicle movements per hour.

Staff Comment

Under the provision of Schedule 3 of the SEPP the proposed quarry is considered "Traffic Generating Development" requiring referral as the proposed quarry is a type of "industry".

The proposed quarry was referred to Council's Technical Services Department and NSW Roads and Maritime Services.

Further detail regarding the potential impacts on roads can be found at s4.9 of this report.

1.4.5 SEPP Mining, Petroleum Production and Extractive Industries 2007

Proponents Submission

Clause 12 of the SEPP provides a number of matters that a consent authority must consider before determining a development application. These matters are similar to, but are in different terms to; the relevant matters contained in the GLEP and are considered in section 3 of this report.

Clause 13 of the SEPP requires that Council must consider the compatibility of development proposals on land in the vicinity of existing mines etc. or of land containing mineral or extractive resources. This provision is to ensure that these resources are not sterilised by incompatible development on surrounding land and is a matter for Council to consider. The proposed development involves a long-term plan to maintain access to the available geological resource.

Clause 14 of the SEPP requires the consent authority to consider whether or not consent should be issued subjection to conditions aimed to ensure the development is undertaken in an environmentally responsible manner. The conditions issued must ensure the following:

(a) That impacts on significant water resources, including surface and groundwater resources, are avoided, or are minimized to the greatest extent practicable;
(b) That impacts on threatened species and biodiversity, are avoided, or are minimized to the greatest extent practicable; and
(c) That greenhouse gas emissions are minimized to the greatest extent practicable.

Clause 15 of the SEPP requires that the consent authority consider whether the proposed resource recovery is efficient. Modern equipment and best practice management principles are used in the operation of the proposed quarry to ensure the resource recovery is efficient and economically viable.

Clause 16 (1) of the SEPP requires the consent authority to consider whether a consent should contain conditions to:

(a) Require that some or all of the transported materials in connection with the development is not to be by public road,
(b) Limit to preclude truck movements, in connection with the development, that occur on roads in residential areas or on roads near to schools,
(c) Require the preparation and implementation, in relation to the development, of a code of conduct relating to the transport of materials on public roads.

Clause 16 (2) of the SEPP requires the consent authority to provide a copy of the development application to each roads authority for the roads used and the Roads and Maritime Services within seven (7) days of receiving the application. This is a matter for Council. Clause 16 (3) of the SEPP outlines that the consent authority must not determine the development application until it has taken into consideration any submission received for the road authorities or the Roads and Maritime Service within 21 days after they were provided with a copy of the application. This is a matter for Council. Clause 17 of the SEPP requires that the consent authority must consider whether or not the consent should be issued subject to conditions requiring rehabilitation of the land affected by the development. This is a matter for Council.

Staff Comment

The proposed development is permissible with consent using the provisions of Clause 7(3) of the *State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007*. Clause 7(3)(a) states that development for the purposes of an extractive industry may be carried out on land on which development for the purposes of agriculture or industry is permitted (with or without consent).

The property is zoned RU1 Primary Production under the provisions of *GLEP*. All types of agriculture are permitted with or without consent on the subject land and therefore, an extractive industry is permitted subject to the submission and approval of a Development Application using the provisions of the SEPP.

Before determining an application for the purposes of an extractive industry, the consent authority must take into consideration the matters listed under the SEPP.

Clause 12 Compatibility of proposed mine, petroleum production or extractive industry with other land uses as follows:

(a) (i) the existing uses and approved uses of land in the vicinity of the development,

The surrounding land uses are predominately dry land and irrigated cropping and cattle grazing properties with rural dwellings. The nearest dwelling is 1.7km from the quarry site. The site or adjoining lands are not identified as State Significant Farmland.

(ii) whether or not the development is likely to have a significant impact on the uses that, in the opinion of the consent authority having regard to land use trends, are likely to be the preferred uses of land in the vicinity of the development,

The EIS details existing buffers that will minimise potential impacts on rural dwellings and adjoining land uses. Living and Working in Rural Areas 2007 recommends as a guide minimum buffers for extractive industries. The recommended buffer distance to rural dwellings of 1000m (for quarries with blasting) is achieved for the development with the closet dwelling being 1.7km away. The potential impacts to adjoining uses are likely to be noise, dust and increased traffic movements from the quarry operations. With implementation of the proposed mitigating measures in the EIS and imposition of the draft conditions of consent, the development is unlikely to have a significant impact on the current and preferred land uses in the vicinity of the development.

(iii) any ways in which the development may be incompatible with any of those existing, approved or likely preferred uses,

The EIS recommends measures to avoid and minimise potential impacts of the development. Through the General Terms of Approval issued by the EPA and draft conditions imposed by Council on the development, it is unlikely that there will be substantial incompatibility issues with the development and adjoining land uses.

(b) evaluate and compare the respective public benefits of the development and the land uses referred to in paragraph (a)(i) and (ii)

The operation of the proposed quarry will result in benefits to the local and regional economy and will help generate employment opportunities whilst assisting in the delivery of much need rail infrastructure. There is little new capital investment as existing plant have additional capacity to produce volumes proposed. It is anticipated that the proposed quarry will generation local employment opportunities. It is not clear if this will be indirect employment of sub-contractors of full time employees. The economic benefits of the development and indirect multiplier effects will stimulate the local and regional economies.

(c) evaluate any measures proposed by the applicant to avoid or minimise any incompatibility, as referred to in paragraph a(iii)

The measures proposed by the applicant to avoid and minimise any potential incompatibility measures have been evaluated and where appropriate, have been imposed as conditions of consent.

Clause 13 Compatibility of proposed mine, petroleum production or extractive industry with other land uses:

The consent authority must also take into consideration Clause 13 of the SEPP if the subject land is:

(1) (a) in the vicinity of any existing mine, petroleum production facility or extractive industry
(b) identified on a map (being a map that is approved and signed by the Minister and copies of which are deposited in the head office of the Department and publicly available on the Department's website) as being the location of State or regionally significant resources of minerals, petroleum or extractive materials, or
(c) identified by an environmental planning instrument as being the location of significant resources of minerals, petroleum or extractive materials

The proposed development is not located in the near vicinity of competing extractive industry, however, is located in the near vicinity of an extractive site (Tikitere Quarry) ran under the same quarry operation. The Pearlman Quarry site is not identified by an environmental planning instrument as being the location of significant resource materials. The nearest comparative development not associated with the sites quarry operator is Runnymede Quarry which is located 30km south west of the proposed development.

Clause 14 Natural resource management and environmental management
Before granting consent for development for the purposes of an extractive industry, the consent authority must consider whether or not the development should be issued subject to the imposition of conditions aimed at ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure the following:

a) that impacts on significant water resources, including surface and groundwater resources are avoided, or are minimised to the greatest extent practicable.

Impacts on water resources has been assessed and detailed in the EIS.

Surface water that is not captured onsite in the sediment dam will be directed around the proposed site to avoid contamination and slowed to avoid erosion. The nearest natural waterways are both ephemeral streams Mungle Creek lies approximately 1.7 km to the north of the proposed development site and Tackinbri Creek lies approximately 2.6km to the south. The quarry site is located along a ridgeline and does not receive surface flows from upslope areas.

The quarry floor level is estimated to be greater than 30m above the artesian aquifer. As such, it is expected that the quarry extraction will not intercept groundwater. Due to the location of the quarry on top of a ridge, the rate of groundwater seepage into the quarry is expected to be low and it is considered that the 'removal' of this water from the groundwater system would have a negligible impact on the behaviour of the aquifer. It is not expected that any groundwater will enter the excavation site from below ground.

The potential impacts from the quarry on water resources include contamination from erosion and sedimentation, increased surface water runoff from increased surface areas not covered by vegetation and groundwater contamination from spills of fuel or hazardous materials. The mitigating measures proposed ensure that no significant impacts result from the quarry operations. The quarry will be required to operate in accordance with its Quarry Environmental Management and Waste Management Plans.

b) that impacts on threatened species and biodiversity are avoided, or are minimized to the greatest extent practicable,

A Biodiversity Development Assessment Report forms part of the EIS and assessed the impacts of the proposal on the threatened species and biodiversity.

The proposed development will remove 1.73 hectares of Semi-evergreen vine thicket (SEVT), which constitutes 2.3%(74.9 hectares) of the total community mapped on the property and less than 1% of the total community mapped in the Border Rivers – Gwydir Rivers region. The SEVT to be removed is small, semi isolated and is considered will not have a significant impact on the remaining community or place it at risk of extinction.

c) that greenhouse gas emissions are minimised to the greatest extent possible

Overall, the greenhouse emissions generated from the development is considered to be minimal for both National and State emission levels. Notwithstanding this, there is a cumulative impact of GHG emissions over time. The applicant should adopt mitigating measures to ensure efficient use of fossil fuel on-site and in associated operations.

Clause 15 Resource recovery

Due to the type of material, being hard rock, to be extracted and the efficient extraction processing methods, minimal resource waste is anticipated.

Clause 16 Transport

It is intended that most haulage of materials will be undertaken along local public roads with some being transported by rail line. Several conditions of consent are proposed relating to transport. Conditions proposed in the consent for the quarry operator/owner to pay an s94 contribution in accordance with Council's Traffic Generation Development Plan relating to the haulage route.

Clause 17 Rehabilitation

Rehabilitation works will be undertaken in accordance with the EIS and Rehabilitation Management Plan generally to be completed within 12 months of quarry operations closure.

It is considered that assessment under the SEPP has been satisfactorily complied with.

1.4.6 SEPP Primary Production & Rural Development 2019

Proponents Submission

No Submission

Staff Comment

This policy aims to:

a) facilitate the orderly economic use and development of lands for primary production,
b) to reduce land use conflicts and sterilization of rural land by balancing primary production, residential development and the protection of native vegetation, biodiversity and water resources,
c) to identify State significant agricultural land for the purpose of ensuring the ongoing viability of agriculture on that land, having regard to social, economic and environmental considerations,
d) to simplify the regulatory process for smaller-scale low risk artificial waterbodies, and routine maintenance of artificial water supply or drainage, in irrigation areas and districts, and for routine and emergency work in irrigation areas and districts,
e) to encourage sustainable agriculture, including sustainable aquaculture,
f) to require consideration of the effects of all proposed development in the State on oyster aquaculture,
g) to identify aquaculture that is to be treated as designated development using the well-defined and concise development assessment regime based on environment risks associated with site and operational factors.

Subsequently, the Primary Production and Rural Development SEPP do not impact upon the proposed development.

1.4.7 SEPP State and Regional Development 2011

Proponents Submission

The application is classified as 'Regional Development' and will be assessed by the Gwydir Shire Council and determined by the relevant Joint Regional Planning Panel under the State Environmental Planning Policy (State and Regional Development) 2011.

Pursuant to Schedule 1 of SEPP (State and Regional Development) 2011, the proposed extractive industry operation does not constitute a State Significant Development as:

1. No more than 490,000 tonnes of extractive material will be extracted per year.
2. Site geological assessments and regional geology mapping estimates that approximately 3.48 millon tonnes.
3. The extraction will not be from an environmentally sensitive area of State Significance.

Staff Comment

The proposed development is classified as regionally significant development under Schedule 4A of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) and is subject to the provisions of Part 4 of the *State Environmental Planning Policy (State and Regional Development) 2011*.

Regional Planning Panels are authorised to exercise the consent authority functions of Councils to which Part 4 of the SEPP applies.

1.5 Commonwealth Legislation

1.5.1 Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Proponents Submission

Under the Federal Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), referral I s required to the Australian Government for proposed actions that have the potential to significantly impact on Matters of National Environmental Significance (MNES) or the environment of Commonwealth land. The assessment of the proposal's impact on MNES and the environment of Commonwealth land found that there is unlikely to be a significant impact on relevant MNES or on Commonwealth land. According, the proposal has not been referred to the Australian Government Department of the Environment and Energy (DoEE) under the EPBC Act.

Staff Comment

The EPBC Act commenced on 16th July 2000. The EPBC Act includes the assessment and approvals system for actions that have a significant impact on:

- matters of National Environmental Significance (NES); and
- the environment on Commonwealth land.

Should an action be determined to likely have a significant impact, an approval from the Commonwealth Minister for the Environment and Heritage is required.

The EPBC identifies seven matters of national environmental significance being:

1. World Heritage properties;
2. National Heritage places
3. RAMSAR wetlands of international significance;
4. National listed threatened species and ecological communities;
5. listed migratory species;
6. Commonwealth marine areas; and
7. Nuclear actions

The Environmental Assessment identified that no NES or Commonwealth land are likely to be significantly impacted by the proposal and therefore an approval from the Commonwealth Minister is not required.

It is considered it is unlikely that a significant impact will be caused by the proposed development and that the Act has been complied with.

2. S.4.15 (1) (a) (ii) Any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority

There were no draft environmental planning instruments that are or have been placed on public exhibition, at the time of the assessment of the proposed development.

3. S.4.15 (1) (a) (iii) Any Development Control Plan (DCP)

3.1 Section 94 Development Contributions Plan No 1 - Traffic Generating Development (GDCP)

This plan was adopted in April 2011 and was developed to ensure the operation of Traffic Generating Development does not adversely impact on local roads and allow Council to assess the demand for road maintenance, repair and reconstruction arising from Traffic Generating Development.

The purpose of the plan is to:

i. Provide an administrative framework under which specific public facilities strategies may be implemented and coordinated;
ii. To ensure the operation of Traffic Generating Development does not adversely impact on local roads. Assess the demand for road maintenance, repair and reconstruction arising from traffic generating development;
iii. To authorise the Council to impose conditions under section 94 of the Environmental Planning and Assessment Act 1979 when granting consent to development on land to which this plan applies;

iv. Provide a comprehensive strategy for the assessment, collection, expenditure accounting and review of development contributions on an equitable basis;
v. To minimise any adverse environmental and social impacts in terms of noise and dust to residences, road users and other development in the vicinity;
vi. Enable Council to be both publicly and financially accountable in its assessment and administration of this plan;
vii. To ensure that the existing community is not burdened by the costs of road works resulting from damage caused by heavy vehicles associated with the Traffic Generating Development;
viii. Demonstrate that the contributions have been set after due assessment for the likely needs and demands of the Traffic Generating Development in terms of access roads and their on-going maintenance;
ix. Justify the application of a levy for road works for each tonne of extracted/processed/produced material.

This plan applies to all Traffic Generating development and related operations that:-

- Require the use of road haulage vehicles to support the operation of the enterprise;
- Generate additional traffic movements above levels of traditional agricultural activities;
- Development which includes the following enterprises:-

  - Wool Scouring Plants
  - Abattoirs
  - Rendering Plants
  - Saleyards
  - Wood or timber milling or processing works including wood preservation works
  - Wineries or associated works
  - Warehouses
  - Light industry
  - Intensive Agricultural Enterprises
  - feedlots
  - poultry farms
  - piggeries
  - dairies
  - Composting Works
  - Transport Terminals
  - Grain Storage Complex
  - Feed mills
  - **Extractive Industries**
  - Mine
  - Rural Industry

Proponents Submission

The development is subject to both the Gwydir Shire Council "Section 94 Development Control Plan No 1 – Traffic Generating Development" (April 2011) (DCP) and the Moree

Plains Shire Council "Section 94 Development Contribution Plan – Traffic Generating Development" (April 2016). The contribution plans allow the Councils to levy contributions from traffic generating developments under Section 7.11 (previously Section 94) of the Environmental Planning and Assessment Act 1979. These contributions are typically utilised to cover the cost of maintenance, repair and reconstruction of roads as a result of damage caused by heavy vehicles generated by the development.

The method of calculating contribution rates is typically based on the reconstruction costs, average road maintenance costs and the length of road likely to be used by vehicles associated with the development. The impact is based on the Equivalent Standard Axle (ESA) loading on the road per vehicle as a proportion of the total loading on the road. This is then converted to a total cost per tonne (1,000 kilograms) per kilometre. The designated haulage route typically forms the length of road upon which the contribution will be levied. Where the designated haulage route involves the use of more than one road then each road should be treated separately in terms of the road maintenance contribution. Therefore, the total contribution payable for the development wold be the sum of all the calculated contribution rates to all the individual roads on the designated haulage route/s.

Given the Proponent intends to supply to various markets the exact haulage route cannot be determined at this time. The makes it difficult to calculate the appropriate contribution rate using the methods included in the Gwydir and Moree Plains Guidelines. For the ease of administration for both the Operator and Council, Quarry Solutions would like to propose the following contribution rates:

- Gwydir Shire Council – 80c/tonne
- Moree Plains Shire Council – 50c/tonne

This contribution rate would be payable on every tonne out the gate regardless of the trip length or road type.

It is considered that the proposed tonnage rate is higher than with similar developments in the region and significantly exceeds the minimum required contribution fees in accordance with Council's DCP – Traffic Generating Developments.

It should also be noted that transparency of outgoing materials and haulage routes can be maintained utilising the Quarry Solutions GPS monitoring system to ensure the estimated contribution rate is consistent with actual usage.

Staff Comment

The proposed quarry development is to haul approximately 80% of quarried material over local roads and the remainder by rail via internal property roads to the rail corridor intersecting the 'Tikitere' property. Thus the requirement for the calculation and payment of s94 Development Contributions (GDCP) to the Gwydir Shire Council is triggered. Section 4.9 and section 6.10 of this report discusses in greater detail the minimum contribution rate that the Gwydir Shire Council believes should be applied in order to compensate for the additional maintenance cost on the identified roads that will be impacted.

The proponent has offer a contributions rate of 50 cents per tonne, to the Moree Plains Shire Council, for the impact of the quarry operations on road within their shire. However, it

would be presumptuous of this assessment to accept this rate on behalf of the Moree Plains Shire Council without expressed written permission. To date this permission has not been given. Therefore it is suggested that a condition be included in the Schedule of Conditions accompanying any approval, that obligates the proponent to enter into a written agreement with the Moree Plains Shire Council regarding this matter prior to commencement of works. In addition, a copy of that agreement be presented to Gwydir Shire Council as proof of the fulfilment of the condition prior to commencement of the proposed quarry operations.

Conditions will be included in the draft schedule of conditions applying the GDCP for the proposed development.

4. S.4.15 (1) (b) The likely impacts of the development, including environmental impacts on both the natural and built environments, and social and economic impacts on the locality

So as to comment on the likely impacts of the proposal, the following matters have been considered:

- Land Use Conflict
- Visual Amenity
- Air Quality
- Noise and Vibration
- Water Supply
- Biodiversity
- Archaeological Heritage
- Natural Hazards
- Access and Traffic
- Waste, Chemicals and Hazardous Material
- Biosecurity
- Land Contamination
- Rehabilitation
- Biophysical
- Social Impacts
- Economic Impacts
- Cumulative Impacts
- Ecologically Sustainable Development

4.1 Land Use Conflict

Proponents Submission

The potential impacts for land use conflicts with sensitive receptors are typically caused by environmental nuisance in the form of dust, noise, odour and visual impacts.

Two distinct receiving environments were identified within the study area, including;

- Isolated receivers located in rural areas adjacent to the proposed quarry site; and

- Receivers in more densely populated areas at North Star, adjacent to the proposed haulage route for material exported from the site

These receiving environments are described further below and in Figure 2

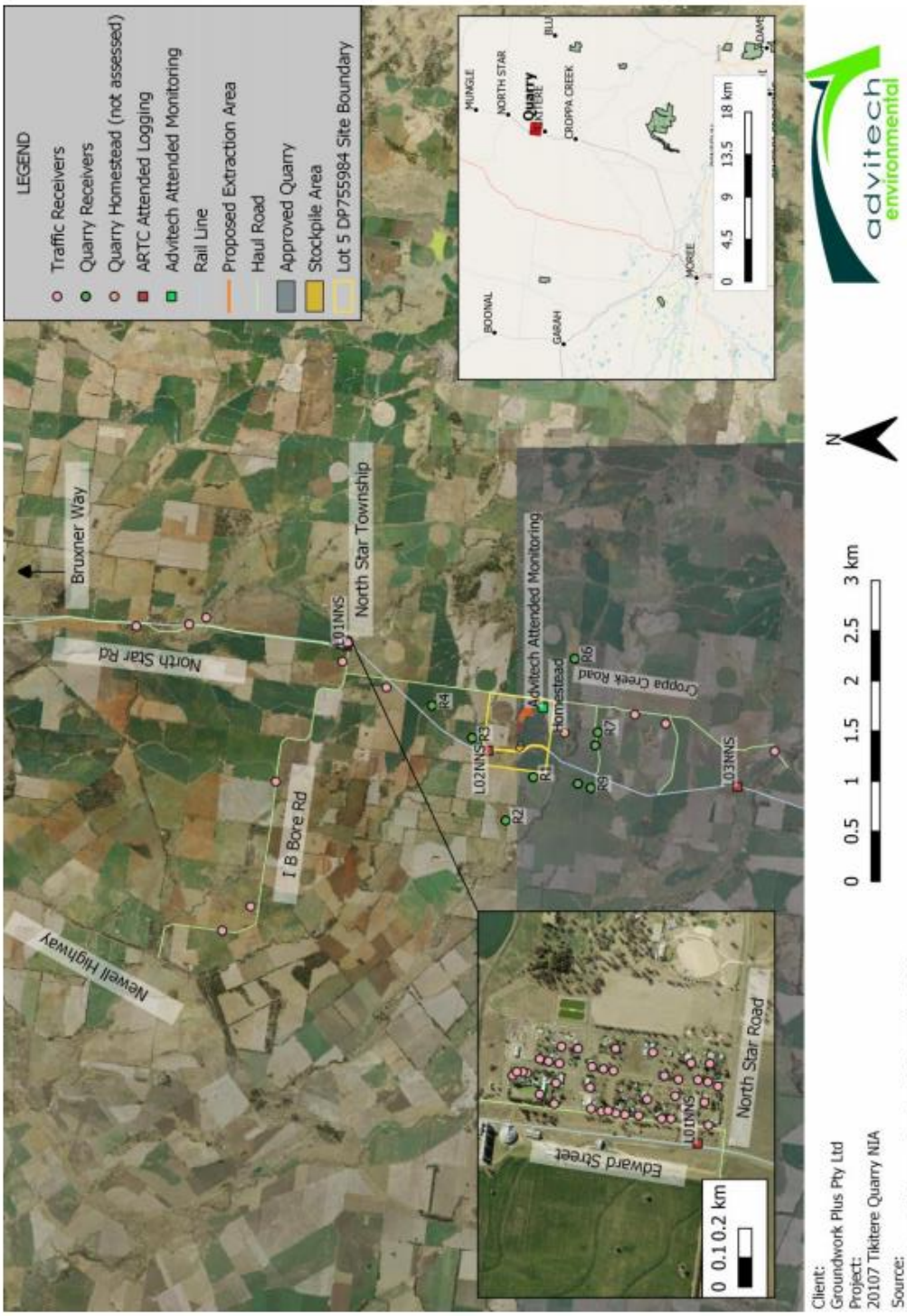


Figure 2: Sensitive receiver locations

(Note: Figure 2 is taken from page 4 of Section 3 Methodology of the "Noise Impact Assessment - Pearlmans Quarry - Quarry Solutions", by Advitech, dated 12 August 2019. Being Attachment 8 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

The surrounding land used in the local setting are dominated by similar agricultural land use comprised by broad acre crop production. Sensitive receptors in the area are rural dwellings on surrounding farms.

Table 1 identifies noise sensitive receptors adjacent to the proposed development site. The nearest residence that is not associated with the proposed development (Receptor 1) is located approximately 1500m south west of the proposed stockpile site associated with the hard rock quarry. The next closest receiver group (Receivers 2 to 9) are located further to the west, north, south southeast, and south of the proposed operations.

Table 1: Details of sensitive noise receivers

Receiver ID	Address (Residences)	Distance from Site (m)	Direction
R1	1137 Croppa Creek Road	1500	W
R2	473 Birrahlee Road	3700	W
R3	1176 Oaklands Road	2200	N
R4	1835 Croppa Creek Road	4300	N
R5	391 Boonery Park Road (Lot 1 DP1080910)	3400	SSW
R6	1216 Croppa Creek Road	3400	ESE
R7	391 Boonery Park Road (Lot 54 DP751116)	3400	S
R8	141 Boonery Park Road	3500	S
R9	391 Boonery Park Road (Lot 1 DP751134)	4200	SSW

(Note: Table 1 is taken from page 3 of Section 3 Methodology of the "Noise Impact Assessment - Pearlmans Quarry - Quarry Solutions", by Advitech, dated 12 August 2019. Being Attachment 8 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

Analysis was undertaken to identify receivers within 600m of the proposed haulage routes, in line with guidance established in the RNP. This study area contains approximately 53 receivers, including;

- Isolated rural receivers adjacent to (and predominately affected by) Croppa Creek Road;
- Isolated rural receivers adjacent to (and predominately affected by) IB Bore Road;
- Receivers located outside the township of North Star exposed to traffic noise from North Star Road; and
- Receivers located within the township of North Star exposed to traffic noise from both Edward Street and the North Star Road. This catchment is shown in Figure 2. *(see above)*

Quarries should be separated from sensitive receptors by maintaining a suitable buffer distance to help minimise potential impacts of environmental nuisance. Table 9 – Recommended Minimum Buffer Distances below outlines minimum buffer distances recommended for mining, petroleum production and extractive industries:

Table 9: Recommended Minimum Buffer Distances

Mining, Petroleum Production & Extractive Industries		
	Normal Operations (m)	**Blasting (m)**
Residential areas & urban development	500	1000
Rural dwellings	500	1000
Education facilities & pre-schools	500	1000
Rural tourist accommodation	500	1000
Watercourses & wetlands	SSD	SSD
Bores & wells	SSD	SSD
Potable water supply/catchment	SSD	SSD
Property boundary	SSD	SSD
Roads (public)	SSD	SSD

SSD: Site Specific Determination. Source: Department of Primary Industries (2007) Living and Working in Rural Areas Handbook

Management and mitigation to reduce the potential impacts for land use conflicts with sensitive receptors (ie caused by environmental nuisance such as dust, noise, vibration, odour or visual impacts), is detailed in their respective sections in this EIS

Staff Comment

Noise and Vibration Impacts

The proposed development has the potential to generate increased noise levels on the subject site, subsequently impacting on surrounding properties.

It is considered that noise and vibration from the proposal will be satisfactorily managed and mitigated. Noise and Vibration impacts are addressed in greater detail in s 4.4 of this report

Dust Impacts

Dust will be generated during the construction and operation of the proposed development. The range of sources on site will include roads, stockpiles, crushing, screening, loading and unloading, excavation, handling of materials and truck movements.

It is considered that dust impacts from the proposal will be satisfactorily managed and mitigated. Dust impacts are addressed in greater detail s 4.3 of this report

4.2 Visual Amenity

Proponents Submission

The potential for visual impacts from the proposed quarry is limited to the presence of equipment and stockpiles that may be visible from nearby residences, public places and roads. Key potential impacts to visual amenity that may result for the operation of the Pearlman Quarry include:

- Increased visual permeability
- Change in landscape from cultivated land to quarry operation
- Impacts to air quality (ie dust generation) during operations.
- Increased traffic on the haul roads.

The following measures are recommended to improve the visual amenity of the development:

- Retain and protect vegetation located outside of the identified extraction zone.
- Where possible, retaining and enhancing vegetation along riparian margins
- Revegetation of the site with appropriate species.

The proposed quarry footprint is set back approximately 550 metres from Croppa Creek Road and will be screened from view by an existing tree line on site. The nearest sensitive receptor is 1.5 kilometres to the west south-west and will be screened from the operations by the existing topography of the hill and an existing tree line running along the western boundary of the adjoining lot. Sensitive receptors located to the south east of the quarry may have line of sight to the disturbance area. In addition to the adequate separation distances, the following mitigation measures are proposed to be adopted to minimise the visual impact of the proposed development:

Aspect	**Control**
Quarry Design	• The quarry design utilises the receding rim technique to minimise the extent of the quarry that will be visible.
Vegetation	• Retain vegetation located outside the identified extraction zone to screen and soften visual appearance. • Where possible clear the site in stages to minimise disturbance including the retention of vegetation until areas are required to meet operational requirements. • Where perimeter bunds or stockpiles are formed, these areas are to be seeded to minimise the amount of exposed areas.
Rehabilitation	• Undertake the rehabilitation of disturbed areas when they are available and no longer required by the operation.
Air Quality	• See Section 3.9 Air Quality.

The Pearlman Quarry would not be visible from the Croppa Creek-North Star Road as a natural woodland corridor extends along the side of the highway. This established vegetation covers a width of approximately 40m, providing a natural screen for the site. The plant and associated quarry equipment will be located on the eastern side of the primary quarry, hidden from view of the receptor. Similarly, the receiver (R3) to the north west is over 2.9 km from the extraction area. It is considered that visual impacts to this receiver are expected to be minima as there are a number of mature vegetation corridors between the residence and the extraction area.

Staff Comment

Having viewed the proposed site, Council staff agree with the applicant's assessment of visual impact. It is considered that there will be negligible visual impacts from the proposed development, due to more an adequate separation distances from rural homesteads and presence of natural topography barriers and vegetation screens along the Croppa Creek Road.

4.3 Air Quality

Proponents Submission

The main sources of air emissions generated through the operation of the Pearlman Quarry are identified as follow;

- Vehicles driving along unsealed internal haul roads and access roads leading to the site.
- Topsoil stripping and overburden removal and placement.
- Extraction will result in the disturbance to in-situ rock and soil which will require the use of heavy machinery equipment to remove and relocate material.
- Haulage of material form the extraction areas to processing plant.
- Loading and unloading of quarry products.
- Haulage of final product off-site.
- Dust generation caused by blasting.
- Combustion engines (ie exhaust smoke).

Considering the above, the following air emissions at the Pearlman Quarry require management techniques:

- Particulate emissions
- Greenhouse gas emissions

The following table provides the proposed management and mitigation measures to be adopted to manage air quality and dust emissions as a part of the proposed development.

Air Quality Management

Aspect	Control
General	• Ensuring all vehicles are to a road registered standard which includes exhaust systems that minimise gaseous and particulate emissions meeting vehicle design standards. • Training of site personnel to include awareness for dust minimizing behaviours and practices will be provided to the workforce personnel including any subcontractors. • Signage will be erected around the site to remind workers of suitable dust minimizing behaviours. • A complaint management system will be used to ensure that complaints are recorded, investigated and responded to within a reasonable timeframe. • Burning of vegetation waste, waste tyres or any other waste products is not permitted on site at any time. • Ensure all access roadways, material storage areas and vehicle entry points have appropriate dust mitigation. • Routinely monitor site conditions to ensure that mitigation measures are being implemented and are suited to the conditions. Records can also be reviewed in the event of a complaint or report of a safety concern.

Site Establishment	• Limiting vegetation and soil clearing to areas only necessary for operations, minimizing the total area of exposed dust generating surfaces. • All active work areas and haulage roads will be routinely treated with water sprays, or suitable dust suppressant additive as required. • Reducing disturbance activities during periods of excessive wind or periods where dust generation and dispersal is more likely to occur.
Plant and Equipment	• Clearing spillages form side rails, tailgates and draw bars of trucks (following loading and tipping). • Levelling loads prior to truck exit from the site. • Securing tailgates of all haulage vehicles prior to loading to prevent material loss along access roads. • Haulage vehicles transporting products to and from the site must have their loads covered and secured at all times, apart from loading and unloading in the processing areas. • Quarry performance to be monitored to prevent trucks queuing, unnecessary idling of plant and equipment in order to minimise unnecessary fuel burn. • Vehicles and equipment must be fitted with appropriate emission control equipment and routinely maintained. Plant should be switched off when not in use. • All plant, equipment and vehicles are to be regularly service according to the manufacturer's specifications. This will include daily prestart checklists to identify any faults that may lead to excessive emissions. A maintenance schedule will be established prior to commencement of works and all maintenance records will be kept on site. • Air emissions from plant, vehicles and equipment should be visually monitored throughout construction. • Site speed limits are to be clearly displayed upon entry to the site. Drivers are to obey on-site speed limits and adopt driving practices that minimise dust generation.
Disturbed Areas	• All disturbed areas such as excavations, processing areas, haulage routes, stockpile areas and other disturbed areas will be treated with a water spray or suitable dust suppressant (ie tackifier or soil binder) as required. • Vegetation clearing and topsoil stripping will be staged to minimise disturbance of the quarry footprint until areas are required by the operation. This also includes restricting vehicle access to these areas until necessary for operations. • Monitoring meteorological forecast when planning dust generating activities to ensure these can be timed with favourable weather conditions.

	• Where possible integrate dust suppressants into the use of the mobile crushing and screening plants or other dust generating equipment on the site.
Stockpiles	• Using water sprays as required during winds likely to generate dust releases. • Stablishing and revegetating topsoil stockpiles where possible. • Using dust suppressant and shielding/wind breaks/screens where possible. • Stablise surface area of stockpile pad to ensure dust promoted through material handling processes are minimized.
Internal Trafficable Areas	• Enforce a maximum speed on internal roads. • Keep trafficable areas well maintained, at a reasonable grade and free of loose dust generating material. • Dampen down trafficable areas using water sprays and/or dust suppressants. (ie chemical additive used in conjunction with water truck). Watering of all haul roads and access roads at a rate of a least 2 litres/m^2/hour at times when dust emissions are visible from vehicle movements. • If dust emissions are still visible on internal roads after the above management measures have been adopted, then specialist advice will be sought for a suitable road stabiliser / binder to further reduce emissions to air.
Odour	• The use of odorous substances or particulates, which create or are likely to create objectionable conditions for the public are not permitted for use on the site.
Blasting	• Unless prior approval is obtained from the administering authority; blasting is only permitted during the hours of 9am to 3pm Monday to Friday, and from 9am to 1pm pm Saturdays. Blasting is not permitted at any time on Sundays or public holidays. • Handling, transport and use of explosives shall be carried out in accordance with the requirements of AS 2187.2-2006 Explosives – Storage and use – Use of explosives, and the Mining and Quarrying Safety and Health Act 1999 (MQSH Act) and associated Regulation. • Only suitable experienced and qualified blasting personnel shall be employed or contracted to provide blasting services. • The maximum instantaneous charge or charge mass per delay will be limited to the lowest possible level. • A blast plan shall be prepared for each blast, containing blast hole layout, initiation sequence, charging, stemming type and height, charge weight and any other design element, required for good blasting practice. • Blast areas may be dampened down prior to blasting to minimise dispersion of dry and fine material where practicable, or where it is identified as a source of potential dust nuisance.

	• Each Blast will be monitored, and the blast plan and design reviewed in the event where excessive dust is generated. • As the Pearlman and Tikitere sites are operated by the same organization safety for workers will be managed through the usual blast exclusion zones coordinated between both sites.
Mobile equipment	• Where possible integrated dust suppressants such as water sprays around the working areas of all dust generating mobile equipment.

The operation of the Quarry with plant and equipment will result in the production of greenhouse gas emissions. By limiting greenhouse gases production through implementing, the following management measures such that the impacts to air quality can be minimised.

Greenhouse Gas Management

Aspect	**Control**
Procurement	• Procurement guidelines will consider a suite of environmentally sustainability requirements prior to product acceptance at the site which may include but not limited to: - Consideration of the energy efficiency ratings of equipment. - Fit for purpose plant and equipment - Sustainability to be adopted into whole of lifecycle asset management strategy - Identification of waste streams and quantities of waste being generated through the sourcing of imported materials - Waste minimization strategy which has developed targeted commitments to reducing waste - Opportunities to source hybrid plant and equipment of those that use alternative fuels such as biodiesel or electricity - Sourcing of materials from local suppliers to minimise traveling time.
Vehicles, Traffic and Transport Planning	• Implementation of vehicle operating guidelines to encourage correct and efficient operation of vehicles that seeks to; - Reduce the number of vehicles and/or trips required for transport - Uses buses for transportation of large numbers of personnel to minimise number of vehicles operating - Implementation of a wider fuel management strategy which encourages use of more efficient plants and vehicles, planning, logistics, driver education and maintenance - Driver and operator training in relation to efficient operation of vehicles, plant and equipment - Sustainability to be adopted into whole lifecycle asset management strategy

	- Workforce awareness to be raised around driver behaviour that minimises diesel consumption and wear and tear on parts - Undertake daily prestart checks to flag any faults with the plant and equipment that may lead to excessive air quality pollutants - Regularly service vehicles, plant and equipment such that exhaust systems and fuel consumption comply with manufacturers' specifications - Minimise transportation distances within the site wherever possible - Operate and maintain air conditioning systems in accordance with manufacturer's instructions and Guide to Best Practice Maintenance & Operation of ABAC Systems for Energy Efficiency (Council of Australian Governments National Strategy on Energy Efficiency) January 2012 - Provide workforce bus to ensure carpooling between nearest township and the worksite can occur.
Waste	• The site will be planned to ensure products such as overburden and topsoil are stockpiled efficiently around the site to ensure that onsite reuse can occur with the minimum of fuel consumption and product handling subsequently reducing the amount of vehicle movements and overall fuel usage during the quarry lifecycle • Offsite disposal of waste is unlikely however the nearest lawful place of disposal will be identified based on the waste streams being generated from the site • See Section 3.17.
Communications	• Use of teleconferencing and video conferencing will be used to reduce travel to and from offices and therefore reducing the contribution of greenhouse gaseous emissions associated with travel
Vegetation Clearing	• Vegetation clearing will be restricted to the areas required for extraction, internal haul roads ancillary and stockpile areas and erosion and sediment control measures. Clearing of these areas will be completed progressively in a staged approach to meet the operation needs of the quarry whilst maintaining groundcover across the site.

It is considered that this suite of management practices will be sufficient to control dust emissions from the quarry site. An Air Quality Management Plan will be developed to ensure the above management practices are implemented as part of the approved development. An Air Quality Impact Assessment has been prepared by Advitech as par to this EIS (refer to Attachment 7 – Air Quality Impact Assessment). The assessment has considered the operation of the Pearlman quarry operating a 490,000 tonnes per annum against the NSW EPA air quality criteria. The assessment has also considered the cumulative

impacts of operating both the Pearlman and Tikitere Quarries within the same area. The assessment has concluded that the proposed Pearlman quarry operating exclusively or simultaneously with the Tikitere site will maintain compliance with all NSW EPA air quality criteria through the adoption of the mitigation and management measures described above.

Staff Comment

Emissions from diesel exhaust can be reduce by careful selection of equipment, effective maintenance and driver education. It is considered that the mitigation measures listed in the EIS and the location of the site are sufficient to ensure that exhaust emission do not have a significant impact on air quality.

Dust will be generated during the construction and operation of the proposed development. The range of sources on site will include roads, stockpiles, crushing, screening, loading and unloading, excavation, handling of materials and truck movements.

The EIS lists the mitigation measures that will be undertaken to minimise dust nuisance to the surrounding properties and road users. These measures include but are not limited to dust suppression by watering, the covering of loads, reduced speed limits, good driver behaviour and effective road maintenance.

Dust emissions are as associated with agricultural activities such as cropping, livestock and haulage of produce, all of which would normally occur on the property "Tikitere" and in the surrounding area.

It is considered that the separation distances between the quarry site and surrounding residential building is adequate to minimise dust impacts. The draft conditions of consent will enforce the mitigation measures listed in the EIS (see section 3.9 – Air Quality of the EIS and EIS Attachments 2 – Quarry Environmental Management Plan and 7 – Air Quality Assessment).

4.4 Noise and Vibration

Proponents Submission

The site and surrounding environment are comprised by rural land comprised mostly by agricultural activities. As such the ambient background noise comprised by the following noise sources:

- Agricultural equipment
- Traffic on public and private roads, including sealed and unsealed roads
- Livestock and other fauna (birds, insects etc)
- Wind in vegetation
- Occasional aircraft movements

Advitech was engaged to undertake a noise impact assessment of the site to determine the existing environment and predict the impact that the proposed development would have of the locality. As part of this report the ambient noise levels were determined for the site and haulage route through attended monitoring.

The results of the attended noise monitoring are reflective of the rural setting however in lieu of completing a long-term monitoring campaign, the Rating Background Levels (RBL of the Noise Policy of Industry (NSW) were adopted for the purposes of this assessment. The sensitive receptors in the locality surrounding the site are predominantly rural dwellings.

Two distinct receiving environments were identified within the study area, including;

- Isolated receivers located in rural areas adjacent to the proposed quarry site; and
- Receivers in more densely populated areas at North Star, adjacent to the proposed haulage route for material exported from the site

These receiving environments are described further below and in Figure 2

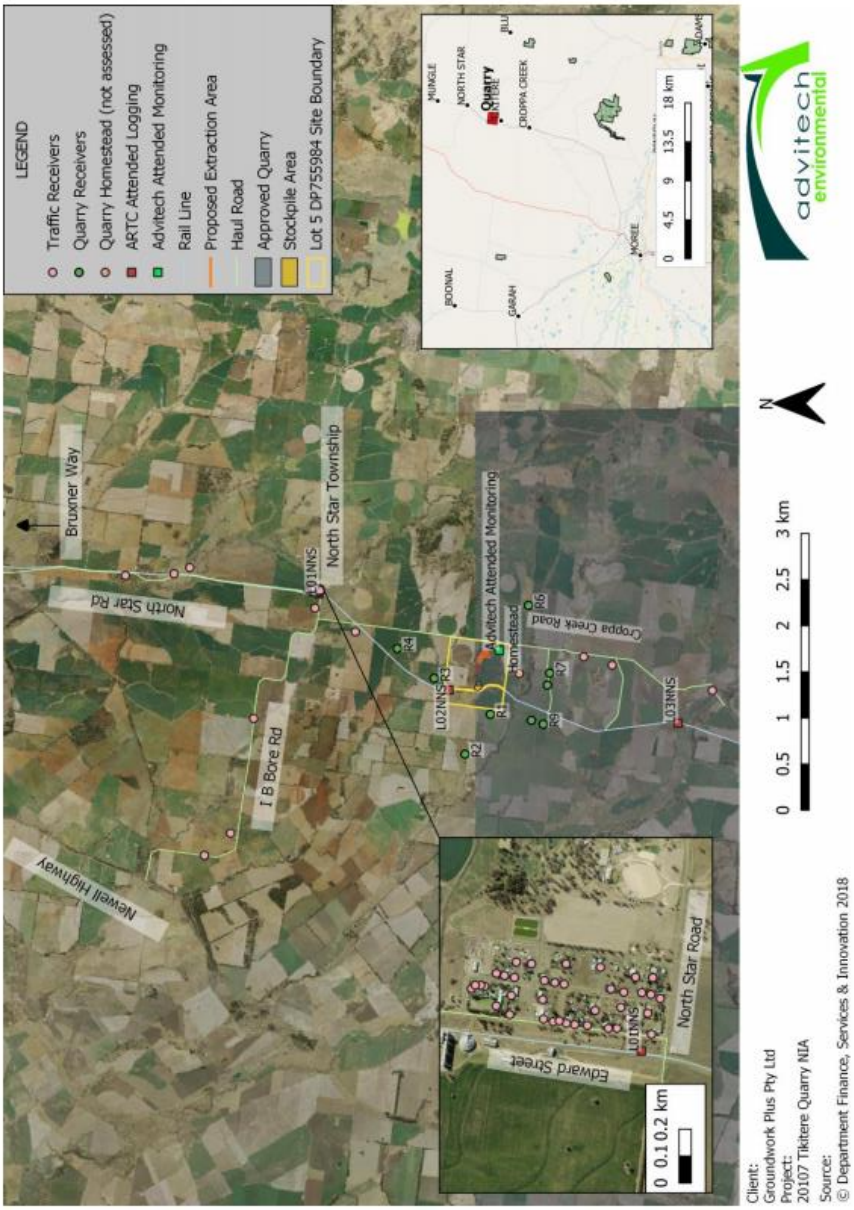


Figure 2: Sensitive receiver locations

(Note: Figure 2 is taken from page 4 of Section 3 Methodology of the "Noise Impact Assessment - Pearlmans Quarry - Quarry Solutions", by Advitech, dated 12 August 2019. Being Attachment 8 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

The surrounding land used in the local setting are dominated by similar agricultural land use comprised by broadacre crop production. Sensitive receptors in the area are rural dwellings on surrounding farms.

Table 1 identifies noise sensitive receptors adjacent to the proposed development site. The nearest residence that is not associated with the proposed development (Receptor 1) is located approximately 1500m south west of the proposed stockpile site associated with the hard rock quarry. The next closest receiver group (Receivers 2 to 9) are located further to the west, north, south southeast, and south of the proposed operations.

Table 1: Details of sensitive noise receivers

Receiver ID	Address (Residences)	Distance from Site (m)	Direction
R1	1137 Croppa Creek Road	1500	W
R2	473 Birrahlee Road	3700	W
R3	1176 Oaklands Road	2200	N
R4	1835 Croppa Creek Road	4300	N
R5	391 Boonery Park Road (Lot 1 DP1080910)	3400	SSW
R6	1216 Croppa Creek Road	3400	ESE
R7	391 Boonery Park Road (Lot 54 DP751116)	3400	S
R8	141 Boonery Park Road	3500	S
R9	391 Boonery Park Road (Lot 1 DP751134)	4200	SSW

(Note: Table 1 is taken from page 3 of Section 3 Methodology of the "Noise Impact Assessment - Pearlmans Quarry - Quarry Solutions", by Advitech, dated 12 August 2019. Being Attachment 8 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

The potential impacts for land use conflicts with sensitive receptors are typically caused by environmental nuisance in the form of dust, noise, odour and visual impacts.

Analysis was undertaken to identify receivers within 600m of the proposed haulage routes, in line with guidance established in the RNP. This study area contains approximately 53 receivers, including;

- Isolated rural receivers adjacent to (and predominately affected by) Croppa Creek Road;
- Isolated rural receivers adjacent to (and predominately affected by) IB Bore Road;
- Receivers located outside the township of North Star exposed to traffic noise from North Star Road; and
- Receivers located within the township of North Star exposed to traffic noise from both Edward Street and the North Star Road. This catchment is shown in Figure 2. *(see above)*

Quarries should be separated from sensitive receptors by maintaining a suitable buffer distance to help minimise potential impacts of environmental nuisance. Table 9 –

Recommended Minimum Buffer Distances below outlines minimum buffer distances recommended for mining, petroleum production and extractive industries:

Table 9: Recommended Minimum Buffer Distances

Mining, Petroleum Production & Extractive Industries		
	Normal Operations (m)	**Blasting (m)**
Residential areas & urban development	500	1000
Rural dwellings	500	1000
Education facilities & pre-schools	500	1000
Rural tourist accommodation	500	1000
Watercourses & wetlands	SSD	SSD
Bores & wells	SSD	SSD
Potable water supply/catchment	SSD	SSD
Property boundary	SSD	SSD
Roads (public)	SSD	SSD

SSD: Site Specific Determination. Source: Department of Primary Industries (2007) Living and Working in Rural Areas Handbook

As blasting is required as a part of the proposed quarry the buffers required for operating the proposed separation distances have been compared with the recommended industry standard. As the closest sensitive receptor is located approximately 1.5 kilometres to the south-west of the proposed quarry site the available separation distance exceeds the minimum buffer distance requirements identified in Table 9 – Recommended Minimum Buffer Distances. *(see above)*

Table 9 provides an analysis of both the intrusiveness and Amenity noise levels for the purpose of establishing a PNTL (Project Noise Trigger Level), for the proposed development.

Table 9: Assessment of PNTL in adjacent receiving environment (dB(A))

Metric	Day	Evening	Night
Rating Background Level	35	30	30
Project Intrusiveness Criteria	40	35	35
Recommended Amenity Level	50	45	40
Project Amenity Criteria	48[1]	43[1]	38[1]
Project Trigger Noise Level	40	35	35

Note 1: Project amenity level established as level equal to the Recommended Amenity Noise Levels for Rural receivers minus 5dB(A) plus 3dB(A) to convert from a period level to a 15-minute level, in accordance with guidance established in Fact Sheet F of the NPfI.

Assessment indicates that the proposed quarry operations will comply with the established PNTL, and that the PNTL may be adopted as appropriate criteria for the proposed development. It is likely that the development will be audible at some receivers, and it is suggested that the above recommendations be put in place to minimise the noise impacts at the surrounding sensitive receivers. It is additionally recommended that systems are put in place to monitor and respond to potential concerns from adjacent sensitive receivers.

To achieve PNTL during the evening and night period, it is recommended that crushing and processing activities is restricted to the day period (7:00 to 18:00). Stockpile maintenance

and loading of trucks may be undertaken during the evening and night period (including the early morning period prior to 7:00) without expectation of adverse impact.
Given the potential for cumulative noise impacts associated with the development of the Inland rail, the following recommendations are provided to minimise adverse road noise impacts:

- Consultation with residents adjacent to the Haul Route;
- Developing an effective traffic management plan to ensure that drivers:
    - Adhere to sign-posted speed limits (40km/h through school zone);
    - Maintain and operate vehicles in a manner that does not generate excessive noise;
    - Schedule haulage of products to maximize periods of respite;
    - Contains a mechanism for monitoring adherence to the plan, and for responding to complaints;
- Where practicable, utilise larger capacity vehicles to minimise the number of movements; and
- Operation of vehicles at speeds below signposted speeds (ie at 50km/h) in built up areas may provide opportunities to reduce levels of impact.

Assessment of the resource indicates that blasting may be required as part of the extraction process. Criteria for both ground vibration and overpressure were adopted from the ANZEC guidelines for the purposes of assessing the blast impacts. Notwithstanding, it is recommended that monitoring of blasts be undertaken until such time that compliance can be demonstrated. It is also recommended that a strategy of notifying neighbours of planned blasts be developed and implemented, and a method of receiving, investigating and responding to complaints is provided.

The following measures are recommended to ensure noise emissions caused by the proposed development remain at reasonable levels:

Noise Management

Aspect	Control
General	• Scheduling high noise generating activities for less sensitive times of the day (for example: scheduling the maintenance and repair of plant during more sensitive periods of the early morning, lunchtime and late afternoon). • Operating only during approved operating hours • Noisy operations and equipment shall be located as far away as possible from a sensitive place or places. • All plant and equipment to be regularly maintained and fitted with high efficiency mufflers. • Maintaining access roads in good condition. • Operating the site with well-maintained plant, vehicles and equipment, and ensure all plant, vehicles and equipment are serviced in accordance with manufacturers' specifications. • Avoiding unnecessary idling of plant and equipment and the unnecessary revving of engines. • Raise awareness amongst workforce about noise minimizing behaviours, ie no shouting driver behaviour, avoiding metal on

	metal contact or dropping load from unnecessary heights during lad and haul operations. • Ensuring that equipment at the site is used for the intended purpose. • Avoiding the use of compression braking on product delivery trucks.
Plant and Equipment	• All equipment must be fitted with appropriate noise reduction devices (eg mufflers) and comply with any relevant Australian Standards. Equipment and noise reducing devices should be maintained in good working order as per manufacturer's instruction. • All compressors and generators must be "sound reduced" models fitted with properly lined and sealed acoustic covers or enclosures, which must remain closed whenever the machines are in use. • All plant must be switched off when not in use, or where this is not practicable, throttled down to a minimum. • Plant and equipment must be regularly serviced according to the manufactures specifications to minimise screeching and squealing. • Where possible, plant and equipment must be located away from residences to reduce noise. • Plant in fixed locations such as generators or lighting towers will be located with consideration to proximity to sensitive noise receptors. Noise attenuation devices will be implemented at these locations if necessary.
Traffic and Transportation	• Suitable haulage routes travel times must be identified prior to commencement of the haulage operation to reduce disturbance to the residents and other sensitive land uses. • Carryout regular inspection of the haulage route to identify surface conditions that may require maintenance to reduce road noise. • Enter into an agreement with the council for the ongoing repair and maintenance of the haulage route. • Include noise mitigating behaviour in the driver code of conduct.
Blasting	The following control measures may be implemented to assist in mitigating potential noise and vibration nuisance from blasting associated with the Site activities: • Unless prior approval is obtained from the administering authority; blasting is only permitted during the hours of 9am to 3pm Monday to Friday, and from 9am to 1pm on Saturdays. Blasting is not permitted at any time on Sundays or Public Holidays. • Handling, transport and use of explosives shall be carried out in accordance with the requirements of AS 2187.2-2006 Explosives – Storage and use – Use of explosives, and the Mining and Quarrying Safety and Health Act 1999 (MQSH Act) and associated Regulation. • Only suitable experienced and qualified blasting personnel shall be employed or contracted to provide blasting services.

	• The maximum instantaneous charge or charge mass per delay will be limited to the lowest possible level. • A blast plan shall be prepared for each blast, containing blast hole layout, initiation sequence, charging, stemming type and height, charge weight and any other design element, required for good blasting practice. • Any complaint received following blasting will trigger a review of the blast plan and its parameters to identify necessary corrective actions in order to reduce noise.
Commitments	• Quarry Environmental Management Plan to include Noise Management Strategy

The extractive activities proposed at the Pearlman Quarry site have been assessed against the NSW noise guidelines. The noise levels are not expected to be at a level that would result in an environmental nuisance in these locations. A full noise impact assessment has been prepared by Advitech which is included as part of this assessment (refer to Attachment 8 Noise Impact Assessment). This assessment has considered all aspects of the proposed development including cumulative impacts of both sites. The assessment concludes that the proposed development will maintain compliance with the EPA noise requirements during construction, road haulage activities and operation of the quarry. As such the mitigation and management measures as set out will be implemented to ensure that noise impacts are minimised.

Staff Comment

The proposed development has the potential to generate increased noise levels on the subject site subsequently impacting surrounding properties. In addition the transport of material along proposed haulage routes will also impact properties and residences.

Activities likely to generate noise during the construction and establishment phase include:

- Traffic noise (likely to be heavy vehicles), as equipment is transported onto the site;
- Machinery such as excavators, bulldozers and trucks as they prepare internal roads, stormwater diversion banks, drains, stockpiling areas and the sediment pond; and
- Light Vehicle movements.

Activities likely to generate noise during the operation of the proposed quarry include:

- Drilling associated with blast preparation, blasting, excavation, ripping;
- Crushing plant, Screening, heavy vehicles to and from the rail line and quarry sites;
- Movement of water truck for dust suppression across the site;
- Loading of material onto trucks/trains and/or stockpiles;
- Movement in and out of the property of laden and unladen trucks/trailers
- Movement of laden and unladen trucks/trailers along haulage routes
- Light Vehicle movements.

The nearest rural dwelling not associated with the proposed development is approximately 1,770 metres to the West. The nearest residential area (being North Star) and associated school is approximately 10,000 metres to the north of the proposed development site. There are no rural tourist accommodation known within the 1,000 metre buffer area.

Distances in excess of 1,000 metres between the development proposal site and the surrounding residences, combined with the topography and natural vegetation screens will assist in mitigating potential noise level even further. However, the proposed operations will be audible at some receivers especially during adverse climatic conditions such as windy days.

The Noise Assessment undertaken on behalf of the proponent by Advitech Environment (See Attachment 8 of the EIS) recommends that crushing activities be restricted to between the hours of 7:00am and 6:00pm to avoid exceeding the evening and night Project Noise Trigger Level (PNTL). The assessment also indicates that sensitive receivers along the proposed haulage routes will be unlikely to experience noise level above the adopted noise limits. However, some minor exceedances may be felt at the North Star school during the day.

The proposed operating hours of 6:00am to 6:00pm Monday to Saturday, blasting during the hours of 9:00am to 5:00am Monday to Saturday with no operation or blasting on Sundays or Public Holidays could be further refined to include the restriction of all noise generating activities to between 8:00am and 5:00am Monday to Saturday with only relatively quiet operation such as vehicle and equipment maintenance being performed from 6:00am to 8:00am and 5:00pm to 6:00pm Monday to Saturday. The restriction of noise in the more sensitive hours early in the morning and in the afternoon will further mitigate any conflicts that may arise from noise without significantly disturbing production. The restriction of the quarry's noisier operations to between 8:00am to 5:00pm Monday to Saturday will also provide some further relief for those residences impacted along the haulage routes.

The implementation of a Traffic Management Plan and the enforcement of a Drivers Code of Conduct will substantially mitigate the impacts of the increased traffic noise generated by the quarry on those located along the haulage routes. It is recommended that Pearlman Quarry, implement the same or similar GPS tracking system, Traffic Management Plan and Driver Code of Conduct has was adopted by the previously approved Tikitere Quarry.

The EIS also indicated that there may be times when operation of the quarry is required outside of the above nominated hours and that on these occasions that notification and approval of the Gwydir Shire Council and EPA will be sought. It is also suggested that the proponent undertake extensive consultation with surrounding property owners and those most impacted along the intended haulage routes, to advise prior to these times, of the duration and extent of the disturbance. It is emphasised that blasting shall not, under any circumstances, be undertaken outside of the nominated hours of 9:00am and 3pm Monday to Friday.

It is considered that noise and vibration from the proposed quarry including the cumulative impacts from the operation of both the Tikitere and Pearlman Quarries, will be satisfactorily managed and mitigated, substantially by suitability of the site and the intelligent placement and maintenance of equipment. Draft conditions of consent will enforcing the operating hours and the mitigation measures listed within the EIS (see Annexure 3) and associate Noise Impact Assessment (see Attachment 8 to the EIS).

4.5 Water and Water Supply

4.5.1 Water Supply

Proponents Submission

Water can be drawn from a number of sources at the Pearlman site. According to the Water NSW harvestable right calculator the site itself has a harvestable right of 84.7 ML. It is expected that water will be required to be sourced from external licensed water suppliers to meet the anticipated shortfalls for quarry operations. As outlined in the water balance assessment results, up to 47.6 ML per annum is expected to be required in a drier than average year. The quarry will be responsible to ensure that any licencing requirements and other approvals required under the Water Act 2012 and/or Water Management Act 2000 are obtained. It is expected that the quarry will be moderately self-sufficient in water supply, hence construction and operation of the development can be undertaken with any additional water requirements being reasonably obtained from an appropriately authorised licensed water supplier.

A series of sediment basins are proposed for the site which are to be designed, constructed and operated to retain the runoff form the disturbed catchment at the site in accordance with DECC (2008) Managing Urban Stormwater – Soils and Construction (Volume 2E). Majority of the water captured on-site will be used in dust suppression except where storm events exceed the design criteria of the sediment basin

A number of bores have been identified from the Water NSWS database. These are shown below in Figure 23 – Groundwater Bores

Figure 23 – Groundwater Bores.

The bores are used for range of uses and have been installed to target deep aquifers suitable for supporting high yields. Should the site require supplementary water use in addition to the onsite dams, the irrigation and water supply bore should provide a supplementary water source during dry periods.

Staff Comment

The intended use of water captured in the quarry sites sedimentation basins as the primary water supply for the quarries operation is considered to be optimistic. The reliance on the capture of surface water is depended on the climate, which can be, as currently experienced, subject to long periods without rain. The EIS has touched on a secondary or back source of water, being reliance on a licensed off-site water supplier or use of the onsite irrigation and water supply groundwater bore.

The use of water in the operation of the quarry is considered an important mitigation measure for the control of dust, and therefore a tool in the retention of the amenity of the area and in the prevention of land use conflict. Thus the lack of certainty around the water supply for the operation is of concern especially if it contributes to the failure of the operation to meet the EIS and Quarry Environmental Managements Plans dust mitigation measures.

A condition shall be placed within the draft Schedule of Conditions to ensure that all mitigation measured committed to in the EIS are implemented. In addition, that a secondary water source be secured so that in the absence of water captured by the sediment basin/s, all relevant mitigation measures stated in the EIS and Quarry Environmental Management Plan can be carried out. The nomination and licensing of a secondary water source shall be provided to Council prior to the commencement of construction works and the operation of the quarry.

4.5.2 Surface Water

The propose Pearlman Quarry drains primarily in a north easterly direction towards an unnamed tributary of Mungle Creek. The unnamed tributary is 1.8km from the site and drains approximately 2.5km to connect with Mungle Creek where it drains in a north westerly direction. Mungle Creek is an uncontrolled stream, whose flow patterns are largely natural. Flows occur in these streams from local runoff. Uncontrolled streams are typically ephemeral (flowing only during floods). Frequently, they open into or flow through wetlands and billabongs.

Water quality information is not available for Mungle Creek, or the unnamed tributary. The site is within the upland region of the Border Rivers Catchment. Based on the DPI Water publication Assessment of the Murray-Darling Basin Plan water quality targets in NSW 2007-2012, the surface water in the upland section of the Border Rivers Catchment is reported to be of good quality.

No watercourse will be required to be crossed in order to access the quarry.

Environmental impacts on water quality as a result of the operation of Pearlman Quarry may include:

- Erosion and subsequent degradation of water quality
- Release of sediment to water through erosive processes
- Changes to downstream flows
- Spills and leaks and subsequent degradation of water quality
- Large spills of environmental hazardous materials, or leaks that continue over extended periods contaminating the groundwater and surface water.

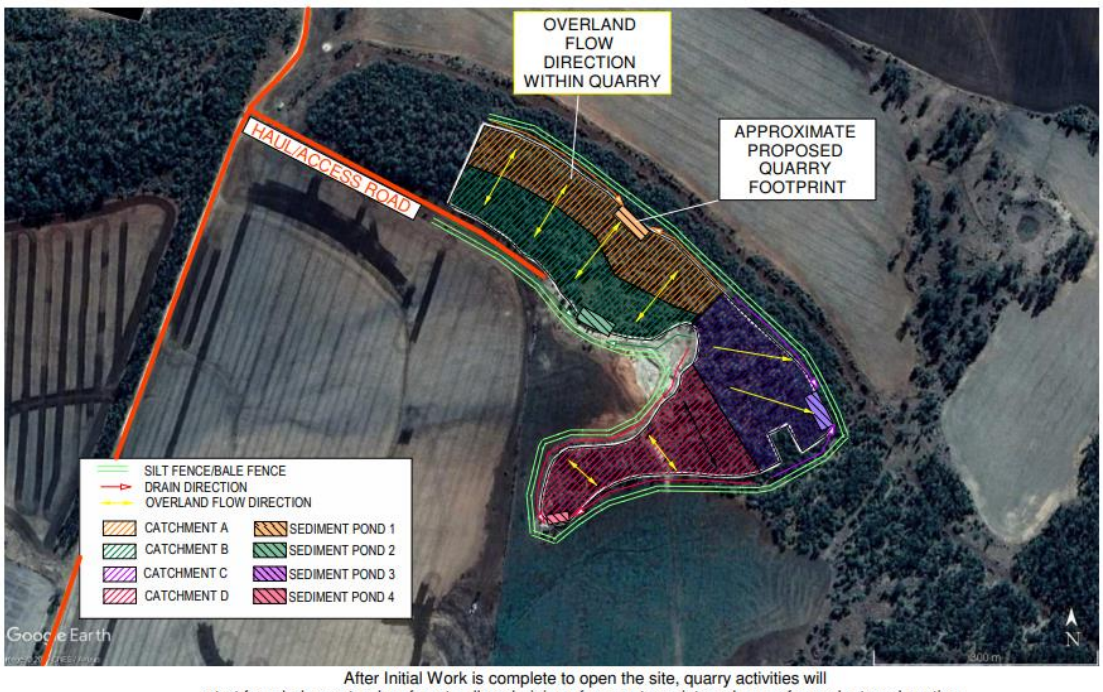
These impacts may result from the following:

- Vegetation clearing
- Topsoil stripping
- Overburden removal
- Construction and maintenance of internal roads and hardstands
- Stockpiling of topsoil and Quarry product
- Accidental spillage during handling of materials
- Storage, handling and use of hydrocarbons and other environmentally hazardous substances.

The total quarry footprint is 9.25 hectares. This has been separated into the 4 catchment areas (A, B, C & D) as shown on the attached plan *(see below)*. All catchments are designed to be equal in area, so a single pond calculation has been calculated for all sediment ponds.

The design event selected is a five (5) day 90th percentile storm where the total runoff for this five-day period is held onsite to allow settlement of sediment to below the maximum discharge threshold of 50 mg/L total suspended solids as required by NSW legislation. Storms in excess of this design event, may discharge from the site. The sediment ponds are considered to capture the first flush from the disturbed area, which will contain the majority of sediments. Additional runoff from the catchment is deemed to contain an acceptable level of sediment due to the large dilution levels that will occur.

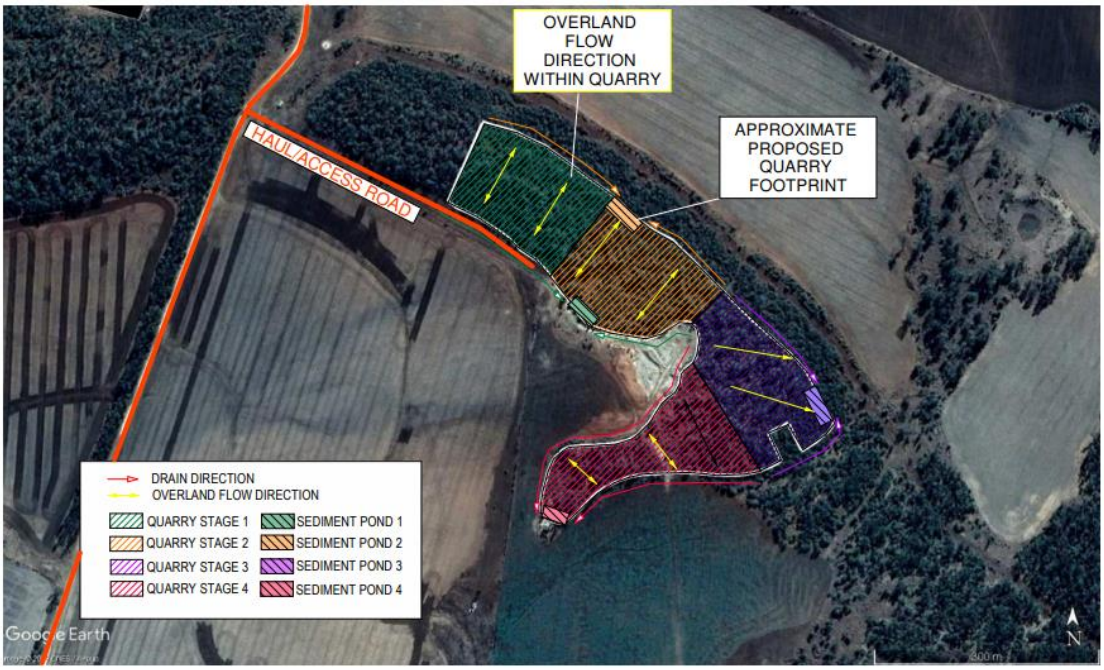
The discharge points collect rainfall runoff water from the areas shown on the plan and each Catchment A, B, C & D will be stored in Sediment Basin 1, 2, 3 and 4 respectively. The surface area contributing to each discharge point is 2.31 hectares.



After Initial Work is complete to open the site, quarry activities will start from below natural surface to allow draining of quarry to an internal sump for each staged section. Sediment will be controlled within the work area with no run-off produced.

(Note: The above is taken from the Layout Plan for Sediment and Stormwater Control During Construction being Appendix 2: Erosion and Sediment Control of the "Soil and Water Management Plan - Pearlmans Quarry - Quarry Solutions", by SMK Consultants, dated

August 2019. Being Attachment 6 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)



(Note: The above is taken from the Layout Plan for Sediment and Stormwater Control During Operation being Appendix 2: Erosion and Sediment Control of the "Soil and Water Management Plan - Pearlmans Quarry - Quarry Solutions", by SMK Consultants, dated August 2019. Being Attachment 6 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

The following measures are recommended to ensure impacts to water quality are managed and minimised.

Water Quality Management

Aspect	Control
Storing fuels, chemicals, wastes and other potentially environmentally hazardous substances	• Chemicals and fuels in containers of greater than 25 litres must be stored within a secondary containment system. • All waste will be stored in a suitable receptacle and removed from site as required • All hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids must be stored and handled in accordance with the relevant legislative requirements and Australian Standards including but not limited to the provisions of: ○ AS 1692-2006 – Steel tanks for flammable and combustible liquids ○ AS 3780:2008 – The storage and handling of corrosive substances

	○ AS 1940:2004 – The storage and handling of flammable and combustible liquid ○ AS 3833:2007 – Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers. • Bunding will be constructed of material which is impervious to the material that is to be stored in the bunded area. • Bunds will be kept in good condition (eg no cracks, gaps or leaks) • Roofed storage facilities are to be provided where possible • Stormwater captured within bunding is to be removed as soon as practicable and appropriately disposed of as contaminated water • Empty hydrocarbon and chemical containers are to be stored closed, in place on a concrete hardstand or within a bunded area • A collection sump or valve must be provided in the floor of the bunding to facilitate the removal of liquids • Where vehicle access to the bunded area is required, access must be by way of a rollover bund. • Development site-specific procedures for storing hazardous material including details on: ○ Quantities of hazardous materials will be kept to a minimum, commensurate with their usage and shelf life ○ Safety Data Sheets of stored hazardous materials will be readily accessible at the place of storage ○ Permanent and temporary containers that hold hazardous materials will be labelled with the relevant safety and risk phrases ○ The volume and types of hazardous materials stored will be known, current and documented and will not exceed the design capacity of the storage area ○ Hazardous materials that may degrade in storage and thus become dangerous will be identified and managed ○ Storage and containment areas (including secondary containment) will be inspected for signs of loss or damage and any deficiencies will be addressed ○ Hazardous materials no longer in use will be identified and assessed to determine if they should be removed from site ○ Dangerous goods will not be held in transport storage areas for longer than fire consecutive working days. Where they are required to be stored for longer periods, they will be moved to permanent hazardous materials storage areas
Refuelling	• Temporary bunding, drip trays or impermeable matting must be used to prevent spillage from any in field refueling or maintenance of plant and equipment, or any other activity that could result in spillage of a chemical, chemical, fuel or lubricant to soil • Refueling of plant and vehicles must be conducted in designated areas away from sensitive receptors and at least 100 m away from

	watercourses, water holes, lakes and wetlands. All in field refueling must include the use of a temporary bund to contain spills • Refueling will utilise auto shut off valves • Maintain appropriate spill kits and PPE at designated locations on site (eg refueling locations, chemical storage facilities, mobile equipment) • Ensure employees are familiar with, and trained in the use of, proper spill clean-up procedures
Vehicles and Equipment	• All vehicles, plant and equipment must be maintained in accordance with manufacturer's specifications and kept in good working order • Routine maintenance and inspections of earthmoving equipment must be conducted • All scheduled maintenance activities must be undertaken at designated workshop areas. Any in field maintenance or refilling should utilise small volumes to limit the quantity of material that could be potentially spilt. Vehicles, plant and equipment maintenance activities will be undertaken off site where possible.
Dewatering of Stormwater	• Quarry activities impacted waters are to captured within on-site temporary sediment basins. Sediment basins are to be designed and installed in accordance with DECC (2008) *Managing Urban Stormwater – Soils and Construction (Volume 2E)* • Water collected within sediment basins, and the receiving environment will be monitored prior to release. • Water quality monitoring will be undertaken to determine if water is fit for discharge or reuse on site for dust suppression. • Only water meeting discharge requirements will be released and be undertaken in a controlled manner to ensure that no scouring of the bed and banks of the receiving watercourse occurs.
Erosion and Sediment Control	**Installation** • Erosion and sediment controls will be installed prior to, and during, initial clearing and grading works, and regularly inspected as part of the day-to-day tasks. • Strategies / mitigation measures for the management of surface water runoff and erosion and sediment transport from the site will be implemented in accordance with the relevant approval conditions. • The sediment basin must be designed assuming the full catchment is going to be disturbed. The associated inflow catch drains must be constructed also prior to earthworks commencing on site. **Site Management** • Land-disturbing activities must be undertaken in such a manner that allows all reasonable and practicable measures to be undertaken to:

	○ Allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities up to the specified designed storm discharge. ○ Consider a staged approach to clearing to ensure that ground covers remain in place and that unnecessary disturbance does not contribute to sediment loss ○ Minimise soil erosion resulting from rain, water flow and/or wind ○ Prevent, or at least minimise, environmental harm resulting from work-related soil erosion and sediment runoff ○ Ensure that use of land/properties adjacent to the development are not diminished as a result of the adopted ESC measures. **Site Access** • Site exit points must be appropriately managed to minimise the risk of sediment being tracked onto public roadways. **Drainage Control** • Wherever reasonable and practicable, all stormwater runoff entering the site from external areas must be diverted around or through disturbed areas in a manner that minimises soil erosion. All site water from contaminated or sediment laden areas is required to be collected in a sediment basin specially designed for the site's catchment and climatic characteristics. • Within the internal drainage area reporting to the sediment basin, silt traps and sediment control devices will be implemented to slow the velocity of the water, ensuring no unnecessary erosion occurs and that the sediment basin remains efficient in settling out sediments within a 5-day period. **Sediment Control** • Efforts shall be employed to trap sediment within the site, and as close as practicable to its source. • Sediment traps must be installed and operated to both collect and retain sediment. • Where sediment basins and other sediment control devices pose a safety risk to workers these areas should be isolated (fenced) from commonly accessible areas to maintain site safety. • All reasonable and practicable measures must be taken to prevent, the release of sediment from the site. • Suitable all-weather maintenance access must be provided to all sediment control devices. • Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event, whether natural or artificial, if the device's sediment retention capacity falls below 75% of its retention capacity.

	Site Management • All erosion and sediment control measures, including drainage control measures, must be maintained in proper working order at all times during their operational lives. • Sediment removed from sediment traps and places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing erosion or environmental harm. **Soils Management** <u>Topsoil</u> • Topsoils will be stockpiled separately and not mixed with subsoils, mulch or other materials. • Topsoils must be stripped and handled with care to minimise compaction and structural degradation and where practicable, stripped topsoil should be re-used by application to areas where a similar soil type is required for rehabilitation. • Topsoils stockpiled for extended periods (<28 days) must be evaluated and treated to prevent erosion and weed infestation, stockpiles may be vegetated, covered or sprayed with a soil binder. • Topsoil stockpiles height must not be greater than 3 m. • All reasonable and practicable measures must be taken to obtain the maximum benefit from existing topsoil. • Topsoils are to be stripped and stockpiled separately to subsoil and overburden materials for use in the rehabilitation process. <u>Stockpiling</u> • Excavated materials will be stockpiled in designated areas and stored separately from other materials (eg vegetation , mulch, water, tyres, topsoil, overburden). Signage and/or survey plans will be used to delineate the separate stockpiles. • Stockpiles will be located to minimise loss of material from water and wind erosion and avoid subsequent sediment release. The stockpiles will also be contained by the use of erosion and sediment measures. • Stockpiles must not be located where there is the potential to result in sedimentation or acidification of land or surface water. Soil containment measures (eg berms) should be used as necessary. • Stockpiled soil must be placed in a designated area, which does not impeded the movement of fauna and or vehicles. • Stockpiles should not impeded natural or constructed surface drainage channels or access tracks. Stockpiles must be located above flood level. • Stockpiles will be visually monitored for erosion and or weeds and appropriate control implemented when required. • All soil and vegetation or other stockpiles will be stored within the approved construction area. Stockpiles will be located away from

	discharge zones and placed in locations where they will not be disturbed by other activities. Stockpiles will not be located against fence lines, or within vegetation to be retained including the tree protection zones of vegetation to be retained. • Stockpiles of erodible materials that has the potential to cause environmental harm if displaced, must be: o Adequately protected from wind, rain, concentrated surface flow and excessive upslope stormwater surface flows. o Located at least 5 m from any hazardous area, retained vegetation or concentrated drainage line. o Located up-slope of an appropriate sediment control system. o A suitable flow diversion system must be established immediately up-slope of a stockpile o Prior to wet season (Nov-Mar) soil stockpiles should be managed or located out of concentrated stormwater flow paths.
Commitments	• Quarry Environmental Management Plan to include: - Soil and Water Management Strategy including Erosion and Sediment Control Plan (prepared in accordance with DECC (2008) *Managing Urban Stormwater – Soils and Construction (Volume 2E)* - Rehabilitation Management Plan

While the proposed development has the potential to generate sediment an adequately sized sediment basin designed to capture site run off will be installed at the site. This provides a controlled environment where the site can capture and treat water prior to discharge thus minimising the impacts to the receiving environment. A full surface water assessment has been undertaken as part of this study (refer Attachment 6 – Soil and Water Assessment). This assessment sets out the required sediment controls and operation and maintenance requirements of these controls. Based on the adoption of the management measures outlined in the assessment and the table above the site can be managed to minimise the impacts of water quality.

Staff Comment

As a part of the proposed development and in response to the mitigation of erosion and contamination, four sediment basins will be constructed at the quarry site. The sediment basins will be constructed at strategic locations around the excavation site and will capture all runoff from within the site. Each basin will have the potential to capture 805m^3 each. However, the quarry site is located on a low ridge and it is not expected that the sediment basins will capture large volumes of stormwater, but will still be able to withstand a 5 day 90th percentile storm event.

A silt or bale fence will be construction around the entire excavation site which will ensure the funnelling of surface water from within the site into the sediment basins and the diversion of clean surface water around the quarry footprint. In addition, watercourses in the area will be further protected from any contamination by surface water run-off through the provision of generous separation distances.

Staff agrees with the proponent's submission and confirmed that the proposed quarry site is not shown as flood prone land under the Macintyre Valley Flood Plain Atlas. Mitigation measures as detailed in the EIS and Quarry Environmental Management Plan will be included as a conditions of consent in order to ensure the adequate control of surface water across and around the proposed development site.

4.5.3 Ground Water

Proponents Submission

The site is located within the Gwydir River Catchment which has a number of applicable water sharing plans. The relevant water sharing plans for the site are as follows:

- Water Sharing Plan for the NSW Great Artesian Basin Groundwater Sources 2008
- Water Sharing Plan for the NSW Border Rivers Unregulated and Alluvial Water Sources 2012

The site is also within the Surat Groundwater Source. The Surat Groundwater Source underlies the catchment west of Moree. The Surat Groundwater Source covers an area of 73,418 km^2 and the water is primarily used for stock, domestic, commercial purposes such as spa bath industries and mining. The area is characterised by a high density of bores, particularly in the south, and high flowing bores with numerous bore drains in the north.

The Groundwater Aquifer is described as Inland Alluvial, as per the NSW Office of Water resources and management overview – Gwydir Catchment 2011, which further broadly describes the area as being of moderate quality, ranging form 500-1,500 Total Dissolved Solids mg/L, suitable for domestic, stock and some irrigation purposes. Figure 22 – Groundwater Aquifer Type – Gwydir Catchment show the approximate site location in relation to the aquifer type.

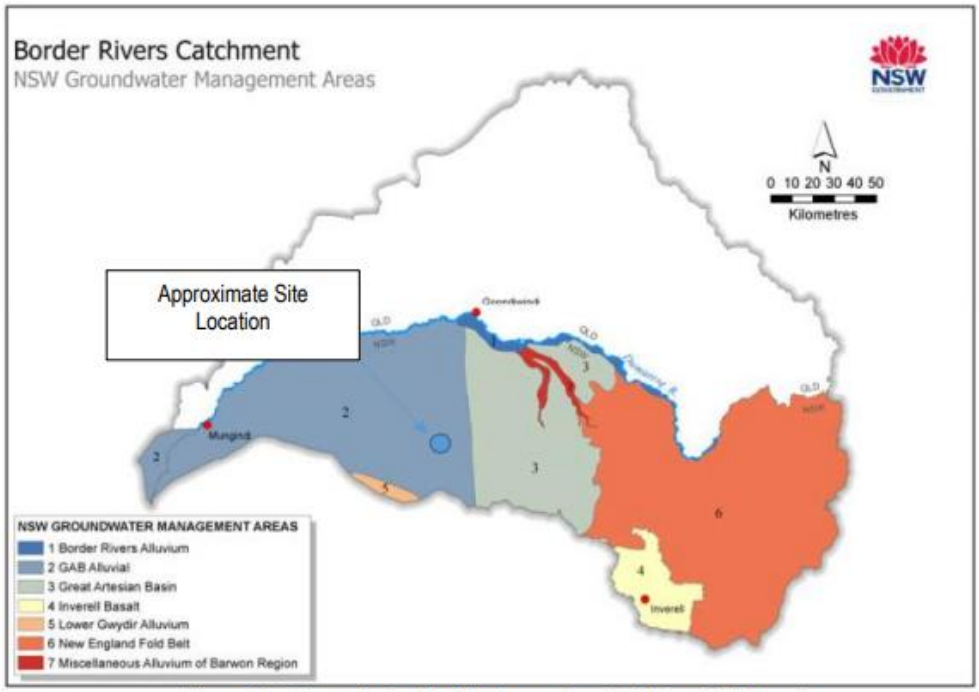


Figure 22 – Groundwater Aquifer Type – Boarder Rivers Catchment
(source https://www.industry.nsw.gov.au/water/basins-catchments/snapshots/border-rivers)

There are no active groundwater monitoring stations in reasonable proximity to the site. A number of bores have been identified from the Water NSWS database. These are shown below in Figure 23 – Groundwater Bores

Figure 23 – Groundwater Bores.

The bores are used for range of uses and have been installed to target deep aquifers suitable for supporting high yields. Should the site require supplementary water use in addition to the onsite dams, the irrigation and water supply bore should provide a supplementary water source during dry periods. A search has been undertaken to determine if any shallower aquifers exist in close proximity to the site as these may be more susceptible to impacts from site operations.

Groundwater dependent ecosystems (GDEs) are defined as ecosystems which have their species composition and their natural ecological processes determined by groundwater. A search of the GDE Atlas (Source: BoM) has been undertaken for the three types of GDEs:

- Aquifer ecosystems that rely on the surface expression of groundwater – this includes surface water ecosystems which may have a groundwater component, such as rivers, wetlands and springs. Marine and estuarine ecosystems can also be groundwater dependent, but these are not mapped in the Atlas
- Terrestrial ecosystems that rely on the subsurface presence of groundwater – this includes all vegetation ecosystems.
- Subterranean ecosystems which include cave and aquifer ecosystems.

The presence of Aquatic and Terrestrial GSEs in relation to the site is provided below in Figures 24 and 25 respectively. Note that there are also no Subterranean GDEs in the region. It is noted that given the position in the landscape, atop Death Adder Hill, the site is well above the groundwater table it is unlikely to contain any GDEs. Further during field work for the biodiversity assessment it had been confirmed that no GDEs exist in the site.

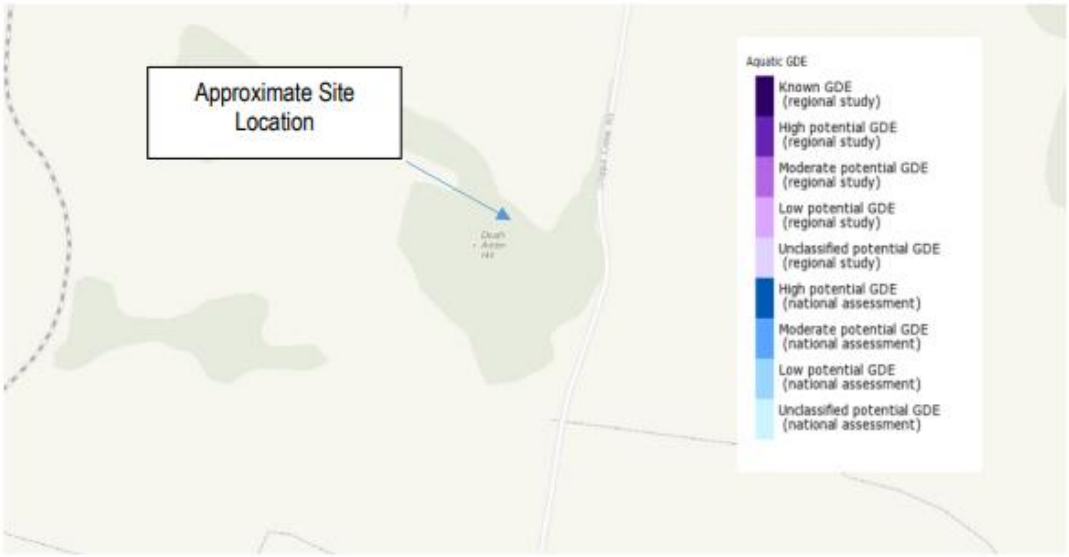


Figure 24 – Aquatic GDE

Figure 25 – Terrestrial GDE

The resource proposed to be extracted is limited to approximately 30 m below surface, which is above the height of the groundwater levels. It is unlikely that groundwater will be intercepted as part of site activities. Nevertheless, if groundwater was to be intercepted potential impacts may include:

- Drawdown of groundwater from sourced aquifer(s) for operations needs such as dust suppression.
- Drawdown of groundwater in overlying and underlying units of sourced aquifer(s).
- Reduction on piezometric head, within aquifers sourced for operational purposes, which could result in the reduction of landholder bore yields.
- The reduction in base flow to surface water systems,
- Impacts on groundwater dependent ecosystems in the context of groundwater quality, quantity and flow characteristics.
- Impacts on groundwater quality as a result of surficial impacts in the form of leaks, spills, surface runoff and seepage into shallow aquifers.

The following measures are commended to ensure potential impacts to groundwater are managed and minimised.

Groundwater Management

Aspect	Control
General	• Include groundwater management as part of any EMO prepared for the site.
Groundwater Quality	• Chemicals and fuels in containers of greater than 25 litres must be stored within a secondary containment system. • All hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids must be stored and handled in accordance with the relevant legislative requirements and Australian Standards including but not limited to the provisions of: o AS 1692-2006 – Steel tanks for flammable and combustible liquids o AS 3780:2008 – The storage and handling of corrosive substances o AS 1940:2004 – The storage and handling of flammable and combustible liquid o AS 3833:2007 – Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers. • Ensure any groundwater bore are properly encased to minimise deterioration of water quality.
Groundwater Quantity and Use	• Obtain the relevant permit and water allocation for the taking or use of groundwater at the site. • Install flow meter on the bore to ensure ground water quantity can be monitored.
Groundwater Intersection	• Maintain quarry floor and extraction areas above the groundwater table. • If groundwater becomes noticeable during the exaction activities, cease work and discuss with DPI Water to identify appropriate mitigation measures.
Commitments	• Quarry Environmental Management Plan to include groundwater Management procedures

As the proposal will be contained above the groundwater levels, groundwater impacts from the proposed development are unlikely. By implementing, the proposed management measures in the table above the site can be managed to have minimal impact to groundwater resources

Staff Comment

The proposed quarry site will excavate a volcanic basalt flow along a low lying ridgeline. It is expected that the basalt deposit will be excavated to or sightly above the surrounding ground level. Groundwater depths in this area vary in depths, however the closest water bearing bore to the proposed development site is located at a depth of 48.7m. It is not expected that the quarry floor will intercept or that the quarry operation will interfere with groundwater systems or ecologies.

As a part of the proposed development and in response to the mitigation of erosion and contamination sediment basins will be constructed at the quarry site. The basins will capture all runoff from the site. The quarry site is located on a low ridge and it is not expected that the sediment basins will capture large volumes of stormwater. Watercourses in the area will be protected through good design of diversion banks, but also through the provision of generous buffers.
Should the quarry operations require the use of groundwater to meet mitigation obligation, it is expected that a further groundwater allocation license will be applied for from NSW Water. It will remain the responsibility of the proponent to ensure that all legislative and licencing requirements are meet for the use of groundwater in the operation of the quarry.

Staff agrees with the proponent's submission. Conditions controlling the use of water across the proposed development will be included in the draft consent conditions.

No groundwater is expected to be intersected during the winning of quarry material.

4.6 Biodiversity

Proponents Submission

An assessment of the biodiversity values in and around the proposed development footprint of the project has been undertaken by Advitech (refer to Attachment 3 – Biodiversity Development Assessment Report) to inform decision making regarding the avoidance and mitigation of impacts on significant biodiversity values resulting from the project. The assessment by Advitech has determined that the extent of the vegetation to be impacted by the proposed quarry site is 8.79 Ha. The condition of vegetation in this area is described to be of a good to very good condition. Existing vegetation mapping indicates the potential of two plant community types (PCTs) to be present on the site, which are listed as follows;

- PCT 418 – White Cypress Pine – Silver-leaved Ironbark – Wilga shrub grass woodland of the Narrabri-Yetman region, Brigalow Belt South Bioregion.
- PCT 147 – Mock Olive – Wilga – Peach Bush – Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion.

The small proportion of the disturbance area (1.73 Ha) is mapped as PCT 147 which conforms to the Endangered Semi Evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions under both the BC Act and the EPBC Act. The combined geographic and habitat search revealed 22 threatened terrestrial fauna species and 7 threatened flora species that could potentially occur within or near the proposed quarry site. The significant grass species Belson's Panic (Homopholis belsonii) have been recorded in close proximity to the site. Belson's Panic is known to be associated with all of the PCTs identified above.

Table 5.3 (*see page 34 Attachment 6 – "Biodiversity Development Assessment Report - Pearlmans Quarry - Quarry Solutions", by Advitech, dated 23 December 2019 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019*) shows that database searches for the proposal site identified 29 threatened species with the potential to occur within the search area (20km radius around the proposal site). Three out of the twelve candidate species were recorded in the search area, including:

- Homopholis belsonii (Belson's Panic;
- Phascolarcoots cinereus (Koala); and
- Hieraaetus morphnoides (Little Eagle).

An additional 26 threatened species were identified in the search area results but not on the BAM candidate species list. A habitat assessment determining the likelihood of these species to be impacted by the proposed works is provided at Appendix II (*of Attachment 6 – "Biodiversity Development Assessment Report - Pearlmans Quarry - Quarry Solutions", by Advitech, dated 23 December 2019 of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019*). Given habitat and geographic constraints, non of these additional threatened species were considered likely to occur at the proposal site.

Table 5.3: Threatened species that may occur in the local area

Scientific Name	Common Name	BC Act[1]	EPBC Act[1]	Records[2]	Potential occurrence
Flora					
Cadellia pentastylis	Ooline	V	V	0	Low
Desmodium campylocaulon	Creeping Tick-trefoil	E		1	Low
Dichanthium setosum	Bluegrass	V	V	0	Low
Digitaria porrecta	Finger Panic Grass	E		1	Low
Homopholis belsonii	Belson's Panic	E	V	4	Low
Thesium asutrale	Austral Toadflax	V	V	0	Low
Tylophora linearis		V	E	0	Low
Aves					
Anthochaera Phrygia	Regent Honeyeater	CE	CE	0	Low
Callidris ferruginea	Curlew Sandpiper	E	CE	0	Low
Chthonicola sagittata	Speckled Warbler	V		1	Moderate
Circus assimilis	Spotted Harrier	V		2	Moderate
Daphoenositta chrysoptera	Varied Sittella	V		2	Moderate
Erythrotriorchis radiatus	Red Goshawl	CE	V	0	Low
Geophaps scripta scripta	Squatter Pigeon (southern)	CE	V	0	Low
Grantiella picta	Painted Honeyeater	V	V	4	Moderate
Hieraaetus morphnoides	Little Eagle	V		2	Moderate
Melanodryas cucullata cucullata	Hooder Robin (south-eastern form)	V		2	Moderate
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V		3	Moderate
Rostratula australis	Australian Painted Snipe	E	E	0	Low

Fish					
Maccullochela peelii	Murray Cod	V		0	Low
Mammalia					
Chalinolobus dwyeri	Large-eared Pied Bat		V	0	Low
Dasyurus maculatus	Spotted-tailed Quoll	V	E	0	Low
Macropus dorsalis	Black-striped Wallaby	E		3	Low
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	0	Moderate
Phascolarctos cinereus	Koala	V	V	11	Moderate
Pteropus poliocephalus	Grey-headed Flying Fox	V	V	0	Low
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V		1	High
Reptilia					
Anomalopus mackayi	Five-clawed Worm-skink	E	V	0	Low
Uvidicolus sphyrurus	Border Thick-tailed Gecko	V	V	0	Low

[1] Status Abreviations: V – Vulnerable, E – Endangered, CE – Critically Endangered.

[2] Number of OEH wildlife atlas records in selected area Approx 20km radius [North: -28.70 West: 149.99 East: 150.81 South: -29.31]

No threatened/candidate flora species were recorded at the proposal site during seasonal surveys undertaken in May, October and December 2019. To determine the impacts of development on candidate species identified at the proposal site, the BAM Calculator assesses the habitat condition within mapped species polygons and biodiversity risk weighting for species contained in the Threatened Biodiversity Collection. Based on the species sensitivity to loss, the BAM Credit Calculator generates credit calculations. No species were recorded in the proposal area; hence no species credits area required to be offset.

The proposed extraction activities will result in the removal of native vegetation present within the proposed quarry area. As the proposed clearing exceeds clearing for than 2 Ha and the site is also larger than 1000 Ha the assessment under the Biodiversity Assessment Method (BAM) is triggered. Based on this Advitech have carried out a Biodiversity Development Assessment Report to identify the biodiversity values of the site and the subsequent offset required under NSW requirements. Based on the proposed clearing the potential impacts to biodiversity may result from the following:

- Removal of vegetation contributing to the loss of ecological values of the site and edging effects with remaining areas of remnant vegetation communities.
- Vegetation removal may also impact the local fauna in the area by detracting from habitat, nesting and foraging areas.
- Increased movement of people, vehicles, machinery, vegetation waste and soil may contribute to the onset of weeds at, and near, the Pearlman Quarry which could detract from agricultural productivity and native ecosystems.

In summary, the proposal has avoided and minimised clearing of native vegetation and habitat by:

- No longer considering the additional quarry located on the Eastern Ridge;
- Maintaining a minimum 50m buffer of vegetation (which is primarily consistent with the Semi-Evergreen Vine Thicket TEC) around the norther boundary of the extraction area to provide habitat connectivity

- Maintaining the haul road to the proposed extraction area to existing tracks; and
- Locating the stockpile area in a cultivated paddock and avoiding impact to native vegetation.

The following mitigation measures are proposed to ensure that biodiversity impacts are minimised to the lowest extent practical.

Biodiversity Management

Aspect	**Control**
Flora	• A vegetation assessment must be undertaken prior to work commencing to determine the presence of weed outbreaks, hollow baring trees, threatened species, communities or their habitat. Any significant areas would be mapped, and areas not approved for clearing would be delineated with exclusion fencing or flagging to prevent over clearing occurring. • All machinery operators would be briefed in a toolbox talk about site specific vegetation clearing to ensure the task and associated risks are well understood. This may include the use of GPS guidance to verify clearing limits and also flagged markers placed by the surveyor in the field. • All machinery to be used during land clearing operations is required to be weed free prior to arriving at site. Weed hygiene practices in the site based EMO are to be followed to ensure the spread of weeds are minimised. • Significant features of the landscape that could be reused on site during rehabilitation to create habitat structures will be identified and salvaged prior to land clearing operations. • Prior to each stage of the quarry footprint expansion the clearing limits will be checked based on the approved clearing limit. • Survey pegs or bunting flags will establish the full extent of the approved clearing limit to ensure no over clearing or encroachment occurs • Existing fallen timber and woody debris in the disturbance zone will be removed with care and relocated to other areas of retained vegetation to improve the habitat values in these areas. • A 50m vegetation corridor will be maintained between the northern boundary of the quarry footprint and the cultivation areas in the paddock below the quarry site to ensure wildlife have sufficient area to travel between retained habitat on the escarpment and the riparian corridor below. • Weed spread as a result of edging effects of the proposed clearing are to be addressed as part of the QEMP and implemented as part of the ongoing management of the site. • Site induction to include awareness of the threatened species that could be found in the area. Should any of these species be discovered as part of the construction or operation of the

	site the works will cease and the project ecologist will attend the site to confirm the next actions.
Fauna	• Vegetation clearing must be undertaken in a staged manner to allow ground dwelling and avian fauna to disperse away from areas being cleared on their own accord. • For any approved clearing of areas that include habitat features, a spotter-catcher will be used to assess hollows and relocated any species that are identified to be at risk during clearing operations. • Prior to the commencement of clearing operations, the nearest wildlife carer would be identified, and all workers made aware of where native wildlife can be taken to, in the unlikely event of injury. • Habitat features such as hollows and log piles will be salvaged, where possible, and place in nearby (retained) habitat areas and used in the rehabilitation of the quarry site. • Work areas are to be checked regularly for fauna that may have entered the work area or become trapped. The sediment dam should remain fenced to exclude native fauna from watering for this area where they could potentially become trapped. • If fauna species require relocation a qualified spotter catcher will be required to handle wildlife. • All waste receptacles should remain sealed and covered at all times to prevent attaching native wildlife into the operation areas of the site. Pest animals such as pigs, goats, foxes, rabbits, wild dogs, feral cats and rodents will be controlled as required. • No pet animals will be allowed to be brought to the construction site. • The quarry manage is to be notified immediately of an incident resulting in the harm, injury or death of a fauna species. • Speed limits will be enforced as part of the driver code of conduct which include safety around wildlife that may cross haul roads on occasion.
Pest and Weeds	<u>Site Awareness</u> • Site inductions for all staff must include information regarding the local weed and pest species that may be present, and protocols required to be undertaken for control of these species. • Training must be provided to all staff regarding the weed identification and management procedures, protocols and restrictions placed on bringing domestic animals onto the site.

	<u>Prior to Construction</u> • Prior to construction, a baseline weed survey would be undertaken to identify the extent of the weed populations across the site, weed management of these areas would be planned prior to disturbance to ensure the spread is minimised. All areas of the site would be regularly monitored to identify any new outbreaks occurring that would require treatment. • Vehicles and equipment are to be cleaned before being brought to site and inspected on arrival at the site. All visitors should be advised of the nearest wees wash down facility in the region. • Vehicles and earthmoving equipment imported interstate for project use will be thoroughly cleaned at their point of origin and accompanied by a weed hygiene declaration certificate to ensure that biosecurity laws are maintained. <u>Infested Areas</u> • Signage is to be installed at weed hot spots identified through the baseline survey. • Weed control will be undertaken in areas that are very heavily infested or where WONS or Class 1 or 2 weeds present prior to disturbance. • Where weed or other pest and disease infestations are identified the infested area should be assessed and appropriate treatment measures undertaken prior to any disturbance in the area. Access to these areas will be restricted with exclusion fencing or signage. • If infestations of weeds continue following treatment, advice from a pest plant expert should be sought. <u>Chemical Control</u> • In the event that chemical control is required, personnel undertaking chemical weed control measures must be qualified to store, transport and apply chemicals. • All chemicals must arrive at site with the corresponding material safety data sheet and be risk assessed and approved by the Quarry Manager or delegate. The storage guidelines should be followed, and all chemicals should be kept in a bunded area with appropriate labelling. <u>Earthmoving</u> • All materials including gravel, mulch, packing materials, sand and soil must be inspected and be certified weed and pest free before being accepted at site. • Soil stripped and stockpiled from areas contain known weed infestations, particularly of declared weeds, are to be stored separately and are not be moved to areas free of weeds.

	• Where applicable and appropriate, disturbed topsoil and vegetative material will be returned as close as possible to the original sites in order to limit potential spread of weeds and pathogens. • Vegetation and soil waste should not be moved to areas of lower weed infestation. <u>Pest Animals</u> • All waste receptacles should remain sealed and covered at all times to prevent attracting pest animals into the operational areas of the site. • Pest animal populations will be monitored during operations. Strategies will be implemented to discourage pest animals to access the site, however if pest animals are noticed in increasing numbers the relevant abatement programs will be established.
Commitments	• Quarry Environmental Management Plan to include a Pest and Weed Management Strategy • Quarry Environmental Management Plan to include a Biodiversity Management Strategy • Quarry Environmental Management Plan to include a site Rehabilitation Strategy

The biodiversity assessment undertaken by Advitech concludes that no matters of national environmental significance or threatened species would be affected by the proposal. The proposed development will result in the removal of 1.73 Ha of the PTC 147 vegetation type conforming to the Semi Evergreen Vine Thicket Community. A five-part test under the Biodiversity Conservation Act 2016 was undertaken to determine the impact that the clearing would have on the wider distribution of this vegetation community. The assessment concludes that the proposed development would not have a significant impact on this community.

Throughout the design phase the proposal all reasonable and feasible avoidance to the impacts of vegetation have been considered. This has included the following measures;

- Avoiding areas of higher value vegetation and in turn paying higher biodiversity offset credits for impacting less valued vegetation communities.
- Modifying the quarry footprint to maintain a wildlife corridor along the northern boundary of the site.
- Maintain all haulage roads to the existing farm roads to ensure that vegetation removal is only for the purposed of accessing the required geological resources.
- Similarly locating stockpile areas in areas of previously cultivated paddock to further reduce the need to impact native vegetation.
- Modifying the quarry footprint to retain culturally significant vegetation.

The assessment of the biodiversity values within the surveyed community, has revealed that the integrity of the ecosystem values in the area of disturbance range from poor quality (0.19 Ha), good quality (1.36 Ha) to very good quality (7.23 Ha). Accordingly, to ensure that there is no net loss of biodiversity value arising from the proposed development, the project

proponent will seek to retire the ecosystem and species credits generated under the BDAR assessment. Through the adoption of the mitigation measures proposed, the site can be managed to minimise impacts on biodiversity.

The proponent seeks the following condition of consent from Gwydir Shire Council as means to retire biodiversity credits generated by the Pearlman Quarry proposal.

"Under the Biodiversity Offset Scheme, the total ecosystem credits generated for the site are 245. It is proposed that ecosystem credits be retired in instalments of 25 credits per year over the lifecycle of the quarry.

No species credits are required to be offset the proposal.

Should the quarry life be reduced from the proposed ten year period, the balance of remaining credits would be paid to the Biodiversity Conservation Trust Fund in full in the final year of operation. A bank guarantee for the total amount of payable offset credits will be provided prior to the commencement of works".

Staff Comment

The proponent has prepared a Biodiversity Impact Assessment Report (BDAR) in accordance as required by the Biodiversity Conservation Act 2016 (BC Act). As required a list of Threatened Species, Endangered Ecological Communities (ECC) and Plant Community Types (PCT) that may occur in the local area was prepared and are listed in Annexure 1.

The first revision of the BDAR was reviewed by the Biodiversity Conservation Division of NSW Planning Industry and Environment and as deemed to be generally adequate with some minor shortfalls which were easily corrected (See BDAR Rev 2). Thus not serious and irreversible impacts (SAII) were identified and the BDAR adequately addressed ways of avoiding, minimising and mitigating the developments impact on flora/fauna and Ecological Communities. The BDAR also adequate identified, with assumed presence in mind (see explanation in next paragraph), the local flora/fauna and PCT that would be impacted by the proposed development. Thus accurately producing the number of ecosystem and species credits required to offset under the Biodiversity Offset Scheme.

Generally, the BC Act requires that during adverse climatic conditions (flood, drought etc) or due to seasonal growth inclinations that any flora/fauna and PCT known to occur in the local area of a development site is to be assumed present even if at the time of field surveys are undertaken that flora/fauna or PCT is not currently found. The list of flora/fauna assumed to present can be reduced by preforming further field survey's at different seasons or in more favourable climatic conditions.

In the case of the BDAR prepared for this development proposal three site assessments were undertaken, 21 to 23 May 2019, 28 October to 1 November 2019 and the 9 December 2019. It should be noted that during this entire period the region of considered to still be in drought conditions.

After the completion of the last site assessment the BDAR was altered to reduce the number of ecosystem credits to 245 and the species credits required to be offset to zero. Below are the species and ecosystems credits listed in the first version of the BDAR (see below Tables

7.2 and 7.3 taken from EIS Attachment 3 Rev 1) and then the credit lists for the third review (see Table 7.2 taken from EIS Attachment 3 Rev 3) .

Table 7.2: Ecosystem credits summary

PCT	Vegetation Zone	Area Impacted (ha)	Credits required
147: Mock Olive - Wilga - Peach Bush - Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion	1	1.13	46
	2	0.59	22
TOTAL		1.73	68
418: White Cypress Pine - Silver-leaved Ironbark - Wilga shrub grass woodland of the Narrabri-Yetman region, Brigalow Belt South Bioregion	1	5.51	158
	2	1.36	18
	3	0.19	2
TOTAL		7.06	178
TOTAL ECOSYSTEM CREDITS REQUIRED			**246**

Table 7.2 - EIS Attachment 3 Rev 1

Table 7.3: Species credits summary

PCT	NSW listing (BC Act)	Species presence type	PCT/ (Vegetation Zones)	Potential SAII	Area Impacted (ha)	Credits required
Hoplocephalus bitorquatus (Pale headed Snake)	V	Assumed present	All Zones	N/A	8.79	306
Lophoictinia isura (Square-tailed Kite)	V	Assumed present	All Zones	N/A	8.79	230
Ninox connivens (Barking Owl)	V	Assumed present	All Zones	N/A	8.79	306
Homopholis belsonii (Belson's Panic)	E	Assumed present	All Zones	N/A	8.79	152
Hieraaetus morphnoides (Little Eagle)	V	Assumed present	All Zones	N/A	8.79	230
Haliaeetus leucogaster (White bellied Sea-Eagle)	V	Assumed present	All Zones	N/A	8.79	306
TOTAL SPECIES CREDITS REQUIRED						**1530**

Table 7.3 - EIS Attachment 3 Rev 1

Table 7.2: Ecosystem credits summary

PCT	Vegetation Zone	Area Impacted (ha)	Credits required
147: Mock Olive - Wilga - Peach Bush - Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion	1	1.13	46
	2	0.60	23
TOTAL		1.73	69
418: White Cypress Pine - Silver-leaved Ironbark - Wilga shrub grass woodland of the Narrabri-Yetman region, Brigalow Belt South Bioregion	1	5.43	156
	2	1.36	18
	3	0.19	2
TOTAL		6.98	176
TOTAL ECOSYSTEM CREDITS REQUIRED			**245**

Table 7.2 - EIS Attachment 3 Rev 3

As shown above there has been a dramatic reduction in the number of credits from 1776 to 245, this is due to the removal of all species credits as further site assessments have allegedly proved that with or without adverse climatic conditions or seasonal growth inclinations that all the species are not present on the proposed development site. Consequently, as the credit have reduce also has the proponents offset liability, the estimated liability reduces from $1,991,415.25 to $1,171,621.66.

Council has requested that the Biodiversity Conservation Division (BCD) of NSW Planning Industry and Environment review the amended version of the BDAR (being Rev 3). The BCD has agreed to take a second look at the BDAR, this is highly unusual as generally only one review from the BCD is allowed per development proposal. Unfortunately, the BCD second review of the BDAR will not be received by Council until after the submission of this report. However, verbal advice from the BCD has been that climatic conditions have not improve enough in the region to discount assumed presence.

In the absence of the second review by BCD Council staff would endorse the removal of the following flora and fauna species from the Species Credit Summary:

Species:	Reasoning:	Credits Removed
Hoplocephalus bitorquatus (Pale-headed Snake)	• General found within 500m of dry eucalyptus forest, woodland and cypress forest • The area surrounding the vegetated areas as been substantially disturbed by cultivation and is in poor condition	306
Lophoictinia isura (Square-tailed Kite)	• No evidence of current or historical nesting sites found during surveys; and • Not sited during surveys.	230
Ninox connivens (Barking Owl)	• Not sited during surveys.	306
Hieraaetus morphnoides (Little Eagle)	• Habitat not found at site of proposed development	230
Haliaeetus leucogaster (White bellied Sea-Eagle)	• No evidence of current or historical nesting sites found during surveys; and • Not sited during surveys.	306
Total Species Credits endorsed for removal by Council staff assessment		1378

The remaining species credit of 152 is for Homopholis belsonii (Belson's Panic). It is likely that the flora species may still be present within the proposed development site due to the following factors:

- The habitat and ecology of this species is poorly known;
- The species is known to inhabit the surrounding area and within the PCT identified on the proposed development site;
- Surveyed period required is December to April – Site Assessment was only carried out on one day during December (6 hours)which was still consider to be under drought conditions even though a small amount of rain had been received
- The proposed development site remains in drought conditions

Version 3 of the BDAR included a section on how the proponent would like to retire the proposed developments credit obligations. In short, the proponent proposes that the credits be retired in equal instalments over the lifecycle of the quarry, expected to be 10

years. The proponent advised that should the lifecycle be shortened that the balance of the outstanding credits would be paid in full to the Biodiversity Conservation Trust (BCT) in the final year of operation. A bank guarantee for the total amount payable for the offset credits would be provided to the BCT prior to commencement of works.

Council has sought advice from the both the BCT and the BCD (Biodiversity Conservation Division of NSW Planning Industry and Environment) who have stated the following:

"s 7.13(5) of the BC Act requires proponents to retire biodiversity credits before development is carried out that would impact on the biodiversity values. This will form a condition of the DA.

The proponent can consider staging the development. In this instance, the proponent only needs to retire the credits associated with the stage of the development they are commencing. The staging, and the associated credits, must be clearly detailed in the DA."

Due to the DA not being registered nor the proponent requesting the development to be assessed as a 'Staged Development' (now known as 'Concept Development') as defined under Division 4.4 of the Environmental Planning and Assessment Act 1979, the option of retiring credits in a staged manner is not available to the proponent and credits will be required to be retire in full prior to commencement of work.

It is recommended that the Draft Schedule of Conditions include the implementation of the management and mitigations measure identified in the EIS and the Pest and Weeds Management Strategy, the Biodiversity Management Strategy, the Rehabilitation Strategy included within the Quarry Environmental Management Plan.

Also included in the Draft Schedule of Condition will be a condition detailing the retirement of the following Ecosystem and Species Credits.

PCT	Vegetation Zone	Area Impacted (ha)	Credits Required
147: Mock Olive – Wilga – Peach Bush – Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion	1	1.13	46
	2	0.60	23
Total		1.73	69
418: White Cypress Pine – Silverleaved Ironbark – Wilga Scrub grass woodland of the Narrabri-Yetman region, Brigalow Belt South Bioregion	1	5.43	156
	2	1.36	18
	3	0.19	2
Total		6.98	176
TOTAL ECOSYSTEM CREDITS REQUIRED			**245**

Species	NSW listing (BC Act)	Species presence type	PCT/ (Vegetation Zones)	Potential SAII	Area Impacted (ha)	Credits Required
Homopholis belsonii (Belson's Panic)	Endang-ered	Assumed Present	All Zones	N/A	8.79	152
TOTAL SPECIES CREDITS REQUIRED						**152**

Additionally, the Draft Schedule of Conditions will included as is required by the BC Act a condition require the proponent to retire the above listed credits in full prior to the commencement of works for the proposed development.

4.7 Archaeological Heritage

4.7.1 Indigenous Heritage

Proponents Submission

Many of the local Aboriginal people in the areas surrounding Croppa Creek and North Star area identify as being part of the Gamilaroi nation. The Moree Gamilaroi Local Aboriginal Land Council members are the Aboriginal custodians of the study area. It must also be considered that Aboriginal Cultures were not static and that clan and tribal boundaries, language groups and dialects most likely changed over many thousands of years. The native title claim is registered under the name of the Gomeroi People with the National Title Tribunal. This claim was registered in 2012.

An AHIMS search was conducted as part of the preliminary assessment which revealed that there is one registered site located to the west of the site located within the adjacent rail corridor. Potential Archaeological Deposit (PAD) and area(s) 'of archaeological sensitivity' are used to describe areas likely to contain subsurface cultural deposits. An aboriginal archaeological assessment was carried out by Advitech to verify if any culturally sensitive areas were present of the site. The assessment was carried out in accordance with the Due Diligence Code of Practice for the Protection of Aboriginal Objects n NSW (OEH 2011). A further Aboriginal Cultural Heritage Assessment (ACHA) was also completed across the site. As part of this assessment two registered Aboriginal party representatives were in attendance during the field work undertaken across the site.

The area is also within the Land Claim region of the Gomeroi Nation, which operates as a larger organisation relating to a large land claim application and group of representatives from Local Land Councils.

Little information is available about aboriginal history in the Tikitere area. No sites of significance have registered on the property. Some sites would be present along the creek corridor. Such sites may include scar trees and artefact scatters. The potential to find sites or artefacts on the development area is negligible as the area has been subject to extensive cultivation for a period of 40 years or more. Artefact scatters would be buried or substantially deteriorated as a result of the cultivation. A search of the area has not identified any artefacts.

A search of the OEH AHIMS register has shown that Aboriginal sites or objects are currently recorded within the search area (approximately 3km radius). The basic details of the known registered sites within 5km are itemised below in Table 3

Table 3: Summary results of AHIMs Extensive search and new additions

Site ID	Site Name	Aboriginal site/object	Status
11-1-0043	NNS IA10	Artefact	Valid
11-1-0048	GWP/IRP/TIK/6	PAD	Updated to "Not a site"
11-1-0049	GWP/IRP/TIK/5	PAD	Updated to "Not a site"
11-1-0050	GWP/IRP/TIK/4	Artefact	Updated to "Not a site"
11-1-0051	GWP/IRP/TIK/3	Artefact	Updated to "Not a site"
11-1-0052	GWP/IRP/TIK/2	Artefact	Updated to "Not a site"
11-1-0053	GWP/IRP/TIK/1	Artefact	Updated to "Not a site"
11-1-0054	GWP/IRP/Pearl/1	Scar Tree	Valid

(Note: The above is taken from page 18 of Attachment 4: "Aboriginal Cultural Heritage Assessment - Pearlmans Quarry - Quarry Solutions Pty Ltd", by Advitech, dated 21 August 2019, of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

A full AHIMs results, details of their specific locations and mapping, are provided in Appendix 1 (*Attachment 4: "Aboriginal Cultural Heritage Assessment - Pearlmans Quarry - Quarry Solutions Pty Ltd", by Advitech, dated 21 August 2019, of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)*. These details results have been separated in order to enable easy detachment of the Appendix and prevent unnecessary public disclosure of these details.

Reliance on the locations provided by the AHIMS searches is tentative. There are many variables that must be considered when using the Aboriginal Heritage Information System (AHIMS). More particularly, site coordinates, and descriptions are not always correct.

In the case of this assessment and the study area, little reliance should be placed on the archaeological context due to the lack of information available by way of comparable studies in the locality and on the same landforms. However, some modelling of past Aboriginal use can be derived from the surrounding registered Aboriginal sites.

Overall, 45% of the land for extraction/stockpile areas was effectively surveyed with additional surveying outside of proposed extraction and stockpile areas. Current disturbance on the property include commercial (farming), ancillary, fencing, alteration of land surfaces by grading/ploughing, fill or excavation and historical and modern clearance of vegetation on the property.

In the instance of Pearlman Quarry study area, only the surface integrity can be investigated, through assessment of past and present land uses and their impacts. Due to the land use impacts (such as clearing, agricultural/pastoral activities, road works, and infrastructure) as well as natural impacts (erosion, bioturbation, flora/fauna activity) within the investigation area, it can be confidently assumed that the integrity of the area is lost. Sites GWP/IRP/TIK/1-6 are included in this disturbance, and as such it is unlikely

that any of these sites were identified in situ, and the potential to find additional in situ sites in subsequent assessments of the investigation area is low to nil.

The detection of Aboriginal objects is dependent on a number of environmental factors including:

- Surface visibility (which is determined by the nature and extent of ground cover including grass and leaf litter and so on):
- The survival of the original land surface and associated cultural materials; and
- The exposure of the original landscape and associated cultural materials (by water, sheet and gully erosion, ploughing, grazing, vehicle tracks and so on).

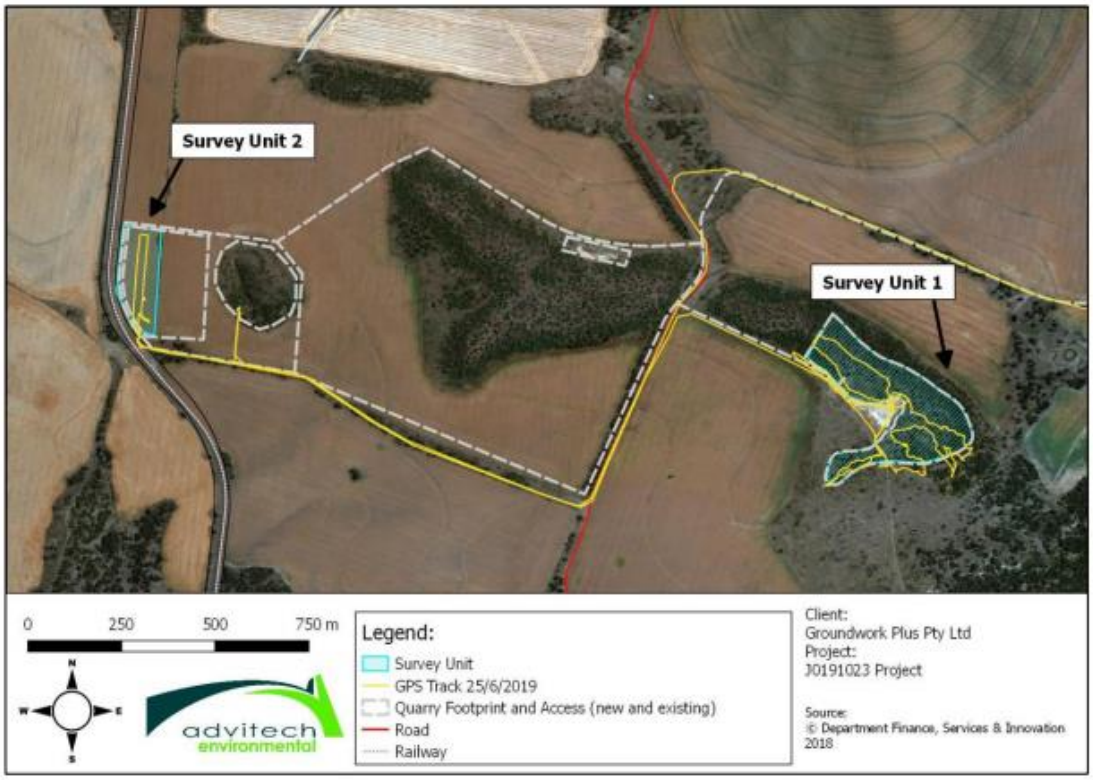


Figure 13: Survey units for ACHA survey (original quarry footprint)

(Note: The above is taken from page 33 of Attachment 4: "Aboriginal Cultural Heritage Assessment - Pearlmans Quarry - Quarry Solutions Pty Ltd", by Advitech, dated 21 August 2019, of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

Survey Unit 1
This survey unit relates to the eastern ridge of the study (see Figure 13). This survey unit has some disturbance from agricultural production on the lower portion of the ridge to south. Access tracks have been cut through vegetation. Vegetation can be relatively dense in sections particularly along the north side of the ridge. Little vegetation clearance has occurred besides where agricultural or exploratory expeditions have occurred for quarrying. An existing quarry area is located adjacent to this survey unit.

Survey Unit 2
This survey unit relates to the flat area on the western side of the project area, on which a stockpile will be created. This area has existing agricultural/pastoral disturbance and

abuts the railway easement along its western edge. To the eastern edge is an existing quarry. Other disturbances include fencing and access tracks. The limiting factors to visibility were vegetation relating to agriculture.

The stockpile area was surveyed on a Tuesday morning after site inductions were completed. The Registered Aboriginal Parties were satisfied with the results of the field survey and no heritage values were identified in the stockpile area.

The quarry area was surveyed on Tuesday morning through to early afternoon. The site had previously contained a few points of possible concern which were noted in the due diligence assessment in January. These related to a siltcrete outcrop and possible raw material manuport (chert).

During the ACHA survey the siltcrete outcrop which is mostly outside the impact area was not deemed a concern by the Register Aboriginal Parties. The eastern side of the site that borders the larger portion of the siltcrete outcrop has exfoliated material that has shattered into natural flakes. From examination of the site this may have occurred through a mixture of natural exfoliation, human disturbance such as road creation, borrow pits and agriculture as well as by animals, with cattle and pigs noted on the property.

Finds during the survey comprised a fallen tree with a scar. The tree is located approximately 30m west from the most eastern boundary of the original quarry footprint (See Figure 16 and 17) and was thought to be of Aboriginal origin. The tree was located near a Kurrajong tree, which the registered parties connected to a potential Women's site. It was recommended that for any future works, female Aboriginal representatives should attend as a culturally appropriate. No cultural information about the site/location was forthcoming in the methodology review period. The tree had evidence of regrowth on the scarred section of the truck. A ring mark was also evident, however given it location with respect to other mature trees in the vicinity, the reasoning for the ring mark was difficult to accurately determine. Potentially the ring mark could be attributed to animal activity or the tree being historically used as part of a fence. The tree was moderately preserved and did not appear to have insect or vegetation damage.

The scar tree was recorded as a Box Gum with the following scar dimensions:

Length	Width	Girth	Orientation
790mm	85mm	1070mm	West (when standing)

Figure 14: Scar tree in quarry impact area

(Note: The above is taken from page 35 of Attachment 4: "Aboriginal Cultural Heritage Assessment - Pearlmans Quarry - Quarry Solutions Pty Ltd", by Advitech, dated 21 August 2019, of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

No other items of heritage value were discovered in the quarry footprint

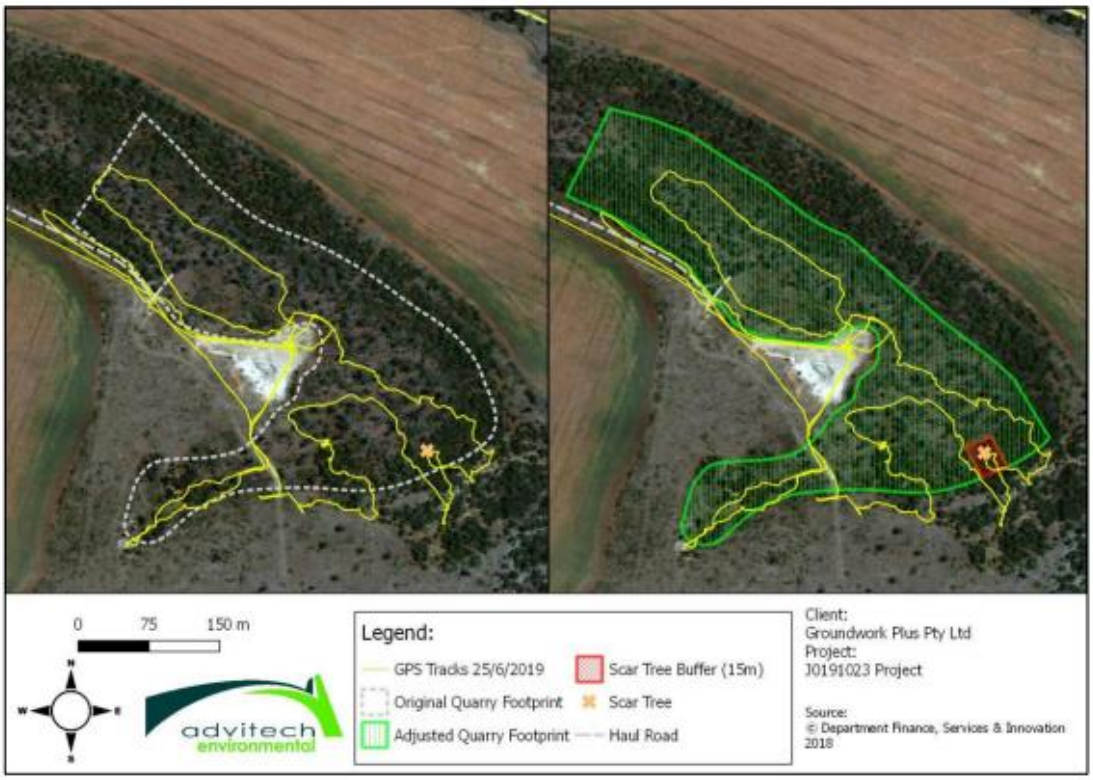


Figure 16: Quarry footprint comparison with June GPS tracks

Figure 17: Map of proposed buffer area and footprint adjustment put forward by Quarry Solutions

(Note: The above is taken from pages 36 and 37 of Attachment 4: "Aboriginal Cultural Heritage Assessment - Pearlmans Quarry - Quarry Solutions Pty Ltd", by Advitech, dated 21 August 2019, of "Pearlmans Quarry Environmental Impact Statement", by Groundwork Plus, dated August 2019)

Ground disturbance activities such as land clearing and excavation can potentially result in direct and indirect impacts to items of heritage value. The direct impacts can result from direct contact with objects that are unexpectedly found during ground distributing activities. Indirect impacts can occur where the contextual setting of artefacts is impacted as a result of nearby activities such as blasting, drilling and the operation of machinery. Based on the nature of these impacts the risk remain present during construction and operational phases of the quarry.

While one culturally sensitive aboriginal heritage item was found during the site assessment, the quarry design has been able to be remodified to exclude this area from ground disturbing activities. All other areas of the proposed quarry footprint were considered to have a low likelihood of containing any additional sites. To ensure the proposed development has the minimal impact on indigenous and non-indigenous cultural heritage present at the site the following management and mitigation measures area proposed to be implemented:

Management and Mitigation Measures – Indigenous Cultural Heritage

Aspect	Control
Aboriginal Cultural Heritage	• The quarry has been redesigned to excise the scar tree from the quarry operations. A buffer of 15m will be maintained around the scar tree site to ensure that impacts are

	minimised. This area will be fenced off and signposted as a no-go area. • The site induction process will include training on aboriginal cultural heritage awareness and will make reference the no-go zones at the site. • Only undertake ground disturbing activities in areas of the site that have been assess and approved for ground disturbance. • Ensure the project staff and contractors and their employees are advised of their legal responsibilities under the National Parks and Wildlife Act 1974 and the Heritage Act 1977. • In the event that any Aboriginal artefacts, items or sites of cultural heritage are found during quarry operations, the following management procedures will be carried out: o Work will cease in the immediate area the project archaeologist will be required to attend site and assess the significance of the site/artefact/relic. Once the significance is known the relevant notifications will be made to the Office of Environment and Heritage (OEH) Heritage Division, Moree Local Aboriginal Land Council and Gwydir Shire Council to determine the next steps. o In the event that human remains are found during the quarry operations, all works are to be ceased, the site secured and the NSW Police, the coroner, OEH heritage and the Aboriginal Community will be notified if it is suspected or confirmed that the remains are of aboriginal origin. o Consultation will be carried out as appropriate in accordance with the following documents: ▪ Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010; ▪ The Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW 2010. Please refer to the Quarry Environmental Management Plan for the full unexpected finds protocol
Commitments	Quarry Environmental Management Plan to include a cultural heritage management strategy including unexpected finds protocal, inductions training and incident reporting processes

The findings of Aboriginal Cultural Heritage Assessment concluded that the register AHIMS site referred to above is not considered to be a site containing any significance and is therefore to be updated on the AHIMS database. The assessment did however reveal that a scar tree site was present in the east of the original quarry footprint. Given the significance of this find the proponent has considered to redesign the quarry footprint to enable this site to remain in situ rather than being salvaged.

A full assessment of Indigenous Heritage is attached in later sections of this report (refer to Attachment 4 – Aboriginal Cultural Heritage Assessment Report).

Staff Comment

It is considered that proponent has adequately complied with the requirements of the National Parks and Wildlife Act 1974 and The Heritage Act 1977 through application of 'Due Diligence' protocols, the carrying of field assessment and in the preparation of an Aboriginal Cultural Heritage Assessment report.

It is noted that although a number of Aboriginal heritage significant sites were recorded near the quarry site, none were found to be located within the excavation or stockpile sites. However, as a result of the field assessment, which was conducted in the presence of two registered interested Aboriginal representatives, a previously unknown item of indigenous heritage significance was found within the quarries original footprint. This item was a fallen scar tree. In order to preserve the item in situ the site of the scar tree and a 15m surrounding buffer area has been excluded from the quarry excavation footprint. Further, the scar tree will be protected from damage or disturbance by an exclusion fence and on-go signage.

It was noted by the Aboriginal representatives at the discovery that the scar tree was in close proximity to a Kurrajong tree which could indicate a connection to a possible women's site. It was also recommended that for any future works, female Aboriginal representatives should attend the site as is culturally appropriate. There appears to be no further mention of a site visit by female Aboriginal representatives with in the assessment report or the EIS so it assumed that further investigations with regards to the scar tree site was not undertaken.

No other items of heritage value were discovered during the surveyed quarry excavation or stockpile areas.

The draft Schedule of Conditions will include conditions that reinforce the proponents responsibility with regards to unexpected finds and ensure the implementation of the management and mitigation measures stated in the EIS and Quarry Environmental Management Plan.

4.7.2 Non-Indigenous Heritage

Proponents Submission

Heritage places and landscapes can include natural resources, objects, customs and traditions that individuals and communities have inherited and wish to conserve for future generations. Cultural heritage comprises places and items that may have historic, scientific, cultural, social, archaeological, architectural, natural or aesthetic significance at a local, State, Nation or International level. As part of this EIS such matters were assessed by researching the following databases; NSW State Heritage Register (SHR), NSW State Heritage Inventory (SHI), Gwydir Local Environmental Plan 2013 (GLEP), relevant Section 170 Registers (S170), relevant section of the National Parks and Wildlife Act 1974, and Commonwealth Heritage List and National Trust List (NT) listed under the EPBC Act 1999. The result of these searches revealed that there are no items of heritage at either Local, State, or National level within 1 kilometre of the study area. 1 item of National Estate Register is present within the wider area beyond the 1k search area of the site.

Ground disturbance activities such as land clearing and excavation can potentially result in direct and indirect impacts to items of heritage value. The direct impacts can result from direct contact with objects that are unexpectedly found during ground distributing activities. Indirect impacts can occur where the contextual setting of artefacts is impacted as a result of nearby activities such as blasting, drilling and the operation of machinery. Based on the nature of these impacts the risk remain present during construction and operational phases of the quarry.

Management and Mitigation Measures – Non-Indigenous Cultural Heritage

Aspect	Control
Non-indigenous Heritage	• Site induction for all staff are to include education sessions regarding Historical Heritage. It is understood that examples of unexpected finds in the Croppa Creek region may consist of a surveyor's mark on a woodland tree. • Unexpected Finds awareness training sessions with all site personnel as part of the site induction. • In the event that an unexpected find of potential heritage significance is uncovered during quarry activities (ie a suspected relic, or human remains) works will cease, the site will be made secure and the quarry manager notified for further investigation. The project archaeologist will be contacted to attend site to determine the significance of the site/artefact/relic. Once the significance of the find is known the relevant notifications will be made to the Office of Environment and Heritage (OEH) Heritage Division and Gwydir Shire Council to determine if any relevant permits are required prior to salvage and return to work. • Advice will be sought from the consulting heritage specialist to determine whether further action is required for archaeological assessment and/or salvage and notification to regulatory bodies prior to the recommencement of works.
Commitments	Quarry Environmental Management Plan to include a cultural heritage management strategy including unexpected finds protocol, inductions training and incident reporting processes

A full assessment of Historical Heritage is attached in later sections of this report (refer to Attachment 5 – Historical Heritage Assessment Report).

Staff Comment

It is considered that proponent has adequately complied with the requirements of the National Parks and Wildlife Act 1974 and The Heritage Act 1977 through application of 'Due Diligence' protocols, the carrying of field assessment, in the preparation of an Aboriginal Cultural Heritage Assessment report and Archaeological Historic Heritage Assessment Report.

It is confirmed that no registered items of indigenous or non-indigenous heritage significance are found on the quarry's excavation or stockpile sites under Schedule 5 of

the Gwydir Local Environmental Plan 2013, the NSW State Heritage Register, NSW State Heritage Inventory, Commonwealth Heritage List and National Trust List or any other relevant registers or legislation.

The draft Schedule of Conditions will include conditions that reinforce the proponents responsibility with regards to unexpected finds and ensure the implementation of the management and mitigation measures stated in the EIS and Quarry Environmental Management Plan.

4.8 Natural Hazards

4.8.1 Flood Hazard Areas

Proponents Submission

The site is not within the Gwydir Valley Floodplain (Floodplain Management for the Gwydir Valley Floodplain 2016). Similarly, the site is not mapped for "Flood Planning" under the NSW Planning Portal. Based on the quarry location on Death Adder Hill, there is limited risk of the site being inundated by flooding.

Staff Comment

It is confirmed that the proposed development site is not located within a flood prone area in accordance with Gwydir Valley Floodplain 2016 nor mapped as flood prone land under the Macintyre Valley Flood Plain Atlas 1982.

It is considered that Flood Hazard will not significantly impact the proposed quarry sites or operations.

4.8.2 Bushfire Hazard

Proponents Submission

Bushfire Prone Land is land that has been identified by local council, which can support a bushfire or is subject to bush fire attack. The NSW Rural Fire Service's Online Mapping Tool was accessed in May 2019, to assess whether the site is located in Bushfire Prone Land. Results of the search indicate that the site is not located in Bushfire Prone Land however advice received from the Rural Fires NSW as part of the SEARs consultation suggest that the site is partially mapped therefore Rural Fire Service (RFS) guideline "Planning for Bush Fire Protection 2006" (RFS 2006).

Potential ignition sources are present on both the proposed development site and neighbouring rural areas. Potential ignition sources for bush fire risk include the following:

- High Risk Activities such as hot works and welding
- Engine exhaust
- Malfunction of electrical infrastructure or portable machinery (internal combustion engines)
- Combustion of flammable materials
- Discarded cigarettes

- Lightning
- Deliberate acts

Based on the likelihood of the hazard that will impact the site bushfire risk has only been considered. The table below identifies potential impacts of bushfire hazard.

Potential Impacts

Receptor	**Specifics**
People	• Staff and contractors • Rural landowners • Rural residential areas including interface areas • Travellers
Property	• Agricultural/grazing land • Commercial/industrial land • Public Infrastructure • Construction equipment • Support infrastructure • Primary infrastructure
Environment	• Threatened species, populations and ecological communities • Locally important species and ecological communities, such as species and ecological communities especially sensitive to fire • Indigenous significance • Non-indigenous heritage • Other cultural assets
Community & Reputation	• Reputation • Contractors reputation • Industry reputation

The following management and mitigation measures should be implemented to ensure that the proposal has minimal potential impacts to bushfire hazard.

Management and Mitigation Measures – Bushfire

Aspect	**Control**
Objectives	The objectives outlined within the RFS 2006 have been considered. The objectives are as follows: • Afford occupants of any building adequate protection from exposure to a bushfire; • Provide for a defendable space to be located around buildings; • Provide appropriate separation between hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;

	• Ensure that safe access and egress for emergency service personnel and residents is available' • Provide ongoing management and maintenance of bushfire protection measures; and • Ensure that utility services are adequate for firefighting needs.
Controls	Risk Controls Management procedures for protection against fire will include: • Consulting with landowners and fire services for implementing fire control management on site in accordance with district/area fire control plans. • Providing fire breaks around the site, and in particular, fueling areas, workshop areas and other areas where hydrocarbons might be present. • Ensuring all staff on site and other personnel are aware of evacuation procedures and the location and the use of firefighting equipment. • Keeping relevant agencies contact numbers in the event of a fire, namely Rural Fire Service. • Ensuring that extinguishers, fire hoses, fire blankets, sand buckets and other such equipment is regularly inspected and maintained in accordance with Australian Standard AS 1851-2005 (A4), Maintenance of Fire Protection Systems and Equipment. • Providing ready access to water storages on site for use in firefighting of fire. • Providing fire breaks around operations and in particular workshop and chemical storage areas. • Ensuring welding and other hot works is undertaken in controlled areas. Ignition Sources • Appropriate signage is to be erected near flammable and combustible areas eg 'No smoking stop engines', hazard symbols (explosive, flammable, combustible). • Any cigarette butts must be free of embers and discarded into site bins. Cigarette butts are not permitted to be thrown out of vehicle or plant windows or onto ground surface. • Vehicles and/or plant must be turned off during refueling. • Mobile phones must be switched off when refueling. Fire Protection • All vehicles and plant must be provided with fire protection equipment (eg fire extinguisher, fire blanket) that meets applicable Australian Standards. • Staff should be trained in the correct use of fire protection equipment.

	• An adequate water source must be kept on site at all times in the event of fire eg sediment basin, recycled water tanker or the like. • All fire extinguishers must be clearly signed and their purpose clearly visible for the user. Evacuation Plan • A site Evacuation Plan must be prepared prior to the commencement of works. It is to be displayed in site offices and all staff trained in the event of an evacuation of the site is required. Site Preparation and Maintenance • Plan, create and/or maintain strategic fire trails • Construct and maintain perimeter fencing to prevent unauthorized access where necessary. • Incorporate fire safety management systems for chemical fires. Reduce the Hazard • Assess fire risk each day and evacuate where necessary as per the Evacuation Plan. • Ensure no fuel load is available around work sites • Preferable burn season is summer to winter and aim for a low to moderate intensity burn. • Create firebreaks around the site and all temporary facilities and infrastructure on site.
Commitments	Quarry Environmental Management Plan to include a Bush Fire Management Strategy

The proposed development would increase the number and type of ignition sources in the local area. However, the proposed management and mitigation measures, in conjunction with general clearing activities associated with the proposal development would ensure that an acceptable bushfire hazard is maintained as part of the proposed development. The temporary plant and equipment required at the site will be located within the quarry floor where an appropriate buffer would be achieved through the development of the quarry thus minimising the vegetation required to be removed.

Staff Comment

According to Council's knowledge, the subject site is not a significant bushfire risk. It is conceded, however, that given the right conditions and fuel source availability any site may be subjected to fire, in particular sites which will store and use hazardous material such as diesel and oils. The applicant has offered extensive mitigation measure in order to minimise the risk and impact of a potential fire onsite.

It is considered that natural hazards that may affect the proposal should be adequately managed through the recommended conditions in the draft schedule of conditions.

4.9 Access and Traffic

Proponents Submission

Croppa Creek Road provides access from the site to I.B. Bore Road, North Star Road, Croppa Moree Rd which in turn lead to the Newell Highway. All roads are sealed and services the farming community surrounding the site. Croppa Creek is a bitumen sealed road. From the site to Newell Highway is approximately 27 km to the north west and 50km to the south west. The road supports the transportation of agricultural supplies and goods, and public use for access to residential properties.

Figure 30 – Existing Site Access.

Internal haul roads within the site are comprised by black cracking clay soils will require improvements to ensure access remains available in all weather conditions. The site will require to establish internal haulage roads within the quarry footprint and between the quarry and the stockpile area. These roads would be constructed to a suitable grade and treated with gravel. Croppa Creek Road is trafficable in all weather conditions and the existing access to the property includes a rumble pad and hardstand treatment to prevent mud tracking or damage to the public road network, refer to Figure 30 above. The existing access was constructed in accordance with the requirements from Council for the Tikitere Quarry. Figure 31 shows the proposed haulage route for the operation of the Pearlman Quarry which is the same as the approved haul routes for the Tikitere Quarry.

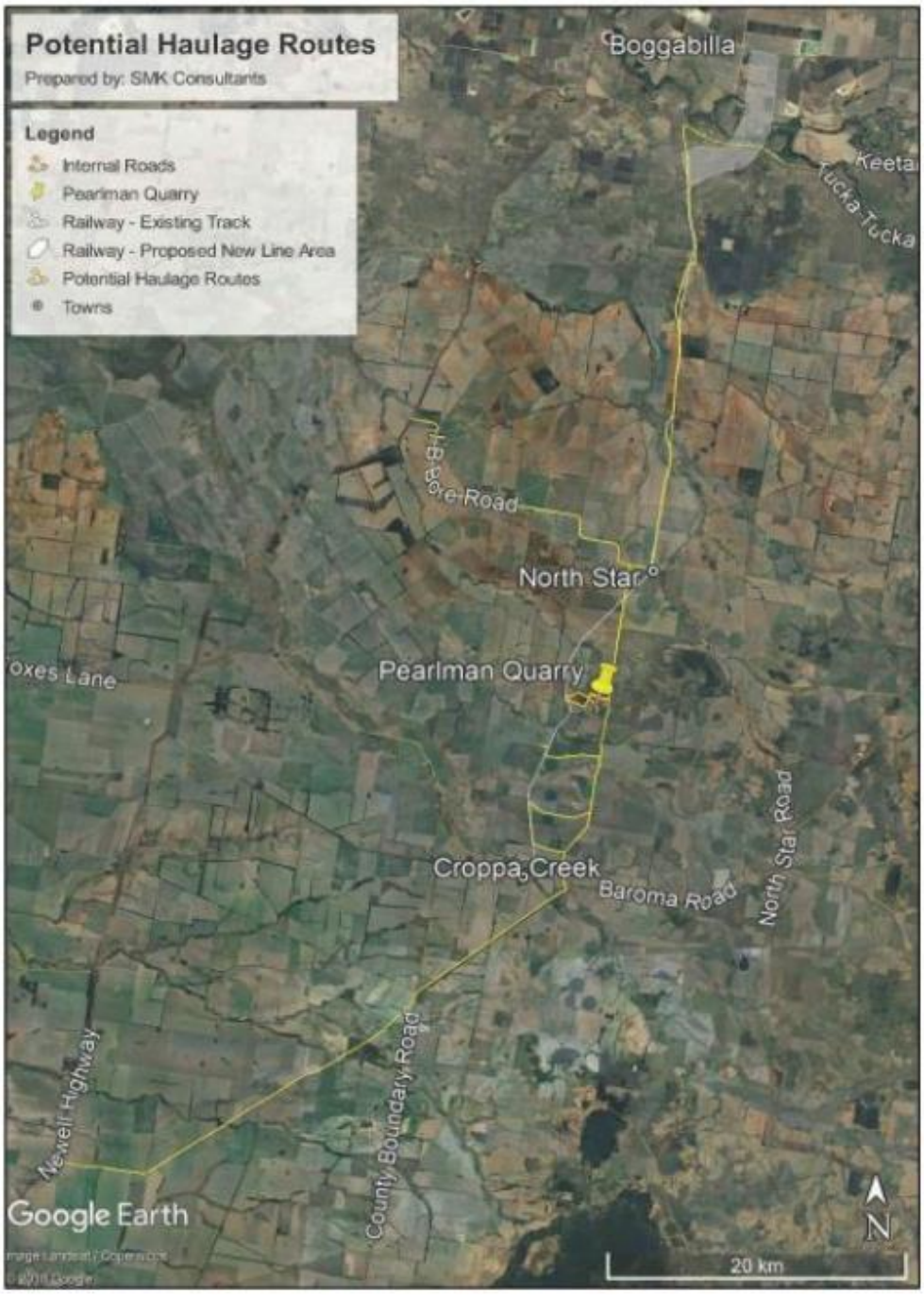


Figure 30 – Proposed Haulage Routes

The existing traffic volumes experienced along the haulage routes are shown below in Table 26 – Background Traffic Volumes. The table highlights the proportion of counts comprised by heavy vehicles. The recent traffic counts reflect the current levels of haulage from the adjacent Tikitere Quarry. The cumulative impacts of both sites operating are discussed further in later sections of the report. The expected traffic volume generated from the Pearlman Quarry is shown in Table 27 – Proposed Traffic Volumes.

Road	Date of Observation	Average Daily Traffic (ADT)	Heavy Vehicles
Croppa Creek Road	March 2011	143	29.5 (20%)
	Dec/Jan 2017	138.0	28 (20.3%)
	July 2019	161	50 (31%)
I B Bore Road	October 2014	32	6.39 (19.9%)
	March 2017	18	2.43 (13.5%)
North Star Road	September 2011	330	51.45 (15.6%)
	June/July 2013	788.43	644.54 (82%)
	March 2014	240	49.3 (20.5%)
	March 2017	297	55.69 (18.8%)
	July 2019	159	27 (17%)
Bruxner Way	June/July 2013	190.57	23.49 (12%)
	July 2019	194	31.04 (16%)
Croppa Moree Road	September 2014	153	23.9 (15.6%)
	March/April 2015	142.86	37.14 (26%)
	March/April 2017	106	21.10 (19.9%)
	July 2019	158	31.6 (20%)
Newell Highway	2015	3,911	1,329.74 (34%)
	2016	3,858	1,234.56 (32%)
	2017	4,051	1,336.83 (33%)
	2018	3,852	1,271.16 (33%)
	2019	3,825	1,185.75 (31%)

Table 266 – Background Traffic Volumes (adapted from SMK).

Traffic Calculations	
Tonnes Processed	490,000 tonnes/year
	9,800 tonnes/week
	1,782 tonnes/day
Trucks	12,895 trucks/year
	258 trucks/week
	47 trucks/day
Truck Movements	25,790 truck movements/year
	516 truck movements/week
	94 truck movements/day

Table 27 – Proposed Traffic Volumes (adapted from SMK).

The main impacts associated with increase in traffic from the Pearlman Quarry is as follows:

- Increased number of vehicles on the haulage routes
- Increased deterioration of the road pavement as a result of heavy vehicle usage
- Tracking of material/sediment onto the road.

A full traffic and access impact assessment has been undertaken by SMK Consultants to determine the impact traffic generated from the proposed development (refer to Attachment 9 – Traffic Impact Assessment).

The following management and mitigation measures should be implemented to ensure that the proposal has minimal potential impacts on traffic.

Management and Mitigation Measures – Traffic

Aspect	Control
Other Users	• Liaise with North Star and Croppa Creek School and school bus operators using North Star Road, IB Bore Road and Buckie Rd to ensure that any issues or complaints that affect school bus services are addressed. • Liaise with residents in Croppa Creek and North Star who will be impacted by the increase in transportation and traffic
Fleet Management System	Quarry Solutions manages their haulage fleet through an advanced GPS tracking system. The system provides several key operational features to enable maximum control and surveillance over the haulage fleet at any time. Features of the system include: • GPS monitoring of each truck for full duration of shift • Live monitoring of truck speed against road speed limits • Notifications of quarry management of erratic driving or speed limit violations • Proximity detector to advise driver separation distance to school bus • Driver fatigue / behaviour monitoring • Electronic load sheets for material tracking • Load count reporting to help maintain compliance with consent conditions • Quarry Solutions successfully implemented the system for the RMS Pacific Highway (Woolgoolga to Ballina) Upgrade Project.
Drivers	• Implement driver monitoring program including use of monitoring software and GPS tracking to ensure all vehicles used as part of the project are obeying road rules and driver code. • Prepare and enforce a driver's code of conduct, ensuring the code provides for the following minimum requirements: o All loads to be covered prior to leaving the quarry o All loads to be weighed prior to exit o Minimise exhaust fumes and compression breaking o Education on school bus routes and pick up / drop off times o Obeying all road rules o Speed limits and communication requirements o Operational hours
Noise	See Section 3.10
Air Quality	See Section 3.9
Surface Water	See Section 3.11
Wet Weather	Minimise truck movements on internal haulage roads immediately following rain events. Put measure in place to prevent mud tracking on public roads.

Maintenance	The haul route maintenance will be via road user development contributions and agreements with Gwydir Shire Council at 80c/tonne and Moree Shire Council at 50c/tonne.
Internal Haul Road	The internal haul roads will be gravelled or graded on natural surface to ensure that all weather access is achieved
Commitment	Traffic Management Plan to be development in accordance with Driver Code of Conduct

Based on the findings of the traffic impact assessment it has been concluded that the proposed development would result in a net increase in traffic generation from the subject site, but the at this traffic increase would not significantly impact upon road safety, traffic density, road utility or general amenity within the region. Road condition of designated routes to be utilised will be maintained through road user development contributions made to both Gwydir and Moree Plains Shire Councils. Consultation has taken place with both Councils. A rate of 80c/tonne has been offered to Gwydir Shire Council and 50c/tonne has been offered to Moree Plains Shire Council in order to cover the additional use of the roads in each shire. Overall through the adoption of the proposed mitigation measures identified the site can be managed to minimise impacts associated with traffic and access

Staff Comment

As can be seen from the Figure 30 above the roads earmarked for haulage use are not all under the jurisdiction of the Gwydir Shire Council, in particular State roads (eg Bruxner Highway) and road under the jurisdiction of other Council's (eg the western part of Tucka Tucka Road is in the Moree Plain Shire Council).

The proponent has suggested that amount of s94 Contributions be paid to the Moree Plains Shire Council of 50 cents per tonne. However, it would be presumptuous of this assessment to accept this rate on behalf of the Moree Plains Shire Council without expressed written permission. To date this permission has not been given. Therefore it is suggested that a condition be included in the Schedule of Conditions accompanying any approval, that obligates the proponent to enter into a written agreement with the Moree Plains Shire Council regarding this matter prior to commencement of works. In addition, a copy of that agreement be presented to Gwydir Shire Council as proof of this conditions fulfilment prior to commencement of the proposed quarry operations.

In accordance with information received by Council on the 5 February 2020 (See attached at Annexure 7) the following advice is offered by Council's Technical Services Department.

Section 94 contributions were calculated through analysis of historical maintenance costs of all routes specified within Gwydir Shire. Annualised rehabilitation costs were added to averaged annual maintenance costs to calculate total Council expenditure per year, per route. For ease of calculation, it was assumed that maintenance and rehabilitation costs are proportional to heavy vehicle traffic.

Using predicted traffic volumes provided by the applicant, expected yearly increases were calculated as a percentage of existing traffic, which were then applied to averaged annual maintenance costs (i.e. a 75% increase in heavy vehicle traffic would be expected to increase Council's expenditure by 75%). This was done on a road by road basis, and where the

applicant identified only a portion of a road as a haulage route that same portion of the cost was applied.

Note: Due to the variability is predicted traffic volumes and quarry output supplied to Council, forecast figures from 2021/2022 were used for the purposed of calculation.

For Example

Road X has existing heavy vehicle traffic counts of 100 vehicles per day and Council spends $100,000 per year on this road for maintenance. The Road is 100km long. The proposed development will generate an additional 50 movements and use 50km of the 100km road.
Increased cost to Council

- 50 new movements / 100 existing movements = 50% traffic increase
- 50% of current annual expenditure = $100,000 x 50% = $50,000
- Quarry traffic utilises only 50km of the road's 100km length = $50,000 x 50/100 = $25,000 increase per year
- Total quarry traffic via Council roads 240,000 tonnes per year
- Cost per tonne for Road X = $25,000 / 240,000 = 10.41 cents

The same calculations are then made for all nominated haul roads (excluding IB Bore Road) and summed to determine the final suggested contribution.

In the below s94 contributions table IB Bore Road is deemed unsuitable for quarry traffic. Volumes provided to Council for this road were applied to North Star Road

Road	Traffic Count (heavy)	Maintenance Cost (Annual Average)	Rehabilitation Frequency	Length	Length Trafficked	Percentage of Length Trafficked	Rehabilitation Cost (per km)	Cost to Rehab Entire Road	Annualised Rehab	Total Annualised Cost	Predicted Quarry Traffic	Percentage Increase Due to Quarry	Annual Cost Burden to Council
Croppa Creek Road	36	36420	40	23.19	23.19	100%	300000	6957000	173925	210345	23	64%	$ 134,387.08
IB Bore Road	9	36546.75	9	21.35	21.35	100%	30000	640500	71166.6667	107713.4167	0	0%	$ -
North Star Road	184	194080	40	81.72	19.29	24%	300000	24516000	612900	806980	25.3	14%	$ 26,192.04
Croppa Moree Road	28	24413.75	40	12.57	12.57	100%	300000	3771000	94275	118688.75	20.7	74%	$ 87,744.90
Crooble Road	5	8000	40	12.2	4.3	35%	20000	244000	6100	14100	5	100%	$ 4,969.67
Buckie Road	11	16795	40	2.15	2.15	100%	300000	645000	16125	32920	5	45%	$ 14,963.64

Total Increased Maintenance Burden) $ 268,257.33

Cost/tonne at 240,000 tones pa $ 1.12

The above process calculates a s94 Contributions figure of a minimum of $1.12 per tonne

Notes
As predicted traffic volumes for Crooble and Buckie Road were not provided by the applicant, 5 movements per day was assumed. As the Quarry entrance is located on Croppa Creek Road, and predictions provided to Council indicate approximately 50% of traffic will head north and 50% south, the increase applied to Croppa Creek Road for the purposes of calculations was 50% of the figure provided to Council. Where multiple traffic counts were available, data was averaged

Boonery Park Road and Tumba Road were excluded from the above calculations as a result of their very low volumes and minimal pavement. As both roads have poor to no pavement in places, their suitability as haulage routes is poor.

4.10 Waste, Chemicals and Hazardous Materials

Proponents Submission

The propose quarry is expected to produce larger amounts of waste than the existing land use. The waste that may be generated from the site during construction and operation of the quarry are identified as follows:

- Paper and general waste from the offices, workshops and amenities facilities
- Packaging wastes
- Scrap metals
- Rubber Tyres from Heavy Machinery and Equipment
- Waste oil, lubricants and coolants
- Chemical or herbicide drums
- Contaminated soils form any clean-up of any hydrocarbon spills
- Food scraps and liquid waste
- Vegetation wastes
- Used Batteries
- Building Wastes from the erection of site offices and crib sheds
- Wastewater and sewerage (portable toilets)
- Excess soil material

Potential impacts from waste generation, incorrect storage and disposal can include the following:

- Visual impacts
- Production of odour
- Fire Hazards
- Attraction of vermin and pest animals
- Contamination to land
- Contamination to surface water
- Contamination to groundwater
- Human exposure to contaminants and hazardous substances causing harm.

Management and Mitigation Measures – Waste

Aspect	Control

General	• All waste generated by the development will be managed in accordance with the waste management hierarchy below.  • Appropriate waste receptacles must be provided for the segregation and storage of waste. This includes recycle bin for bottles/cans vs general bin for food scraps/wrappers. • All wastes will be segregated onsite and disposed of with specific waste services providers. • Waste storage areas should be free from bush fire risk. Waste tyres will be stored in accordance with the NSW Fire and Rescue Guideline for bulk storage of rubber tyres 2014. • Bins and storage areas must be maintained so they are free of vermin (mice, rates, cockroaches, flies). • Littering is not permitted. All worksites must be free of litter, including cigarette butts. • No waste is to be burnt on site or removed from site and burnt at another place. • All waste streams are to be removed off site by a licensed waste contractor to a lawful point of disposal.
Waste Storage of Chemicals	• Bins and/or drums will be designated for the storage of used chemicals, empty chemical/paint/solvent containers, used filters, oily rags, batteries. • Bins and/or drums will be sealed, labelled and stored within appropriately bunded areas and where required in accordance with AS1940 – 2004 and located within waste management areas. • Spill kits will be strategically located throughout the project area and maintained as necessary. • Wherever possible recycle waste chemicals, liquid waste, drums, used filters, oily rags, batteries and dispose at a licensed waste facility.
Waste Avoidance	• Waste avoidance strategies to be embedded in the procurement process of the site. Including supply chain management, consideration of packaging by-products and the ability to buy in bulk to minimise waste.

	• Increased efficiency in the use of raw materials, energy, water such as fitting out the temporary site facilities with energy efficient fittings and fixtures. • Aim to accurately estimate and order quantities of materials required to avoid over supply.
Waste Reuse	• Consider the reuse of operational by products elsewhere in the operation ie regrading of solvents and hydrocarbons to degrease equipment when servicing, reuse of waste water for dust suppression, reuse of habitat feature logs/bush rock in the rehabilitation of the site, reuse of IBC pod for the missing of flocculants for sediment dam treatment. • All topsoil that has been stripped will be stockpiled separately and reused to rehabilitate the site. • Any surplus overburden materials are reused onsite for constructing safety bunds and ERSED controls, internal road. • Reusing silt/sediment onsite to maximum practicable extent.
Waste Recycling	• Segregate recyclable wastes from non-recyclable. • Recovering oils, greases and lubricants for collection by a licensed oil recycling contractor, recovering, separating and recycling packaging (including paper, cardboard, steel and recyclable plastics). • Recycling used plant and equipment to the maximum practicable extent.
Waste Disposal	• Where waste cannot be reused on site and is required to be disposed, recycled or treated offsite, all waste will be transferred to a location that can lawfully except the waste product. • The waste generator (the Quarry) will undertake due diligence on waste disposal sites to ensure the waste receiver can lawfully except the waste based on its classification.
Waste Storage	• Waste storage containers or areas are to be provided and located at safe and convenient locations. Each container will be identified with the type of wastes which may be disposed of in each container. Each container or area will be designed to prevent waste materials from being lost,

Management and Mitigation Measures – Hazardous Waste

Aspect	**Control**
General	• Hydrocarbon spills are up to be cleaned up immediately by controlling the source of the leak, containing the spill and using spill kit materials to absorb all materials. Following a spill, the hydrocarbon contaminated material will be placed in the regulated waste and the spill kit materials restocked.

	• Ensure employees are familiar with, and trained in the use of, proper spill clean-up procedures. • Refueling, equipment maintenance and cleaning of vehicles is to be undertaken within the designated area such as a hardstand, capable of capturing and containing contaminants to prevent release to land. • Maintain the chemical storage areas in a neat and tidy condition. • Bunds / spill trays are to be used during refueling and equipment maintenance. • Safety Data Sheets (SDS) of chemicals used on site shall be kept in a register at the site office. • An Emergency response Procedure has been prepared for spill events. • If applicable, hazardous materials signage must be erected at the entrance to the site and display the quantity, type and location of hazardous materials stored and handled at the site. • Maintain appropriate spill kits and Personal Protective Equipment (PPE) at designated locations on site (eg refueling locations, chemical storage facilities, mobile equipment).
Bunding and Storage	• Chemicals and fuels in containers must be stored within a bunded area at all times. • When jerry can are being used in the field consider temporary bunding equipment. • All hazardous chemicals, corrosive substances, toxic substances, gases, dangerous goods, flammable and combustible liquids must be stored and handled in accordance with the relevant legislative requirements and Australian Standards including but not limited to the provisions of: o AS 1692 2006 – Steel tanks for flammable and combustible liquids o AS 3780:2008 – The storage and handling of corrosive substances o AS 1940:2004 – The storage and handling of flammable and combustible liquid o AS 3833:2007 – Storage and handling of mixed classes of dangerous goods in packaged and intermediate bulk containers. • Bunding will be constructed of material which is impervious to the material that is to be stored in the bunded area. • Bunds will be kept in good condition (eg no cracks, gaps or leaks). • Roofed storage facilities are to be provided where possible. • Stormwater captured within the bunding is to be removed as soon as practicable and appropriately disposed of as contaminated water. This will be checked prior to and

	following rainfall events. All bunded areas exposed to the weather will be covered in plastic to prevent the ingress of clean water into the bunds. • A collection sump or valve must be provided in the floor of the bunding to facilitate the removal of liquids. • Development site-specific procedures for storing hazardous material including details on: o Quantities of hazardous materials will be kept to a minimum, commensurate with their usage and shelf life o SDS's of stored hazardous materials will be readily accessible at the place of storage. o Permanent and temporary containers that hold hazardous materials will be labelled with the relevant safety and risk phrases. o The volume and types of hazardous materials stored will be known, current and documented and will not exceed the design capacity of the storage area. o Hazardous materials that may degrade in storage and thus become dangerous will be identified and managed. o Storage and containment areas (including secondary containment) will be inspected for signs of loss or damage and any deficiencies will be addressed. o Dangerous goods will not be held in transport storage areas for longer than fire consecutive working days. Where they are required to be stored for longer periods, they will be moved to permanent hazardous materials storage areas o Hazardous materials storage areas will be kept clear of combustible material, vegetation and refuse by a minimum of three meters.
Refuelling	• Temporary bunding, drip trays or impermeable matting must be used to prevent spillage from any in field refueling or maintenance of plant and equipment, or any other activity that could result in spillage of a chemical, chemical, fuel or lubricant to soil • Refueling of plant and vehicles must be conducted in designated areas away from sensitive receptors and at least 100 m away from watercourses, water holes, lakes and wetlands. All in field refueling must include the use of a temporary bund to contain spills • Refueling will utilise auto shut off valves • Refueling trucks and designated refueling areas will include ample spill kits material in the event of an emergency spill. • One dedicated smoking area will be established away from the refueling and hydrocarbon storage areas. Signage will be implemented to remind workers not to smoke around areas where hydrocarbons are being used.

Plant/ Equipment/ vehicle maintenance	• All vehicles, plant and equipment must be maintained in accordance with manufacturer's specifications and kept in good working order • Routine maintenance and inspections of earthmoving equipment must be conducted including daily restart and regular maintenance. • All scheduled maintenance activities must be undertaken at designated workshop areas. • For major plant and equipment maintenance activities works will be undertaken off site.
Disposal	• Hydrocarbon and chemical contaminated materials are to be appropriately disposed of at a licensed facility. • If the material is a trackable waste, it will be transported and disposed of by a licensed contractor. • A waste register for the disposal of waste will be maintained and the corresponding weighbridge dockets verifying the volumes of waste and truck rego will be maintained.
Contaminated Land	• A hydrocarbon management procedure detailing the management of spills is to be developed and the workforce trained on this procedure. The procedure will refer to the Pollution Incident Response Plan, which will verify the process to follow in the event of a spill resulting in a pollution event. • If widespread contamination occurs as a result of the construction activities, then management will be carried out in accordance with the contaminated land provisions of the EO Act, national Environment Protection (Assessment of Site Contamination) Measure 1999 (NEOM, 1999). Broadly, the management measures will include the following: o A site contamination assessment (SCA) will be undertaken in accordance with the NEPM. o Management and remediation will adhere to any Site Management Plan or Remediation Action Plan that has been approved by the administering authority. o Validation sampling will be conducted to verify that remediation is successful, and any further remedial actions implemented as required.
Commitments	• Quarry Environmental Management Plan to include a Waste Management Strategy • Pollution Incident Response Plan (PRIMP) to be developed.

Based on the adoption of these mitigation measures the site can minimise waste management impacts to an acceptable level. It is recommended that a Waste Management Plan (WMP) is prepared to further describe waste management procedures, protocols, monitoring and response to pollution incidents. The WMP should

be prepared in conjunction with a Pollution Incident Response Management Plan as required.

Staff Comment

Staff agree with proponent's submission. A Waste Management Plan will be prepared, as a part of the Quarry Environmental Management Plan, and submitted prior to the operation of the proposed quarry. Conditions have been included in the draft schedule of conditions to manage and monitor the storage, application and disposal of waste materials.

4.11 Biosecurity

Proponents Submission

The presence of weeds is expected to be associated with the existing agricultural use of the site.

The potential impact that weeds can have on the area surrounding Pearlman Quarry include;

- Spread of weeds along access and haulage routes of the site through the movement of vehicles, machinery and waste.
- Increasing the prevalence of weeds on the site which may contribute to the reduction in quality of habitats for some flora and fauna species, particularly by replacing native plants. This can apply to both the areas of vegetation being retained and also the quality of the rehabilitation of the site.
- Site management practices that could result in an increase in the population of pest animals.

To reduce the risk of these potential impacts occurring, the propose mitigation measures are detailed below

Management and Mitigation Measures - Biosecurity

Aspect	Control
Awareness	• Site inductions for all staff must include information regarding the local weed and pest species that may be present, and protocols required to be undertaken for control of these species. • Training must be provided to all staff regarding the weed identification and management procedures, protocols and restrictions placed on bringing domestic animals onto the site. • All personnel entering the site must be advised of their responsibilities for declared weed management, cleaning procedures for vehicles and equipment, weed identification and weed reporting. • Make all personnel aware of The General Biosecurity Duty (section 22 of the Biosecurity Act 2015).
General	• In times of drought or in dry conditions, wildlife and pest animals travel looking for food and water sources. The following needs to be considered during construction;

	○ Fence or secure general waste areas (food scrap bins). ○ Reduce access to water sources such as sediment basins and areas of quality fresh feed such as newly rehabilitated areas. This may involve erecting exclusion fencing around the perimeter of these areas. ○ Refuse workers bringing domestic animals on site.
Prior to Construction	• Prior to construction, a baseline weed surveys to identify initial weed populations and ongoing monitoring of these populations and for any new occurrence are to be undertaken. • Signage is to be installed at weed hot spots identified through the survey. • Vehicles and equipment are to be cleaned before being brought to site and inspected on entry to site. • Vehicles and earthmoving equipment imported interstate for project use will be thoroughly cleaned at their point of origin to mitigate introduction of foreign seed and soil potentially harmful to Australian flora and fauna.
Infested Areas	• Signage is to be installed to identify weed affected areas being treated with herbicide. • Weed control will be undertaken in areas that are very heavily infested or where WONS or Class 1 or 2 weeds present prior to disturbance. • Restricted access to infested areas must be in place until all control measures are implemented. For any substantial outbreak of a declared plant detected in the approved construction area or access tracks the area must be isolated with no access permitted until the area is declared to be controlled for weeds. • All materials including gravel, mulch, packing materials, sand and soil must be inspected and be certified as pest free before being accepted at site. • Plant, equipment or other items that may be moved from one property to another must be visually inspected prior to movement. • A weed hygiene certificate may be required to accompany plant, equipment or other items if requested by the landholder.
Chemical Control	• In the event that chemical control is required, personnel undertaking chemical weed control measures must be qualified to store, transport and apply chemicals. • All chemicals must be approved by the Site Manager or representative prior to use.
Soil Material Importation	• All soil and materials of plant origin that are to be imported to site are to be certified as weed free by the supplier. • Waste management measures should include containment of food scraps in securely sealed containers.

Earthmoving	• Soil stripped and stockpiled from areas contain known weed infestations, particularly of declared weeds, are to be stored separately and are not be moved to areas free of weeds. • Where applicable and appropriate, disturbed topsoil and vegetative material will be returned as close as possible to the original sites in order to limit potential spread of weeds and pathogens. • Vegetation and soil waste should not be moved to areas of lower weed infestation.
New Infestations	• New weed infestations, breach of vehicle hygiene, feral animal sightings and any suspected plant or animal diseases will be photographed and reported to the Quarry Manager immediately. • All declared pest plants detected will be fenced out with exclusion fences so treatment can take place.
Pest Animals	• Pest animal occurrence will be monitored during construction. If increased densities of pest animals are observed, or new pest animals are identified, pest abatement program will be established and implemented.
Commitments	• Quarry Environmental Management Plan to include a Weed and Pest Management Strategy

Implementation of the above mitigation measures will minimise potential biosecurity impacts to an acceptable level.

Staff Comment

Council agrees with comments made. A condition has been included in the draft schedule of conditions referring to the management of weeds and pest.

4.12 Land Contamination

Proponents Submission

The subject land has been historically developed for agricultural purposes. As activities have been limited to grazing, cultivation and other agriculturally related activities. Whilst some chemicals, including herbicides are typically utilised as part of normal farming practices, these chemicals are generally unstable, volatile products which biodegrade over time. If these chemicals are present, current concentrations of chemical residue would be negligible and would not impact the quarry site. The contaminated land register has been checked to verify no contamination is present on the subject site in the form of old sheep dips, dump sites or tanneries. It is therefore considered that no further investigation into land contamination is required.

The impact of the quarry operation impacts would most likely arise from spill of hazardous / contaminating substances.

The following measures will be implemented to reduce the likelihood of land contamination occurring, and in the event, contamination does occur, how the land will be restored.

Management and Mitigation Measures – Land Contamination

Aspect	**Control**
Hazardous Substances Management	• See Section 3.17
Spill Response	<u>Initial Response</u> • The spill will be assessed to identify the type of oil (lube oil, diesel or chemical0, location of the spill source, the quantity of oil spilled and its environment, community, health and safety impact. The Incident Controller will undertake immediate steps to spill containment/control, recovery of spill material and waste management. • Implement Spill Response Plan • Cease the spill where reasonable, safe and practical to do so. • Where reasonable, safe and practical to do so prevent spill from entering drainage features or water courses and absorbent material will be placed on spillages which will be collected for disposal and any contaminated soil removed for treatment and disposal <u>Clean Up</u> • Clean up spills immediately and dispose of contaminated soil and clean-up materials off site at an appropriate facility. • Undertake water or soil sampling as required • Undertake an investigation. • In relation to environmental incidents, reports to the administering authority of the EP Act must include "the event, its nature and the circumstances in which it happened". Environmental incident investigations and report will cover: o A description of the incident, including witness accounts o A description of any releases to land, air or water or other environmental harm that may have occurred, including loss of native plants or habitat for native animals. o A description of the environmental values affected or potentially affected. o Whether releases or other harm caused by the incident was in excess of prescribed standards or requirements (for example, whether particulate emissions exceeded compliance levels, or whether vegetation was cleared outside of area where clearing was authorized). o Whether a formal non-compliance with legislative requirements or approval conditions occurred. o Whether the incident constituted serious or material environmental harm.

	○ Whether internal procedures or requirements were breached. ○ Formal and informal reports and notifications made internally and externally. ○ A review of the causes of the incident or near miss. ○ Recommendations in relation to actions required to rectify any environmental harm or damage that may have occurred. ○ Recommendations in relation to preventing a recurrence of the incident or near miss. These may include: ▪ Disciplinary action against individual employees ▪ Revision of procedures and work methods ▪ Maintenance, repairs or re-design of infrastructure, facilities or equipment. ▪ All recommendations from incident investigations will be included in the corrective action register.
Remediation	• Ideally contaminated land is to be managed at the time of the incident by removing and remediating the impacted area in accordance with the appropriate guidelines and standards. • Prior to decommissioning the temporary disturbance areas, a contaminated land assessment by a suitably qualified person may be required to be completed if spills or potential contamination has occurred. Should it be identified that areas of the temporary disturbance areas have been contaminated, these areas are to be remediated and then validated as contaminant free. • Assessment of site contamination, if required, is to be undertaken and managed in accordance with the following: ○ National Environmental Protection (assessment of Site Contamination) Measure 1999 (amended 2013). ○ Australian Standard (AS 4482.1-2005) Guide to the sampling and investigation of potentially contaminated soil. Part 1 – Non-volatile and Semi- volatile compounds ○ Australian Standard (AS 4482.2-2005) Guide to the sampling and investigation of potentially contaminated soil. Part 2 – Volatile compounds
Commitments	• Quarry Environmental Management Plan to include Waste Management Strategy • Preparation of a Pollution Incident Response Management Plan (PIRMP)

Land contamination impacts from the operation of the Pearlman Quarry may occur from spills of hazardous substances / contaminants. By adopting the mitigation measures above potential impacts for land contamination will be minimised.

Staff Comment

Council agrees with comments made and Council concurs with the proponents findings with relation to existing contamination issues on site. The preparation of a Pollution Incident Response Management Plan and the mitigation measures and Waste Management Strategy included with the Quarry Environmental Management Plan will form part of the Draft Schedule Conditions of consent

4.13 Rehabilitation

Proponents Submission

As the quarry reaches the end of its lifecycle, areas of the site that are surplus to operational needs will be identified for rehabilitation. The key outcomes sought for the rehabilitation of the site are as follows;

- Produce a stable landform capable of supporting grazing purposes
- Establish groundcover across all disturbed areas to ensure that erosion is minimised
- Ensure that all areas drain adequately to prevent water logging and also prevent concentrated flows that may result in scour.
- Maximise biomass of groundcover to provide a resilient and functional landform.

The area disturbed for the quarrying activity will be rehabilitated to a suitable standard for supporting ongoing rural activities.

Management and Mitigation Measures – Rehabilitation

Aspect	Control
Rehabilitation	<u>Removal of Infrastructure</u> • Site buildings, plant an d equipment will be removed at the cessation of the extraction activities. • There are no site services that will require rehabilitation at closure as these services will be made available through alternative means (ie generator for power, rainwater or bore water for water use, satellite phones for communications etc). • Roadways and haul roads that are not required post quarrying land use will be decommissioned and rehabilitated. • Roadways and haul roads that are not required post quarrying land use will be decommissioned and rehabilitated. These areas will be re-profiled to march surrounding rehabilitation profile, ripped and seeded to encourage vegetation regrowth. • All refueling will be done via service trick to eliminate the need to store large quantities of fuel onsite. If necessary, any contaminated soils will be preferentially treated on-sit in accordance with the recommendations of the Site Based Management Plan (SBMP) or any recommendations from the site-specific contaminated land assessment. <u>Rehabilitation of Sediment Basins</u> • Any sediment basins will be retained as agricultural dams. • Alternatively, sediment basins may be filled to a level consistent with the surrounding landform.

	<u>Landform Shaping</u> • When the floor level for a working area has been excavated to its final extraction level and is no longer required for ongoing quarry activities, the floor will be graded to encourage water drainage in the appropriate direction. • Once desired landform shape has been achieved the area will be top soiled and seeded to achieve ground cover and stable landform. <u>Soil Preparation</u> • Remove any weed species which may be present in the overburden and topsoil stockpiles prior to using in the rehabilitation works. • Carry out soil tests to determine whether any soil ameliorants (eg nutrients, lime, gypsum) are required to improve the quality of the topsoil an overburden for supporting vegetative growth. • Spread topsoil a minimum depth of 0.1m. The topsoil should be moist but not wet when spread. • Incorporate any required soil ameliorants during the spreading works. • Topsoil is to be levelled to achieve an even roughened surface. • If the operational requirements permit, topsoil and overburden materials can be placed directly over the quarry floor area as an alternative to stockpiling these materials. <u>Revegetation</u> • Return the land to a conditions capable of sustaining the ongoing rural land use. <u>Stockpile Areas</u> • Areas that have been used for stockpiling will be deep ripped and treated with an ameliorant if required. These areas will be restored to a condition suitable for supporting agricultural production.
Commitments	• Quarry Environmental Management Plan to include a: o Erosion and Sediment Control Plan (prepared in accordance with DECC, 2008 *Managing Urban Stormwater Soils and Construction Vol 2E*); and o Rehabilitation Management Strategy; and o Pest and Weed Management Strategy.

To ensure sufficient financial resources are available to implement the above rehabilitation strategy the proponent has committed to $15,000 to be set aside over the course of the operation for this purpose. As the site approaches the end of its lifecycle, topsoil resources, earth moving equipment and labour will already be available on site and can be utilised for rehabilitation. Therefore, the costs will be mainly in seed and fertiliser purchases. Based on this it is considered that the proposed funds are adequate to satisfy the rehabilitation objectives

Staff Comment

The rehabilitation of the site to a landform able to sustain cropping is considered to be satisfactory. Although, the site is able to be returned to pre-excavation conditions and the loss of vegetation to the area is not ideal, the retention of the 50m vegetation corridor along the norther boundary is considered to adequately provide fauna passage between remnant vegetation island.

It should be noted that the budget set aside for the rehabilitation works of $15,000, would seem to be quiet conservative when considering the amount of work to be carried out including the initial landform establishment, revegetation and the ongoing maintenance of the site to ensure a self-sustaining outcome. However, the proponent has advised that this estimate does not include the cost of equipment and labour as these will already be available on site.

It is recommended that a condition be placed in the draft schedule of conditions that emphasis the need for sufficient funds to be made available to achieve the outcomes stated in the EIS, Rehabilitation Management Strategy and another measures stated with the Quarry Environmental Management Plan.

4.14 Social Impacts

Proponents Submission

The proposed location is considered suitable for the purpose of developing and operating a quarry with respect to land use zoning and the intended purpose of the land. A description of the surrounding land use and sensitive receptors as detailed in Section 3.7.

An assessment of potential social impacts of the proposed development has been undertaken with regards to scoping methodology outlined in the Social Impact Assessment Guideline (2017) (SIA Guideline), published by the Department of Planning and Environment. The proposed development has the potential to result in adverse social impacts (eg adverse amenity or sense of community) in the absence of the implementation of any mitigation measures. The Checklist of Matters Assessment below provides on assessment of the proposed development against the identified social impact assessment checklist matters.

Checklist of Matters Assessment

Matters		Key Links to Social Impacts	Risk of Impact Without Mitigation	Nature of Impact	Explanation
Amenity	Acoustic	Way of life;	Likely	Negative	Noise generated from machinery, vehicles and processing equipment may impact on neighbouring properties, however assessments have confirmed the relevant noise criteria can be complied with.
	Visual	Surroundings	Unlikely	Negative	The quarry might be visible from some areas on public and private land; however, mitigation measures are in place to manage this.
	Odour	Surroundings	Unlikely	Negative	Quarry operations will not produce a strong odour.
	Microclimate	Surroundings	N/A	Nil	Quarry operations will not significantly impact microclimate.
Access	Access to property	Way of life;	N/A	Nil	Development will not impact on access to neighbouring properties.
	Utilities and public transport	Access to infrastructure, services and facilities;	Unlikely	Negative	The proposed development will utilise public roads for transportation. This will not result in the reduction of access to public transport services.
	Road and rail	Personal and property rights.	Unlikely	Negative	The proposed development will utilise public roads and rail sidings for transportation. However, this will not preclude the public from access roads and rail facilities as a result of the project. Potential impacts to public roads will be managed and mitigated.
Built Environment	Public domain	Community;	N/A	Nil	The development will not impact the public domain as it will be located on private land.
	Public infrastructure	Access to infrastructure, services and facilities;	N/A	Nil	As per above the proposal will not preclude public access to public infrastructure.
	Other built assets	Surroundings; Personal and property rights.	N/A	Nil	As above.
Heritage	Natural	Way of life;	Unlikely	Negative	The proposed development will not impact on the way of life for the surrounding community.
	Cultural	Community;	Likely	Negative	The subject site does not contain any non-aboriginal cultural heritage values. An unexpected finds procedure will be implemented when undertaking quarry construction / operations.
	Aboriginal culture	Culture;	Likely	Negative	Where Aboriginal cultural heritage values have been identified. These areas have been marked as no-go zones and a buffer area established around the site. An unexpected finds procedure will be also be implemented during construction and operation
	Built	Surroundings.	Unlikely	Negative	The subject site does not contain any built heritage values.
Community	Health	Health and wellbeing;	Likely	Negative	Dust and noise emissions are expected to be below NSW guidelines and comply with the relevant EPA criteria, therefore minimising the possibility of health impacts within the community.
	Safety	Surroundings;	Likely	Negative	Increased traffic between Croppa Creek Rd and the Newell Highway presents potential for road safety issues however these aspects are mitigated through a traffic management plan, approval haulage routes and driver behavioural measures.
	Services and facilities	Way of life; Access to infrastructure, services and facilities;	N/A	Nil	The proposed development does not impact on public services or facilities.
	Cohesion, capital and resilience	Way of life; Community; Culture;	Likely	Positive	The proposed development will provide employment opportunities for the region. However, the scale of the quarry operation is not large enough to artificially inflate the cost of housing in nearby townships.
	Housing	Way of life; Personal and property rights.	N/A	Nil	As per above.
Economic	Natural resource area	Way of life;	Likely	Positive	The quarry will utilise available natural resources in a sustainable manner. The natural resources consumed will be supplied to support the construction of the Inland Rail Project and associated road projects which has significant benefit to the region.
	Livelihood	Surroundings;	Likely	Positive	The proposed development will provide employment and training opportunities for the area. The economic activity generated by the proposed development will also relate to the longer-term benefit to the region through the construction of the Inland Rail project and associated road projects.
	Opportunity cost	Personal and property rights	N/A	Nil	The net benefit to the community far outweighs the loss of natural resources in term of vegetation (being offset) and the consumption of geological resources.
Air	Air emissions.	Surroundings	Likely	Negative	The proposed quarry will comply with the NSW EPA air quality criteria. Air quality mitigation measures will be implemented.
Biodiversity	Native vegetation and fauna	Surroundings	Likely	Negative	Vegetation clearing is proposed on site however the net loss of biodiversity impacts is offset by the provision of biodiversity credits under the biodiversity assessment method and associated trading scheme.
Land	Stability/structure, land capability	Surroundings	Likely	Negative	While the quarry operation will disturb the land controls will be in place and at the cessation of quarry activities the site will be rehabilitated.
Water	Quality, availability	Surroundings	Unlikely	Negative	Soil and water management measures will address any potential impact to surrounding water bodies and hydrological flows.

Management and mitigation measures for each of the elements comprising a social impact have been addressed in their relevant sections of the EIS. Based on the implementation of these management measures the net result will relate to social impact being minimised.

Staff Comment

The proposed development has the potential to generate a positive economic impact on the surrounding locality by providing additional employment opportunities. In addition, the proposal has the potential to increase economic activity in the long term by supporting the reconstruction of the rail line. The reactivation of the inland rail line will ultimately provide an alternate and economic means of transporting goods and material between Melbourne and Brisbane than is currently used. It is hoped, that the

development of the inland rail will relieve the local road network of at least some heavy vehicle traffic and road maintenance.

However, in the event that the facility is managed in a manner which does not minimise potential noise and dust nuisance, the proposal may have a social impact on residential dwelling-houses in the immediate locality and increase heavy traffic along haulage routes. The effect of haulage of materials through the village of North Star may impact the greater amount of residents and in particular the North Star School. It will be essential that haulage vehicles travelling through North Star behave with upmost care and curtesy to avoid and minimise any negative impacts on those residents.

The proposed quarry expects to create 5-10 employment positions (including traineeship) most of which will be sort from the local area. In addition the quarry will require off site services such as mechanic, water supplier/carters, cleaning, waste removal, accommodation and catering which may assist in supporting local businesses.

Council is not in the position to determine whether the proposed development will have either a positive or detrimental effect on surrounding property values.

It is considered that any negative social impacts unable to be avoided or mitigated to an acceptable level will be temporary and minor in nature. The draft conditions of consent will contain provisions for complaint handling and recording.

4.15 Economic Impacts

Proponents Submission

The capital investment value of the proposed development is estimated to be less than $23,440 excluding GST consisting of the cost required to treat haulage roads, construct a sediment basin and the rehabilitation of the site following completion of the quarrying. All plant and equipment associated with the quarry have a lifecycle beyond the operational life of the quarry and will be redeployed from the site once the construction activity in the area is completed.

The proposed quarry operations will stimulate economic activity within the local area. This will include the creation of employment opportunities which are targeted at sourcing applicants from within the local area. It is important to note that these opportunities include traineeships for young people to assist in the transition from leaving school to full time employment and skills growth. As the quarry operation has limited staff, local support services are relied upon for the secondary functions of the site. These services may include but are not limited to waste service providers, mechanical services, cleaning services, fencing contractors, fuel supply services, weed and pest control services, water supply services and plumbing and building services. The quarry's procurement strategy targets locally sourced services and supplies to ensure sustainable principles are adopted.

Majority of the workforce will be locally sourced, however infrequent site visits from specialist contractors and quarry management staff will also generate indirect employment in the local area in the provision of hospitality services, fuel supply and other miscellaneous items required for short term visits to the area.

Overall, the resource available at the Pearlman Quarry are required to provide construction materials to projects of state and regions significance. In turn these projects have far reaching benefits to the wider community through achieving greater efficiency of interstate freight logistics across the eastern seaboard. To ensure the efficient construction of these projects, locally sourced quarry products are required. Through supporting these infrastructure projects form the local regional setting, the community can benefit from increased demand for labour, resources and services which are beyond the traditional economic base of the region.

Staff Comment

As also stated in s 4.15 above the proposed development has the potential to generate a positive economic impact on the surrounding locality by providing additional employment opportunities and supporting the Inland Rail Project. In addition to providing direct employment opportunities the proposed quarry will also require support from the local areas business and service providers, such as providing food, accommodation, fuel, mechanical service etc. This will have a positive economic impact on local business and service providers as a new source of income.

In the long term, once the inland rail line is re-opened, the potential ripple effect in providing rail infrastructure may enhance the local agricultural industry by providing economical transportation of materials and greater accessibility to markets. Another economic saving is also anticipated in the long run as a result of the rail re-opening and that is less road maintenance and heavy vehicle traffic on local and state roads.

Council is not in the position to determine whether the proposed development will have either a positive or detrimental effect on surrounding property values.

On the other hand the proposed development may create a negative economic drain on the quality of roads and road safety. As much as possible these impacts will be mitigated through Development Contributions and an effective Traffic Management Plan.

Of course the quarry operates in a sector which depends on the extraction of a finite resource, so the immediate economic benefit of the quarry will only be felt for as long as the quarry is operating. Thus the local economic benefit and employment may only be short term.

It is considered that in the short term the proposed quarry will be on economic benefit to the local area and that the re-opening of the Inland Rail will benefit the local area and the region in the long term. Overall, it is considered that the proposal will have a positive economic impact but the scale of that impact is not easily discerned.

4.16 Cumulative Impacts

Proponents Submission

Potential cumulative impacts are those which are generated by the combined impacts on the local environment as a consequence of the project, together with other developments of a similar nature (both existing and proposed). For the purposes of the EIS, the assessment of cumulative impacts considers the impacts of existing and proposed extractive industry development in the local area.

As described in earlier sections of this report the surrounding land use in the immediate vicinity are predominantly comprised by agricultural activities. The Tikitere Quarry is currently operating at the site however the resource base of this quarry is diminishing as it has been operational for a number of years. The Tikitere Quarry will be near expiration after the first year of the Pearlman Quarry becoming operational. As such the cumulative impacts of both quarries operating concurrently will be limited. Regardless cumulative impacts of these quarries operating simultaneously have been assessed. Noise, dust and traffic impacts have been modelled based on these assumptions that have determined cumulative impacts are acceptable.

The impacts of the proposed development are mostly confined to the site and haulage route allowing the receiving environment to maintain social, economic and environmental objects. Accordingly, no further cumulative assessment is required.

Despite the impacts, the proposed development does have some social and economic benefits. The operators of the proposed quarry do actively support the local communities that they work within by offering local school's opportunities for educational site visits and other community groups. They also actively support local charities and sporting activities in the region. The employment opportunities mentioned above extend to local community and include trainee programs to target school leavers, university students and local indigenous groups.

Overall the proposed development does include some positive contributions which extend beyond the zone of impacts. Accordingly, cumulative impacts of the proposed development are considered to be compatible with the rural setting of the site and its surround.

Staff Comment

The quarry proposal's cumulative impact have been calculated to include the current operation of the 'Tikitere Quarry', which operates on the same property as the proposed Pearlman Quarry. Information provided to Council (being the number of tonnes of material extracted) emerging from the existing operation would suggest that it has not reached anticipated rates of extraction and haulage. This suggests that either 'Tikitere Quarry' is not fully operational as yet or that the anticipated available resource was exaggerated. The main issue with this is that it is now difficult to denounce whether the cumulative, noise and dust impacts have been accurately assessed in the EIS.

A search of the local area have only found one other potential land use which should be included in the cumulative calculations and that is the Myola Feedlot which is located approximately 6.2km south of the proposed quarry. The Myola Feedlot also uses the Croppa Creek Road for the haulage of livestock and feed products. At present the feedlot when operating at full capacity can accommodate 20,000 head of cattle per day. This will soon become 35,000 head once the approved expansion has been completed.

It is considered that, as the main impacts have been identified by the applicant and the government agencies, the mitigation and control measures proposed will be adequate to minimise any negative impacts on the surrounding environment, agricultural operations and residential uses. These have been included as conditions of consent.

That being said if the operation of the quarry, including haulage activity, is in accordance with "good management practices" there still may be at times some minor loss of amenity and inconvenience for surrounding rural residences and road users in respect of noise, dust, vibration and traffic.

4.17 Ecologically Sustainable Development

Proponents Submission

Ecologically Sustainable Development (ESD) is defined as:

> "Using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased" (DPM 1990).

The principals of ecologically sustainable development are as follows

a) *The precautionary principle, namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principal, public and private decisions should be guided by:*
   i. *Careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment, and*
   ii. *An assessment of the risk-weighted consequences of various options*

The proposed Quarry will be developed in accordance with relevant Guidelines. As the Pearlman Quarry will be operated as per the measures highlighted in this EIS, the proposed development is expected to be a sustainable operation for the duration of its lifecycle without irreversible environmental harm to the environment.

b) *Inter-generational equity, namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.*

The proposed development is not expected to have any long-term environmental impacts that would impact future generations. The areas subject to ground disturbance will be returned to a functional landscape through quality land rehabilitation treatments. Additionally, the quarry footprint has been modified to retain and preserve a scar tree site for the benefit of future generations.

c) *Conservation of biological diversity and ecological integrity, namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration*

The proposed development has been planned to avoid areas of high-value remnant vegetation. Conservation of biological diversity has been a key component of consideration of the quarry layout. Management measures are in place to ensure that areas of existing ecological integrity are maintained as part of the proposed development.

d) *Improved valuation, pricing and incentive mechanisms, namely, that environmental factors should be included in the valuation of assets and services, such as:*

i. *Polluter pays, that is, those who generate pollution and waste should bear the cost of containment, avoidance or abatement,*
ii. *The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste,*
iii. *Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, that enable those best place to maximise benefits of minimise cost*

The proposed development includes several development costs associated with environmental factors. These costs are directly proportionate to the scale of the development and costs will not be passes on through the supply chain or market mechanisms.

In conclusion, the proposed development can be supported based on achieving the objectives of ecologically sustainable development.

Staff Comment

Council agrees with comments made.

5. S.4.15 (1) (c) The suitability of the site for the development

5.1 Meteorology and Climate

Proponents Submission

The Pearlman Quarry is located within the Gwydir River catchment which is characterised by a temperate to sub-tropical climate, with a considerable gradient from east (cooler and wetter) to west (hotter and drier). Average rainfall ranges from 1,000mm per year in the east to around 500mm in the west.

The Bellata Post Office, which is the closest BOM station that could provide comprehensive rainfall data. The weather station is located approximately 10km south east of the site and is considered suitable for use in understanding the expectant rainfall conditions at the site. Rainfall statistic show a mean average rainfall at Bellata Post Office of 603.7 mm per annum, which accords with the characteristics of the Gwydir River catchment, with the majority of total rainfall occurring in the summer months.

The closest weather station to provide comprehensive climate data is the Moree Aero BOM site. The weather station is located approximately 40km west of the site. Wind roses have been sources from the BOM for Moree Aero Station, which show both the annual and seasonal wind characteristics. Wind roses summarise the occurrence of winds at a location, their strength, direction and frequency. These are particularly important when planning for potentially high dust generating activities, and selection of appropriate mitigation measures.

Figure 7 – Annual – Calm 19%

Figure 8 – Summer – Calm 9%

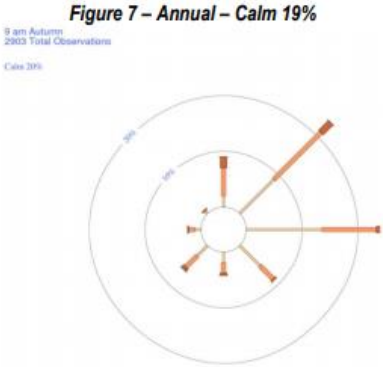


Figure 9 – Autumn – Calm 20%

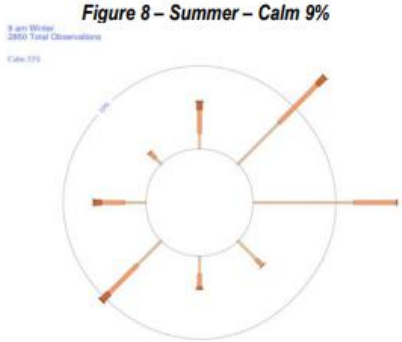


Figure 10 – Winter – Calm 30%

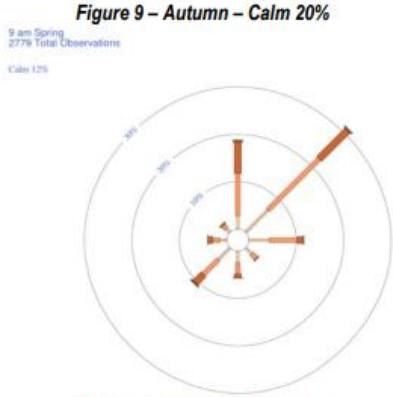


Figure 11 – Spring – Calm 12%

The wind rose data shows that Winter has the highest proportion of calm conditions, the highest wind speeds are over the Winter period and the predominant wind direction over the annual period is from the north east.

Climatic data detailed above, forms a basis of environmental management, particularly with regard to air, water, noise and land management.

5.2 Topography, Soils and Geology

Proponents Submission

<u>Topography</u>

The site is located on what is locally referred to as Death Adder Hill, at approximately 328m AHD at its peak. The landform is based on a ridgeline which extends from the south east to the north west, forming a watershed.

Given this, the site currently drains overland to lower order ephemeral drainage lines which connect through cropping land to Tackinbri Creek.

Cross sections as depicted in Figures 12-14 for the site have been prepared belwo, sourced from Google Earth, to provide an appreciation of the current condition of the site with respect to existing topographical characteristics.

Cross Section A shows the cross section in a north east to south west direction. The maximum slope in this area is 11.1% and the slope of this aspect will drain towards the north east in the direction of agricultural farmlands.

Cross Section B shows the cross section in a north west to south east direction. The maximum slope in this area is 8.2%, associated also with the northerly aspect with drainage towards the direction of Tackinbri Creek. The area towards the southern portion of the iste has a similar fall in the southern direction.

Tikitere is located in the north-west slopes and plains in an area described as the northern basalts characterised by undulating hills traversed by numerous ephemeral streams. Slopes generally range between 1-6%. Tackinbri Creek transverses the southern edge of the property. The proposed quarry site is located at approximately 310 AHD.

Figure 12 – Cross Sections

Figure 13 – Pearlman Quarry Cross Section A (North East to South West)

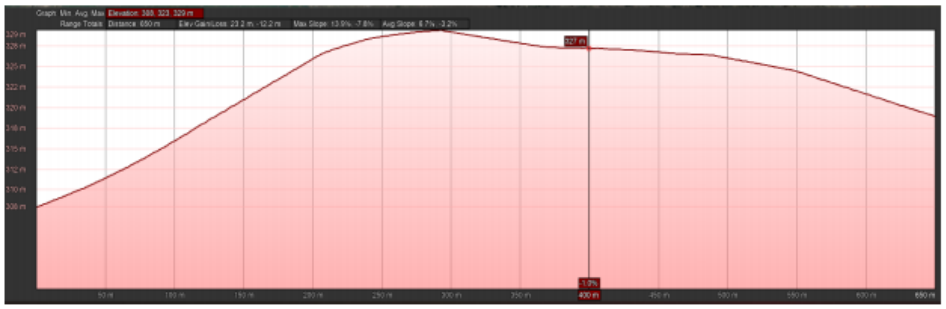
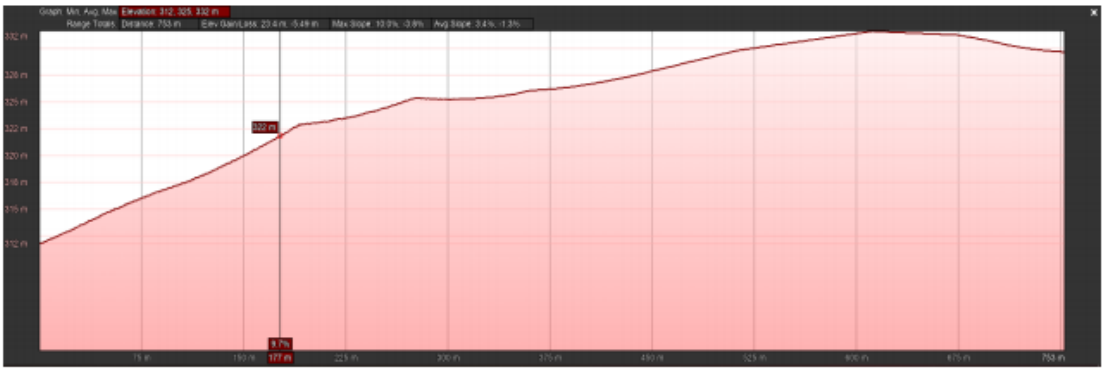


Figure 14 – Pearlman Quarry Cross Section B (North West to South East)



Soils

The NSW Soil and Land Information Database, eSPADE, managed by the NSW Office of Environment and Heritage, has been referred to for assessing the likely soil conditions for the site: The soil distribution of the site is provided below, along with a summary of the main soil characteristics and their limitations.

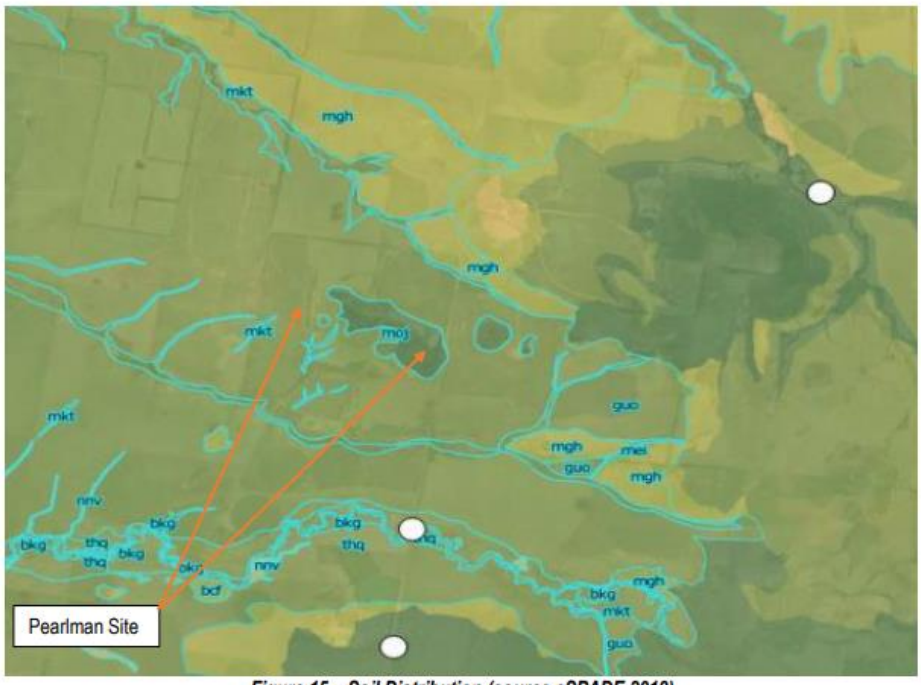


Figure 15 – Soil Distribution (source eSPADE 2018)

Manamoi Soil – Quarry site	**Landscape** - Rectilinear to concave footslopes and gently undulating rises to low hills on Tertiary basalt. Slopes range from 3 - 10 %, local relief varies between 5 - 50 m and elevation ranges between 200 - 330 m. Drainage is by overland flow; natural drainage lines were not observed, although contour banks and grassed waterways have been constructed to control runoff.

	Geology - Geology mapping identifies this area being dominated by Tertiary Volcanics/Nandewar Volcanic Complex (Tnt1) consisting of hawaiite, trachyandesite, tristanite, trachyte, minor peralkaline trachyte and tuff. **Soils** - Soils are generally Vertosols with high shrink-swell properties. Deep to very deep (>150 cm), moderately well-drained, self-mulching Black Vertosols (Black Earths) on slopes and imperfectly to poorly-drained self-mulching Grey Vertosols (Grey Clays) on lower slopes. Moderately deep (50 - 150 cm) Brown Dermosols (Chocolate Soils/Brown Clays) expected on steeper slopes associated with in situ development on bedrock. **Qualities and limitations** - localised foundation hazard, widespread productive arable land, widespread recharge zone, localised discharge zone, localised gully erosion hazard, widespread sheet erosion hazard, widespread high run-on.
Gurley Soil – Stockpile site	**Landscape** - Extensive level plains to undulating rises of Pleistocene alluvium adjacent to bedrock hills in the eastern Moree Plains. Slopes are level to gently inclined, with gradients between 1 - 3%, local relief varies from 1 - 9 m, and elevation ranges between 180 - 320 m. The landscape consists of a large remnant sheet-flood fan system with elevation and local relief rising to the east. Surfaces are locally weakly gilgaied. Drainage is by surface flow and contemporary alluvial processes are absent. These are the eroded fifth terraces of Ward W.T. (1999). These fans are discernible from more recent fan systems by radiometric imagery (low Potassium response). **Geology** – These are the oldest alluvial/sheet flood fans of the north-west plains fans systems (the eroded fifth terraces of Ward et al. (1999), distinguished by a low Potassium radiometric response. Gravel lenses outcrop in some locations, particularly around the edge of the unit where it adjoins the Bellata (btj) soil landscape. In some locations a strongly-structured bright reddish brown subplastic clay, believed to be parna, occurs as prior channel infill deposits. Geological mapping indicates the dominant geological units include an unnamed Quaternary sheet wash (Qc), consisting of often gilgaied clayey colluvium. Also occurring is the Quaternary colluvium (Qrhs3) unit, consisting of often gilgaied clayey substrate, and Unnamed Quaternary Alluvium/Piedmont plain or bajada 3 (Qs3) consisting of texture-contrast soils with sand dominating at the surface. **Soils** – The soils are generally all Vertosols with high shrink-swell properties and consist of very deep (>150 cm), moderately well-drained to imperfectly drained, Epipedal to self-mulching, Brown and Grey Vertosols (Grey Clays) on crests and slopes with occasional Black Vertosols (Black Earths). Very deep (>150 cm), imperfectly drained Grey Vertosols (Grey Clays) on lower slopes. **Qualities and limitations** – Widespread foundation hazard, localised seasonal water logging, localised sheet erosion, Widespread woody weeds, Widespread productive arable land, low salt stores.

In addition to the above soil characteristic, other considerations with regard to soil resources have been assessed, specifically Acid Sulfate Soils and Biophysical Strategic Agricultural Land (BSAL). The following information is provided regarding these aspects:

- The site is not mapped as containing Acid Sulfate Soils (ASS), and given its location and geological characteristics, these would not be present in this region.
- The proposed Pearlman Quarry site is partly mapped as containing Biophysical Strategic Agricultural Land (BSAL).

The area of mapped BSAL generally correlates with both the Manamio and Gurley Soil distribution within the site. Majority of the soil type that the Pearlman Quarry footprint is located on areas mapped as BSAL. As such the Pearlman Quarry propose to disturb areas mapped as BSAL, however as per the photos below it appears that where this BSAL is mapped in areas of the upper hill slope the soil profile is these locations are constrained with a larger number of basalt floaters in the upper horizon of the soil profile. Based on this the area of the quarry footprint mapped as BSAL are likely to have limitations in supporting agriculture which is further demonstrated in the land capability.

Figure 17 – Soil conditions in areas of mapped BSAL

Geology

The geology of the site comprise ridgelines of remnant undifferentiated Tertiary basalt flows which overlie Jurassic sandstone and siltstone of the Warialda Sandstone. The ridgeline to the west of the site is considered as a localised volcanic vent due to its limited lateral extent, varying depth profile (>30m in the central portion) and occurrence of pumice breccia on the margins. The site of the proposed Pearlman Quarry occupies a relatively thin but laterally extensive basalt ridge and considered to be a remnant flow, possibly sourced from the nearby vent further to the west.

A summary of potential impacts is as follows

- Change to topography characteristics that redirects or retains overland flow.
- Loss of soil resources because of wind erosion
- Loss of soil resources because of water erosion
- Impacts on waterways associated with sediment loss
- Impact on air quality as a result of dust generation
- Erosion of soil surface as a result of concentrated stormwater flows.

Conservation of soil resources will be required during the operation of the site, and for those areas requiring disturbance, management of the soil resource and associated potential impacts will be required to be undertaken. Likewise, at the cessation of quarrying activities the site will be required to be rehabilitated to restore the cultivation capacity of the disturbance areas.

Management and Mitigation Measures – Soil Management

Aspect	Control
Erosion and Sediment Controls	• See Section 3.11 Surface Water
Soil Management	<u>Topsoil Stripping</u> • A nominal stripping depth of 100 mm has been allowed for the proposed quarry area. • The operator shall remove topsoil from within the limtes of disturbance to a depth of 100 mm unless determinied otherwise through the site validation. • All grass, root fibre, decayed vegetation matter and any other organic or deleterious material shall be removed and stockpiled for reuse in the rehabilitation of the site. <u>Prior to Stripping Commencing</u> • Topsoil stripping depths will be determined and marked on the site for earthmoving plant operators to follow. • Earthmoving plant operators are to be made aware of stripping depths and the topsoil stripping management plan. • Prior to stripping activities, Aboriginal cultural heritage clearance approvals will need to be in place. • Suitable stockpile areas (as required) will be nominated. • Suitable areas for direct return of topsoil (if available) will be nominated. <u>Stripping</u> • The topsoil removed shall be applied directly to a prepared rehabilitation area. If no rehabilitation areas exist topsoil shall be stockpiled at appropriate locations. • Topsoil will be recovered using appropriate equipment. Depending on compaction and recovery rates, deep ripping may be required to maximise topsoil recovery with care taken not to mix topsoil with problematic subsoil. • It is preferable for material to be stripped when it is in lightly moist conditions. • Contractors bringing machinery onto the site will be required to present such machinery in a weed free conditions • Disturbance areas will be stripped progressively, as required, in order to reduce erosion and sediment generation, to reduce the extent of topsoil stockpiles and to utilise stripped topsoil as soon as possible for rehabilitation. • Rehabilitation of disturbed areas, such as roads, embankments and batters, will be undertaken as soon as practicable after these structures are completed / no longer required or as areas are no longer required for quarrying purposes. <u>Stockpiling</u> • Topsoil shall be stockpiled in low mounds.

	• The side slopes of stockpiles shall not be steeper than 1 vertical in 4 horizontals.
	• Surface drainage of the stockpiles shall be managed to minimise loss of material through erosion. Stockpiles shall not be located so as to impede the drainage from upstream catchment areas.
	• Stockpile locations will be subject to the following actions:
	  o Grazing stock, machinery and vehicles will be excluded.
	  o Overland water flow onto or across stockpile sites will be kept to a practical minimum.
	  o Where possible, stockpile sites will be selected to maximise protection from 'the prevailing winds', particularly if the material is friable in nature.
	  o Drainage from higher areas will be diverted around stockpile areas to prevent erosion
	  o As required, sediment controls will be installed downstream of stockpile areas to collect any run-off.
	  o Topsoil stockpile locations will be strategically located to assist the sequence of future rehabilitation.
	
	<u>Respreading of Topsoil</u>
	• Topsoil shall be respreads evenly over the rehabilitated area and access tracks on completion of operations.
	• Balance the topsoil requirement for rehabilitation areas against store stockpile inventories and proposed stripping volumes.
	• Maximise the opportunities for direct placement of topsoil from pre-strip to rehabilitation areas.
	• During removal of soils from the stockpiles, take car to minimise structural degradation of the soils
	• Re-spread topsoil material in even layers at a thickness appropriate for the landform and land capability of the area to be rehabilitated.
	• Contour rip to encourage rainfall infiltration and minimise run-off.
	• Soon after spreading, plant cotton, to return the disturbance area to the pre-disturbance use (cotton cultivation)
	• Construct contour banks in accordance with the applicable landform design criteria to limit slope lengths and control run-off.
	• Construct collection drains and sedimentation dams to collect run-off and remove suspended sediment.
	• Regularly inspect and maintain rehabilitation areas to facilitate sediment and erosion control and revegetation success.
	• Regularly inspect rehabilitated areas for declared plants and environmental weeds, and control significant weed outbreaks using chemical or mechanical control methods.

Rehabilitation	• See Management and Mitigation Measures detailed in Section 3.6 Land Capability
Commitments	• Quarry Environmental Management Plan to include Erosion and Sediment Control Plan (prepared in accordance with DECC, 2008 *Managing Urban Stormwater Soils and Constuction Vol 2E*). • The Quarry Environmental Management Plan will include a Rehabilitation Management Plan

Whilst the proposal will disturb the land, appropriate mitigation measures will manage the potential impacts. Erosion and sediment control will minimise potential impacts to water and air quality, and rehabilitation of the site as a free draining landform suitable for the continuation of agricultural activities will also ensure that land capability is restored.

5.3 Land Capability

Proponents Submission

Land and soil capability assessment is a function of the biophysical aspect of the subject land, including the parameters – slope, wind hazard, soil pH, surface structural stability, salinity, rocky outcrop, water logging, potential and existing erosion of a landform. Land capability is classified into a numerical system with 1 being the land with the fewest limitations for agricultural use, and 8 being land with extreme limitations and the least capability to support agricultural activities. The NSW Soil and Land Information Database eSPADE, managed by OEH, has been referred to for assessing the mapped land capability of the site, which is shown below in Figure 18 – Land Capability. Table 6 Land Capabilty Summary, details the land capability classification for the site. It is important to note that the all quarrying activities will be wholly contained with the area mapped as Land Capability Class 4.

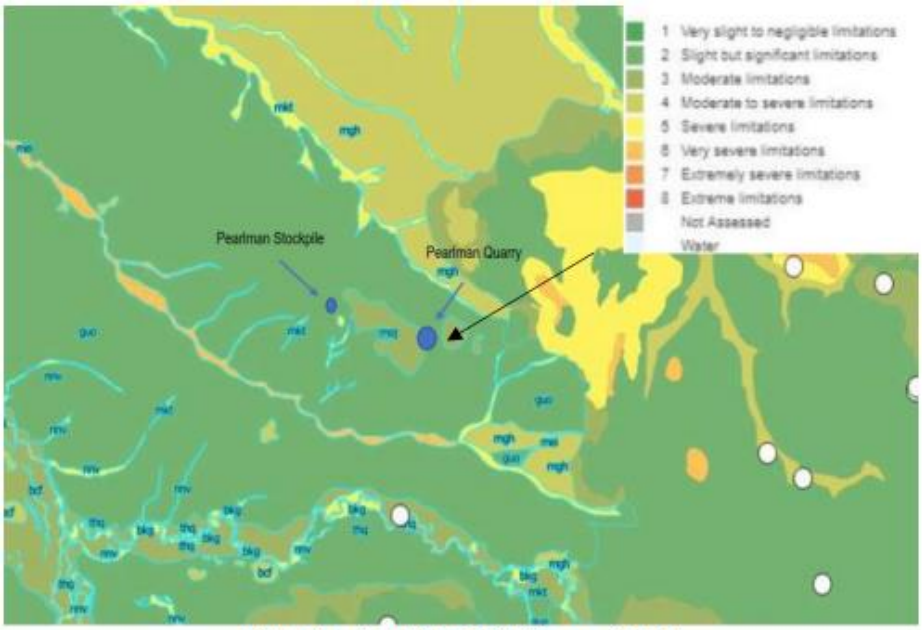


Figure 18 – Land Capability (Source: eSPADE)

Table 6 – Land Capability Summary

Area on site	Land Capability	Comment
Proposed Quarry Site	4 - Moderate/Severe Limitations	The proposed quarry is contained within the Death Adder Hill which is class 4 land. Limitations are likely owing to topographical and geological constraints such as existing erosion, shallow soils, steep slopes and rock outcrops resulting in the inability to effectivity utilise the land for cultivation for high value crops.
Area on site	**Land Capability**	**Comment**
Proposed Stockpile Site	2 – Slight but Significant Limitations	The Pearlman Quarry will utilise the existing stockpile area already established for the Tikitere site. This area avoids remnant vegetation and areas under cultivation.

The potential impacts include the erosion of disturbed areas, the mobilisation of rock, further shallowing of the soil resources and formation of a benched landform. The management of these potential impacts are outlined below.

Management and Mitigation Measures – Soil Management

Aspect	Control
Erosion and Sediment Controls	• See Section 3.11 Surface Water
Weeds	• See Section 3.18 Biosecurity
Rehabilitation	<u>Removal of Infrastructure</u> • Site buildings, plant and equipment will be removed at the cessation of the extraction activities. • There are no site services that will require rehabilitation at closure as these services will be made available through alternative means (ie generator for power, rainwater or bore water for water use, satellite phones for communications etc). • Roadways and haul roads that are not required post quarrying land use will be decommissioned and rehabilitated. • Roadways and haul roads that are not required post quarrying land use will be decommissioned and rehabilitated. These areas will be re-profiled to march surrounding rehabilitation profile, ripped and seeded to encourage vegetation regrowth. • All refueling will be done via service trick to eliminate the need to store large quantities of fuel onsite. If necessary, any contaminated soils will be preferentially treated on-sit in accordance with the recommendations of the Site Based Management Plan (SBMP) or any recommendations from the site-specific contaminated land assessment. <u>Rehabilitation of Sediment Basins</u> • Any sediment basins will be retained as agricultural dams. • Alternatively, sediment basins may be filled to a level consistent with the surrounding landform. <u>Landform Shaping</u> • When the floor level for a working area has been excavated to its final extraction level and is no longer required for ongoing quarry

	activities, the floor will be graded to encourage water drainage in the appropriate direction. • Once desired landform shape has been achieved the area will be top soiled and seeded to achieve ground cover and stable landform. <u>Soil Preparation</u> • Remove any weed species which may be present in the overburden and topsoil stockpiles prior to using in the rehabilitation works. • Carry out soil tests to determine whether any soil ameliorants (eg nutrients, lime, gypsum) are required to improve the quality of the topsoil an overburden for supporting vegetative growth. • Spread topsoil a minimum depth of 0.1m. The topsoil should be moist but not wet when spread. • Incorporate any required soil ameliorants during the spreading works. • Topsoil is to be levelled to achieve an even roughened surface. • If the operational requirements permit, topsoil and overburden materials can be placed directly over the quarry floor area as an alternative to stockpiling these materials. <u>Revegetation</u> • Return the land to a conditions capable of sustaining the ongoing rural land use. <u>Stockpile Areas</u> • Areas that have been used for stockpiling will be deep ripped and treated with an ameliorant if required. These areas will be restored to a condition suitable for supporting agricultural production.
Commitments	• Quarry Environmental Management Plan to include a: o Erosion and Sediment Control Plan (prepared in accordance with DECC, 2008 *Managing Urban Stormwater Soils and Construction Vol 2E*); and o Rehabilitation Management Strategy; and o Pest and Weed Management Strategy.

The extractive activities will be limited to the area mapped as Land Capability Class 4, and not in areas that are suitable for supporting high value agriculture. Rehabilitation of the quarry will be progressive as areas become available for restoration. All disturbed areas will be rehabilitated to a final condition suitable of continuing the agricultural activities of the area. This includes the area to be utilised as the stockpile area.

5.4 Resource Assessment

Proponents Submission

The basalt at Tikitere East forms an east-south-east trending ridge line, approximately 1600m by 150m wide, which rises to about 10m above the surrounding plain.

This investigation was focussed on drilling along the axis of the main ridge line to test the depth to the contact with the underlying sandstone, with some holes drilled on the edges of the ridge line to determine contact morphology.

Drilling encountered reasonably consistent basalt thickness along the ridge line, with some holes showing up to 8m of basalt. Average thickness is around 7m for the western ridge line and 5 m for the central ridge line. Although it wasn't drilled, it is estimated the basalt on the eastern ridge is also around 5m average thickness.

Modelling of the basalt-sandstone contact based on drilling and aerial photo interpretation was undertaken and enabled a reasonably accurate estimate of basalt thickness and volume (refer to Figure 6 – Tikitere East Basalt Thickness). Estimated volumes are shown in Table 4, using a 50mm buffer zone to the property boundary.

Figure 6 – Tikitere East - Basalt Thickness

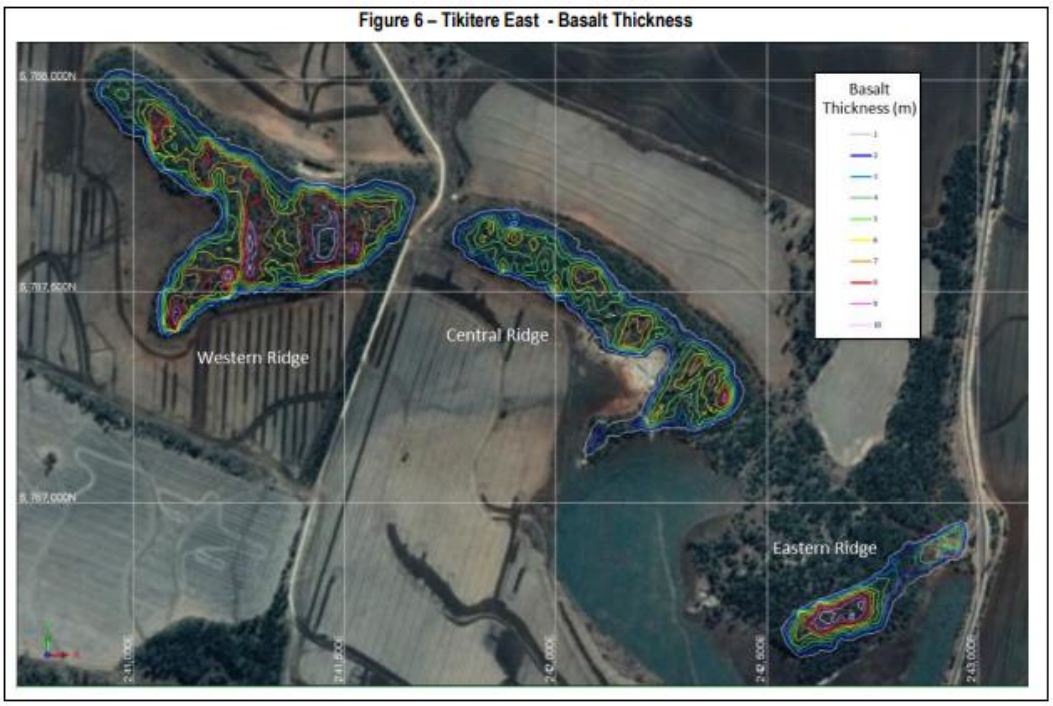


Table 4 - Tikitere East Basalt Volumes

Basalt	Volume (m^3)
Western Ridge	1,040,000
Central Ridge	515,000
Eastern Ridge	182,000
Total	**1,737,000**

The quality of the basalt on the ridges appears to be slightly less than that of Tikitere West. Likely because flows are less massive than vents and are more susceptible to weathering processes. However, the basalt of the ridge lines is still considered of good quality and should meet the specifications of rail ballast.

Staff Comment

The proposed quarry area is located within a highly altered landscape previously used for farming activity and the areas of remnant native vegetation. Some of the native vegetation in the area is considered to be pocketed and small in size, are isolated and degraded.

However, this is not the case at the proposed quarry site, an area of 8.7 hectares of native vegetation is to be removed most of which is considered to be in good or very good condition. The vegetation to be removed includes two plant community types (PCT):

- 6.98 hectares of PCT 418 being White Cypress Pine – Silver-leaved Ironbark – Wilga shrub grass woodland of the Narrabri-Yetman region, Brigalow Belt South Bioregion; and
- 1.73 hectares of PCT Mock Olive – Wilga – Peach Bush- Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion which is considered an Endangered Ecological Community.

The removal of the native vegetation is not considered to place either PCT nor any flora/fauna in endanger of extinction and will be mitigated by the retirement of Biodiversity credits.

The assessment of Aboriginal and Cultural heritage was comprehensive and resulted in the discovery of a previously unknown item of indigenous heritage. The item is to be left in its current location and protected from disturbance by the Quarry Environmental Management Plans avoidance and mitigation measures. However, it would be advisable that a further site visit be organised by indigenous women as recommended by the registered interest Aboriginal representatives who were present during the field assessment of the site. This visit should take place prior to the quarries commencement.

Other potential impacts such as noise, vibration and dust emission are minimised by the proposed mitigation measures and the sites advantageous location, providing effective separation distances from sensitive receptors.

The implementation of an effective Traffic Management Plan will minimise the noise experienced by residents and inconvenience to road users caused by the increase of heavy vehicles on the local road network. In addition the increased pressure to the local road networks infrastructure will be mitigated by the payment of an appropriate s94 Development Contribution.

Accordingly, the Resource Investigation carried out for the Inland Rail project identified a significant quantity of material at the site which is considered to be of an adequate standard for the materials proposed usage as ballast of the reconstruction of the Narrabri to North Star and North Star to the Border sections of the Inland Rail.

According to Council's knowledge the property is not subject to local flooding, subsidence, slip or bush fire.

The development proposal before the Panel will not have a significant effect on conserving and using prime / productive agricultural land.

The site is considered suitable for the proposed development if all measures to avoid, minimise and mitigate the potential impacts are implemented.

6. S.4.15 (1) (d) Any submission made in accordance with this Act or the Regulations.

The proposed development was advertised and notified in accordance with the Environmental Planning and Assessment Act 1979 and Environmental Planning and Assessment Regulation 2000. Adjoining landowners within a 500 metre buffer of the proposed development were directly notified, as was those adjoining proposed haulage routes. The proposed development was also internally and externally referred to the following:

- Environmental Protection Authority (EPA)
- Roads & Maritime Services (RMS)
- Department of Primary Industries (DPI)
- Department of Planning Industry and Environment (DPIE)
- Department of Industry – Natural Resources Access Regulator (NRAR)
- Office of Environment and Heritage
- NSW Water (NOW)
- Moree Plains Shire Council
- Technical Services Department (Internal Referral)

6.1 Environment Protection Authority

The EPA reviewed the proposed developments EIS and has determined that it is able to issue a licence for the proposal, subject to conditions.

The EPA have provided General Terms of Approval which will form part of the Draft Conditions of Consent.

In additions the EPA have identified a number of environmental issues that may be considered during the assessment of the proposed development

- The EPA notes that the proposed activity is predicted not to exceed the relevant noise criteria but is likely to be audible to nearby residence and therefore noticed as a change in the acoustic environment. The proponent is encouraged to:
    - Schedule noisy operations as much as practicable after 7am;
    - Utilise a site layout that maximises forward movement and minimises vehicle and machinery reversing, to minimise reversing alarm noise; and
    - Use alternatives to tonal reversing alarms (“beepers”) such as broadband alarms, reversing cameras, proximity alarms or a combination of these, to minimise potential noise impacts associated with reversing beepers.
- The EPA also notes the proponent intends to operate between 6am – 6pm Monday to Saturday however, there is potential to operate 24 hours a day. Because of the use of assumed power levels for some plant and equipment, the EPA expects actual measured levels of plant and equipment operating on site to be supplied with any application for 24-hour operation, to ensure noise limits and criteria remain appropriate.

Where appropriate conditions have be included with Council's Schedule of Conditions, alleviating or mitigating the matters raised in the above submissions.

A copy of the EPA's submission has been included at Annexure 6.

6.2 Roads and Maritime Services

Roads and Maritime Services reviewed the EIS and attachments (in particular Attachment 9 – Traffic Impact Assessment) and have provided the following comments:

- The Austroads BAR, BAL and sealing improvements that were undertaken for the adjoining Tikitere Quarry has a limited capacity before they will require upgrading to a CHR and/or AUL. Roads and Maritime recommends that the total number of loads for both quarries should not exceed mort ha 15/hour for each approach of Croppa Creek Road until the intersection is further upgraded.
- The development application has demonstrated that the largest design vehicle entering the site will be a truck and dog. Council will need to determine if the consent will need to be conditioned to limit access to larger design vehicles.
- It is noted that arrangements have been made with both Gwydir and Moree Shire Councils for contributions to the maintenance of the road network.
- The existing Traffic Management Plan (TMP) and Code of Conduct used by Tikitere Quarry should be implemented for the Pearlman Quarry.

Where appropriate conditions have be included with Council's Schedule of Conditions, alleviating or mitigating the matters raised in the above submissions.

A copy of the EPA's submission has been included at Annexure 6.

6.3 Department of Primary Industries

DPI has reviewed the proposal and provided no comment.

6.4 Department of Planning Industry and Environment – Biodiversity and Conservation Division

The DPIE reviewed the proposed development Biodiversity Development Assessment Report (BDAR) and confirmed that the BDAR adequately addresses the requirements of the Biodiversity Assessment Method (BAM) required under the BC Act.

The DPIE provided details of the minimum requirements for a BDAR and how these requirements were met by the proposal, along with additional comments on the BDAR and the BAM calculator.

Where appropriate conditions have be included with Council's Schedule of Conditions, alleviating or mitigating the matters raised in the above submissions.

A copy of the DPIE's submission has been included at Annexure 6.

6.5 Department of Industry – Natural Resources Access Regulator

The NRAR reviewed the proposal and confirmed that the matter was not a matter for NRAR because the proposal does not require a licence/lease under the Mining Act, nor was it a Controlled Activity under the Water Management Act.

6.6 NSW Water

No response was received.

6.7 Office of Environment and Heritage

No response was received.

6.8 Moree Plains Shire Council

No response was received.

6.9 Public Submission and Response to Submissions from applicant

One public submission by way of an objection was received by Council in relation to this proposal. A summary of the concerns raised in the submission are listed below along with the applicants response to those concerns. Complete copies of the submission and the applicant response can be viewed at Annexure 5.

1	Tikitere Bora Ground	• Group of Carved Trees are almost certainly a bora (initiation) ground. • Somewhere close to the proposed quarry site is a very important Aboriginal sacred site which was not addressed in the EIS. • Carved trees and there locality are documented in AHIMS • The Parish name Booraba – suffix Baa meaning place of or domain of, which adds to the idea that the locality is of ceremonial significance.	• The AHIMS register was reviewed as part of the Aboriginal Cultural Assessment Report. • During the assessment known AHIMS registered locations where reviewed in relation to the quarry footprint • During the assessment a previously unknown scar tree was located and the quarry site modified to ensure the location was avoided.
2	Artefacts Known	• Aboriginal stone artefacts have been seed along Tackinbri Creek near Croppa Creek to the south east of the proposed quarry. • Artefacts are likely to be found across the landscape	• The Aboriginal Cultural Assessment reports field assessment was undertaken in conjunction with interested aboriginal parties. • The field assessment concentrated on the

		where ground visibility is high.	presence of heritage items with in the disturbance footprint for the quarry. • Tackinbri Creek is over 2.5km for the quarry site and consist of a difference landscape which may be of higher cultural heritage value.
3	Possible Axe Quarry	• Based on known examples, small outcrops of hard basalt rock may have been quarried in pre-colonial times for stone axe heads, an important tool and trade item. • The quarry site and any basalt parts of the larger hill to the east should be thoroughly inspected for a Aboriginal axe quarry	• The Cultural Heritage Assessment followed relevant industry guidelines including: - The Burra Charter - Guide to investigation, assessing and report on Aboriginal cultural heritage in NSW - Aboriginal Cultural Heritage Consultation Requirements for Proponents - Code of Practice for Archaeological investigation of Aboriginal Objects in NSW - Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW
4	Mitigation Relating to Cultural Heritage is Inadequate	• Proposed mitigation with regards to unexpected finds not convincing as it relies on staff and contractors to recognise artefacts. • Suggests that regular visits by a skilled local Aboriginal person throughout the quarries operations to	• Awareness raising of Cultural Heritage Values at the site in only one part of the Quarry's Environmental Management Plan. Other measures include exclusion zones, fencing and signage for the scar tree, hazard identification and

		check and train staff in what to look for.	reporting, routine area inspections and pre-clearing inspections.
5	Aboriginal Consultation is Necessary	• Consultation with the Aboriginal Community regarding potential impacts has not be carried out. • Failed attempts at contacting the Local Aboriginal Land Council do not count.	• Refer to point 3 above
6	Commonwealth Legislation	• Proposal should be referred to Commonwealth Minister under the Environment Protection and Biodiversity Conservation Act in relation to impacts on Semi-Evergreen Vine Thicket ECC	• Advitech Environmental completed a Biodiversity Development Assessment Report (BDAR) as part of the proposal. • The BDAR has been accepted by the NSW Office of Environment and Heritage
7	Vegetation Management Plan	• A Vegetation Management Plan should be assessed and approved prior to granting any development consent. • The Vegetation Management Plan should be made an enforceable condition of consent.	• The BDAR covers the approval requirements with respect to vegetation aspects.
8	Protect the EEC	• The DA should be refused based on the loss of the Semi-Evergreen Vine Thicket. • The remaining Semi-Evergreen Vine Thicket be placed under a conservation management agreement to offset the area being destroyed by the quarry. • That the Aboriginal Community have an opportunity to be involved	• Refer to points 6 and 7 above

		in the management of this vegetation area.	
9	Groundwater	• Likely diversion of surface waters and increase in groundwater recharge once quarrying is completed and the site rehabilitated. • This requires further analysis	• Rehabilitation will include the replacement of topsoil and revegetation of disturbed areas. • Groundwater recharge will not be accelerated in these areas.
10	Rehabilitation	• The proposed rehabilitation fund of $15,000 is inadequate and more is recommended	• Plant, equipment and labour costs are considered in-kind costs that have been excluded for this estimate
11	Cumulative Impacts	• The proposed quarry is in addition to the existing Tikitere Quarry. Both quarries are part of the inland rail development and should be assessed as cumulative parts of the major development, rather than as small stand-along proposals	• This point was not addressed in the applicant's response.

6.10 Internal Council Referrals

The proposed development was referred internally to Council's Technical Services Department for advice on the following:

1. Cumulative Impacts on proposed haulage routes due to the operation of both the Tikitere and Pearlman Quarries
2. Any need for upgrades to the access and egress points form the quarries internal haulage roads
3. Consideration of the development in accordance with the Gwydir s94 Development Contributions Plan – Traffic Generating Development.
4. Identification of any other impacts or potential problems that the operation of the proposed development may cause.

Staff Comment

In accordance with information received by Council on the 5 February 2020 (See attached at Annexure 6) the following advice is offered by Council's Technical Services Department.

Section 94 contributions were calculated through analysis of historical maintenance costs of all routes specified within Gwydir Shire. Annualised rehabilitation costs were added to

averaged annual maintenance costs to calculate total Council expenditure per year, per route. For ease of calculation, it was assumed that maintenance and rehabilitation costs are proportional to heavy vehicle traffic.

Using predicted traffic volumes provided by the applicant, expected yearly increases were calculated as a percentage of existing traffic, which were then applied to averaged annual maintenance costs (i.e. a 75% increase in heavy vehicle traffic would be expected to increase Council's expenditure by 75%). This was done on a road by road basis, and where the applicant identified only a portion of a road as a haulage route that same portion of the cost was applied.

Note: Due to the variability is predicted traffic volumes and quarry output supplied to Council, forecast figures from 2021/2022 were used for the purposed of calculation.

For Example

Road X has existing heavy vehicle traffic counts of 100 vehicles per day and Council spends $100,000 per year on this road for maintenance. The Road is 100km long. The proposed development will generate an additional 50 movements and use 50km of the 100km road.
Increased cost to Council

- 50 new movements / 100 existing movements = 50% traffic increase
- 50% of current annual expenditure = $100,000 x 50% = $50,000
- Quarry traffic utilises only 50km of the road's 100km length = $50,000 x 50/100 = $25,000 increase per year
- Total quarry traffic via Council roads 240,000 tonnes per year
- Cost per tonne for Road X = $25,000 / 240,000 = 10.41 cents

The same calculations are then made for all nominated haul roads (excluding IB Bore Road) and summed to determine the final suggested contribution.

In the below s94 contributions table IB Bore Road is deemed unsuitable for quarry traffic. Volumes provided to Council for this road were applied to North Star Road

Road	Traffic Count (heavy)	Maintenance Cost (Annual Average)	Rehabilitation Frequency	Length	Length Trafficked	Percentage of Length Trafficked	Rehabilitation Cost (per km)	Cost to Rehab Entire Road	Annualised Rehab	Total Annualised Cost	Predicted Quarry Traffic	Percentage Increase Due to Quarry	Annual Cost Burden to Council
Croppa Creek Road	36	36420	40	23.19	23.19	100%	300000	6957000	173925	210345	23	64%	$ 134,387.08
IB Bore Road	9	36546.75	9	21.35	21.35	100%	30000	640500	71166.6667	107713.4167	0	0%	$ -
North Star Road	184	194080	40	81.72	19.29	24%	300000	24516000	612900	806980	25.3	14%	$ 26,192.04
Croppa Moree Road	28	24413.75	40	12.57	12.57	100%	300000	3771000	94275	118688.75	20.7	74%	$ 87,744.90
Crooble Road	5	8000	40	12.2	4.3	35%	20000	244000	6100	14100	5	100%	$ 4,969.67
Buckie Road	11	16795	40	2.15	2.15	100%	300000	645000	16125	32920	5	45%	$ 14,963.64

Total Increased Maintenance Burden) $ 268,257.33

Cost/tonne at 240,000 tones pa $ 1.12

The above process derives a s94 Contributions figure of a minimum of $1.12 per tonne

Notes
As predicted traffic volumes for Crooble and Buckie Road were not provided by the applicant, 5 movements per day was assumed. As the Quarry entrance is located on Croppa Creek Road, and predictions provided to Council indicate approximately 50% of traffic will head north and 50% south, the increase applied to Croppa Creek Road for the purposes of calculations was 50% of the figure provided to Council. Where multiple traffic counts were available, data was averaged

Boonery Park Road and Tumba Road were excluded from the above calculations as a result of their very low volumes and minimal pavement. As both roads have poor to no pavement in places, their suitability as haulage routes is poor. It is recommended that both roads be upgraded to Arterial gravel road standard (8m crushed rock formation, 200mm thick) and the intersections of both roads be upgraded to Austroad standards to the nominated haulage configuration and predicted volumes at the cost of the proponent. Side tracks should be eliminated or blocked off due to potential conflict between vehicles merging between the two formations.

It is also recommended that a condition of consent be included that states, that until IB Bore Road is upgraded to a sealed formation, approval is not granted to utilise the road as a haul route. In addition, all unsealed roads must be avoided during adverse weather conditions.

Further, as recommended by Roads and Maritime Services, that a condition of consent be included that states the intersection of the quarry access road and Croppa Creek Road is to be upgrader to CHR/CHL Austroads standard. Until such time as the upgrade has been undertaken, total combined vehicle movements from both quarries must not exceed 15 per hour.

7. S.4.15 (1) (e) The public interest - *Federal, State and Local Government Interests and Community Interests.*

Proponents Submission

The project would extract a maximum of 490,000 tonnes per annum, to supply the Inland Rail Project and associated road projects and thereby support and enhance the economic viability of the region. Consent is being sought for a period of up to ten (10) years, subject to the progress of the construction activity in the area and would not include necessary time for the completion of any rehabilitation works once the resource is exhausted.

The Australian Rail Track Corporation (ARTC) identified the need for structural fill, track capping and ballast material requirements for the Narrabri to North Star section of the inland rail project upgrade project. In the EIS prepared for this project (ARTC, 2017), specially sections 8.52, identifies that the procurement of these material would be sourced locally from suitable quarries along the Inland Rail alignment. Similarly, Roads and Maritime Services (RMS) require similar materials for the Newell Highway upgrade works and note in approval documents that there are limited local supplies of gravel and aggregate that conform to suitable standards, requiring such resources to be imported from further afield.

The subject site was selected based on the absences of constraints, abundance of high-quality resources and proximity to the Inland Rail Project site and road upgrade project

works. The consequences of not carrying out the project were also considered, resulting in the ARTC and RMS having to source construction material from other existing or new greenfield sites which may be at a higher cost based similarly levels of disturbance.

The project has been designed to avoid impacts to the areas of environmental significance on the site and minimise any remaining potential impacts through appropriate design and management measures. A thorough and comprehensive assessment of existing environmental values and potential environmental impacts have been undertaken. Environmental aspects considered by this EIS include the following:

- Aboriginal and historic heritage
- Traffic impacts
- Biodiversity impacts
- Noise, dust and blasting impacts
- Surface water management
- Resource characteristics

Extractive industries are a significant contributor to the material needs of local and regional communities and to economic activity and development. Extractive resources are site specific, limited in occurrence by geological conditions and are finite. Because they are high-volume, low cost materials, they need to be located close to communities that use them as the cost of transport to the end users contributes greatly to the overall cost of the delivered product. Extractive industries underpin all urban and infrastructure development and make a major contribution to the ongoing economic growth of the community through direct and indirect employment opportunities

The potential environmental impacts of the project have been identified and measures proposed to manage and mitigate those impacts. Therefore, it is considered unlikely that the project would have a significant detrimental impact on the environmental values of the site. The project would provide economic benefit to the local community through additional employment whilst also providing improved material delivery efficiencies to the Inland Rail Project which will benefit the wider region. Accordingly, it is considered that the proposal is justified and its impacts acceptable subject to the implementation of the management and mitigation measures identified by this EIS and supporting specialist assessments.

Staff Comment

There are no submissions received by Council directly relating to public interest.

Submissions made by the public, state agencies and other groups/organisations have been assessed and addressed within the report and draft schedule of conditions. The approval of the proposed development will not be contrary to the public interest, subject to implementation of the recommended conditions of consent.